Working Paper No. 31

Arnim Kuhn and Oleg Nivyevs'kiy

An Ex-Ante Analysis of a Minimum Price System for Ukraine

March 2005

Arnim Kuhn, Dr.sc.agr.: Research assistant at the Institute of Agricultural Policy, University of Bonn, and member of the German Advisory Group with the Ukrainian Government in Kyiv. Research in quantitative trade policy modelling (EU agricultural policy, WTO issues), market formation in transition economies; consultancy work in farm planning. Professional experience as farmer; academic education at Kiel University and the Center for Development Research (Bonn University).

Oleg Nivyevs'kiy: Research Associate. Research fields: productivity and efficiency analysis; international trade with concentration on agricultural and food markets. Special attention is devoted to the assessment of reform process in agriculture and rural arrears of Ukraine. Graduated from the National University of "Kyiv-Mohyla Academy" (Master's degree in Economics) and from the Kamyanets'-Podil's'ky State Pedagogical University (Specialist in Physics and Computer Sciences).

An Ex-Ante Analysis of a Minimum Price System for Ukraine

Arnim Kuhn and Oleg Nivyevs'kiy

Abstract

Ukrainian agricultural markets have been characterised by occasional instability throughout the last decade, which has further reinforced the widespread conviction that market mechanisms do not lead to satisfactory results in the agro-food sector. Such mistrust against the 'invisible hand' has led to repeated attempts to stabilise prices and support farm incomes through various market interventions, most of which, however, remained ineffective after all. In the aftermath of the severe winterkill in 2003, which reduced the wheat harvest to one third of its average volume, a comprising effort was started to get domestic agricultural prices under public control. The major policy tool to achieve this goal is the introduction of minimum prices coupled with extensive intervention purchases for the most important agricultural commodities. In this paper we investigate possible consequences of the introduction of such floor prices in agriculture and the food sector of Ukraine on production, producer incomes, domestic market prices, trade, and overall welfare. The quantitative part of the analysis is carried out with the Regional Agricultural Sector Model of Ukraine (RASMU). This model aims at analysing the consequences of different policy actions in the field of agriculture and the processing industry. Our simulation results clearly show that the use of minimum prices is incompatible with Ukraine's position as a net exporter of agricultural commodities and its aspirations to join the WTO, and that such an intervention system would inflict a considerable burden on consumers and the state budget.

1 Introduction

The 'invisible hand' is working in Ukraine, but weak market integration is curtailing a lot of its beneficial potential. More specifically, huge trade costs combined with volatile harvests have resulted in wide producer price fluctuations throughout the previous decade. But instead of addressing the problem directly by improving agricultural productivity and reducing transaction costs of trade, the government of Ukraine (GOU) has repeatedly tried to achieve stability through either direct interventions or the establishment of target prices. Direct intervention usually came in the form of excessive monitoring and control of commodity movements, both inter-regionally and through the processing chain. A recent attempt to guarantee a certain producer price level for grain was made in the form of a pledge price system aimed at easing the downward pressure on farm

gate prices during the harvest period. But while price guarantees have been largely ineffective for lack of funding through the GOU, the command-style direct interventions – particularly enforced sales to publicly owned elevators and price controls – were suited to create mistrust among market participants against authorities and policymakers. In the aftermath of the severe winterkill in 2003, which reduced the wheat harvest to one third of its average volume, another comprising effort was launched to get domestic agricultural prices under public control. The major policy tool to achieve this goal is the introduction of minimum prices coupled with extensive intervention purchases for the most important agricultural commodities.[1] The GOU seems to be determined to introduce this minimum price system, which is supported by the fact that UAH 335 m (USD63 m) has been earmarked for this purpose in the draft state budget for 2005. The question, however, is whether the introduction of such measures would be sustainable in fiscal, economic and legal terms.

A minimum price system has proved to be unsustainable in European agriculture, especially as it became incompatible with WTO standards, i.e. lost its legal foundation (CRAMON, 2004). But also the budgetary impact of ever increasing spending on intervention and export subsidies contributed to the factual replacement of the minimum price by direct income support. On the other hand, the economic losses in the form of increased consumer prices have played only a minor role. In the case of Ukraine, both the fiscal *and* economic affordability of such an intervention system is important, as Ukraine's GDP per capita (roughly USD 5240 at PPP in 2003) is that of a developing country comparable to China, leaving much less room for implicitly taxing consumers. In this paper we investigate possible consequences of minimum prices on agricultural production, producer incomes, domestic market prices, trade, and overall welfare. In section two we briefly recall the most important economic aspects of minimum price regimes. Section three is devoted to a quantitative analysis carried out with a regional agricultural sector model for Ukraine, and section four concludes the article with a discussion of alternative solutions for the volatility of Ukraine's agricultural markets.

