



**German Economic Team Belarus**  
**IPM Research Center**

Policy Paper Series [PP/05/10]

# **Improving the Competitiveness of Agriculture in Belarus**

Stephan von Cramon-Taubadel, Oleg Nivyevskiy

Berlin/Minsk, August 2010

## **About the IPM Research Center**

---

The IPM Research Center was established in 1999 within the mutual project of the Institute for Privatization and Management (Minsk, Belarus) and CASE - Center for Social and Economic Research Foundation (Warsaw, Poland). It is a member of the CASE research network, William Davidson Institute NGO Alliance, and Economic Policy Institutes Network (project of the UNDP's Regional Bureau for Europe and the CIS). The IPM Research Center actively cooperates with the German Economic Team in Belarus (GET Belarus). Within this cooperation the IPM Research Center provides independent policy advice on economic issues to the different official agencies, namely to the Council of Ministers, National Bank, Ministry of Economy, Ministry of Finance and other organizations involved in the process of formation and implementation of economic policy.

The Mission of the IPM Research Center is to enhance national competitiveness through elaboration of the research-based economic policy recommendation and the promotion of professional dialogue on the urgent issues related to economic performance.

### **IPM Research Center**

50B Zakharova Street, 220088, Minsk, Belarus

Tel: +375 (17) 2 100 105

Fax: +375 (17) 2 100 105

E-Mail: [research@research.by](mailto:research@research.by)

<http://www.research.by>

## **About the German Economic Team Belarus (GET Belarus)**

---

The main purpose of GET Belarus is to conduct a dialogue on economic policy issues with the government, civil society, and international organizations. Experts of German Economic Team have experience in policy advice in several transition economies, including Ukraine, Russia, and Kazakhstan. In Belarus the IPM Research Center and the German Economic Team provide information and analytical support to the Council of Ministers, the National Bank, the Ministry of Foreign Affairs, the Ministry of Economy and other institutions involved in the process of formation and implementation of economic policy.

### **German Economic Team Belarus**

c/o Berlin Economics

Schillerstr. 59

D-10627 Berlin

Tel: +49 30 / 20 61 34 64 0

Fax: +49 30 / 20 61 34 64 9

E-Mail: [info@get-belarus.de](mailto:info@get-belarus.de)

<http://www.get-belarus.de>

# Improving the Competitiveness of Agriculture in Belarus

## Executive summary

Large parts of Belarusian agriculture are not internationally competitive. This represents a major challenge for policy makers in the country because deepening economic integration with neighbours such as Russia and the EU will increase the exposure of Belarusian agriculture to international competition. Hence, increasing the competitiveness of agriculture is an important goal for policy makers in Belarus. Two main factors contribute to international competitiveness. One of these is prices. Some analysts expect that international agricultural commodity prices will increase in the future. This would improve the competitiveness of Belarusian agriculture. However, this effect is likely to be limited because many key input prices (e.g. energy, fertiliser) are likely to increase as well. Furthermore, the effect of increasing international agricultural prices may be dampened by domestic policy reforms that reduce current price distortions. These price distortions (output price supports and input price subsidies) place a significant burden on the rest of the Belarusian economy and keep many farms in production that could not survive if they faced international prices. The other main factor that influences agricultural competitiveness is productivity, which is determined by the speed and efficiency with which new technologies are developed, adapted to local conditions, and employed by farmers. Policy makers in Belarus can influence agricultural productivity by investing in research, education and training, and by encouraging foreign investment in agriculture. The resulting productivity growth would generate sustainable improvements in agricultural competitiveness, regardless of future international commodity price developments, and would enable more farms in Belarus to operate successfully without relying on measures that distort prices.

