II. ADJUSTING BULGARIAN AGRICULTURAL POLICIES TO THE EU'S CAP

ALTERNATIVE AGRICULTURAL POLICY OPTIONS FOR BULGARIA

The assumption is that, as a new entrant, Bulgaria will have to adjust to the EU, accepting the full body of the existing legislation and policies in the EU. Accession negotiations will therefore focus on the speed and method by which Bulgaria has to adopt the EU legislation. However, agricultural policy in the EU is also evolving beyond the changes introduced under the so-called McSharry reform and Agenda 2000. Current prices in the EU are not necessarily a good benchmark for price alignment. The pressure for reform in the CAP will probably become even stronger if the WTO negotiations on agriculture will take place, and due to the approaching time for EU enlargement. Therefore, the EU agricultural policy at the time of accession has to be seen as a "moving target" which depends on a number of still open questions.

Some words have to be said about the limitations and various considerations to implement EU agricultural policy scenarios:

- A rapid alignment would push food prices upward, reducing consumer's real income, particularly for those who spend a relative high share of their income on food. By how much, is an empirical question we examine below.

- Moreover, higher farm gate prices would imply higher prices for raw materials for the agro-processing industry in Bulgaria, which would force the processing industry to absorb these higher prices through lower processing and marketing margins. This phenomenon could greatly reduce the prospects of modernization and restructuring of the agro-processing industry.

- Rapid alignment to CAP prices would probably result in surplus production, which could not be exported without export subsidies, and - before membership - such exports are to be financed by Bulgaria's government budget.

- Bulgaria is bound by trade agreements with several countries. It has a free trade agreement with CEFTA countries which includes agriculture. Most important, due to the Europe Agreement, Bulgaria is very restricted in imposing tariffs against the EU.

To the extent that current supply control policy in the EU continues for some products (production quotas for sugar and milk, acreage for compensation payments and set-aside requirements in grains), will the level of allowed production continue to be based on a past reference period? If so, this gives the (wrong) incentives to new entrants to expand their production before accession so that it gives them a higher production base for receiving compensation payments and production rights. Presumably the EU and the new entrants will find an agreement on a method for establishing base numbers that do not induce such artificial output expansion before accession.

Consequently, it would be difficult, if not impossible, to implement a rapid price adjustment with the CAP in Bulgaria. For importables, the restriction to impose extremely high tariffs (due to WTO) and to impose tariffs against certain trading partners at all (due to trade agreements) might fail to implement full EU price support. For exportables, the prohibition of export subsidies will restrict the support of domestic prices. This applies above all for dairy products. A possible solution would be to do the same as has been done in the EU and implement a quota regime. This, however, would be administratively very costly to implement[1] and possibly a critical mistake from a strategic point of view, in the sense that Bulgaria looses competitiveness in many agricultural products.

DERIVING AGRICULTURAL POLICY OPTIONS

The task of deriving future agricultural policy option for Bulgaria on its way to EU accession would have been considerably easier if one could anticipate more precisely what EU agricultural policies will be at the time of Bulgaria's accession. To answer this question with sufficient certainty, a simulation approach was used to analyze the potential impacts the most relevant policy options for Bulgaria to consider for the pre-accession period. Considering the likely evolution of EU agricultural policy as discussed above and considering the current trade regime prevailing in Bulgaria, the following policy scenarios have been chosen to this pre-accession analysis (in no particular order of importance):

Scenario A: **Bulgaria keeps is current liberal trade and market policy** (this scenario will also be referred to as *'base-period scenario'*).

Scenario B_1: **(Rapid) Partial adoption of current CAP,** *without* compensatory payments: Under this extreme scenario, Bulgaria adopts the current CAP (1999/2000 regulations) within a short period of time, but without introducing the compensatory payment schemes.

Scenario B_2: **(Rapid) Complete adoption of current CAP,** *including* compensatory payments: Basically similar to Scenario B_1, but including introduction of compensatory payment schemes equal to those currently applied in the EU.

Scenario C_1: **Partial adoption of CAP Agenda 2000,** *without* compensatory payments: Under this scenario, Bulgaria rapidly adopts the final price levels projected in Agenda 2000 for output levels assumed to be eligible under future CAP regulations. This scenario explicitly excludes the system of compensatory payments on a per hectare or per head base.

Scenario C_2: **Complete adoption of Agenda 2000,** *including* compensatory payments: Basically similar to Scenario C_1, but including introduction of compensatory payment schemes equal to those currently applied in the EU.

Scenario D: **Complete removal of current divergences** (this scenario will also be referred to as *'non-intervention scenario'* or *'reference scenario*'): This reference scenario, which sets NRPs to zero, is close to a free trade

[1] Although countries like Hungary or Slovakia have a law on introducing a milk quota, no such instrument works effectively in any CEEC.

scenario. It provides an order of magnitude of the effects of the current trade regime in Bulgaria.

As a new member of the European Union, we assume that Bulgaria will have to adopt the full body of the relevant existing EU legislation and policies under the current CAP regime (Scenarios $B_{1/2}$) or that of CAP Agenda 2000 (Scenario $C_{1/2}$). As outlined above, we restrict our analysis to the set of agricultural and trade policies that are currently applied (Scenarios $B_{1/2}$), or projected to be implemented from the 2000/01 marketing year on (Scenario $C_{1/2}$). Moreover, the authors of the study are aware of the fact, that, at the time of Bulgaria's accession, new developments in the EU policy framework could have significantly modified the agricultural policy regime, which is well defined by the expression of "hitting a moving target".

It can be stated without regarding the quantitative results of this study, that a rapid alignment of Bulgaria to the current CAP (Scenarios $B_{1/2}$) would lead to a substantial increase in domestic farm prices. This phenomenon implies higher prices for raw materials for the agro-processing industry, forcing these industries to adjust, presumably in the direction of reducing processing and marketing margins (unless border protection for their own products is also increased). A consequence of this process would be a further decline in their –currently already very low– export potential as they become less competitive in international markets. Furthermore, higher farm prices would also lead to an increase in food prices, consequently reducing the real income of Bulgarian consumers, who already spend a very high share of their income on food (above 60% for low and middle income households).

Another consequence of higher farm prices is the likely increase of export surpluses of farm products that is already a heavy burden for Bulgarian markets at currently prevailing market conditions. Assuming Bulgaria would align to CAP policies before EU accession takes places, Bulgaria would, on one hand, be faced with the prospect of having to offer export subsidies, and this, of course, would have adverse fiscal implications. On the other hand, adjustments to Bulgaria's foreign trade regime are bound by trade agreements with neighboring countries (CEFTA) and restricted by Bulgaria's WTO membership.

Under the current CAP regime in the EU, and also under the future provisions of Agenda 2000, compensatory payments are bound to "historical reference yields" (see explanation above). Furthermore, the current CAP includes livestock limitations (max. 90 livestock units per holding are eligible for direct payments). In addition, the production of some products (e.g., milk, sugar, suckler cows, wine) is subject to quota limitations. The EU and potential entrants like Bulgaria would have to agree fairly soon on future levels of reference yields and quotas, if these are to apply to the accession candidates. Any further delay in determining these future procedures enhances the motivation for candidates to expand current production in order to establish a higher base for compensation and production rights.

SIMULATION OF AGRICULTURAL POLICY SCENARIOS

For the twelve activities selected (wheat, barley, maize, sunflower seeds, tomatoes, potatoes, grapes, milk, beef, pork, poultry, and eggs) the simulation approach identifies and quantifies the potential impact under each scenario on producers' value added (farm income), consumers' real income, and on the state budget.

Table 8: Summary of Simulation of Effects under Policy Scenarios

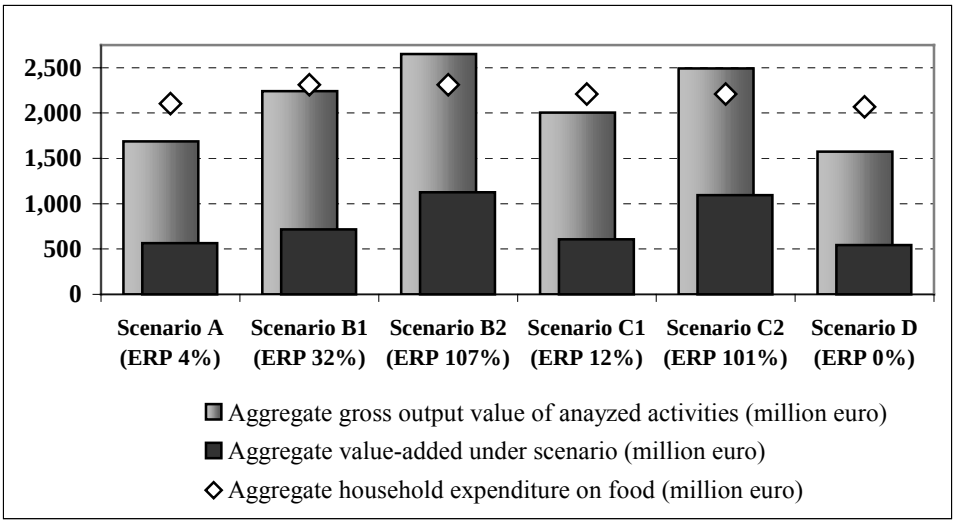
		Scenario					
		A	***B_1***	***B_2***	***C_1***	***C_2***	***D***
		Current policies	CAP, excl. dir. paym.	CAP, incl. dir. paym.	A2000, excl. dir. paym.	A2000, incl. dir. paym.	Non-Intervention
		Agricultural producers					
NRP, main products[a,b]	*percent*	2.1	38.2	38.2	22.8	22.8	0.0
Gross output value[a]	*million €*	1,686.6	2,242.3	2,651.7	2,006.4	2,491.0	1,575.1
VA at domestic prices[a]	*million €*	565.3	717.1	1,126.5	608.0	1,092.7	544.1
VA at border equiv. prices[a]	*million €*	544.1	544.1	544.1	544.1	544.1	544.1
ERP[a,b]	*percent*	3.9	31.8	107.0	11.7	100.8	0.0
		Households					
Expenditure on food[c]	*million €*	2,104.9	2,312.9		2,210.3		2,067.1
Change in real income	*percent*	0.0	-5.1		-2.7		1.0

[a] aggregate measurement for all analyzed products, [b] aggregate estimate is a weighted average of the product-wise indicators, [c] including non-alcoholic beverages

Source: own calculations.

Table 8 and **Figure 18** provide a summary overview on selected results (in euro) obtained from the simulations carried out under the assumptions of the policy scenarios mentioned above. These results will be discussed and interpreted in detail in the following sections of this study.

Figure 18: Selected Results of Simulations of Alternative Policy Scenarios



Source: own calculations.

Producer Income Effects

Table 9 presents the results of the base-period analysis of producer incomes in Bulgarian agriculture. The base-period represents the agricultural policies prevailing during the time of the World Bank mission to Bulgaria (autumn 1999). These policies have been projected on the 1998 price and cost situation, since complete data for 1999 was not yet available at the time of preparation of this report.

