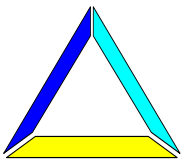
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T28

Coping with a good grain harvest 2004

Executive summary

The grain harvest for 2004 is projected at 34 m tons, with wheat harvest accounting for 15 m tons. Thus, there are reasons to believe that in 2004/2005 Ukraine will switch to an export situation. This switch is likely to be associated with a reduction in the domestic grain prices of UAH 581-586 per ton. As a result of grain production expansion and the consequent price decrease farmers are likely to realize gains in revenues by UAH 1484 m compared to 2003/2004, but profits will be cut by UAH 1874 m. Nevertheless, profits are expected to be positive and account for about UAH 2.8 bn. This leads to the conclusion that good harvest does not necessarily imply that grain producers get better off.

We recommend the following:

- Instead of providing direct state aids in bad years market-based risk reduction mechanisms such as futures markets and yield and price insurance systems should be developed.

- Price variability should be reduced via a reduction in marketing costs. This can be achieved by investing more into infrastructure (roads, ports, etc.) and by reducing the main cost components such as railway tariffs, storage costs, etc.

- To avoid frequent switches from an import to an export situation and vice versa yield variability should be decreased. This can be achieved by facilitating farmers' access to modern technologies, investing more into selection activities, agricultural education, research and extension services.

1. Introduction

The year 2003 in Ukrainian agriculture was marked by a tremendous decline in grain production due to adverse weather conditions: grain production declined from a record of 38.8 m tons in 2002 to 20.2 m tons in 2003. Such a low grain harvest gave rise to concerns among agricultural lobbyists who insisted on increasing financial support to Ukrainian agricultural sector and claimed that

agricultural producers would suffer substantial losses. However, the evidence points to the contrary: in 2003 the net *profit* in Ukrainian agriculture accounted for 25.1 m UAH, while in 2002 agricultural enterprises suffered a net *loss* of 330.8 m UAH. Furthermore, profitability of grain production increased from 19% in 2002 to 45% in 2003[1]. Thus, on average high grain prices seem to have compensated for yield losses and in the year 2003 agricultural producers were, *on average*, better off than a year earlier. The averages, however, do not tell most of the story and one should bear in mind that losses and profits from grain production were not evenly distributed across oblasts. Southern oblasts (Kherson, Odessa and Mykolaiv oblasts) suffered most and as a result of frost, drought and locust invasion grain yield decreased 3.5-4.5 times in these oblasts, while the average reduction of yield was 46%. Obviously, grain price increases were not sufficient to compensate yield losses in these oblasts, even though on average they were. A natural question then arises: Is high grain harvest good or bad for agricultural producers?

ProAgro company releases rather optimistic projections of 2004/2005 grain harvest in Ukraine. Grain production is expected to reach 34 m tons with wheat accounting for 15 m tons[2]. The most recent UkrAgroConsult forecast is 33,997 million tons of grains, with 15,669 million tons of wheat[3]. Thus, there are reasons to believe that Ukraine will again switch to an export situation. This switch, in its turn, will likely be associated with a reduction in the domestic price for grains harvested in 2004. Will this price reduction be relatively small relative to the increase in production, leading to higher revenues and profits than last year, or will the price reduction be proportionally higher than the production increase, leading to lower revenues and profits?

This paper adds to the recent discussions about the impact of a good grain harvest 2004 on the domestic grain price and, consequently, welfare of agricultural producers. The paper is organized as follows. Section 2 contains projections of the world price for grains. Section 3 discusses the future development of grain prices in Ukraine and assesses changes in producer welfare in 2004 (expected) vs 2003 as a result of grain price reductions. The final section contains policy recommendations.

2. World Price projections

Price behavior in any country that is engaged in international trade is heavily dependent on the world prices[4]. Under competitive conditions and with no restrictions to trade arbitrage would ensure that any price difference between the world and domestic price is phased out.

[1] Derzhkomstat
[2] www.proagro.com.ua, news as of March 22, 2004
[3] UkrAgroConsult, Weekly report #13, 2004
[4] For an explanation of the world price formation see Appendix A.