2 Economic Consequences of A Minimum Price Regime

This chapter highlights the basic economic, institutional, and legal consequences of a minimum price regime. First, we qualify the impact of a minimum price regime on several groups of economic agents by means of a partial market model: i) consumers; ii) taxpayers; iii) landowners; iv) farm households/producers; and v) suppliers of inputs and owners of resources. Then we discuss additional costs of the program and finish this chapter with WTO-relevant aspects of the issue.

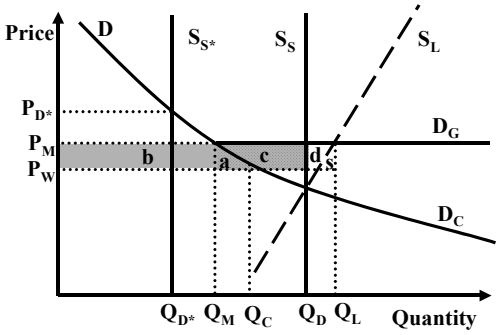
[1] Laws of Ukraine № 507-XII "On prices and pricing" (Article 9) and № 1877-IV "On the State Support of Agriculture in Ukraine" as of 24 June 2004;

2.1 Market Effects of Minimum Price Regime

In the following we will carry out a conventional welfare analysis of floor prices for grain in Ukraine. On the supply side, the market consists of more than 10 thousand agricultural enterprises. In 2004 these produced about 42 m tons of grain, including 16.5 m tons of wheat. This harvest amount is far beyond the domestic needs of the country, which makes grain exports necessary in the further course of the marketing year. Moreover, most grain producers suffer from limited on-farm storage capacity and are therefore forced to sell immediately after harvest at low prices, or store their grain in elevators run by large companies, which often have some degree of regional monopoly power. Consequently, these elevator companies are able to charge fees above their marginal costs from producers and traders, thereby increasing the marketing costs of grain. These stylised facts hold in most years[2] and serve as a justification for policy makers to implement support price programs, as, for example, the minimum price regime envisaged.

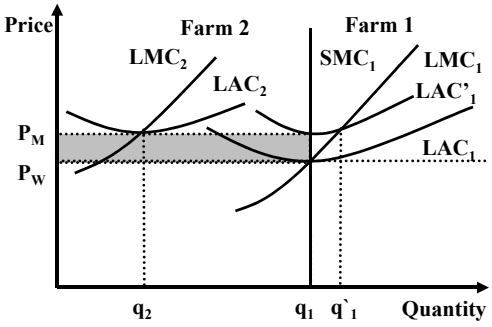
Graph 1

Commodity Market (short-run and long-run perspectives)



Graph 2

Representative Firms (short-run and long-run perspectives)



To illustrate how a price support program affects the situation on a market, consider the model of a grain market as shown in Graph 1. The minimum price regime affects market demand and supply by raising the domestic price level as shown in Graph 1. Introducing the floor (minimum) price causes total demand DD_C to become perfectly elastic at the support level P_M, since the government is (theoretically) ready to buy unlimited amounts of grains to defend this price level. Total demand then becomes DD_G. In the short run, total supply S_s (inelastic in the short run), is represented by a vertical line.

In a period following a below-average harvest which is characterized by a low market supply S_S*, the market price P_D* exceeds the support price level, rendering government intervention purchases obsolete. On the other hand, after a bumper crop (see S_S), as in 2004, the government needs to procure the amount (Q_D-Q_M) to prevent competitive forces from driving

[2] Only when harvest failures occur, the country slides back into grain net-import, such as in the year 2003, when approximately 4 MMT of grain had to be imported.