Among the several interesting features in **Table 9** it is observable that a ranking of the various activities in terms of their share in total gross output value, which is a common practice, differs significantly from a ranking based on value added. For instance, although total revenue of milk is higher than that of wheat, the latter is a relatively larger sector (in terms of contribution to farm income) than milk. This reflects the differences in the ratio value added to gross output value. It was already mentioned earlier in this study that value added for most of the crop production activities accounts to around 65% of gross output value which is an exceptionally high value compared to other transition economies (where often not even values above 50% can be observed). Livestock activities turned out to generate extremely low relative levels of value added (around 20% of gross output value). In the two cases of potato and pork production no positive value added can be generated. Due to the high importance of livestock production for Bulgarian agriculture the weighted share of generated value added accounts for 33% of gross agricultural output value of the analyzed activities[2].

An interesting pattern is the comparison of nominal protection of intermediary input costs[3] between crop and livestock production activities. Whereas nominal protection of inputs translates to a high implicit taxation for all crop production activities, it only implies a slight implicit taxation for all livestock activities. As mentioned in the context of measurement of current protection, prices for fertilizers and energy being significantly above their border price equivalents were identified as the main reason for the implicit taxation of inputs in crop production. In livestock production, the taxation effect of energy is overcompensated by an implicit subsidization arising from domestic prices for feeding stuff that are well below border price equivalents.

From the analysis of the aggregate effect of farm support policies in Bulgaria as they currently prevail, is can be concluded that farm income is increased (implicitly subsidized) by approximately 10%. Even if the analysis of effective protection for this particular scenario is almost identical with what was presented in the section on measurement of current protection, some issues are worth being recalled.

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[2] Consequently it can be observed that crop production is, compared to livestock production, the larger sector in terms of value added. This illustrates a point made earlier in the discussion of indicators, namely why this study stresses effective rather than nominal protection.

[3] As was explained earlier, NRPs for intermediary inputs require a careful interpretation. As usual, positive NRPs indicate an implicit subsidization and negative NRPs an implicit taxation of the producer of the analyzed good. Since the NRPs on tradable *inputs* refers to (potentially) purchased inputs, Bulgarian farmers are consumers of that input rather than producers. Subsequently, positive NRPs on tradable inputs have to be interpreted as discrimination (implicit taxation) against farmers, whereas negative NRPs indicate a protection of farmers that 'consume' this input or input-mix.

As described in more detail in the section of measurement of current protection in Bulgaria, the analysis of different sources of price divergences on Bulgarian markets revealed an aggregate effective protection of 3.9% is the effect of an implicit subsidization of farm incomes by current agricultural policies (19.7% relative to incomes that would prevail at border equivalence prices) that is partially offset by an implicit taxation of farm incomes by structural distortions (15.9%).

Table 9: Simulation of Base-Period Results for Major Activities (Scenario A)

Indices	unit	Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Border equivalence price	*BGN per ton*	124.5	143.8	159.0	436.8	288.5	148.2	620.0
NRP, main products	*percent*	8.6	-8.2	4.8	-16.2	-12.0	-5.4	2.4
Domestic price	*BGN per ton*	135.1	132.0	166.7	366.1	254.0	140.2	634.9
Quantity produced	*thous. tons*	3,203.4	717.1	1,303.4	524.2	489.0	478.3	396.3
Gross output value[c]	*million BGN*	461.0	100.0	217.3	191.9	124.2	67.1	251.6
Gross output value shares	*percent of total*	14.0	3.0	6.6	5.8	3.8	2.0	7.6
NRP, intermediary inputs	*percent*	36.1	30.9	29.1	48.6	34.2	0.1	21.4
Value added[c]	*million BGN*	274.3	73.6	141.3	149.5	116.1	-10.5	207.5
Value added shares	*percent of total*	24.8	6.7	12.8	13.5	10.5	-0.9	18.8
ERP	*percent*	-5.3	-16.6	-4.8	-25.4	-14.0	-58.4	-0.9
Value added at border equiv.[c]	*million BGN*	289.5	88.3	148.4	200.5	135.0	-6.6	209.3

Indices	unit	Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total
Border equivalence price	*BGN per ton*	270.1	2,792.8	1,840.1	2,269.1	1,167.3	—
NRP	*percent*	32.7	-1.7	-7.2	-8.0	14.2	2.1
Domestic price	*BGN per ton*	358.4	2,745.5	1,708.3	2,087.8	1,333.3	—
Quantity produced	*thous. tons*	1,287.4	50.0	271.9	107.6	101.4	—
Gross output value[c]	*million BGN*	604.3	165.9	636.3	324.8	154.2	3,298.7
Gross output value shares	*percent of total*	18.3	5.0	19.3	9.8	4.7	100.0
NRP, intermediary inputs	*percent*	4.4	3.5	4.6	5.0	9.0	8.8
Value added[c]	*million BGN*	77.0	40.2	-103.0	118.8	20.8	1,105.6
Value added shares	*percent of total*	7.0	3.6	-9.3	10.7	1.9	100.0
ERP	*percent*	336.4	13.0	7.0	17.1	239.3	3.9
Value added at border equiv.[c]	*million BGN*	-32.6	35.6	-110.9	101.5	6.1	1,064.2

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight

[c] Gross output values comprise of gross output value (GOV) from main products and, if applicable, from by-products. Consequently, value added is calculated on base of these GOVs, i.e. value added differs from 'actual price' minus 'intermediary inputs by GOV from by-products.

Source: own calculations.

Simulation results under Scenario B_1 (Rapid Alignment with CAP, without direct payments) are presented in **Table 10**. As expected, domestic farm prices under this scenario increased substantially for most products. For example, the price of wheat increased from 135 BGN per ton in the base-period to 233 BGN per ton (**Table 9**). Similarly, the prices of the other threshing crops, beef, and pork rises significantly. The price of milk was assumed to show a smaller increase (from 358 BGN per ton to 399 BGN per ton) since, at Bulgaria's current milk quality standards, a significant amount of the produced milk will be penalized for non-compliance with EU quality requirements (as

regards germ and bacteria contents)[4]. In contrast to these price increases, prices of tomatoes and grapes were assumed to remain unchanged (no increasing impacts of EU market regimes on these commodities could be identified), the price of domestically produced eggs was even expected to decrease from 1333 BGN per ton (**Table 9**) to 1200 BGN per ton (**Table 10**). Even if nominal protection of intermediary input costs remains higher in crop activities than in livestock production, the increase in prices of intermediary inputs were found to be, in relative terms, much more significant in livestock activities. Since around 70% of the total intermediary input costs of livestock production are made up by feeding stuffs, these activities are highly affected by the increase of prices for domestic grains.

Overall, this scenario would induce a clear increase in the income of primary producer, as reflected in the change in value added. On average, aggregate value added for all analyzed activities increases by 26.9% (gross output value by 32.9%[5]). Compared to a valuation at border equivalence prices the effective protection under Scenario B_1 was assumed to increase to a level of 31.8% (aggregate NRP for main products 38.2%).

Even if this increase in farmers' income is impressive, it might appear to be relatively small compared to the substantial increase in farm gate prices that the introduction of Scenario B_1 would bring about. Detailed examination reveals a dissimilar impact on the individual activities. Compared to the base-period scenario, value added of livestock activities was (with the exception of beef production) negatively effected by Scenario B_1, while crop producers enjoy high income increases. Consequently, the shares of value added of crop and livestock production in the total value added of all analyzed activities changed from 86% and 14% to 6% and 94%, respectively. Therefore, considerable differences of impact on different farm types will occur depending on their individual output mix and technologies. Of course, remarkable differences can be observed regarding the impact on value added in the different activities within the groups of crop and livestock production. The value added in wheat, barley, maize and sunflower production increases (relative to the base-period) by 88.4%, 75.0%, 41.3% and 11.5%, respectively. The corresponding values for ERPs are 78.5%, 45.9%, 34.6% and –16.8%, respectively. On the other hand, producers of tomatoes, potatoes, and grapes –activities for which the current CAP does not provide direct price support schemes- experience no significant changes in value added generation (-0.4%, 0.2%, and –0.5%). Value added in livestock production activities are much more pronounced, from an decrease –267% in egg production to an increase of 213% in beef production[6]. As mentioned earlier, most of the livestock producers will have to cope with decreasing incomes unless they adjust their production technology. Due to the currently prevailing technologies, Bulgarian livestock farmers would be severely affected by the significant increase in input prices that overcompensate the output price increases and would not be able to reap the benefits of an introduction of 'current CAP'-type market regimes.

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[4] This approximation has been carried out on basis of the German *Regulation on Milk Quality*.

[5] The difference between value added growth and gross output value growth is caused by a smaller relative increase of intermediary input costs than relative product price growth.

[6] The arithmetic problem of high relative changes in low-value added commodities has already been addresses in the context of measurement of current protection (see above).

Table 10: Simulation Results for Rapid Price Alignment with Current CAP (Scenario B_1)

Indices	unit	Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Border equivalence price	*BGN per ton*	124.5	143.8	159.0	436.8	288.5	148.2	620.0
NRP, main outputs	*percent*	87.3	54.0	39.3	-7.1	-12.0	8.0	2.4
Domestic price	*BGN per ton*	233.1	221.5	221.5	405.6	254.0	160.0	634.9
Quantity produced	*thous. tons*	3,203.4	717.1	1,303.4	524.2	489.0	478.3	396.3
Gross output value (GOV)[c]	*million BGN*	774.8	164.1	288.7	212.7	124.2	76.5	251.6
GOV change rel. to base-run	*percent*	68.1	64.2	32.8	10.8	0.0	14.1	0.0
NRP, intermediary inputs	*percent*	88.0	75.3	51.1	61.0	42.5	12.3	24.0
Value added (VA)[c]	*million BGN*	516.9	128.8	199.7	166.7	115.6	-10.5	206.5
Value added shares	*percent of total*	36.9	9.2	14.2	11.9	8.2	-0.7	14.7
ERP	*percent*	78.5	45.9	34.6	-16.8	-14.4	-58.6	-1.3
VA change rel. to base-run[c]	*percent*	88.4	75.0	41.3	11.5	-0.4	0.2	-0.5

Indices	unit	Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total
Border equivalence price	*BGN per ton*	270.1	2,792.8	1,840.1	2,269.1	1,167.3	–
NRP, main outputs	*percent*	48.0	94.7	60.4	-8.0	2.8	38.2
Domestic price	*BGN per ton*	399.9	5,437.2	2,952.1	2,087.8	1,200.0	–
Quantity produced	*thous. tons*	1,287.4	50.0	271.9	107.6	101.4	–
Gross output value (GOV)[c]	*million BGN*	752.4	300.6	974.5	324.8	140.7	4,385.6
GOV change rel. to base-run	*percent*	24.5	81.1	53.1	0.0	-8.8	32.9
NRP, intermediary inputs	*percent*	47.3	43.6	50.4	31.0	43.5	47.9
Value added (VA)[c]	*million BGN*	8.2	126.2	-88.4	67.8	-34.9	1,402.6
Value added shares	*percent of total*	0.6	9.0	-6.3	4.8	-2.5	100.0
ERP	*percent*	125.2	254.3	20.2	-33.2	-668.0	31.8
VA change rel. to base-run[c]	*percent*	-89.3	213.6	-14.2	-42.9	-267.4	26.9

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight

[c] Gross output values comprise of gross output value (GOV) from main products and, if applicable, from by-products. Consequently, value added is calculated on base of these GOVs, i.e. value added differs from 'actual price' minus 'intermediary inputs by GOV from by-products.