## Authors

Stephan von Cramon-Taubadel	<a href="mailto:scramon@gwdg.de">scramon@gwdg.de</a>	+49 551 / 39 22 872
Oleg Nivjevskyi	<a href="mailto:oniviev@gwdg.de">oniviev@gwdg.de</a>	+49 551 / 39 48 04

## **Contents**

1.	Introduction: What is international competitiveness? .....	5
2.	The competitiveness of Belarusian agriculture .....	6
3.	What determines competitiveness?.....	7
4.	How to improve competitiveness in the future .....	8
5.	Conclusions .....	12

## 1. Introduction: What is international competitiveness?

International competitiveness is the ability of a firm to supply goods (output) to the world market at prices that provide adequate returns on the resources (inputs) used to produce them. Since most major agricultural commodities (grains, oilseeds, meat and many dairy products) are traded internationally, world market prices for these outputs provide a benchmark for international competitiveness. A farm is internationally competitive in the production of wheat, for example, if it produces wheat for sale at the world market price, and the proceeds from this sale are sufficient to cover the costs (also evaluated at world market prices) of all the inputs that went into producing it.<sup>1</sup>

Like all definitions, this definition of international competitiveness is useful but also subject to limitations. First, prices for inputs and outputs are often distorted by government policies (e.g. price supports, minimum/maximum prices, import/export quotas, subsidized inputs, etc). This is especially true in agriculture, a sector in which many governments intervene heavily. As a result, a firm that is actually lacking competitiveness at undistorted world market prices for inputs and outputs might appear to be competitive at the policy-distorted domestic prices that it faces, or *vice versa*. This distinction between true international competitiveness and 'apparent' competitiveness will be discussed below in greater detail with reference to the situation in Belarus.

Second, in many discussions reference is made to the competitiveness of industries or even entire countries. However, it is rarely the case that an entire industry or country is either competitive or uncompetitive. Industries are composed of firms which are often highly heterogeneous. At any given time, some of these firms will be highly competitive; others will be earning just barely enough to pay for the inputs they employ; yet others will be earning less than required and incurring debt or facing bankruptcy. One can measure the competitiveness of the average firm in an industry, but the finding that this average firm is or is not competitive does not provide any information about the distribution of competitiveness across the industry in question – i.e. what share of the firms or what share of the industry's output is competitive.<sup>2</sup> This is also especially true in agriculture, which is made up of many farm enterprises that differ considerably in terms of agro-climatic conditions, size, structure and – most important – managerial ability. Governments often distort prices in agriculture, as mentioned above, precisely because they want to relieve the pressure on uncompetitive farms. In the long run, however, what is more effective than 'masking' a lack of competitiveness in this manner is to study and understand the differences between competitive and uncompetitive farms and to implement policies that help the latter improve their performance and join the ranks of the former.

In the following (section 2) we first present some information on the current competitiveness of agriculture in Belarus. We then discuss the factors that influence competitiveness of agriculture (section 3), and what policy makers in Belarus can do to improve it (section 4).

---

<sup>1</sup> The world market prices referred to here are border prices that must be first adjusted to the farm-gate by accounting for marketing costs such as transportation. For an input or output that is exported, the adjusted export parity farm-gate price will lie below the world market price at the border by the amount of these marketing costs; for one that is imported, the adjusted import parity farm-gate price will lie correspondingly above. In the interest of brevity we will simply refer to world market prices in the following.

<sup>2</sup> See Nivievskiy, O. and S. von Cramon-Taubadel (2009): Measuring and Comparing the Competitiveness of Heterogeneous Production Systems in Agriculture: a Note. *Outlook on Agriculture*, Vol. 38(1), pp.31-39.

## 2. The competitiveness of Belarusian agriculture

Table 1 summarises the results of a detailed analysis of agricultural competitiveness in Belarus that was carried out by the authors for the World Bank in 2009. For a number of major agricultural products it shows, for 2006 and 2007, the estimated shares of competitive large commercial farms in Belarus, both at world market prices (international competitiveness) and at domestic prices ('apparent' competitiveness).