prices below the floor price. The associated reduction in consumption is (Q_C-Q_M), since in a net export situation under free market conditions, domestic consumers will consume the amount Q_C. Consequently, consumers incur welfare losses represented by area marked *b* and *a* (reduction in consumer surplus). The induced costs for taxpayers, needed to pay for government purchases, equal the rectangle with base (Q_D-Q_M) and height (P_M-P_W). Thus, if the government intends to raise the domestic price above the world price parity level, it needs to buy out of the market even more than the amount that would have been exported at P_W, i.e. (Q_D-Q_C). Moreover, if the support price were raised above the c.i.f. price level (i.e. world market price plus trade costs: tariffs, transport, marketing costs), imports would occur at this price in almost unlimited quantities, and prevent the government to achieve its price goals (see section 2.3 for further discussion). On the other hand, due to the increased price level, producers gain the area represented by (*b*+*a*+*c*+*d)*. Nevertheless, for all groups together there is a net loss equal to the triangle *a*.
The above analysis, however, applies only to a short-run perspective. In the long run the supply response to a change in the domestic price is larger, as supply will become price-responsive. The important thing here is that the number of farms and some of the factors of production are fixed in the short run (e.g. capital), but variable in the long run. The increase in price means that firms, on average, will make super-normal or excessive profits, represented by the shaded rectangle on the Graph 2. The presence of super-normal profits attracts new firms with higher long-run average and marginal costs (LAC and LMC curves respectively, e.g. farm 2) to enter the industry, while existing firms invest to expand their output. As a result the short-run supply curve turns outward, causing the long-run supply curve to be inclined to the right (S_L curve on Graph 1). Production expands towards the level Q_L. In this case, the corresponding long-run net loss is larger by area *s*. As new farms enter and existing farms expand production of grain, there will be increased demand for the scarce resources needed to produce grain: equipment, land, fertilizers etc. Increased demand for these inputs will raise the long-run marginal and average costs of producing grain to LMC_1 and LAC'_1 (see Graph 2), which drives economic profits for the average producer in the industry down to zero again. Since the firms do not earn any super-normal profits in the long, this entire long-run increase in producer surplus is shifted back to inputs or production factors such as land or capital. The increased demand for inputs tends to raise input prices and permits suppliers of theses inputs to earn greater profits than they would in the absence of a price support program. Thus the producer surplus is partly distributed further on in the form of higher rents on fixed factors (e.g., land, entitlements etc.). The distribution of these rents depends on the elasticity of factor supply and substitution as well as on the relative importance of the factor in crop production (GARDNER, 1987).

As a consequence from this, minimum price regimes or market price support (according to OECD analysis) were shown to be the least efficient policy instruments for increasing the incomes of producers. For example, only roughly 40% of price support payments end up in farmers' or land owners' pockets. The remaining 60% of payments end up either in the hands of input suppliers or as administrative and other costs. (I would shift this sentence to the conclusions section) (CRAMON, 2004).

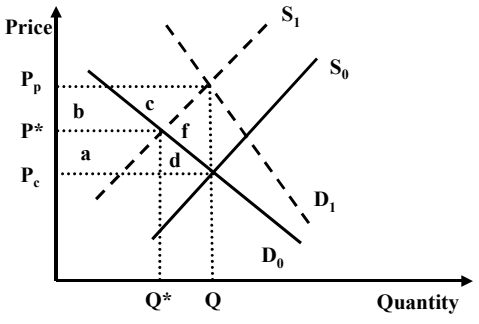
It is possible to extend this conventional static equilibrium analysis by a dynamic perspective. For instance, MIRANDA AND HELMBERGER (1988) have examined a rational expectation model of the U.S. soybean market in which the government attempts to stabilise price through open market purchases and sales. The authors show that although price support program raise market prices in the short run, they can also reduce prices in the long run under certain conditions, thereby questioning the suitability of such a program. Moreover, although price programs can substantially stabilize prices, they can serve to destabilise producer revenues, particularly when harvests are volatile.

On the demand side minimum producer prices will most likely result in increased consumer prices, making the poorest layers of population suffer most. Since such a situation might be politically unacceptable, the GOU may take its rescue to controlling retail prices, requiring the restoring of administrative controls (limits on mark-ups) or additional budgetary spending (subsidies to the grain-processing sector). Given that we have a competitive processing sector down to the retail bakery shops, any artificial restrictions on processing margins will not work, as, under competition, these margins will not be significantly above zero whatsoever.

That ultimately means that the GOU would have to start using consumer subsidies in order not to reduce the activity of the processors. Let us consider the downstream sector and welfare consequences of a minimum price regime and consumer subsidies simultaneously used. As discussed above, the minimum price regime inflicts additional costs to the operation of the downstream sector in terms of higher inputs costs, shifting the supply curve S_0 inward to S_1 (Graph 3). As a consequence consumers face a higher price P*. In order to compensate consumers, the government introduces an ad-valorem subsidy sufficient to restore the pre-program level of consumption Q, shifting the demand curve from D_0 to D_1.