Source: own calculations.

The next scenario examined (Scenario B_2) corresponds to the CAP scenario presented above (Scenario B_1) but assumes that Bulgaria will also introduce direct payments to agricultural producers. Since prices are basically the same as in Scenario B_1, only those activities will be affected to which direct payment schemes apply (total allocation on activities are displayed in **Table 11**. Among the plant production activities these are wheat, barley, maize, and sunflower, where value added changes relative to the base-period increase to 209.5%, 189.6%, 139.6%, and 160%, respectively. The corresponding ERPs of 193.2%, 141.4%, 128.1%, and 93.9%, respectively, indicating a substantial increase in effective protection. Beef production is the only livestock activity that would be eligible for direct payments under a 'current CAP'-type market regime. Here value added would increase by 272.8% (213.6% under CAP without direct payments). As expected crop production becomes more preferable and creates a clear incentive to modify the land related product mix in favor of directly supported crops. While crops accounted for 94% in aggregate value added of all analyzed activities in

Scenario B_1, this share increases by another percentage point to 95%. On average, an implementation of a policy set equal to Scenario B_2 would translate to an increase of farmers' income of approximately 99.3% (rel. to base-period), which means an additional 60 percentage points compared to results obtained for Scenario B_1. Simultaneously, the effective protection of agricultural incomes would increase to 107.0% (31.8% in Scenario B_1).

Table 11: Simulation Results for Rapid Support Alignment with Current CAP (Scenario B_2)

Indices	unit	Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Domestic price	*BGN per ton*	233.1	221.5	221.5	405.6	254.0	160.0	634.9
Quantity produced	*thous. tons*	3,203.4	717.1	1,303.4	524.2	489.0	478.3	396.3
Direct payments	*million BGN*	331.9	84.3	138.7	222.0	0.0	0.0	0.0
GOV (incl. Dir. aid)[c]	*million BGN*	1,106.8	248.4	427.4	434.6	124.2	76.5	251.6
GOV change rel. to base-run	*percent*	140.1	148.5	96.7	126.5	0.0	14.1	0.0
Value added (VA)[c]	*million BGN*	848.8	213.1	338.4	388.7	115.6	-10.5	206.5
Value added shares	*percent of total*	38.5	9.7	15.4	17.6	5.2	-0.5	9.4
ERP	*percent*	193.2	141.4	128.1	93.9	-14.4	-58.6	-1.3
VA change rel. to base-run[c]	*percent*	209.5	189.6	139.6	160.0	-0.4	0.2	-0.5

Indices	unit	Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total
Domestic price	*BGN per ton*	399.9	5,437.2	2,952.1	2,087.8	1,200.0	—
Quantity produced	*thous. tons*	1,287.4	50.0	271.9	107.6	101.4	—
Direct payments	*million BGN*	0.0	23.8	0.0	0.0	0.0	800.7
GOV (incl. Dir. aid)[c]	*million BGN*	752.4	324.4	974.5	324.8	140.7	5,186.3
GOV change rel. to base-run	*percent*	24.5	95.5	53.1	0.0	-8.8	57.2
Value added (VA)[c]	*million BGN*	8.2	150.0	-88.4	67.8	-34.9	2,203.3
Value added shares	*percent of total*	0.4	6.8	-4.0	3.1	-1.6	100.0
ERP	*percent*	125.2	321.2	20.2	-33.2	-668.0	107.0
VA change rel. to base-run[c]	*percent*	-89.3	272.8	-14.2	-42.9	-267.4	99.3

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight

[c] Gross output values comprise of gross output value (GOV) from main products, direct payments and, if applicable, from by-products. Consequently, value added is calculated on base of these GOVs, i.e. value added differs from 'actual price' and direct payments minus 'intermediary inputs by GOV from by-products.

Source: own calculations.

The simulation carried out under Scenario C_1 corresponds to the provisions of Agenda 2000 (excluding direct payment schemes), the reformed framework of the European Union's Common Agricultural Policy. The results of Scenario C_1 are displayed in **Table 12**. Compared to the previous simulation (Scenario B_1: rapid alignment with CAP, without direct payments), the changes in prices relative to base-run levels are more moderate under the Agenda 2000 scenario. For domestic prices of milk an introduction of Agenda 2000 would even translate to a decrease by around 7%[7]. On one hand, the

[7] As mentioned earlier, the average CAP price for milk of the average quality currently prevailing in Bulgaria was carried out on basis of the German *Regulation on Milk Quality*. Since Agenda 2000 foresees a price cut of 15% for cow milk, the domestic price in Bulgaria was assumed to be below the one currently prevailing.

nominal protection of farm gate output prices was estimated to amount to 22.8%, on the other hand the average nominal protection of intermediary inputs would induce an implicit taxation of input costs amounting to 35.6% However, Scenario C_1 still induces clear increases in both gross output value (35.6%) and aggregate value added (7.6%). Thus, the effective protection indicator ERP reveals that farmers' income would earn an income that is roughly 11.7% higher than in an undistorted border price environment.

The patterns of impacts on revenue and value added of crop activities vis-à-vis livestock activities are similar to what was observed for Scenarios B_1 and B_2, but in absolute figure the situation appears to be much more dramatic. Aggregated value added of livestock production amounts to only 1% of aggregate value added of all analyzed activities. This occurs because the production of milk, pork, and eggs cannot generate a positive value added. This again underlines the considerable need for investments in livestock production technologies.

Table 12: Simulation Results for Rapid Price Alignment with Agenda 2000 (Scenario C_1)

Indices	unit	Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Border equivalence price	*BGN per ton*	124.5	143.8	159.0	436.8	288.5	148.2	620.0
NRP, main outputs	*percent*	59.2	30.9	18.4	-7.1	-12.0	8.0	2.4
Domestic price	*BGN per ton*	198.1	188.2	188.2	405.6	254.0	160.0	634.9
Quantity produced	*thous. tons*	3,203.4	717.1	1,303.4	524.2	489.0	478.3	396.3
Gross output value (GOV)[c]	*million BGN*	662.8	140.3	245.4	212.7	124.2	76.5	251.6
GOV change rel. to base-run	*percent*	43.8	40.3	12.9	10.8	0.0	14.1	0.0
NRP, intermediary inputs	*percent*	71.7	62.4	40.8	61.0	42.5	12.3	24.0
Value added (VA)[c]	*million BGN*	427.2	107.6	162.4	166.7	115.6	-10.5	206.5
Value added shares	*percent of total*	35.9	9.0	13.7	14.0	9.7	-0.9	17.4
ERP	*percent*	47.5	21.9	9.5	-16.8	-14.4	-58.6	-1.3
VA change rel. to base-run[c]	*percent*	55.7	46.2	15.0	11.5	-0.4	0.2	-0.5

Indices	unit	Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total
Border equivalence price	*BGN per ton*	270.1	2,792.8	1,840.1	2,269.1	1,167.3	–
NRP, main outputs	*percent*	16.6	55.7	44.4	-8.0	2.8	22.8
Domestic price	*BGN per ton*	315.1	4,349.8	2,656.2	2,087.8	1,200.0	–
Quantity produced	*thous. tons*	1,287.4	50.0	271.9	107.6	101.4	–
Gross output value (GOV)[c]	*million BGN*	605.0	246.2	894.0	324.8	140.7	3,924.1
GOV change rel. to base-run	*percent*	0.1	48.4	40.5	0.0	-8.8	19.0
NRP, intermediary inputs	*percent*	33.8	29.2	36.5	21.8	31.6	35.6
Value added (VA)[c]	*million BGN*	-70.9	89.3	-70.3	85.9	-20.4	1,189.2
Value added shares	*percent of total*	-6.0	7.5	-5.9	7.2	-1.7	100.0
ERP	*percent*	-117.7	150.7	36.6	-15.3	-431.5	11.7
VA change rel. to base-run[c]	*percent*	-192.1	121.9	-31.8	-27.7	-197.7	7.6

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight

[c] Gross output values comprise gross output value (GOV) from main products and, if applicable, from by-products. Consequently, value added is calculated on basis of these GOVs, i.e. value added differs from 'actual price' minus 'intermediary inputs by GOV from by-products.

Source: own calculations.

The situation for the Bulgarian livestock sector as a whole improves slightly under Scenario C_2 which simulates a move of agricultural policies towards an Agenda 2000-type including direct payment schemes. Under the assumptions of this scenario the

livestock sector accounts for 6% of aggregate value added. Similar to the differences between Scenario B_1 and B_2, prices in both Agenda 2000 scenarios are the same, and only those activities are additionally affected which fulfill the eligibility criteria for direct payment schemes (among the analyzed products this will be wheat, barley, maize, sunflowers, milk, and beef; see **Table 13**). As explained above, Agenda 2000 reduces the level of direct price protection and strengthens the role of direct support to farmers. In aggregate, the impact of this scenario translates to a 93.3% increase of farm incomes compared to the base-period. Thus farm incomes would be twice as high as valued with border equivalence prices.

Table 13: Simulation Results for Rapid Support Alignment with Agenda 2000 (Scenario C_2)

Indices	unit	Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Domestic price	*BGN per ton*	198.1	188.2	188.2	405.6	254.0	160.0	634.9
Quantity produced	*thous. tons*	3,203.4	717.1	1,303.4	524.2	489.0	478.3	396.3
Direct payments	*million BGN*	384.9	97.7	160.8	181.6	0.0	0.0	0.0
GOV (incl. Dir. aid)[c]	*million BGN*	1,047.7	238.0	406.2	394.3	124.2	76.5	251.6
GOV change rel. to base-run	*percent*	127.3	138.1	86.9	105.4	0.0	14.1	0.0
Value added (VA)[c]	*million BGN*	812.0	205.3	323.3	348.3	115.6	-10.5	206.5
Value added shares	*percent of total*	38.0	9.6	15.1	16.3	5.4	-0.5	9.7
ERP	*percent*	180.4	132.6	117.9	73.8	-14.4	58.6	-1.3
VA change rel. to base-run[c]	*percent*	196.0	179.0	128.8	133.0	-0.4	0.2	-0.5

Indices	unit	Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total
Domestic price	*BGN per ton*	315.1	4,349.8	2,656.2	2,087.8	1,200.0	—
Quantity produced	*thous. tons*	1,287.4	50.0	271.9	107.6	101.4	—
Direct payments	*million BGN*	64.7	58.2	0.0	0.0	0.0	948.0
GOV (incl. Dir. aid)[c]	*million BGN*	669.7	304.3	894.0	324.8	140.7	4,872.1
GOV change rel. to base-run	*percent*	10.8	83.4	40.5	0.0	-8.8	47.7
Value added (VA)[c]	*million BGN*	-6.2	147.4	-70.3	85.9	-20.4	2,137.1
Value added shares	*percent of total*	-0.3	6.9	-3.3	4.0	-1.0	100.0
ERP	*percent*	-81.0	314.1	-36.6	-15.3	-431.5	100.8
VA change rel. to base-run[c]	*percent*	-108.0	266.5	-31.8	-27.7	-197.7	93.3

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight

[c] Gross output values comprise of gross output value (GOV) from main products, direct payments and, if applicable, from by-products. Consequently, value added is calculated on base of these GOVs, i.e. value added differs from 'actual price' and direct payments minus 'intermediary inputs by GOV from by-products.