In a real world, however, the prices in the exporting and importing region will differ (Appendix A). Let us consider, for example, a *small* country that is in a net export situation. A 'small country' notation means that a country can have no impact on the world price and takes it as it is at the border. Assume that the domestic price (P^E) is far below the world price (P^W). Then, traders could make profits of (P^W-P^E-transaction costs) per unit by buying wheat on the domestic market and exporting it. As the domestic supply shrinks (because of exports) the domestic price rises. Exports will continue and the domestic price will rise until the difference between the world price and the domestic price is just as large as to cover the transaction costs traders incur to export grain, that is, until traders can make no profit by exporting. Thus, if a country is in a net export situation the domestic price is determined by the world price less transaction costs. The same logic applies to a net import situation: if a country is in a net import situation the world price equals (the world price + transaction costs).

So, from this discussion it follows that under open trade it is the world price that determines the domestic one for a small country like Ukraine. With this respect in order to make projections of the Ukrainian grain prices in 2004/2005 it is important to know the future world price as well as the linkage between the world and Ukrainian grain price. The later will be discussed in the next section.

In 2003/2004 the world faced a reduction in the grain harvest of approximately 90 m tons compared to 2002/2003 year. In addition the ratio of grain ending stocks to grain consumption in 2003/2004 is expected to fall to the lowest level since 1981/1982 – to 16%. The decrease in the stocks-to-use ratio is expected to put an upward pressure on the wheat price and according to the projections of Food and Agricultural Policy Research Institute (FAPRI) the Gulf FOB wheat price will grow 1.1% annually after 2003/2004[5]. Thus, in 2004/2005 the world wheat price is forecast at $138/ton. Coarse grain prices are projected to be $99/ton in 2004/2005 (FAPRI). According to the OECD outlook forecasts (OECD Agricultural Outlook 2003) wheat price in 2004/2005 is expected to be at $139.8/ton, and coarse grain price - $102.6/ton. However, according to the OECD forecasts wheat price in 2003/2004 is expected to be $138.7, while the average wheat price (US HRW, FOB Gulf) over the first 7 month of the 2003/04 crop year has actually accounted for $148.3/ton. So the OECD forecasts would appear, at least for the current year, to be on the low side. World markets have remained tighter than expected since this forecast was made.

3. Ukrainian grain price projections

[5] http://www.fapri.iastate.edu/outlook2003/

As was mentioned in the previous section the domestic price is determined by world market prices, marketing margins and a country's net trade position. In 2003/2004 Ukraine switched to an import situation and an increase in the domestic price for grain was inevitable. Note that even though in 2003/2004 Ukraine was a net importer of wheat and a net exporter of coarse grains the domestic price for coarse grains was relatively high (above the level that would have prevailed in an export situation), which can be explained by the fact that the domestic demand for coarse grains increased, as wheat was substituted for grains, thus putting an upward pressure on the price. In 2004/2005 the situation is likely to change: with a harvest of 34 m tons Ukraine will switch to an export situation. This switch will lead to a reduction in the domestic price to the world price less the costs of delivering grains from Ukraine to the world.

Using the monthly data on domestic wheat prices (EXW)[6] and the world wheat price (US Gulf ports, FOB)[7] from 1998 up to now we estimated the following relationship between the domestic and the world price:

***Export situation**: $P^{DOM} = 85.9+0.56*P^{WORLD}$* *(1)*

***Import situation:** $P^{DOM} = 516.0+0.56*P^{WORLD}$* *(2)*

where P^{DOM} – domestic price for wheat, UAH/t;

P^{WORLD} – the world wheat price, UAH/t.

Since traders incur identical costs when transporting wheat and coarse grain to the world market we can assume that relationships (1) and (2) are also valid for coarse grain. Plugging in the projected values of wheat and coarse grain we can make a prediction that as Ukraine switches to an export situation the domestic price for wheat and coarse grain will equal UAH 500 and UAH 384 per ton, respectively. It should be stressed, however, that this is the forecast conditional on the exchange rate: we assume that UAH/USD exchange rate remains at 5.33. The path of past and future (projected) price developments is plotted in Figure 1. As can be seen as Ukraine will switch from an import to an export situation wheat price will decrease from UAH 1180/ton to UAH 500/ton or by 58%.

