

Modeling Agricultural Reform in Russia and Ukraine

To illustrate the impact of a hypothetical productivity increase, some modeling projections have been made for wheat and barley for the next decade using the USDA Agricultural Baseline Projections to 2011 (USDA, 2002c). The USDA baseline estimates world production and trade and takes into account possible changes in world prices, making the system useful for predicting the response in world trade markets to productivity increases in the CIS. The effect of improving agricultural productivity on GDP is not modeled, which might be significant in Ukraine, where agriculture is about 30 percent of GDP. Nevertheless, because agricultural production is only 7 percent of GDP in Russia, the effects there would probably be slight. Wheat and barley were selected because they are the most significant crops produced in Russia and Ukraine that are widely traded on world markets. For each crop, productivity increases are modeled as an increase in the yield growth rate over the baseline projected growth rate.

Modeling Scenarios

The base scenario is modestly optimistic, assuming an average yield growth of 1.5 percent per year for each crop, reversing recent downward trends. The base scenario also incorporates optimistic consumption growth forecasts based on the 5-percent annual GDP growth

projected for Ukraine and Russia into the next decade. Under this scenario, wheat production increases 16 percent between 2001 and 2011 (table 6).

Consumption rises 6 percent to 54.5 million mt while exports (total) increase to 8.8 million mt (6.2 million mt net exports). Barley production increases 2 percent in the same period, and total exports increase to 1.6 million mt.

This guarded optimism is justified for a number of reasons. Oil prices have increased in recent years, allowing the Russian Government to afford more subsidized inputs.¹³ In addition, the ruble devaluation that occurred in 1998 shifted the terms of trade in favor of local producers relative to imports.¹⁴ Grain harvests in Russia have also rebounded in the past few years. While most of the rebound is due to favorable weather conditions, many believe that the favorable terms of trade resulting from the ruble devaluation have contributed significantly to the turnaround.

Because Russia is relatively more reform oriented, prospects for reform to impact productivity growth are

¹³Changes in world prices are usually not fully reflected in prices paid for fuel by Russian farmers.

¹⁴The real exchange rate as calculated by the Stockholm Institute of Transition Economics fell 30 percent from August to September 1998. The real exchange rate halted its devaluation in January 1999 at 37 percent of the August level and has been appreciating ever since.

Table 6—Summary of scenarios

	Russia and Ukraine				World				Ref. price
	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption	
	----- Million tons -----								\$/mt
Wheat									
2001	52.4	4.2	2.2	51.4	588.2	110.0	110.0	601.7	110.1
2011									
Base	60.7	2.6	8.8	54.5	702.1	153.8	153.8	703.8	112.5
Russia only ¹	68.1	1.9	13.8	56.1	706.3	154.0	154.0	707.8	108.1
Moderate growth ²	71.5	1.9	17.0	56.4	708.2	154.6	154.6	709.6	106.0
"Catch up" ³	83.8	1.9	27.0	58.7	715.3	156.8	156.8	716.4	99.2
Barley									
2001	21.4	0.2	3.9	18.8	137.2	19.0	19.0	138.7	80.5
2011									
Base	21.9	0.6	1.6	20.9	155.7	19.8	19.8	155.3	73.8
Russia only	24.4	0.3	3.4	21.4	156.9	20.1	20.1	156.5	70.1
Moderate growth	25.8	0.3	4.0	22.1	158.0	20.2	20.2	157.6	68.7
"Catch up"	30.2	0.3	7.0	23.5	160.7	21.0	21.0	160.5	63.5

¹Yields in Russia increase by additional 1.5 percent.

²Yields in Russia and Ukraine increase by additional 1.5 percent.

³Yields in Russia and Ukraine increase by additional 3 percent.

greater for Russia than for Ukraine. The **“Russia only”** scenario considers yield growth in Russia alone. In this scenario, combined wheat production of Russia and Ukraine would increase by 7.4 million mt, while exports increase by 5 million mt. For barley, production increases by 2.5 million mt and exports increase by 1.8 million mt.