Source: own calculations.

Table 14: Simulation Results for Complete Removal of Current Distortions (Scenario D)

Indices	unit	Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Domestic price	*BGN per ton*	124.5	143.8	159.0	436.8	288.5	148.2	620.0
Quantity produced	*thous. tons*	3,203.4	717.1	1,303.4	524.2	489.0	478.3	396.3
Gross output value (GOV)[c]	*million BGN*	426.8	108.4	207.3	229.0	141.1	70.9	245.7
GOV change rel. to base-run	*percent*	-7.4	8.5	-4.6	19.3	13.6	5.7	-2.4
Value added (VA)[c]	*million BGN*	289.5	88.3	148.4	200.5	135.0	-6.6	209.3
Value added shares	*percent of total*	27.2	8.3	13.9	18.8	12.7	-0.6	19.7
VA change rel. to base-run	*percent*	5.6	20.0	5.0	34.1	16.3	-36.9	0.9

Indices	unit	Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total
Domestic price	*BGN per ton*	270.1	2,792.8	1,840.1	2,269.1	1,167.3	—
Quantity produced	*thous. tons*	1,287.4	50.0	271.9	107.6	101.4	—
Gross output value (GOV)[c]	*million BGN*	472.5	157.1	595.7	297.7	128.5	3,080.6
GOV change rel. to base-run	*percent*	-21.8	-5.3	-6.4	-8.4	-16.7	-6.6
Value added (VA)[c]	*million BGN*	-32.6	35.6	-110.9	101.5	6.1	1,064.2
Value added shares	*percent of total*	-3.1	3.3	-10.4	9.5	0.6	100.0
VA change rel. to base-run	*percent*	-142.3	-11.5	7.6	-14.6	-70.5	-3.7

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight
[c] Gross output values comprise of gross output value (GOV) from main products and, if applicable, from by-products. Consequently, value added is calculated on base of these GOVs, i.e. value added differs from 'actual price' minus 'intermediary inputs by GOV from by-products.
Source: own calculations.

Table 14 presents the results for Scenario D, that is the removal of current interventions. Compared to the first scenario (Scenario A), it measures the effect of removing actual levels of protection prevailing in Bulgaria in 1998[8]. As shown in **Table 14**, for the sector as a whole, moving towards free trade would result in a 3.7% decline of aggregate value added. However, because of differences in production patterns different farm types will be affected in very different ways. Crop farmers in Bulgaria would gain from the removal of negative protection on their products, whereas livestock farmers would loose income from the removal of positive effective protection on most of their outputs. In a more detailed view, this negative perspective for livestock production is mainly based on the negative value added values for milk and pork. Producers of beef, poultry, and eggs would still earn a positive contribution to their income from these activities.

Adjusting for Supply Response Effects

In all the simulations presented so far, output levels for all analyzed activities have been kept constant (i.e., assumption of totally inelastic supply). This is a simplifying assumption but one which presumably captures the essence of the short-term effects. However, after some time, producers would naturally begin to react to the new price situation, readjusting the output mix and the overall level of resource intensity.

[8] For an explanation of sources of current protection see the section *'Measuring the Current Protection'*.

As an illustration of the potential effect on income, once adjustments for supply response are introduced to the model, **Table 15** to **Table 17** (for Scenarios B to D) present results for all analyzed activities under alternative elasticities of supply. These are not econometrically estimated supply elasticities; they were chosen from various studies for other countries. The input-output coefficients (quantity of intermediary inputs per unit of main product) were assumed to remain constant, and no adjustments were made for cross-price effects. For each activity the obtained results are compared assuming completely inelastic supply response (elasticity = 0) with those assuming the medium run supply elasticities.

As can be seen from the tables, the assumed output supply elasticities in the usual sense (indicated as 'unadjusted elasticities', *e*) were 0.1 for grapes, 0.3 for barley, 0.4 for wheat, tomatoes, milk, and beef, 0.5 for maize, sunflower seeds, and eggs, 0.6 for potatoes, and 0.75 for pork and poultry. In a next step, elasticities were adjusted to capture difference in the ratio of value added to price (Valdes, 1973, p.158 f.) among the considered production activities. In particular, the 'adjusted elasticities', ε, are calculated by $\varepsilon = e\upsilon$, where υ is the rate of per-unit value added at base-run prices (V_B, i.e. per-unit value added as of the base-period) to base-period price (p). Estimates of percentage quantity supply response (i.e., the quantity change indicated in **Table 15** to **Table 17** for the product j induced by changes in value added at prices under the scenario *S*[9] have been computed by applying δq_j in percent = $\varepsilon*(V_{jS} / V_{jB}-1)*100$. The calculation of the change in total gross output value relative to the base-period scenario (Scenario A) was captured by the expression $[(p_S + c_{S)*}q_S]/[(p_B + c_{B)*}q_B]-1$, where c represents the direct (compensatory) payments to primary producers converted to a per-unit price equivalent. Total value added is also based on q_S and q_B, respectively. Consequently, assuming a positive supply response, the percentage change per-unit value added differs from the percentage change in total value added due to the quantitative effects of supply response.

As shown in **Table 15** to **Table 17**, the outputs quantities under the Current CAP scenarios increase, on average, by 10.4% (B_1) and 31.7% (B_2), and by 4.7% (C_1) and 29.0% (C_2) under the more moderate price changes of the Agenda 2000 scenarios. The removal of all currently existing market distortions (Scenario D, see Table) would induce output quantities to slightly increase by 0.6%. As expected, for scenarios under which direct payment schemes are introduced (B_2 and C_2) quantity changes are more pronounced. Furthermore, a comparison of the results of Scenarios B_2 and C_2 shows that the additional compensatory payments of the Agenda 2000 do not fully compensate the production effects of price reductions. For all relevant crop activities increased quantities were observed, while producers of most livestock activities are likely to reduce they produced quantity (except beef). In the case of egg production (and milk production under Agenda 2000) this is the response to negative price changes that induce negative changes of value added. In the other cases, negative supply response occurs even if positive price changes (and positive elasticities) have been assumed. At a first glance, this behavior appears to be irrational, but is a logical consequence of both the methodology described above and the changes in per-unit value added. Due to increasing costs for

[9] In the calculation of value added under different scenarios, input-output coefficients remain constant, but adjustments for price changes of intermediary inputs under the scenarios have been included in the simulations.

intermediary inputs (mainly due to increased prices for ingredients of feeding stuffs) price effects are overcompensated and subsequently per-unit value added declines. The latter creates an incentive to respond by reducing the quantity produced.

Table 15: Simulation Results for Rapid Alignment to Current CAP, Assuming a Positive Supply Response, % change relative to the 1998 base-run

Indices	Wheat		Barley		Maize		Sunflower		Tomatoes		Potatoes		Grapes	
Unadj. supply elasticity[c]	*0.40*	*0.00*	*0.30*	*0.00*	*0.50*	*0.00*	*0.50*	*0.00*	*0.40*	*0.00*	*0.60*	*0.00*	*0.10*	*0.00*
Adj. supply elasticity[d]	*0.25*	*0.00*	*0.23*	*0.00*	*0.33*	*0.00*	*0.39*	*0.00*	*0.37*	*0.00*	*0.09*	*0.00*	*0.08*	*0.00*
Scenario B_1:	*Alignment excluding direct compensatory payments*													
price change	72.5	72.5	67.8	67.8	32.8	32.8	10.8	10.8	0.0	0.0	14.1	14.1	0.0	0.0
quantity change	22.4	0.0	17.5	0.0	13.4	0.0	4.5	0.0	-0.2	0.0	0.0	0.0	0.0	0.0
GOV change	105.8	68.1	92.9	64.2	50.7	32.8	15.8	10.8	-0.2	0.0	14.1	14.1	0.0	0.0
per unit VA change	88.4	88.4	75.0	75.0	41.3	41.3	11.5	11.5	-0.4	-0.4	0.2	0.2	-0.5	-0.5
total VA change	130.7	88.4	105.6	75.0	60.3	41.3	16.5	11.5	-0.6	-0.4	0.2	0.2	-0.5	-0.5
Scenario B_2:	*Complete Alignment including direct compensatory payments*													
price change	72.5	72.5	67.8	67.8	32.8	32.8	10.8	10.8	0.0	0.0	14.1	14.1	0.0	0.0
quantity change	53.1	0.0	44.2	0.0	45.4	0.0	62.3	0.0	-0.2	0.0	0.0	0.0	0.0	0.0
GOV change	267.5	140.1	258.4	148.5	185.9	96.7	267.6	126.5	-0.2	0.0	14.1	14.1	0.0	0.0
per unit VA change	209.5	209.5	189.6	189.6	139.6	139.6	160.0	160.0	-0.4	-0.4	0.2	0.2	-0.5	-0.5
total VA change	373.7	209.5	317.6	189.6	248.2	139.6	322.0	160.0	-0.6	-0.4	0.2	0.2	-0.5	-0.5

Indices	Milk[a]		Beef[b]		Pork[b]		Poultry[b]		Eggs		Total	
Unadj. supply elasticity[c]	*0.40*	*0.00*	*0.40*	*0.00*	*0.75*	*0.00*	*0.75*	*0.00*	*0.50*	*0.00*	*elast.*	*inelast*
Adj. supply elasticity[d]	*0.07*	*0.00*	*0.12*	*0.00*	*0.17*	*0.00*	*0.40*	*0.00*	*0.08*	*0.00*		
Scenario B_1:	*Alignment excluding direct compensatory payments*											
price change	11.6	11.6	98.0	98.0	72.8	72.8	0.0	0.0	-10.0	-10.0	35.4	35.4
quantity change	-6.0	0.0	25.0	0.0	-2.4	0.0	-17.0	0.0	-20.6	0.0	10.4	0.0
GOV change	17.1	24.5	126.5	81.1	49.5	53.1	-17.0	0.0	-27.6	-8.8	38.2	32.9
per unit VA change	-89.3	-89.3	213.6	213.6	-14.2	-14.2	-42.9	-42.9	-267.4	-267.4	26.9	26.9
total VA change	-90.0	-89.3	292.2	213.6	-16.2	-14.2	-52.6	-42.9	-232.9	-267.4	45.1	26.9
Scenario B_2:	*Complete Alignment including direct compensatory payments*											
price change	11.6	11.6	98.0	98.0	72.8	72.8	0.0	0.0	-10.0	-10.0	35.4	35.4
quantity change	-6.0	0.0	32.0	0.0	-2.4	0.0	-17.0	0.0	-20.6	0.0	31.7	0.0
GOV change	17.1	24.5	158.0	95.5	49.5	53.1	-17.0	0.0	-27.6	-8.8	91.0	57.2
per unit VA change	-89.3	-89.3	272.8	272.8	-14.2	-14.2	-42.9	-42.9	-267.4	-267.4	99.3	99.3
total VA change	-90.0	-89.3	392.0	272.8	-16.2	-14.2	-52.6	-42.9	-232.9	-267.4	188.4	99.3

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight [c] Own-price supply elasticities
[d] For explanation of adjustment procedure see explanation above.
Source: own calculations.