* - forecast

[6] Data are reported by UkrAgroConsult on a weekly basis and are aggregated to monthly data.
[7] USDA http://www.ers.usda.gov/publications/so/view.asp?f=field/whs-bb/

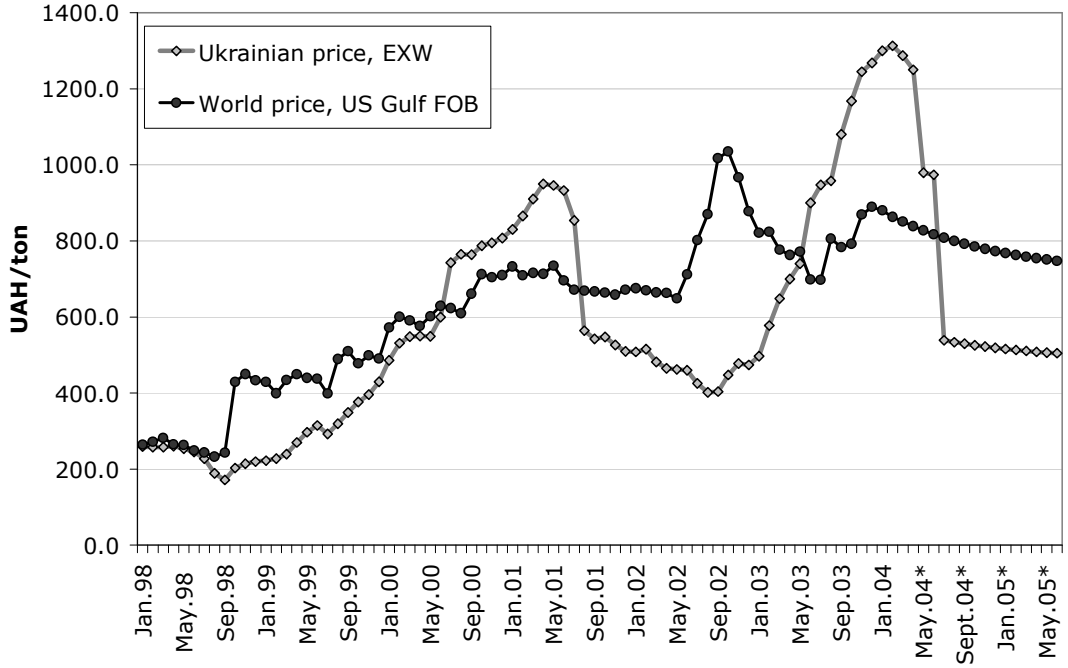


Figure 1. Price development

Which factors are responsible for such price reductions? The domestic price for grains has two main components: in an import situation these components are the world price at the border and the costs of moving grain to *inland* positions where it is milled, while in an export situation these components are the world price at the border and the costs of moving grain *from* a farm to the Ukrainian frontier. The major cost components when importing grain have been discussed in paper T18[8]: in 2003/2004 the costs of importing wheat into Ukraine accounted for about UAH 325/ton. In an export situation an exporter incurs marketing costs of UAH 261.27 per ton under DAF terms of delivery and UAH 246.02 under FAS terms of delivery. What are the cost components? Table 1 gives an indication of the various cost components in an export situation[9].

Table 1. Typical costs of marketing export wheat

[8] "Wheat market stabilization", Institute for Economic Research and Policy Consulting, T18, December 2003

[9] According to the data provided by the Ukrainian Grain Association

	Marketing cost component	Cost (UAH/t) under the terms of delivery	
		DAF Ukrainian border	FAS port-Ukrainian border
1.	Transporting from the field to the farm	9.75	9.75
2.	Cleaning	10.00	10.00
3.	Drying	20.00	20.00
4.	Transporting from the farm to the elevator	20.00	20.00
5.	Acceptance on the elevator	5.11	5.11
6.	Cleaning on the elevator	18.75	18.75
7.	Drying on the elevator	34.85	34.85
8.	Storage	12.60	12.60
9.	Loading on the elevator	19.32	19.32
10.	Transporting to the border	45.00	45.00
11.	Other	1,69	1,69
12,	Extra railway fees	13.31	13.31
13.	Broker's service	6.45	6.45
14.	Forwarder's service	5.33	5.33
15.	Fumigation	21.14	4.32
16.	Degassing	3.55	-
17.	Certification - certificate of the state grain inspection - certificate ST-1 - Quarantine certificate - Veterinary certificate - Carriage disinfection	 1.53 4.03 1.21 4.36 3.29	 1.53 0.26 1.21 4.36 3.29
18.	Forwarder's service at the port	-	5.46
19.	State grain inspection service	-	1.10
20.	State quarantine service	-	0.12
21.	State veterinary control service	-	1.96
22.	Broker's service	-	0.13
23.	Independent surveyor service	-	0.12
	Sum	**261.27**	**246.02**

Thus, when Ukraine switches from an import to an export situation a reduction in the grain price of UAH 571/ton [246+325] or UAH 586/ton [261+325] is inevitable!