**Table 1: The share of farms in Belarus that produce agricultural products competitively**

Product	2006		2007	
	Internationally competitive	Competitive at domestic prices	Internationally competitive	Competitive at domestic prices
Wheat	10.5	63.2	64.7	78.7
Corn	2.2	60.4	10.5	80.0
Barley	33.9	39.7	22.1	53.5
Sugar beet	2.7	55.4	0.0	61.0
Potato	64.7	49.3	47.5	48.3
Rapeseed	25.3	44.1	25.8	51.5
Beef	4.2	6.1	1.2	4.2
Pork	0.9	23.9	7.0	21.5
Poultry	0.0	37.8	0.0	31.7
Milk	10.9	73.4	45.3	74.8

Source: „Belarus – Agricultural Productivity and Competitiveness“, Report No. 48335-BY, World Bank, Washington DC, September 2009. This study also provides estimates of the shares of total production of the products in question in Belarus that are competitive. These shares are generally somewhat larger than the shares in the table above, because competitive farms tend to account for a disproportionately large share of total production.

A number of conclusions can be drawn from the estimates in Table 1. First, for some products a relatively large share of the farms in Belarus is internationally competitive. Wheat, potatoes and milk in 2007 are the clearest examples. Some increases in international competitiveness between 2006 and 2007 – most notably for wheat and milk – are likely due to the increase in world market prices for these products that began to be felt in 2007 (the so-called 'world food crisis' or 2007/08). Second, hardly any farms in Belarus are able to produce products such as sugar beet and poultry in an internationally competitive manner. This means that evaluated at world market prices, the value of these products in Belarus is lower than the value of the inputs that go into producing them.

Third, the difference between international competitiveness and 'apparent' competitiveness at distorted domestic prices is often striking. With the sole exception of potatoes in 2006, price distortions in Belarus have the effect of increasing the share of competitive farms. A detailed look at the underlying price data for individual outputs and inputs (not shown) reveals a mixed pattern. Some domestic output prices in Belarus are below world market levels; one example is wheat where policy in Belarus presumably aims to keep bread prices low. Other output prices are much higher domestically than on world markets; an example is sugar beet where Belarusian policy presumably aims at maintaining the supply of sugar beets for the domestic sugar processing industry. On the input side almost all domestic input prices in Belarus (fuel, fertilizer, capital, etc.) are considerably below world market levels. In the final analysis, the estimates in Table 1 show that the net effect of price distortions in Belarus is to provide farms with artificially favourable output/input price ratios and to make agricultural production appear to be

more competitive than it actually is. This 'illusion' of competitiveness is especially strong in the case of sugar beet; while no farms were internationally competitive in the production of sugar beet in 2007, 61% of the farms that produce this crop appear to be competitive as a result of price distortions.

In summary, while some farms in Belarus are able to produce some agricultural products in an internationally competitive manner, many farms are not. The net impact of policy measures that distort domestic agricultural prices in Belarus is to increase the share of farms that appear to be competitive, but even with the help of these price manipulations many farms are still not able to produce competitively. In the following we take a closer look at the factors that determine competitiveness in order to identify possible responses to this situation.

### 3. What determines competitiveness?

International competitiveness is a product of many factors and the interactions among them. The change in a firm's international competitiveness from one period to the next can be decomposed into the following components:<sup>3</sup>

$$\% \Delta \text{Competitiveness} = \% \Delta \text{Technology} + \% \Delta \text{TE} + \% \Delta \text{SE} + \% \Delta \alpha P_{\text{output}} - \% \Delta \beta P_{\text{input}} \quad (1)$$

where  $\% \Delta$  refers to 'percentage change', TE is technical efficiency and SE is scale efficiency.  $P_{\text{output}}$  and  $P_{\text{input}}$  are undistorted output and input prices, and  $\alpha$  and  $\beta$  are revenue and cost shares so that the last two terms on the right hand side of equation (1) refer to weighted average output and input price changes, respectively.