As expected, the changes in total value added in simulation with supply response are significantly higher that under a totally inelastic response (this does not apply to Scenario D where the aggregate change of value added amounts to zero). Combining the effects of per-unit value added changes (due to price and compensatory payment modifications) with quantity adjustments, value added changes are almost two-fold higher than under the inelastic response assumption. Whereas aggregate value added changes under the Current CAP scenario were estimated to amount to 26.9% (B_1) and 99.3% (B_2) under inelastic supply, these values increase to 45.1% (B_1) and 188.4% (B_2) under the elastic supply assumption. Mainly, due to the more moderate price changes under Agenda 2000 these estimates amount to 7.6% (B_1) and 93.3% (B_2) under inelastic

supply, these values increase to 17.2% (B_1) and 170.1% (B_2) under the elastic supply assumption. For reasons already explained above, the patterns of affection vary between crop and livestock activities.

Table 16: Simulation Results for Rapid Alignment to Agenda 2000, Assuming a Positive Supply Response, % Change Relative to the 1998 Base-Run

Indices	Wheat		Barley		Maize		Sunflower		Tomatoes		Potatoes		Grapes	
Unadj. supply elasticity[c]	*0.40*	*0.00*	*0.30*	*0.00*	*0.50*	*0.00*	*0.50*	*0.00*	*0.40*	*0.00*	*0.60*	*0.00*	*0.10*	*0.00*
Adj. supply elasticity[d]	*0.25*	*0.00*	*0.23*	*0.00*	*0.33*	*0.00*	*0.39*	*0.00*	*0.37*	*0.00*	*0.09*	*0.00*	*0.08*	*0.00*
Scenario C_1:	*Alignment excluding direct compensatory payments*													
price change	46.6	46.6	42.6	42.6	12.9	12.9	10.8	10.8	0.0	0.0	14.1	14.1	0.0	0.0
quantity change	14.1	0.0	10.8	0.0	4.9	0.0	4.5	0.0	-0.2	0.0	0.0	0.0	0.0	0.0
GOV change	64.1	43.8	55.5	40.3	18.4	12.9	15.8	10.8	-0.2	0.0	14.1	14.1	0.0	0.0
per unit VA change	55.7	55.7	46.2	46.2	15.0	15.0	11.5	11.5	-0.4	-0.4	0.2	0.2	-0.5	-0.5
total VA change	77.7	55.7	61.9	46.2	20.6	15.0	16.5	11.5	-0.6	-0.4	0.2	0.2	-0.5	-0.5
Scenario C_2:	*Complete Alignment including direct compensatory payments*													
price change	46.6	46.6	42.6	42.6	12.9	12.9	10.8	10.8	0.0	0.0	14.1	14.1	0.0	0.0
quantity change	49.7	0.0	41.7	0.0	41.9	0.0	51.8	0.0	-0.2	0.0	0.0	0.0	0.0	0.0
GOV change	240.2	127.3	237.5	138.1	165.2	86.9	211.8	105.4	-0.2	0.0	14.1	14.1	0.0	0.0
per unit VA change	196.0	196.0	179.0	179.0	128.8	128.8	133.0	133.0	-0.4	-0.4	0.2	0.2	-0.5	-0.5
total VA change	343.1	196.0	295.5	179.0	224.7	128.8	253.7	133.0	-0.6	-0.4	0.2	0.2	-0.5	-0.5

Indices	Milk[a]		Beef[b]		Pork[b]		Poultry[b]		Eggs		Total	
Unadj. supply elasticity[c]	*0.40*	*0.00*	*0.40*	*0.00*	*0.75*	*0.00*	*0.75*	*0.00*	*0.50*	*0.00*		
Adj. supply elasticity[d]	*0.07*	*0.00*	*0.12*	*0.00*	*0.17*	*0.00*	*0.40*	*0.00*	*0.08*	*0.00*	*elast.*	*inelast*
Scenario C_1:	*Alignment excluding direct compensatory payments*											
price change	-12.1	-12.1	58.4	58.4	55.5	55.5	0.0	0.0	-10.0	-10.0	20.3	20.3
quantity change	-12.8	0.0	14.3	0.0	-5.3	0.0	-11.0	0.0	-15.2	0.0	4.7	0.0
GOV change	-12.7	0.1	69.6	48.4	33.1	40.5	-11.0	0.0	-22.7	-8.8	18.4	19.0
per unit VA change	-192.1	-192.1	121.9	121.9	-31.8	-31.8	-27.7	-27.7	-197.7	-197.7	7.6	7.6
total VA change	-180.3	-192.1	153.6	121.9	-35.4	-31.8	-35.6	-27.7	-182.8	-197.7	17.2	7.6
Scenario C_2:	*Complete Alignment including direct compensatory payments*											
price change	-12.1	-12.1	58.4	58.4	55.5	55.5	0.0	0.0	-10.0	-10.0	20.3	20.3
quantity change	-7.2	0.0	31.2	0.0	-5.3	0.0	-11.0	0.0	-15.2	0.0	29.0	0.0
GOV change	2.8	10.8	140.7	83.4	33.1	40.5	-11.0	0.0	-22.7	-8.8	76.1	47.7
per unit VA change	-108.0	-108.0	266.5	266.5	-31.8	-31.8	-27.7	-27.7	-197.7	-197.7	93.3	93.3
total VA change	-107.4	-108.0	381.0	266.5	-35.4	-31.8	-35.6	-27.7	-182.8	-197.7	170.1	93.3

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight
[c] Own-price supply elasticities [d] For explanation of adjustment procedure see explanation above.
Source: own calculations.

Table 17: Simulation Results for Complete Removal of Current Distortions, Assuming a Positive Supply Response, % Change Relative to the 1998 Base-Run

Indices	Wheat		Barley		Maize		Sunflower		Tomatoes		Potatoes		Grapes	
Unadj. supply elasticity[c]	*0.40*	*0.00*	*0.30*	*0.00*	*0.50*	*0.00*	*0.50*	*0.00*	*0.40*	*0.00*	*0.60*	*0.00*	*0.10*	*0.00*
Adj. supply elasticity[d]	*0.25*	*0.00*	*0.23*	*0.00*	*0.33*	*0.00*	*0.39*	*0.00*	*0.37*	*0.00*	*0.09*	*0.00*	*0.08*	*0.00*
Scenario D:	*Complete Removal of Distortions*													
price change	-7.9	-7.9	8.9	8.9	-4.6	-4.6	19.3	19.3	13.6	13.6	5.7	5.7	-2.4	-2.4
quantity change	1.4	0.0	4.7	0.0	1.6	0.0	13.3	0.0	6.1	0.0	-3.4	0.0	0.1	0.0
GOV change	-6.1	-7.4	13.5	8.5	-3.1	-4.6	35.2	19.3	20.5	13.6	2.0	5.7	-2.3	-2.4
per unit VA change	5.6	5.6	20.0	20.0	5.0	5.0	34.1	34.1	16.3	16.3	-36.9	-36.9	0.9	0.9
total VA change	7.0	5.6	25.5	20.0	6.8	5.0	51.9	34.1	23.4	16.3	-39.0	-36.9	1.0	0.9

Indices	Milk[a]		Beef[b]		Pork[b]		Poultry[b]		Eggs		Total	
Unadj. supply elasticity[c]	*0.40*	*0.00*	*0.40*	*0.00*	*0.75*	*0.00*	*0.75*	*0.00*	*0.50*	*0.00*		
Adj. supply elasticity[d]	*0.07*	*0.00*	*0.12*	*0.00*	*0.17*	*0.00*	*0.40*	*0.00*	*0.08*	*0.00*	*elast.*	*inelast*
Scenario D:	*Complete removal of distortions*											
price change	-24.6	-24.6	1.7	1.7	7.7	7.7	8.7	8.7	-12.5	-12.5	-2.0	-2.0
quantity change	-9.5	0.0	-1.3	0.0	1.3	0.0	-5.8	0.0	-5.4	0.0	0.6	0.0
GOV change	-29.2	-21.8	-6.6	-5.3	-5.2	-6.4	-13.7	-8.4	-21.2	-16.7	-7.0	-6.6
per unit VA change	-142.3	-142.3	-11.5	-11.5	7.6	7.6	-14.6	-14.6	-70.5	-70.5	-3.7	-3.7
total VA change	-138.3	-142.3	-12.7	-11.5	8.9	7.6	-19.5	-14.6	-72.1	-70.5	0.0	-3.7

[a] cow-milk only [b] (c.w.): all results displayed for carcass weight [c] Own-price supply elasticities
[d] For explanation of adjustment procedure see explanation above.
Source: own calculations.

Effects for Consumers of Food Products

Bulgarian households, on average, spend more than half of their disposable income on food and beverages; for the lowest decile this share is about 70% (see **Table 18**). Thus, policy reforms that affect food prices will undoubtedly affect consumers' real income. For each scenario, the approach we use (based on Schiff and Valdes, 1992, ch. 8) is to compute the effect of the price change in the primary product on the price at the retail level and then compute the expected change in the cost of the consumers' basket given a constant nominal income. Different income groups have different consumption patterns and thus this estimate captures this differential effect of a given change in farm prices. We then express this change in the cost of the consumers' basket as a percent of household income, under the assumption of a constant nominal income. Clearly, this is a short/medium-term type analysis. In the long-term, consumers would adjust their consumption patterns to the changes in relative prices, and the rise in food prices could have some effect on nominal wages (increase) and the subsequent share of expenditures on food (decrease). Thus our approach overestimates somewhat the true longer-run impact of the change in farm prices.

The availability of a detailed household survey enabled the inclusion of about 160 single food products, beverages, and tobacco products in the simulations. The available statistics provided the shares of household income (by deciles) spent on each of the single food products. In order to present the findings clearly, these products have been aggregated to groups of food product in the following tables (these groups will be referred to as 'food products' in the subsequent sections of this study). The food products

covered by this analysis are cereals and pasta, meat and products thereof, milk, dairy products, eggs, fats, and oils of vegetable and animal origin, vegetables and potatoes, 'dining out', as well as alcoholic beverages[10]. Sample data on nominal expenditure and expenditure shares is provided for selected deciles in **Table 18**.

Table 18: Structure of Household Expenditure for Selected Deciles

	Average	Decile I	Decile IV	Decile VIII	Decile X
	Nominal expenditure [BGN/capita]				
Total expenses	920.1	395.2	589.3	604.6	684.8
Food, beverages and tobacco	530.5	281.6	346.7	394.7	429.1
Food and non-alcoholic beverages	500.2	269.4	332.5	378.2	410.3
	Expenditure shares [% of total expenditure]				
Total expenses	100.0	100.0	100.0	100.0	100.0
Food, beverages and tobacco	57.7	71.3	58.8	65.3	62.7
Food and non-alcoholic beverages	54.4	68.2	56.4	62.6	59.9
Cereals and pasta	12.6	24.4	17.6	17.9	16.0
Meat and meat products	11.6	10.0	8.7	10.3	10.6
Fish and fish products	0.6	0.9	0.7	0.8	0.8
Milk, dairy products and eggs	9.5	10.0	9.6	11.0	10.6
Fats and oils (veg. and anim.)	2.2	3.5	2.8	3.0	2.8
Fruit, fresh or dried	3.6	2.9	2.7	3.3	3.4
Vegetables and potatoes	8.5	10.6	9.2	10.3	9.9
Sugar and sugar products	2.4	2.7	2.3	2.7	2.6
Other food, non-alc. beverages	1.7	2.0	1.6	1.8	1.8
Dining out	1.7	1.2	1.2	1.3	1.5
Alcoholic beverages	1.7	0.9	0.9	1.1	1.2
Tobacco products	1.6	2.2	1.5	1.7	1.6

Source: NSI, own calculations.