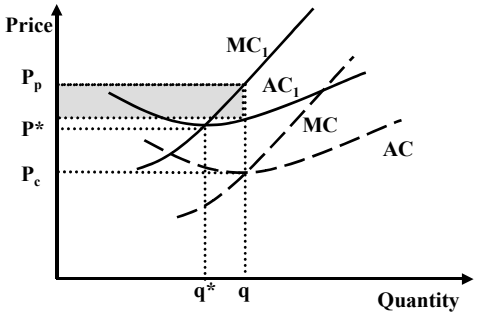
Graph 3

Consumer subsidy impact



Graph 4

Representative firm



Thus producers receive price P_p and consumers the pre-program price P_c. In order to pay enough subsidies to restore the initial level of consumption Q, the GOU needs to use budgetary funds represented by the area *(a+b+c+d+f)* in Graph 3. Graph 4 shows that increased input prices drive up the marginal and average cost curves of the downstream sector enterprise to the new equilibrium (P*, q*). And the consumer subsidy would allow the representative enterprise of the downstream sector to earn

additional profits (shaded area in Graph 4). Although producers and consumers gain areas *(b+c)* and *(a+d)* respectively, the whole economy ends up with a net welfare loss (area *f*) in addition to the net welfare losses from the minimum price regime as shown in Graph 1 above. The magnitude of these losses, of course, depends on the elasticities of supply and demand functions. Nonetheless, a very important implication can be drawn from this analysis. Since every point on the demand curve shows how much people value that particular level of consumption, the subsidy simply induces them to consume goods that are priced below their resource cost. It would be more efficient to hand out a direct grant to consumers (i.e. the area *a+d* on Graph 3), relieving budgetary funds for other purposes, and fully compensate consumers.

2.2 Institutional effects

There are additional effects deriving from minimum prices to be taken into consideration when assessing the costs of such a policy programme. Minimum prices also weaken the incentives of producers to improve their production efficiency and reduce costs, thus spoiling the industry's international competitiveness. As Graph 2 above demonstrates, the minimum price creates rents (shadowed area in Graph 2 or 4) for some low-cost producers (e.g. Farm 1), which creates incentives to lobby policy makers to maintain the support measures. So once Ukraine will have implemented such a minimum price regime, it will probably take a long time to abandon it again, inflicting a significant burden on consumers and taxpayers. This is exactly what has happened in the European Union: it is politically very difficult to drive down a level of economic support for agriculture or other beneficiaries as soon as the measure has been in place for some time.

Moreover, the measures to administrate the program and its associated costs constitute an additional burden for taxpayers. First of all, this concerns the administrative body that carries out the procurement and storage of purchased commodities. The government (or basically taxpayers) incurs significant expenditures for the staff salaries of that body, and for commodity handling and maintaining storage facilities, etc. Also one should not underestimate the costs deriving from the perishing of stored grain, which adds up to the overall costs.

2.3 Legal Aspects

Due to its substantial trade distortion effects, market price support is becoming increasingly controversial under multilateral trade agreements, and, above all, within the WTO, accession to which Ukraine is currently pursuing. Driving prices above the world level is not a feasible option for agricultural policy, as this requires the use of export subsidies in the case of a surplus producer such as Ukraine. Since export subsidies are explicitly not allowed under WTO rules, Ukraine will face considerable constraints selling its minimum price program to its trade competitors participating in the WTO accession negotiations (OECD, 2004). Inevitable countervailing measures would negatively influence the competitiveness of Ukraine's exports and would thwart the long-term goal of Ukraine to become a powerful agro-food exporter.

Furthermore, a minimum price regime might be ineffective without corresponding import barriers. If the minimum price is set above the c.i.f. - import parity price, an import tariff (either prohibitively high or flexible) has to prevent imports from entering the domestic market. As the level of import protection is monitored by the WTO, Ukraine could run into trouble with WTO partners once it would introduce a floor price regime.

3 Enumeration of Economic Impacts of Minimum Prices

This chapter attempts a to make a quantitative analysis of a minimum price regime on Ukraine's agricultural markets. First, we describe the basic features of the simulation model RASMU (Regionalized Agriculture Structural Model of Ukraine) which was used for the analysis. Second, we explain how the minimum price regime was incorporated into the model. Then we define our simulation setup and, finally, present the results of simulations.