While the underlying mathematical derivations are complex, the basic idea behind equation (1) is straightforward. First, the change in a firm's competitiveness over time is determined by changes in the technology it employs; if the firm implements more productive technologies its competitiveness will increase, all other things being equal. The second factor in equation (1) is technical efficiency (TE) which measures how close a firm is to producing the maximum output possible given its size, the inputs it employs and the technology at its disposal. Improving technical efficiency will lead to increased competitiveness. The third factor, scale efficiency (SE), measures whether or not a firm is moving towards the optimal size/scale of operation. Finally, the fourth and fifth factors in equation (1) capture changes in average (undistorted) output and input prices, respectively; if output (input) prices increase, competitiveness will improve (be reduced) as a result.

Applying this decomposition to agriculture in Belarus produces some interesting insights. Figure 1 summarises the results in graphical terms for the large commercial farms in Belarus between 2006 and 2007; to produce this decomposition all prices are expressed in relative terms to crop prices. Figure 1 reveals that 30% of the farms in Belarus experienced an increase in international competitiveness between 2006 and 2007. Most of this increase was due to improvements in technology (on 92% of all farms), although increased technical efficiency (on 53% of all farms) and scale efficiency (60% of all farms) also contributed. Most price movements tended to reduce the competitiveness of agriculture in Belarus between 2006 and 2007; the majority of farms experienced increases in most input prices and reductions in output prices.

Altogether, therefore, we can conclude that many of the large commercial farms in Belarus were able to counteract unfavourable price changes by improving the technology that they employ, and the efficiency with which they implement this technology.

---

<sup>3</sup> For more details on this decomposition and the empirical application to agriculture in Belarus that follows, see Nivjevskyi, O., S. von Cramon-Taubadel and B. Brümmer: *A Note on Technical Efficiency, Productivity Growth and Competitiveness*. Paper presented at the Agricultural and Applied Economics Association Meetings in Denver, Colorado, July 25-27, 2010.

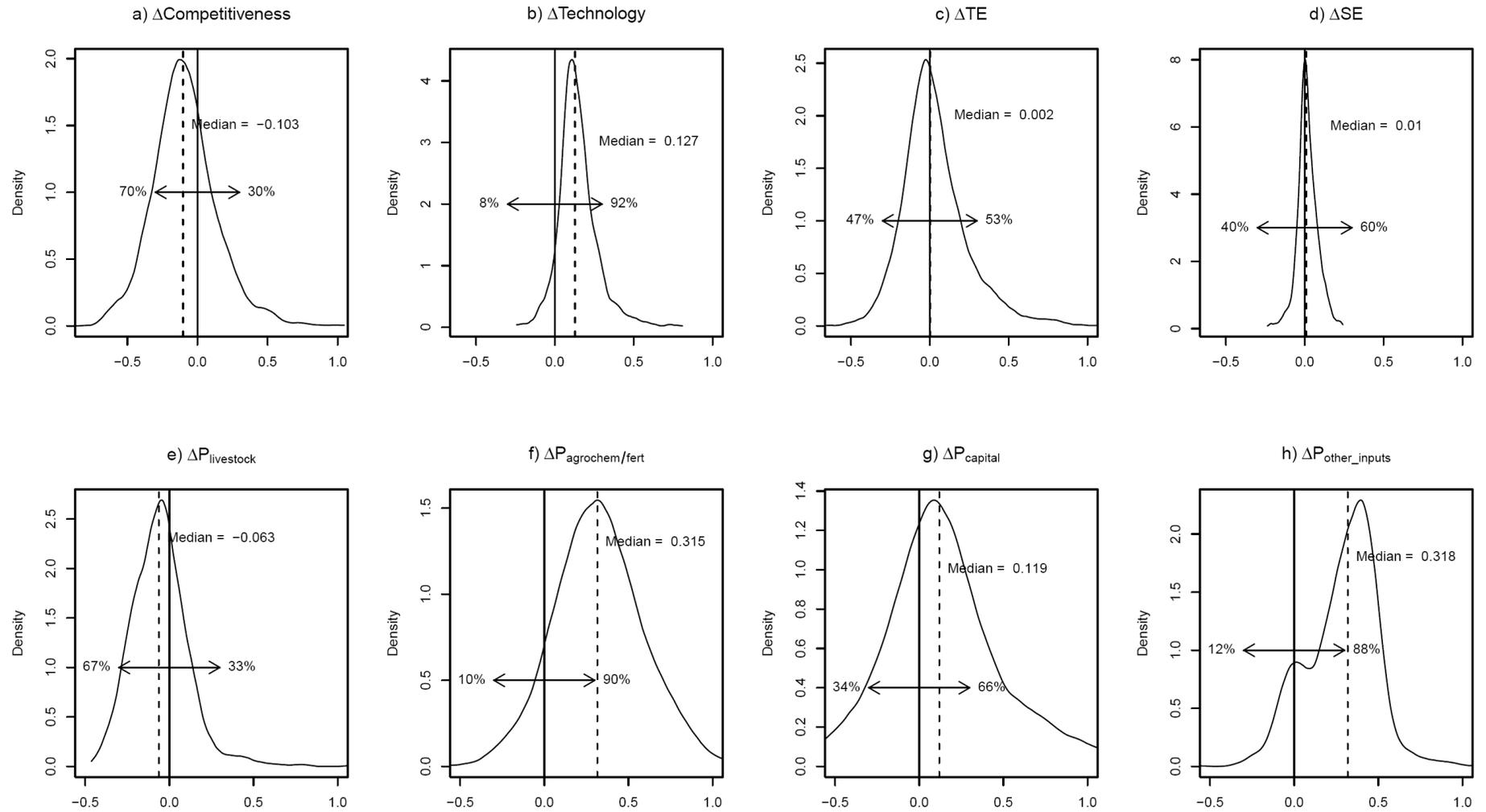
However, for the majority of the large commercial farms (70%) the net impact of all of the factors was to reduce competitiveness.