Food price changes had to be estimated on the basis of assumed cost shares of purchased agricultural raw products in the total costs of the food processing industry[11]. Transmission of price changes was computed under assumption of constant processing and trading margins, i.e. food price changes are solely the result of raw product price changes. The relevant price levels in Bulgaria have been evaluated based on the NRP measure provided above and were taken as a reference for the simulation of the adoption of measures of the EU trade regime under the different scenarios. Thus, for each scenario, food price changes were obtained by adjusting the 1998 food prices (base-period) by the

[10] In addition, fish and fish products, fruits, sugar and products thereof, non-alcoholic beverages, and tobacco products were included in our analysis. Since none of the analyzed agricultural products was assumed to have a direct impact on the prices of these food products, they will not be displayed in the following result charts. Nevertheless, the expenditure on these products remains as a constant in the aggregate assessment of consumers' income effects.

[11] Cost structure information on the food processing industry was provided by SAPI Ltd., Sofia.

relative change in nominal protection of raw materials weighted by its share in the total costs of food production. Similar to the analysis on the supply and farm income effect, this computation corresponds to a short-term impact, a situation that does not capture the effect of consumers' reaction to the new set of relative prices. Conceptually, all household types face identical food price changes, but the impact of these price changes on their real incomes varies as a result of the different weight of the various food items in their household expenditure.

Table 19 summarizes the main results of the simulations. For each scenario the impact of food price changes on: (a) nominal expenditure (change of food expenditure relative base-period food expenditure); and (b) consumers' real income (reduction of purchasing power of nominal income induced by changes in expenditure on food) is estimated. As expected, changes in food expenditures under Scenario B (Alignment to current CAP)[12] are more pronounced than under the Scenario C (Alignment to Agenda 2000). On average, the price changes under these scenarios induce a 9.4% (B) and 4.8% (C) increase of expenditure on food, beverages and tobacco. Only regarding the expenditure on food and non-alcoholic beverages, consumers would have to spend an additional 9.9% and 5.0%, respectively, than under the current base-period market conditions. In both scenarios, the highest expenditure changes occur in products of cereals and pasta (15.5% in Sc. B; 10.0% in Sc. C) and meat and meat products (23.8% in Sc. B; 17.8% in Sc. C). Due to the significant price changes for main agricultural products of the CAP scenario (compared to the currently prevailing prices in Bulgaria), increases of expenditure were recorded for all food product groups under the assumptions of Scenario B. As was mentioned earlier in this study, the assumptions of the Agenda 2000 Scenario provide for a relative decrease of cow milk prices relative to the base-period (-12%). This affects consumers' expenditure on milk and dairy products, inducing an 8.3% decline of this expenditure position.

In contrast, a non-interventionist policy framework (as assumed in Scenario D) would induce slight decreases of consumers' expenditure on food (1.7%). Even if prices of meat and meat products, vegetables and potatoes, as well as of 'dining out' are assumed to increase to some extent (3.4%, 4.0%, and 0.1% respectively), this is overcompensated by declining prices for cereals and pasta (1.7%), fats and oils (2.3%), and milk dairy products and eggs (15.2%).

As presented in **Table 19**, both simulations of a potential introduction of EU-type agricultural policies in Bulgaria have been estimated to induce reductions of consumers' real income of 5.1% (CAP) and 2.7% (Agenda 2000) as an impact of food price changes on average households. On the other hand a removal of all currently existing market distortions (Sc. D) would favor domestic consumers by inducing a slight increase of real income by 1.0%, indicating an almost neutral impact under this scenario. Even if the results of Scenarios B and C may, at a first glance, appear to be relatively moderate, they impose an additional burden on Bulgarian households, which already spend a significant

[12] By this token, no distinction has to be made between Scenario B_1 and Scenario B_2, since price effects of both variants are basically the same. Direct compensatory payments to primary producers are covered by the state budget. Due to the assumption of constant nominal net incomes direct payments to producers will not affect consumers' real income.

share of their disposable income on food. This is especially true when regarding the impacts on the lower deciles. Due to their higher share of food in total expenditures and their different mix of the food consumption basket[13], lower income households experience a more significant change in real income than higher income groups. The immediate introduction of the current CAP policies in Bulgaria would reduce real incomes of the first decile households by 5.1% which is significantly above losses for households with a higher income (e.g., 4.7% for decile IX households) . Under Agenda 2000, the corresponding reductions in real incomes of this decile was estimated to amount to 3.2% (average of all households 2.7%, decile IX households 2.4%).

Table 19: Simulation of Scenario Effects on Real Income of Selected Household Deciles, Assuming Inelastic Demand Response

Scenarios:	**B: Current CAP**		**C: Agenda 2000**		**D: Non-Intervention**	
Type of Household:	**Average**	**Decile I**	**Average**	**Decile I**	**Average**	**Decile I**
Change in real income *[%]*	**-5.12**	**-6.09**	**-2.67**	**-3.19**	**+0.98**	**+1.34**
	Change in nominal expenditure [%]					
Food, beverages and tobacco	+9.37	+9.11	+4.76	+4.63	-1.69	-1.85
Food, non-alcoholic beverages	+9.88	+9.49	+5.01	+4.82	-1.79	-1.94
Cereals and pasta	+15.52	+15.79	+9.97	+10.14	-1.69	-1.72
Meat and meat products	+23.80	+18.72	+17.80	+14.09	+3.43	+3.13
Milk, dairy products and eggs	+3.93	+4.34	-8.26	-8.30	-15.23	-15.45
Fats and oils (veg. and anim.)	+1.77	+1.16	-1.00	-0.45	-2.33	-1.11
Vegetables and potatoes	+1.75	+1.98	+1.75	+1.98	+3.97	+3.49
Dining out	+5.81	+5.70	+4.02	+3.95	+0.40	+0.39
Alcoholic beverages	+1.68	+2.22	+1.06	+1.40	+0.10	+0.21

Source: own calculations.

Adjusting for Demand Response to Price Changes

A simple approach was used to sketch out the magnitude of possible impacts of demand response. To better capture the medium- to longer-term response in consumption to price changes, price demand elasticities for each separate product group were introduced. Thus, they were assumed to be -0.1 for bread, pasta, and potatoes, -0.2 for vegetable fats, vegetables (and products) other than potatoes, and alcoholic beverages, and -0.3 for all other products. Compared to what has been estimated or assumed for other studies under a single price change, these elasticities are rather low. However, considering that the simulation captures simultaneous changes in many prices, we expect these parameters would be lower than those which apply under a discrete price change.

Table 20 presents the results of the simulation of changes in consumers' real income under the elastic demand assumption. Subsequently, **Table 21** compares the real income changes under the two assumptions of elastic and inelastic demand supply for the

[13] As can be observed in Table 16, relatively poorer households consume a higher share of the more heavily affected products such as cereals and pasta products.

three relevant scenarios. As expected, the effects of the 'elastic' scenarios is substantially lower compared to inelastic demand scenarios. Under the current CAP scenario, real income losses in the elastic variant are 3.6% instead of 5.1% in the case of inelastic demand. For the Agenda 2000 scenario real income losses in the elastic variant were observed to amount to 1.9%, compared to 2.7% in the inelastic variant. The pattern of impacts on the different deciles of households under the elastic variant is principally the same as described above.

Table 20: Simulation of Scenario Effects on Real Income of Selected Household Deciles, assuming elastic demand response

Scenarios:	**B: Current CAP**		**C: Agenda 2000**		**D: Non-Intervention**	
Type of Household:	**Average**	**Decile I**	**Average**	**Decile I**	**Average**	**Decile I**
Change in real income *[%]*	**-3.56**	**-4.74**	**-1.88**	**-2.57**	**+0.78**	**+1.07**
	Change in nominal expenditure [%]					
Food, beverages and tobacco	+6.40	+6.99	+3.32	+3.70	-1.35	-1.49
Food, non-alcoholic beverages	+6.74	+7.28	+3.49	+3.85	-1.43	-1.56
Cereals and pasta	+13.58	+13.82	+8.81	+8.97	-1.53	-1.56
Meat and meat products	+12.83	+10.57	+10.34	+8.44	+2.34	+2.14
Milk, dairy products and eggs	+2.56	+2.84	-6.00	-6.02	-11.38	-11.56
Fats and oils (veg. and anim.)	+1.22	+0.82	-0.72	-0.32	-1.77	-0.83
Vegetables and potatoes	+1.52	+1.70	+1.52	+1.70	+3.11	+2.72
Dining out	+3.93	+3.86	+2.75	+2.70	+0.28	+0.28
Alcoholic beverages	+1.32	+1.75	+0.84	+1.11	+0.08	+0.17

Source: own calculations.

Table 21: Change in Consumers' Real-Incomes under Different Demand Elasticities

	Scenario B		*Scenario C*		*Scenario D*	
Decile	Alignment to CAP		Alignment to Agenda 2000		Removal of Distortions	
	inelastic	*elastic*	*inelastic*	*elastic*	*inelastic*	*elastic*
Average	***-5.12***	***-3.56***	***-2.67***	***-1.88***	***0.98***	***0.78***
I	-6.09	-4.74	-3.19	-2.57	1.34	1.07

Source: own calculations.

Impact on Poverty

As mentioned earlier in this section, Bulgarian households spend on average more than half of their disposable income on food and beverages; for the lowest decile this share is as high as 70% (see **Table 18**). Consequently, all changes in the agricultural policy framework aiming at an increase of product prices are likely to noticeably reduce the real income of domestic consumers. The relative reduction of real consumer incomes is the most significant for households with low disposable incomes and thus high share of expenditure on food products (Engel's Law). In order to assess the potential impact of the

analyzed policy scenarios on the poorest parts of the Bulgarian population the analysis of effects for consumers of food products has been extended by an estimation of potential poverty effects of the scenarios.

First, parts of the Bulgarian population classified as poor were determined based on the findings of a World Bank study on poverty issues in Bulgaria (World Bank 1999b). The report applies two poverty lines: the first (lower) poverty line equals 50% of average per capita consumption in 1997; and the second (higher) poverty line equals 66.7% of average per capita consumption in 1997. Applying these poverty lines, the study estimates 20.2% of the Bulgarian population to be below the lower and 36% below the higher poverty line.[14] As displayed in **Table**, poverty is more widespread in rural regions (41.2% of population) than in urban regions (33.5%), but even among the urban regions significant differences occur.