3.1 Data and Modelling Framework

The RASMU model allows analysing the consequences of different existing and planned policy actions in the field of agriculture and the processing industry within a simplified and consistent framework of quantities and prices.[3]

To begin with, the model distinguishes between Ukrainian oblasts, so it allows capturing the diverse agro-ecological conditions in Ukraine, and thereby determines where certain policy measures have the greatest effect. For the sake of simplicity, four aggregate regions (West, North, Center, and South), composed of neighboring oblasts with similar agro-ecological conditions, have been identified, and these four representative regions trade among each other and the rest of the world. When looking at similar modeling approaches (e.g. PUSTOVIT, 2003), the major difference to RASMU is the treatment of trade. On the one hand, RASMU has no differentiated treatment of the world outside Ukraine, while Pustovit's model distinguishes trade relations with the EU and other major trade partners. On the other hand, Pustovit's model treats Ukraine as one singular market, while RASMU allows for regionally differentiated analyses within Ukraine.

RASMU is a partial equilibrium model, operating only with agricultural product and input markets. It comprises 27 commodities: raw commodities (wheat, barley, rye, maize, oats, buckwheat, potatoes, sunflower seed, sugar beets, pulses, cow's milk, beef cattle, pigs, poultry, hens) and processed commodities (bread products, maize flour, processed buckwheat, sunflower oil, sugar, butter, cheese, other milk products, beef, pork, poultry meat, eggs), whose production, consumption, and trade are modelled. Although such a framework may not completely account for

[3] For detailed description of the RASMU model see Kuhn (2004)

some macroeconomic repercussions, it simplifies the data management process and equation system.

The model is comparative-static in nature, meaning that it is not a multi-period dynamic model producing future forecasts. Nevertheless, the development in Ukrainian agriculture has been too volatile during the past decade to derive appropriate trend parameters, making the model results satisfactory for the time being.

To assess the effectiveness of policy measures RASMU employs an aggregate welfare calculation. There are four elements included in it: producer surplus, feed user surplus, consumer surplus and the balance of the government budget. The interregional and foreign trade relations in RASMU are represented as net trade flows. The idea of this mechanism is simple. If the target region has excess supply, it exports the commodity to those regions where the price difference (minus trade costs) is highest. The trade flows provide for a relative equalisation of commodity prices between the regions and the world market. Trade costs, in turn, comprise handling and packaging, transport, transaction costs, and administrative trade barriers. But due to the lack of information, RASMU considers only railway transport costs so far. As a proxy for real transport costs, these are probably overestimated. However, existing estimations of trade costs for Ukrainian grain trade indicate that the magnitude of the current transport costs in RASMU comes relatively close to the level of overall trade costs.

The decision variable for crop supply is the regional cropping area, which is driven by the change in revenue per hectare. This formulation has been chosen to allow for the simulation of abrupt yield shocks for a crop, which often happens in Ukraine due to adverse weather conditions. (??) Production of livestock and processed commodities in turn is driven by the change in the prices of crops, livestock, and processed products. Consumption demand is determined by a linear expenditure system (LES) in which the marginal budget share is fixed and each commodity is characterised by a minimum consumption (subsistence) level. Processing demand is represented by fixed (Leontieff-type) input-output coefficients.

The database of RASMU consists of annual regional-level data for 2001 and 2002: i) production and consumption; ii) regional prices (producers, consumers); iii) border prices; iv) trade costs (railway fees). The data was accumulated from different sources: national and regional statistics; international statistics (FAO); surveys of farms, rural households, and consumers; own parameter estimations on the basis of surveys (elasticities).

3.2 Minimum prices in RASMU

This subsection shows how the RASMU model, formulated as a Mixed Complementarity Problem (MCP), deals with a minimum price regime and compensating consumer subsidies. Following the discussion in chapter 2, the state commits itself to buy grain surpluses from producers at a minimum price P_M. Thus we introduced the minimum price regime to the optimization problem as an additional constraint in the form of an inequality:

$$P_M \le PD_{i,r} \perp VINTV_{i,r} \ge 0 \qquad \forall i,r \tag{1}$$

where the symbol "$\perp$" means that at least one of the adjacent inequalities must be satisfied as a strict equality. In other words, the inequality (1) says that if the domestic price for good *i*, $PD_{i,r}$, in the target region *r* exceeds the floor price level P_M, then the volume of intervention purchases of grain $VINTV_{i,r}$ must be positive.