#### **4. How to improve competitiveness in the future**

What conclusions for the future can be derived from this analysis of past developments in the competitiveness of Belarusian agriculture? Of course, we must be cautious about deriving too strong conclusions from the analysis of a single pair of years (2006 and 2007). It would clearly be interesting to extend this analysis to cover a longer period of time and in particular to study how Belarusian agriculture has responded to the strong international price fluctuations of recent years. Nevertheless, the analysis above does generate some insights that are relevant for the development of future agricultural policy strategies in Belarus.

The decomposition in equation 1 shows that competitiveness is driven by two main groups of factors: i) technology/efficiency and ii) prices. Consider prices first. What trends will prices follow in the future, will these trends tend to improve the competitiveness of Belarusian agriculture, and can domestic policy influence these trends? The future development of agricultural prices has been subject to heated debate since the times of Malthus and earlier. Since the middle of the 19<sup>th</sup> century agricultural prices have tended to fall over time – subject to significant short-run fluctuations – as rapid technical change in agriculture and transportation and growth in the global availability of agricultural land have allowed supply growth to outstrip demand growth. Many observers are convinced that this 150-year trend has reached an end, and that a variety of factors such as rapid population and income growth, climate change, and limits on the growth of both yields and agricultural areas will lead to an increasing trend for agricultural prices in the coming decades – again subject to short-run fluctuations.

**Figure 1: The decomposition of changes in the competitiveness of Belarusian agriculture between 2006 and 2007**



Source: Own calculations

Can we therefore conclude that increasing output prices will boost the competitiveness of Belarusian agriculture in the future? Perhaps to some extent, but several caveats are in order. First, the prices for many commodities that are key inputs into agriculture are also expected to increase in the coming decades. Many of the same demand and supply factors that are expected to push up agricultural prices are also expected to boost prices for fossil fuels and fertiliser. Furthermore, what is an output for one farmer (e.g. a producer of feed crops such as barley) is an input for another (e.g. a pork producer). These factors will dampen any positive effect that increasing output prices have on the competitiveness of Belarusian agriculture.