What would happen to revenues and profits of Ukrainian farmers if the domestic price for wheat reduces to UAH 500 and that for coarse grains to UAH 384? Will this price reduction be large enough to eliminate any gains in profits as a result of increased production?

In the following we are answering these questions. According to the Derzhkomstat data the average grain price for the second half of 2003 *received by agricultural enterprises* was UAH 659/ton: wheat price - UAH 896/ton (EXW wheat price was UAH 1108/ton), coarse grain price - UAH 594.

The change in grain producers' revenue from 2003/2004 to 2004/2005 equals:

Wheat: changeR = 500*15-896*4.25 = 7500-3808 = **3692** m UAH

Coarse grain: changeR=384*19-594*16=7296-9504=**-2208** m UAH

Thus, wheat producers will enjoy higher revenues as a result from increased yield despite a price reduction, while coarse grain producers will become worse off in 2004/2005 compared to the previous year. The net change in the surplus (revenue) of all grain producers is positive and equals 1484 m UAH (3692-2208).

The situation with farmers' profits is a bit different. The cost of production of wheat in 2003/2004 was roughly twice as large as it would have been if that had not been because of adverse weather conditions, that is, UAH 560/ton.[10] As for spring grains almost all spring crops survived. However, unfavorable weather conditions manifested themselves in lower yields. Coarse grain yield declined by 40%, which inevitably led to an increase in the cost of producing 1 ton of coarse grains. Taking into consideration yield losses we assume that in 2003 the cost increased by about 40% to UAH 392/ton (UAH 280*1.4). In 2004/2005 yields are expected to be at their average level and according to our calculations the cost of producing one ton of wheat and coarse grain of 2004 harvest will be UAH 370 and UAH 340, respectively[11].

Using information on production costs we can calculate the change in farmers' profits in 2004/2005 compared to 2003/2004 year as follows:

Wheat: change Profit = (500-370)*15-(896-560)*4.25 = **522** m UAH

Coarse grain: change Profit=(384-340)*19-(594-392)*16 = **-2396** m UAH

As in the case with producer surplus wheat producers are likely to realize gains in profits of UAH 522 m as a result of yield improvements. However, a reduction in the domestic grain price as a result of good 2004 grain harvest will negatively effect coarse grain producers with profits falling by about UAH 2.4 bn. Combining the effect on wheat and coarse grain producers we see that **in 2004/2005 profits will likely decrease by about UAH 1.9 bn compared to 2003/2004 year when there was a poor grain harvest**, which is 75% of the annual agricultural budget. Nevertheless, in 2004/2005 in general

[10] According to the Derzhkomstat reports in 2002 the cost of producing 1 ton of wheat was on average UAH 260. Inflating this number by the Producer Price Index in 2003 of 1.078 yields UAH 280/ton. This is the cost that would have been incurred by farmers had it not been because of adverse weather conditions. Because some farmers had to re-seed the winter crops that died or re-seed the area with spring crops they incurred additional costs. Furthermore, crop yields in 2003 were half of those in 2002. Thus, there are reasons to believe that the cost of producing 1 ton of wheat was about two times higher, that is, UAH 560/ton.

[11] On average, for seeding a farmer in Ukraine uses 2.28 centners of grain per ha. Since the average grain price in 2002 was UAH 31.3 per centner, the cost of seed in total costs of producing 1 ton of grain was UAH 24 ((UAH 31.3*2.28 centners/ha)/25 centners/ha, where 25 centners/ha – crop yield). Thus, other costs rather than seed accounted for UAH 232. For 2004 harvest the cost of seed is much higher: taking into consideration that in 2003 the average wheat and coarse grain price was UAH 896 and UAH 584, respectively, the cost of seed in 1 ton of wheat and coarse grain must be UAH 82 and UAH 53. Inflating UAH 232 by the PPI of 1.24 (according to the forecast of the Institute for Economic Research and Policy consulting PPI is expected to be 14.7% in 2004) yields UAH 288. Adding the cost of seed we come up with the production cost for wheat of UAH **370**/ton and that of coarse grain – UAH **340**/ton in 2004.

profits of grain producers are expected to be UAH 2.8 bn (see Table 2). In terms of profitability it is about 27%.