Table 22: Regional Distribution of Poverty in Bulgaria, 1997

Region	**Urban**	**Rural**	**Total**
Sofia	37.6	0.0	37.6
Bourgas	18.5	38.7	24.8
Varna	30.6	41.3	33.8
Lovech	30.5	32.0	31.1
Montana	22.4	34.4	27.3
Plovdiv	42.4	52.3	45.8
Russe	37.3	38.6	37.9
Sofia Reg	50.2	49.0	49.7
Haskovo	22.3	37.0	28.1
Bulgaria	33.5	41.2	36.0

Note: all results are based on application of the higher poverty line (66.7% of average consumption).
Source: World Bank, 1999b.

Second, changes in poverty groups due to different EU integration scenarios were calculated using these poverty shares. Similar to the assessment of real income effects presented earlier in this section, changes in food prices have been computed on the basis of the price changes for primary agricultural products and the share of these primary products in the final food products (approach according to Schiff and Valdes, 1992, ch.8). The results of this estimation are presented in **Table 2**.

[14] The study revealed that poverty increased sharply during the period 1995-97 when the macroeconomic conditions disfavored Bulgarian consumers. In terms of the higher poverty line, the proportion of the population in poverty rose from 5.5% (approximately 450,000 people) in 1995 to 36% (approximately 3 million people) in 1997. According to the report, the bulk of the rise in poverty can be explained by the generalized fall in consumption and incomes. However a significant share was found to occur due to widening inequality in earnings, and consequently, consumption. Today, with more favorable macroeconomic conditions, the overall poverty figure of 20% or 36% is probably an overestimate. However, these figures were used as the latest available data.

Table 23: Impact of Scenarios on Poverty

	Share of poverty in population *[%]*		***Number of poor citizens***[a] *[million]*	
	Poverty line 1	*Poverty line 2*	*Poverty line 1*	*Poverty line 2*
	Current situation			
Scenario A: Base-run	20.0	36.0	1.66	2.98
	Inelastic demand response			
Scenario B: Current CAP	24.8	40.7	2.05	3.37
Scenario C: Agenda 2000	22.3	38.3	1.84	3.17
Scenario D: Non-Intervention	19.6	34.9	1.62	2.89
	Elastic demand response			
Scenario B: Current CAP	23.5	39.4	1.94	3.26
Scenario C: Agenda 2000	21.7	37.7	1.80	3.12
Scenario D: Non-Intervention	10.4	35.2	0.86	2.91

[a] Total population 1998: 8,283,200
Source: World Bank (1999b), own calculations

According to the 1997 higher poverty measure approximately 3 million people of the total population (8.3 million) were assumed to be poor. Our results show that an introduction of CAP-type policies increases the extent of poverty.[15] As expected, the increases in relative poverty are more pronounced under the Scenario B (Current CAP) than under Scenario C (Agenda 2000). Applying the higher poverty line, a rapid adoption of current CAP price support schemes would increase the share of poor inhabitants to 40.7% (compared to 36.0% at current, i.e. base-run, conditions), which corresponds to an absolute increase of 392,000 people. The introduction of Agenda 2000 price schemes would increase poverty by 190,000 people to 38.2%. Since consumers will be able to adjust their consumption patterns to the altered food prices over time, we also included the assumption of an elastic demand response to the analysis. As expected, the increase in poverty under this assumption is more moderate but still significant. Under the Current CAP, poverty would rise (by 282,000 people) to 39.4% and Agenda 2000 prices would translate to an increase (by 141,000 people) to 37.7% poor. Comparing the growth of poverty between the two 'poverty groupings' as established by the two different poverty lines (high and low), it is clear that the increases of poor people falling under the lower poverty line are more pronounced in both CAP-type scenarios. This clearly underlines the more negative impact on the 'very poor' parts of the population by CAP-type pricing policies.

A further removal of all distorting market influences (as simulated in Scenario D) would reduce the share of poor people to a different degrees. Assuming no demand response, the share of poverty would decline to 34.9%, when applying the higher poverty line. Using the lower poverty line, only a marginal decline in poverty would be realized. Under the assumptions of an elastic demand response, which is the more likely case, the share of poor population would decline to 35.2%, when applying the higher poverty line. In comparison the results for the lower poverty line are much more striking – here the

[15] The simulation results take into account only the impacts of food price changes, it does not account for further transfers to/from consumers in an EU integration environment.

extent of poverty would be reduced to 10.4% (from an initial 20%) or by 800,000 people (from an initial 1.7 m people). This result clearly indicates that the very poorest shares of the population would benefit most significantly by a removal of current distortions in the pricing of food products.

Effects on the State Budget

Trade Related Budget Effects

This section on simulations provides estimates of possible trade related budget effects that arise from an introduction of CAP-type policies in Bulgaria. An implementation of EU policies would require a wide range of additional budgetary allocations. The most important effects are: (a) direct budget effects of internal price support measures (e.g., intervention purchases and border measures); (b) budget effects due to direct income transfers; and (c) budget effects of restructuring Bulgaria's administrative infrastructure and institution building in order to implement the described set of EU policies.

The effect of the policy changes on tariff revenues and export refunds are estimated based on the premise that they are required to 'protect' domestic price levels under CAP-type policies. The budget effects below only represent a lower limit of total budget effects since we only included a limited range of products in our analysis and, as was explained above, these measures only represent a certain part of awaited budgetary allocations to the agricultural sector. On the other hand, in this computation we did not treat Bulgaria as an EU member state, but as implementing CAP-type policies separately, i.e. the calculated revenues from trade flows still include trade with EU member countries.

Tariff revenues and export refunds under both scenarios are calculated for each importable and exportable commodity by multiplying the net traded quantity by the difference between the border price equivalent and the assumed domestic price. For importables, the net imported quantity has been multiplied by the difference between border prices and domestic prices covered by the tariff in order to protect the domestic price level, (where NRP>0). For exportables, export refunds have been computed by multiplying net exports by the price difference (where NRP>0)[16]. Yearly net traded quantities have been estimated on the basis of Bulgarian trade statistics and assumed to remain constant. Regarding price levels, we assumed NRPs estimated in the first part of this report to remain constant.

The results of the analysis of potential trade related budgetary effects are provided in **Table 24**. The estimations show that under the Current CAP scenario (Scenario B), the net budget effects are almost 45% higher than those for the Agenda 2000 scenario (Scenario C) which arises from the decrease of the domestic price level foreseen for the CAP reform. The total effect under the CAP scenario which corresponds to an additional budgetary burden of 62.0m BGN (31.7m euro) is dominated by export refunds amounting to 95.6m BGN (48.9m euro). In their largest shares, these funds will have to be disbursed on wheat exports. The second largest negative impact arises from tariff revenue foregone

[16] Thus, the calculated values correspond to an ad valorem equivalent tariff.

(e.g., on pork markets). Similarly, negative budgetary impacts of the Agenda 2000 scenario (42.9m BGN; 22.0m euro) are clearly dominated by additional allocations on export refunds (60.2m BGN; 30.8m euro).

Table 24: Simulation of Trade Related Budget Effects - Tariff Revenues and Export Refunds

		Wheat	Barley	Maize	Sunflower	Tomatoes	Potatoes	Grapes
Net exports	*[1000 t]*	916.43	9.35	90.65	46.37	-1.18	-20.52	-1.31
		Scenario B: Current CAP						
NRP	*[%]*	87	54	39	-7	-12	8	2
Net budget effects	*[m BGN]*	-89.78	-0.84	-4.96	0.00	0.00	0.03	0.00
		Scenario C: Agenda 2000						
NRP	*[%]*	59	31	18	-7	-12	8	2
Net budget effects	*[m BGN]*	-57.73	-0.53	-1.95	0.00	0.00	0.03	0.00

Indices		Milk[a]	Beef[b]	Pork[b]	Poultry[b]	Eggs	Total *[BGN]*	Total *[euro]*
Net exports	*[1000 t]*	-46.10	-18.34	-15.46	7.12	-3.61	---	---
		Scenario B: Current CAP						
NRP	*[%]*	48	95	60	-8	3	38	
Net budget effects	*[m BGN]*	0.76	41.61	-8.86	0.00	0.00	-62.04	-31.72
		Scenario C: Agenda 2000						
NRP	*[%]*	17	56	44	-8	3	23	
Net budget effects	*[m BGN]*	-0.79	24.80	-6.75	0.00	0.00	-42.93	-21.95

[a] cow-milk equivalents [b] (c.w.): all results displayed for carcass weight equivalents
Source: own calculations.

In a long-time perspective the identified effects could become even more significant as the result of producers' and consumers' behavior. Producers will expand production in some activities while consumers will tend to substitute relatively expensive foods with cheaper goods. Both reactions would lead to increasing budgetary outlays on agricultural market regimes in order to maintain the target farm price levels. Furthermore, any interpretation of these results should take into account, that these do only comprise of the analyzed commodities. Thus, the results presented above are likely to underestimate the true budgetary effects of an implementation of CAP-type market regimes in Bulgaria.

Table 25: Bulgarian Potential Contributions to and Revenues from the EU Budget, 1998 Conditions

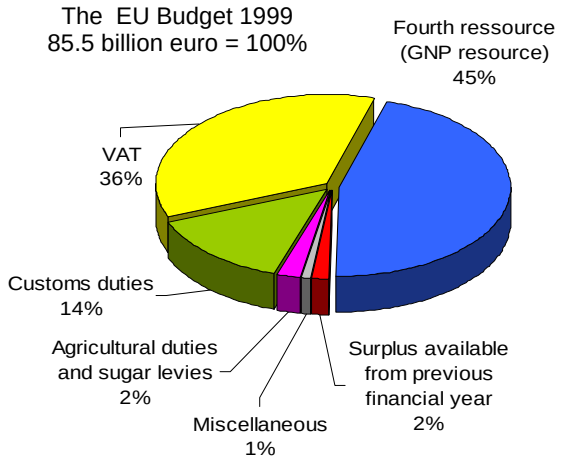
			million BGN	*million euro*
Contributions to the EU Budget	VAT based contribution		89	45
	GNP based contribution		126	64
	Total contribution		214	110
Revenues from the EU Budget [a]	Direct payments to agric.	*CAP*	801	409
	Direct payments to agric.	*A 2000*	948	485
	Structural funds [a]		3,710	1,897
	Cohesion funds [a]		729	373
	Total revenues	*CAP*	5,240	2,679
	Total revenues	*A 2000*	5,387	5,061
Net Revenue from the EU Budget	unrestricted [a]	*CAP*	5,025	2,569
Net Revenue from the EU Budget	unrestricted [a]	*A 2000*	5,172	2,645
Net Revenue from the EU Budget	restricted [b]	*A 2000*	1,597	816

[a] Calculation based on current (i.e., CAP) support conditions, since negotiations on Agenda 2000 conditions for budgetary contributions and support from structural and cohesion funds were still in process at the time of preparation of this report.
[b] Restriction under Agenda 2000 scenario: maximum annual receipts from structural operations (i.e., including the Cohesion Fund) should not exceed 4% of national GDP (BGN 863 million based on Bulgaria's 1998 GDP).
Source: own calculations.

The EU Budget Revenues and Bulgaria's Potential Contribution

In 1999, the total size of the EU budget was about 85.5b euro (total appropriations for payments), an increase of 2.4% from 1998 due to rising outlays for structural and cohesion funds (1999: 30.6b euro, approximately 7%)[17].