We also accounted for the net budgetary outlays necessary to carry out intervention purchases at the minimum price (and eventually exporting it abroad at world prices), so as the difference between these magnitudes would constitute the net costs of the program to the budget. Also we added intervention stocks $VINTV_{i,r}$ as an additional component to the total demand calculations.

A consumer subsidy has been introduced as a negative ad-valorem tax on bread products:

$$P^C{}_{i,r} = PD_{i,r} \cdot \left(1 + Pm_{i,r} - Subs_{i,r}\right) \qquad \forall i = bread, r \tag{2}$$

where $P^C{}_{i,r}$ stands for consumer price for good *i* in the target region *r*; $PD_{i,r}$ is the warehouse price; $Pm_{i,r}$ is a processing margin (including VAT); $Subs_{i,r}$ is a consumer subsidy. Also we accounted for additional budgetary outlays for subsidizing bread consumption.

3.3 The Policy Experiments

This section discusses policy simulation scenarios using RASMU to estimate the economic costs and benefits of introducing a minimum price regime for cereals. We distinguish between the following scenarios which are compared to the base situation without minimum prices:

1. Scenario I: floor price at UAH 800/t[4] (USD 151.2/t) for wheat and a EURO 40/t import duty;[5]
2. Scenario II: Scenario I together with compensating 20% consumer subsidy for bread products;

Scenario I: We present the results for simulation I in Table 1. The table also illustrates the impact of the minimum price regime on the 'bread products' sector. Generally, table 1 quantitatively supports the analysis we conducted in chapter 2. If a floor price for wheat were implemented, we would observe an expansion of both area and production by almost 16% (18 m tons) due to increased prices. Producers most likely would use either

[4] At this price the GOU purchased wheat to intervention stocks in 2004 (AGROBUSINESS, #14, 2004)

[5] The import duty is necessary to avoid that imports enter the domestic market in unlimited amounts, thus thwarting the desired effects of the minimum price regime.

idle land or substitute land under competing crops for wheat. In total, the surplus of wheat producers would increase by nearly 1377 m USD as a consequence of introducing the floor price. Due to the increased domestic price (UAH 800/t = USD 151.2/t) wheat becomes a more expensive input for the processing sector (both feed and bread products), which leads to decreased processed volumes (-3.6%) and feed use (-68.6%). As a consequence, producers of breadstuffs would be worse off by USD 157.8 m. We observe a slight decline of domestic consumption of breadstuffs by -3.6%, primarily due to increased domestic prices on bread products by 15% combined with the assumption that bread products are non-tradable. Also the fact of increased domestic prices on breadstuffs needs a rigorous consideration. Since bread products constitute a considerable share of expenditures of the representative household in Ukraine (GALUSHKO et al., 2004), rising prices for bread may bear considerable political risk. The GOU may counteract with additional measures, meaning additional budget expenditures to be discussed below.

Table 1
Scenario I: Economy-wide results for wheat and bread products

	Base values:	Scenario I:	Changes in percent
Wheat			
Area (1000 ha)	5,978	6,926	15.9
Production (1000 t)	15,657	18,185	16.1
Processing (1000 t)	6,122	5,903	-3.6
Feed use (1000 t)	4,789	1,503	-68.6
Net trade (non-subsidised exports) (1000 t)	3,049	0	-100.0
Intervention stocks / subsidised exports (1000 t)		8,734	
Domestic price (US$/t)	91	151	66.0
Producer surplus (m US$)		1,377	
Bread Products			
Production (1000 t)	6,101	5,884	-3.6
Domestic consumption (1000 t)	6,101	5,884	-3.6
Producer margin (US$/t)	176	155	-11.5
Domestic price (US$/t)	275	317	15.1
Producer surplus (m US$)		-157	

Source: PS&D, RASMU simulations

But most importantly, table 2 shows that the government would need to take about 8.7 m tons of wheat away from the market in order not to let the market price slip below the floor price level, and this in an average year! This is caused by the expectation that unsubsidized exports of wheat (Table 1) will not be competitive any longer on the international market at

a floor price of UAH 800/t.6 Table 2 also illustrates the welfare implications of the minimum price regime for the model regions and Ukraine as a whole. It is clearly seen that the South and Center would gain most, whereas Northern and Western regions would lose. This is due to the fact that South and Center produce the most significant wheat surpluses in Ukraine, so they are better off first of all due to significantly increased crop producer surpluses. But on the national level Ukraine would suffer a USD 179 m welfare loss, which means that the losses of West and North would outweigh gains of Center and South. Moreover, floor prices for wheat alone would cost at least USD 614 m or approximately 5% of the 2004 central state budget, which is equivalent to all central budget expenditures on agriculture in 2004.