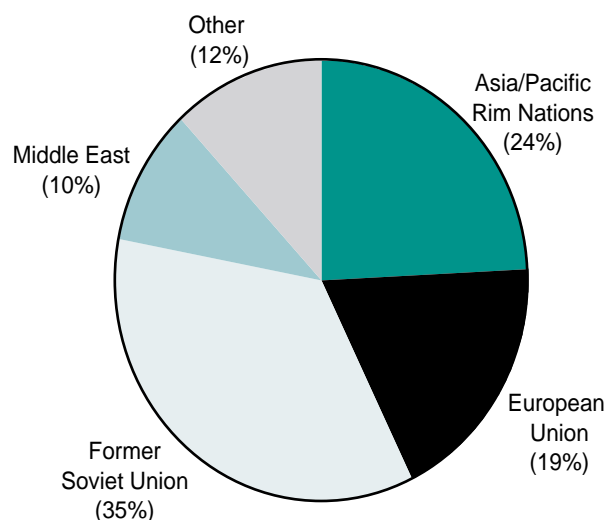
In the **“moderate growth”** scenario, yields in Russia and Ukraine are increased by an additional 1.5 percent (3-percent yield growth overall). This is the most realistic scenario, given the results of analysis from the “reversible output decline” section and the prospects for reform. The 3-percent growth rate is characteristic of the recent average yield growth in moderately high-growth performers, such as France, Hungary, India, and Pakistan. In this scenario, production of wheat and barley in both countries would increase from 82.6 million mt in the base scenario to 97.3 million mt in 2011, with corresponding exports increasing from 10.4 million mt to 21 million mt.

In the **“catch-up”** scenario, the yield increase is higher to allow Russia to close the productivity gap between Russian and Western countries that has been widening since the early 1960s. The catch-up effect is modeled as an increase in the yield growth rate of each crop by an additional 3 percent (4.5-percent growth rate overall). The catch-up scenario is possible, but difficult to achieve – only China was able to sustain such a high growth rate in average yields over the 1962-91 period among major wheat producers (Trueblood and Arnade, 2001). In this scenario, production of wheat and barley in both countries would rise to 114 million mt by 2011, of which 34 million mt would be exported.

An increase in grain exports from both Russia and Ukraine could have an important impact on world markets. While a large part of agricultural exports from Russia and Ukraine go to countries of the former Soviet Union (see figs. 10a and 10b), the European Union (EU), Pacific Rim, and Middle East are also large markets for agricultural products from Russia and Ukraine. If Russia and Ukraine significantly increase their production, exports to these traditional partners would likely increase, and perhaps compete with exports from other parts of the EU and the United States.

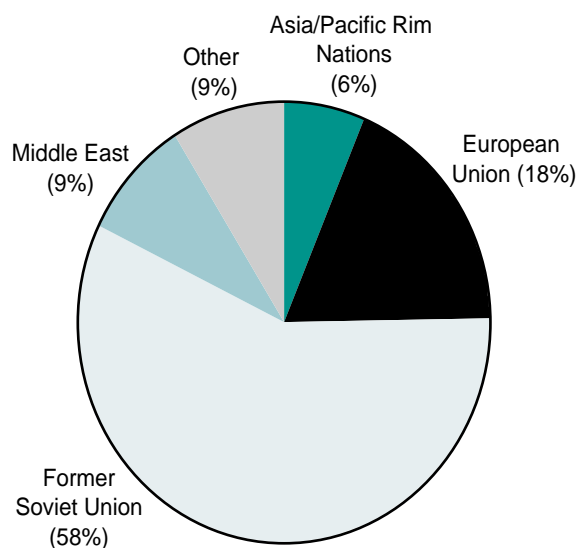
According to model results, successful agricultural reform in Russia and Ukraine would put downward pressure on world grain prices if both become large

Figure 10a
Russian main trade partners for its agricultural exports, 1997-2000



Source: United Nations (2001).
Ukraine data derived from trade partners.

Figure 10b
Ukraine's main trade partners for its agricultural exports, 1997-2000



Source: United Nations (2001).
Ukraine data derived from trade partners.

grain exporters. In the “moderate growth” scenario, world wheat prices in 2011 would be 6 percent lower than in the base scenario (\$106/mt compared with \$112/mt). In the less likely “catch-up” scenario, world wheat prices would decline by 12 percent to \$99/mt.



Photo courtesy Belarus Tractor International.

While the projections take into account shifts in global demand and supply, they do not incorporate possible policy responses on the part of other major players in world grain markets. For example, the fall in grain prices projected in the “catch-up” scenario could put pressure on EU agriculture and lead to a buildup of EU stocks, assuming EU internal support prices remain unchanged. This would probably create pressure for an increase in export subsidies, an increase in land set-asides, or reduction in domestic support price (or some combination of these policies). These policy responses on the part of the EU would reduce supply and offset to some extent the downward pressure on world prices. Another possible policy response from Russia or Ukraine would be to protect local industries from import competition, for example, in the livestock

sector. This might be accomplished by a number of policy instruments, including an export tax on feed grains.

As a final caveat, there are many other issues not addressed in these scenarios that could also affect the grain sectors of Russia and Ukraine. Such issues include grain quality improvements, feed issues related to the livestock sector (whose future is highly uncertain), and shifts in the structure of consumer demand due to changing preferences. Uncertainty over future agricultural trade is further complicated by Russia’s recent efforts to accelerate its accession to the World Trade Organization. These issues are beyond the scope of this report.