Table 2. Projected profits and revenues in 2004/2005 crop year

	Projected production cost, UAH/t	Projected price, UAH/t	Projected revenue in		Projected profits in	
			2004/2005, m UAH	Change compared to 2003/2004, m UAH	2004/2005, m UAH	Change compared to 2003/2004, m UAH
Wheat	370	500	7800	+3692	1950	+522
Coarse grains	340	384	7505	-2208	836	-2396
Sum	353	435	**15305**	+1484	**2786**	-1874

It should be mentioned that the scenario described above is rather optimistic. If one looks at the relationship between the price farmers were actually paid in the past and the domestic price EXW (figure 2) a salient feature is that farmers received EXW price less UAH 75-150. Assuming that in 2004/2005 year this trend will be maintained wheat producers will get about UAH 400/ton [500-100], and coarse grain producers – UAH 284/ton [384-100]. Under such a scenario profits of wheat producers will account for UAH 450 m in 2004/2005, while losses of coarse grain producers – UAH 1064 m. **Thus, in 2004/2005 grain producers may suffer losses of UAH 614 m despite a good 2004 harvest**, while in 2003/2004 they were enjoying profits of about UAH 4.4 bn.

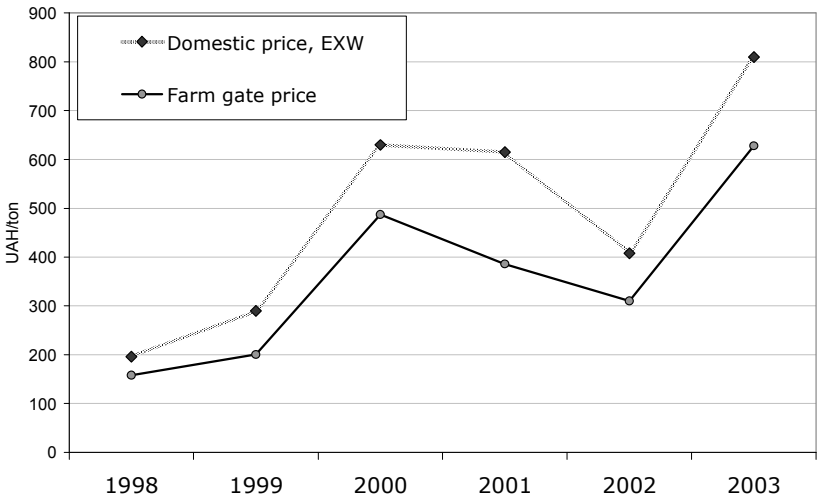


Figure 2. The margin between EXW wheat price and farm gate price

Conclusions and policy implications

The calculations presented in the previous section lead us to the following conclusions and policy recommendations.

First, if the 2004 grain harvest turns out as expected the domestic price for grain is likely to fall by UAH 581-586 per ton. Farmers are likely to realize

gains in revenues by UAH 1484 m compared to 2003/2004 crop year and a reduction in profits of UAH 1874 m.

The opponents of agricultural reforms were quick to seize upon a poor 2003 grain harvest as evidence that reform is bad for Ukrainian agriculture and bad for Ukrainian peasants and the government undertook some anti-reform measures. By agricultural lobbyists a poor 2003 grain harvest was used as an indicative of a necessity to increase subsidies and provide UAH 716 m as disaster assistance to Ukrainian agriculture. However, as the calculations reveal **a poor harvest does not necessarily imply that grain producers get worse off**. The price alone is not relevant; what matters more are revenues and profits. These are 'automatically' stabilized somewhat by the fact that as Ukraine moves from good to bad harvests and back, it also moves from a net export to a net import situation and back. As a result, prices tend to be negatively correlated with harvests, which stabilizes returns. Or course, this effect only works on average; high prices last year provided little comfort to farms that harvested next to nothing. For farms in this situation, targeted support measures are called for. Before turning to direct state aids, however, market-based risk reduction mechanisms should be developed. **One such mechanism** is to develop futures markets. These would help farmers make production decisions, since they are sure of future prices[12]. Furthermore, instead of providing ad-hoc disaster payments to farmers in the years of bad harvest it is advisable to develop yield insurance in Ukrainian agriculture[13]. It should be stressed that **the availability of "free" disaster assistance** (for example, UAH 716 m appropriated in the 2003 budget to compensate for catastrophic losses) **reduces the attractiveness of buying insurance policies and hinders the development of insurance markets in Ukrainian agriculture.**

Second, because of high marketing costs[14] there occurs a tremendous price reduction when Ukraine switches from an import to an export situation, which makes farmers on average worse off. To reduce price variability the government should invest into road and port infrastructure as well as reduce the main cost components such as railway tariff, costs of storage at the railway station, the costs of weighing and storage on the elevator and others. It should be mentioned that non-redemption of export VAT also contributes to an increase in the gap between the world and the price farmers receive, as traders lay some of the burden on farmers.