Table 2
Scenario I: Intervention stocks and overall welfare changes

	Scenario I vs base values				
	Ukraine	North	West	Center	South
Regional wheat intervention stocks (1000 t)	8,734	373	0.0	3,303	5,057
Welfare effects (m USD)					
Feed users	-441	-94	-73	-159	-115
All producers and processors	1,003	128	70	356	449
Consumers	-568	-117	-92	-161	-199
Taxpayers (budget)	-614	-136	-101	-158	-219
Total welfare	-179	-125	-123	37	31

Source: RASMU simulations

As these calculations do not include the administrative costs of the program, these 5% rather represent a lower bound of budgetary costs. Producers, however, would gain about USD 1.0 bn with Center and South benefiting the most, where the bulk of wheat supply is located. On the other hand, animal producers, processors, consumers and taxpayers would suffer huge losses regardless of their home region. Obviously, taxpayers in South and Center would incur the highest losses. The reason for this is that Center and South are significantly more populated than North and West, meaning higher overall costs of increased consumer prices for the region. Feed users are confronted with a similar situation, as the demand for feed wheat is higher in South and Center, meaning higher overall losses there.

Scenario II: For the second scenario we chose a consumer subsidy (20 % ad-valorem) such that the consumption level of bread products is kept constant in contrast to simulation I. Table 3 describes the welfare implications if the GOU introduced a minimum price regime coupled with this compensating consumer subsidy.

[6] An attempt of the GOU in 2004 to procure only 3.5 m tons of grain (where wheat constituted only a share of the volume) from the market to support producers was far from being sufficient for that purpose.

Table 2
Scenario II overall welfare changes

	Scenario II vs base values (m USD)				
	Ukraine	North	West	Center	South
Feed users	-458	-98	-79	-163	-117
All producers and processors	1,190	170	97	410	512
Consumers	-353	-71	-69	-100	-111
Taxpayers (budget)	-926	-205	-152	-238	-330
Total welfare	-89	-106	-124	71	70

Source: RASMU simulations

Compared to the table 2, however, we observe a 50% increase in central budget expenditures, i.e. almost USD 1 bn. Producers also benefit in the magnitude of almost USD 190 m, while the welfare of bread consumers alone increases by about USD 213 m, which complies with our qualitative analysis in section 2.1. Nevertheless, consumers as a whole still suffer losses because the notion "consumer" in the model comprises the whole spectrum of consumers, not just bread consumers. While bread product consumers are compensated, consumers of milk or meat products are not, despite increased milk and meat prices due to feed wheat price changes. Additionally, we observe a smaller national welfare loss as compared to simulation I. This can be explained by the partial character of the model: the misallocation on the consumer side is partly removed, while the negative effect of the additional tax burden on resource allocation is not accounted for in a partial equilibrium model.

The simulation results illustrate that once the government supports producers, it starts a whole cycle of consequences: huge budget outlays, implicit taxation of feed and downstream sectors, and higher consumer prices. If the government tries to counteract by compensating consumers through subsidies, it additionally increases budgetary outlays, leaving consumers only partially compensated.

4 Conclusions

The analysis illustrates sectoral adaptation processes and welfare implications for Ukraine's economy if a minimum price regime were seriously implemented in Ukraine. First of all, the GOU would incur huge budget outlays to sustain intervention system working in Ukraine. As the analysis has shown, the GOU would need at least USD 614 m to maintain prices at floor level. This constitutes approximately 5% of the 2004 central state budget, or all central budget expenditure on agriculture in 2004, which is quite a lot for Ukraine under the current budget constraints. From an economic point of view, if a minimum price regime happened to be implemented, Ukraine would suffer a USD 179 m welfare loss. But behind this net effect are much larger redistributive processes, shifting wealth from feed users, processors, consumers and taxpayers on to grain

producers. The more the government tries to compensate losers, the higher are the budgetary costs of the measures. A partial model underestimates the distortions, which are inflicted on the national economy by increased taxes to help a relatively small group of producers.