Figure 19: Resources of the EU Budget, 1999



Overall EU revenues comprise of: (a) miscellaneous revenues (accounting for less than 1% of the budgeted revenue); and (b) 'own resources' (equaling 85b euro, i.e. more than 99% of budgeted revenue)[18]. EU own resources are comprised of: (a) the so-called "Traditional Own Resources" (TOR); (b) Member States' contributions based on Value Added Tax; (c) Member States' contributions based on Gross National Product; and (d) Member States' contributions to the financing of the so-called UK-rebate. The 1999 ceiling on expenditures has been fixed at 1.27% of the Union's GDP.

[17] For details on the 1999 budget see European Commission, 1999a.

[18] See European Commission, 1998b.

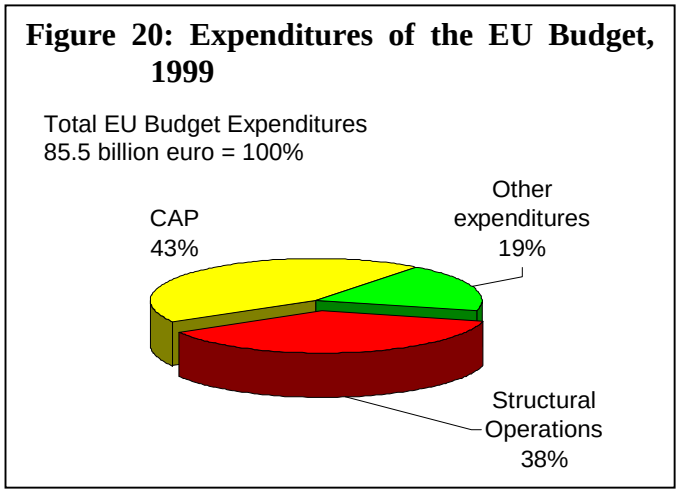
In 1999 TOR made up 16.2% of the total budget, a continuous decrease in terms of the share of the budget (1988: 29.1%). In particular, they consist of customs duties (13.2 bn. euro), agricultural levies (1.1 bn. euro), and sugar levies (1.1 bn. euro)[19]. Member states' contributions based on VAT account for 30.4b euro, corresponding to a share of 35.4% (1988: 60.0%). This contribution is paid as a 0.9% uniform rate[20] based on a VAT base which is calculated for all countries in a harmonized way. This VAT base may not exceed 55% of national GNP. Consequently, Bulgaria's VAT based contribution would not exceed 88.8m BGN (45.4m euro). The Gross National Product Resource is a residual resource and is used to balance the EU budget. In 1999, it accounted for 41.5 billion euro (48.5% of the total budget). The contribution of each member state is calculated based on their GNP. In 1999, it accounted for 24.5b euro (48.5% of the total EU budget). The contribution of each member state is calculated based on their GNP. Based on a EU-15 GDP of 7130b ECU, the Bulgarian contribution to GNP resources was estimated not to exceed 125.6m BGN (64.2m euro).

Having considered Bulgaria's potential obligations to the EU budget, the estimations are that transfers to the EU budget will not exceed 214.4m BGN (109.6m euro; computed on the basis of 1998 figures), i.e. roughly 1% of Bulgarian GDP.

The EU Structural and Cohesion Funds and Bulgaria's Potential Gains

Potential transfers from the EU budget to Bulgaria were estimated by focusing predominantly on the so-called Structural and Cohesion Funds[21]. Financial transfers to be received in case of an implementation of CAP-type compensatory payments were presented in context of the simulations (CAP-scenario: 800.8m BGN, 409.4m euro; Agenda 2000-scenario: 948.0m BGN, 484.7m euro). Additional budgetary outlays other than the ones mentioned above are either used for public goods of the EU with little direct transfers to member states or for non-member countries, and are significantly smaller in total volume[22].

Figure 20: Expenditures of the EU Budget, 1999



In terms of appropriations for commitments, the breakdown of expenditure from the 1999 budget by subsections is 43.7% of total spending for Common Agricultural Policy measures (mainly for the so-called Guidance Section of the European Agricultural Guarantee and Guidance Funds (EAGGF), 37.7% for structural operations,

[19] Member States retain 10% of TOR revenues to cover costs of collection.

[20] In 1999 a cap on that base was introduced. Formerly this rate was 1.4%.

[21] A more detailed description of these funds are provided in the Annex 5.

[22] Since the estimations presented here refer to a situation after accession of Bulgaria, transfers from SAPARD funds are not included. These are analyzed in the chapter 5.

6.2% for internal policies, 6.6% for external action, 4.6% for administrative expenditures, and 1.2% for other expenditures.

Planned appropriations for structural operations grew significantly during recent years and reached 39.0b euro for commitments and 30.5b euro for expenditure in the financial year 1999. According to Agenda 2000 proposals, structural operations are not to exceed a final level of 32.5b euro in 2006 (measured in 1999 prices). The largest portion of resources for structural operations is allocated to the Structural Funds (35.9m euro appropriated for commitments, 27.6m euro appropriated for payments), and a smaller portion is allocated to the Cohesion Fund (3.1m euro appropriated for commitments, 2.9m euro appropriated for payments).

The EU Structural Funds are administered by the Commission to finance Community structural aid. The European Union maintains four structural funds, namely The European Regional Development Fund (ERDF), The European Social Fund (ESF), the aforementioned EAGGF, and the smaller Instrument For Fisheries Guidance. All of these funds have the common aim of redistributing income from the relatively richer to the poorer regions of the EU. Actions are focused on six main objectives. Altogether, the budget of the Structural Funds has quadrupled in the last few years, totaling more than 161 billion ECU for the period 1994-1999 (see below). In addition, structural operations are carried out by the Cohesion Fund and loans from the European Investment Bank (EIB), which are based on a project-financing approach and are governed by their own specific rules.

The assistance of the ERDF is provided to less favored regions and is focused mainly on productive investment, infrastructure and development of small- and medium-size enterprises[23]. About 44% of the total spending on Structural Funds is allocated to the ERDF. Under current provisions, ERDF payments are granted to regions eligible for payments under Objectives 1, 2, 5b and 6. The ESF accounts for 27% of budgetary allocations to Structural Funds. Its main task is the financial support of vocational training and employment aids in less favored regions of the EU eligible under Objectives 1, 2, 3, 4, 5b and 6. Promotional activities of agricultural structures and rural development measures under the Guidance Section of the EAGGF account for another 14% of Structural Funds. Its activities are limited to the regions eligible for support under Objectives 1, 5a, and 5b (a further detailed description of structural operation of the European Union is presented later on in **Chapter 5**).

Since the eligibility criteria have not been fully decided for the new Objectives, we restrict our estimates of Bulgaria's potential gains from Structural Funds to the current structure of Objectives. Under current conditions, Bulgaria would fall under Objective 1. Bulgaria's receipts from Objective 1 programs were estimated on the basis of average per capita payments (under Objective 1) to EU member states, which amounted to 229 ECU per inhabitant during 1994-1999[24]. Assuming Objective 1 applies to Bulgaria, the country would receive about 1.89b euro yearly payments, i.e., around 3.7b BGN or 17% of the 1998 GDP. However, it has to be taken into account that these estimates are rather

[23] See European Council, 1993c, Art. 1.

[24] Estimates based an payments to Greece, Ireland, and Portugal, which are completely eligible.

optimistic and also assume that Bulgaria would be supported under the framework of the 1999 conditions that apply to current members of the EU.

Furthermore, an assessment of Bulgaria's potential gains from the structural funds has to bear in mind that funding of projects under the priority objectives are subject to a co-financing mechanism. Thus, the amount estimated above only constitutes the EU's share in project funding, and has to be accompanied by funds from the national (i.e., Bulgarian) budget. The EU's contribution to structural funding is subject to the following ceilings[25]: (a) a maximum of 75% of the total eligible cost and, as a general rule, at least 50% of eligible public expenditure in the case of measures carried out in the regions covered by Objective 1. Where the regions are located in a Member State covered by the Cohesion Fund, the Community contribution may rise, in exceptional cases, to a maximum of 80% of the total eligible cost; (b) a maximum of 50% of the total eligible cost and, as a general rule, at least 25% of eligible public expenditure in the case of measures carried out in areas covered by Objective 2 or Objective3. Assuming that Bulgaria will qualify for assistance under Objective 1 and the Cohesion Fund, and assuming a EU participation rate of (on average) 75%, the EU's contribution of 3.7b BGN would have to be accompanied by a Bulgarian co-financing share of about 1.2 billion BGN from the national budget[26].

Bulgaria's potential gains from the Cohesion Fund have been estimated on the basis of the payments granted to Greece, Ireland, Portugal, and Spain. Cohesion Fund payments are granted to countries (not regions) with a per capita GNP of 90% of the EU average. The total amount to be spent in 1999 is 2.88b euro, i.e. 45 euro per inhabitant. If Bulgaria receives equal payments, it could expect to receive 372m euro, i.e. 729m BGN.

Given that our estimates are based on current support conditions of the EU, they have to be considered extremely optimistic. Under these assumptions (current CAP and current structural support) we estimated a transfer from structural operations of about 2.6b euro (5.0b BGN), corresponding to about 23% of Bulgaria's 1998 GDP. Under Agenda 2000, a restriction will apply that restricts the maximum annual receipts from structural operations to 4% of national GDP of any Member State. In this case, Bulgaria would only be able to receive a maximum of 863 million BGN (estimate based on Bulgaria's 1998 GDP).

Additional Costs to the Bulgarian Budget

It is of great importance to keep in mind the context of the above analysis of budgetary effects of integrating Bulgaria's agriculture and food sector into the EU. The transfers of budgetary gains and duties to new EU member countries are political questions, which will be answered during EU accession negotiations and will be influenced by external determinants such as changes in world market prices and the next WTO round of negotiations.

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[25] Information adapted from European Commission, 1999c.

[26] Applying the Agenda 2000 restrictions for structural funding (annual receipts from structural funding, i.e. including Cohesion Fund, should not exceed 4% of national GDP), Bulgaria would receive a maximum of 863m BGN from structural operations (estimate based on Bulgaria's 1998 GDP).

Moreover, it should be noted, that budgetary costs of EU accession in the agriculture/rural area are more numerous that those quantified above. Most importantly, in addition to the effects of price support measures which occur at the border, direct income transfers, and costs of structural programs, there occur administrative costs. Although they are relatively difficult to quantify, they can expected to be quite substantial. To some extent, Bulgaria's local regional and national agricultural and rural administration would need to be reformed substantially even without integration into the EU. In any case, old administrative structures would have to be convert the into more efficient ones which better suit the objectives of Government authorities in a market environment, many institutions would have been necessary to establish in order for the private sector to be able to compete in Western, and, in particular, EU markets.

However, the implementation of the complex CAP and the entire detailed *acquis communutaire* in the agricultural area requires considerable additional resources which would not be necessary if Bulgaria, without the superior objective of EU integration, would have chosen a liberal agricultural policy with few interventions and a limited number of targeted support measures. For example, only the extra administrative efforts for the implementation of the direct payments per hectare/per animal are estimated to be at least 15% of the value of subsidies by some authors.