Third, frequent switches from an import to export situation and vise versa accompanied by substantial price changes are the result of considerable variations in production. Thus, one of the long-term goals to ensure

[12] "A market for risk and not for grain: An introduction to futures markets for agricultural products", Institute for Economic Research and Policy Consulting, Q11, December 2001
[13] A paper on crop insurance will shortly appear.
[14] "Wheat market stabilization: options for Ukraine", Institute for Economic Research and Policy Consulting, T18, December 2003

sustainable agricultural development for policy makers should be to reduce yield variability. This can be achieved if the government **(i)** favors transfers of modern technologies, and **(ii)** invests more into selection activities to ensure that farmers use seeds of high-yield frost- and drought-resistant crops. Transfer of modern technologies does not merely mean acquisition of new equipment because modern technologies cannot be adopted one to one, but rather should be adapted to Ukrainian conditions. So, the government could alleviate the process of transferring modern technologies by investing more in education, research and extension. In addition to having 'good' inputs (seeds of frost- drought-resistant crops) available farmers should possess necessary knowledge about, for example, seeding densities, seedbed preparation, timing of preparation and fertilizer application. Extension services could be an effective tool to ensure transfer of this knowledge to farmers.

V.G. Lector S. von C.-T.

April, 2004

Appendix A.

In the following we discuss how the world price is formed.

Theoretically, the world can be divided into two parts: countries that import a particular commodity (importing region) and countries that export this commodity (exporting region). Let this commodity be wheat. In autarky the price in the importing region equals P^I, while in an exporting region it is considerably lower and equals P^E (Figure 1). When we open up trade it is evident that the importing region would import certain amount of wheat at any price lower than P^I. This enables us to construct an import demand curve for the world – Id – which shows the amount the importing region is willing to import at a price below P^I. Let us now turn our attention to the exporting region: at any price above P^E there is excess supply and the region is willing to export wheat to the world market. The amount of wheat the exporting region is willing to supply to the world market at any price above P^E determines the world export supply curve – Es (the middle graph). The equilibrium world price occurs at the intersection of the world import demand and export supply curve and is given by P^W on the graph. Under open trade this price prevails in both exporting and exporting region: the importing region produces Q^3 and imports Q^3Q^4, while the exporting region produces Q^2 and exports Q^1Q^2. Note that world exports should be equal to world imports.

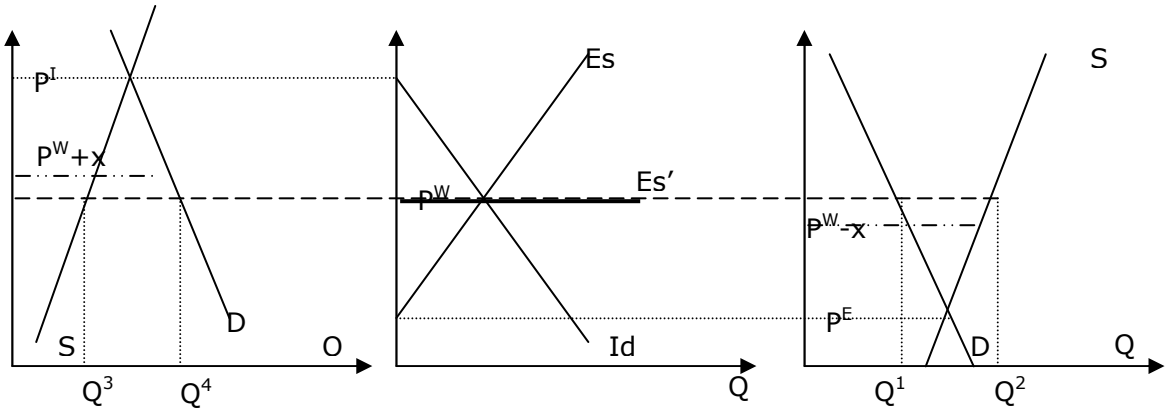


Figure 1. World price formation

It should be mentioned that particular countries within the exporting or importing groups have little influence on world market prices and must simply take them as they are at the border. This means that a small exporting country like Ukraine is a price taker, i.e. the excess supply function is effectively perfectly elastic. Thus for a small exporting country export supply curve looks like Es'.

Let us now introduce marketing costs x. If a country cannot effect the world price it should bear these costs by itself. In an exporting country marketing costs drive the domestic price down to P^W–x, while in an importing country marketing costs increase the domestic price to P^W+x.