Much mistrust against the ability of the 'invisible hand' to stabilise producer incomes can quickly turn into a very costly affair. Even if the intervention system would be based on minimum prices in line with long-term average domestic prices, neither price nor income stabilisation is a simple and cost-neutral matter of buying wheat in times of excess supply, storing it, and selling it later when prices are dear. Ukrainian grain (wheat) prices do not follow a regular seasonal pattern because world prices do neither. This is explained by the fact that at any point in time, grain is being harvested somewhere in the world (CRAMON, 2003). Each of these harvests is subject to fluctuations due to factors such as weather and policy changes. As a consequence, traders on the world grain market face a continuous flow of new information, which has an impact on world price levels, which are transmitted to domestic markets. Since each year is characterized by a unique flow of information, each year is also characterised by a unique seasonal price pattern.

The amount of grain likely to be subject to intervention purchases is very high and exceeds the current average grain net exports, as feed use would be reduced. Sooner or later this grain would have to be disposed of to the world market using export subsidies, given the assumption that long-term grain prices on the international market largely remain stable. This would thwart the attempts of Ukraine to become a member of the WTO. Another important aspect is the burden laid on livestock producers by introducing such high floor prices. Livestock production has suffered most during transition, and it would be disastrous to disrupt the recovery of this promising sector through implicit taxation.

There are some more effective options for Ukrainian policy makers to choose. The notorious failure to refund VAT on grain exports indirectly taxes Ukrainian producers of grain. Exporters simply offer a lower bid price to grain producers to compensate for VAT refund arrears. Straightening out the VAT refund administration to grain exporters would most likely lead to a bid-up of producer prices. Moreover, investing budget funds into improving marketing services and infrastructure would be another feasible option for GOU. Investments in transport infrastructure are the most important component of price stabilisation policies, since improved transportation networks decrease marketing costs, increasing farm-gate prices (thus increasing farmers' incomes), lower input costs and thus significantly contribute to a reduction of price fluctuations.

References

Auerbach, R., (1970): The Effects of Price Suports on Output and Factor Prices in Agriculture, The Journal of Political Economy, Vol. 78, pp. 1355-1361.

Galushko, V., Kuhn, A., and Nivyevs'kiy, O. (2004): The 2003 Wheat Crisis and Food Security, in: von Cramon-Taubadel, S., Demyanenko, S., Kuhn, A. (eds.): Ukrainian Agriculture – Crisis and Recovery, Kyiv, pp. 167-180.

Gardner, B. L. (1987): The Economics of Agricultural Policies, NY: Macmillan Publishing Company.

Kuhn, A., (2004): RASMU: Regional Agricultural Sector Model for Ukraine, IER Working Paper No.27, Kyiv, IER, < http://pigra.kiev.ua/ier/wp/wp_27_eng.pdf >.

Lichtenberg, E., and Zilberman, D., (1986): The Welfare Economics of Price Supports in U.S. Agriculture, The American Economic Review, Vol. 76, pp. 1135-1141.

Miranda, M. J., and Helmberger, P. G. (1988): The Effects of Commodity Price Stabilization Programs, The American Economic Review, Vol. 78, pp. 46-58.

Pustovit, N. (2003): EU-Osterweiterung und WTO-Liberalisierung aus Sicht der ukrainischen Agrarwirtschaft. Wirkungsanalyse und Bewertung mit Hilfe eines partiellen Gleichgewichtsmodells. Dissertation, University of Giessen (Germany), Vauk.

OECD, (2004): Achieving Ukraine's Agricultural Potential. Stimulating Agricultural Growth and Improving Rural Life, Paris.

von Cramon-Taubadel, S., (2003): Wheat Market Stabilization: Option for Ukraine, IER Advisory Paper No. T18, Kyiv, IER, http://www.ier.kiev.ua/English/papers/t18_en.pdf >.

von Cramon-Taubadel, S., Zorya, S. (2004): The Implication of WTO-Accession for agriculture Policy in Ukraine, in: von Cramon-Taubadel, S., Demyanenko, S., Kuhn, A. (eds.): Ukrainian Agriculture – Crisis and Recovery, Kyiv, pp. 5-15.

Wright, B. R., and Williams, J. C., (1984): The Welfare Effects of Introduction of Storage, The Quarterly Journal of Economics, Vol. 99, pp. 169-192.