Second, recall that output and input prices in Belarus are currently subject to policy distortions, and that these distortions on the whole have the effect of artificially improving the output/input price ratios faced by farmers in the country. The agricultural policies that are in place in Belarus are very expensive in international comparison (total transfers to agriculture account for over 5% of GDP in Belarus, compared with 0.6% in the EU-27, 0.5% in the USA and 2.25% in Ukraine) and may not be fiscally sustainable in the medium and long run. Furthermore they are not compatible with international integration via WTO membership or regional integration in the form of free trade agreements, for example with the EU.

Hence, while international agricultural prices may follow a positive trend in the coming decades, domestic agricultural prices in Belarus may not be able to follow this trend in full because they are currently supported above international levels in Belarus, and there is reason to expect that this support cannot be sustained indefinitely. Furthermore, many world market prices for inputs can also be expected to increase in the future, and these increases will probably be even stronger on domestic markets in Belarus as policies that currently depress input prices are reformed. In summary, future price developments cannot be expected to produce major improvements in the competitiveness of Belarusian agriculture, and policy reforms that might become necessary in the coming years could actually lead to reductions in apparent competitiveness.

That leaves the other group of factors that drive competitiveness; technology and efficiency. These factors in equation (1) (technology, technical efficiency and scale efficiency) are often combined to produce a measure that is called 'total factor productivity' (TFP), which is a measure of a firm's overall ability to convert inputs into outputs. We saw above (Figure 1) that 92% of the large commercial farms in Belarus experienced improvements in technology between 2006 and 2007, 60% experienced improvements in scale efficiency, and 53% experienced improvements in technical efficiency. Combining these results we can show that 81% of the large commercial farms in Belarus experienced TFP growth between 2006 and 2007, and we can conclude that this TFP growth was largely responsible for the increases in agricultural competitiveness experienced by 30% of the large commercial farms over this period. In other words, while output and input prices were developing unfavourably for most farms, TFP growth enabled at least some to improve their international competitiveness nonetheless.

Given that unfavourable price developments will likely continue in the future, we propose that maintaining and strengthening TFP growth is the most effective and sustainable way to foster the competitiveness of Belarusian agriculture. TFP growth in agriculture can be boosted by:

- Investment in basic and applied agricultural research to encourage the development of new technologies and the adaptation of technologies developed in other countries to domestic conditions;
- Investment in training, education and extension to increase on-farm technical efficiency and to speed up the adoption of new technologies; and
- Policy changes that permit farms to engage in deep restructuring by adjusting their sizes and production structures (e.g. to abandon lines of production that are not profitable) and thus to increase both technical and scale efficiency.

- Policy changes that encourage foreign investment in Belarusian agriculture and thus allow new technologies (mechanical and biological, but also organisational) that have been developed elsewhere to enter the country.

These measures would all represent medium- and long-run investments in the future of Belarusian agriculture. They require patience; unlike an increase in support prices for outputs or input subsidies they do not have immediate effects on farm competitiveness. They also require flanking measures to help buffer the social costs of technology adoption and farm restructuring, which often results in a shift from labour- to capital-intensive production and thus a reduction in farm employment. But these measures have powerful, lasting effects<sup>4</sup>; they are fully compatible with international trade agreements; and unlike price support, they foster true international and not apparent competitiveness.

How has TFP growth in Belarusian agriculture compared with TFP growth in other countries and regions of the world in the past? Table 2 provides some estimates based on a recent study prepared by the authors. Table 2 reveals that since 1992, Belarusian agriculture has experienced annual TFP growth of 2.9%. This is strong growth, but actually slightly below the global average rate of 3% over the same period, and considerably less than the 4.0% and 4.1% recorded by Russia and Ukraine, respectively. However, Table 2 also reveals that TFP growth in Belarus has accelerated considerably since 2000; from 1992 to 2000 the annual rate of TFP growth in the country was only 0.5%, but between 2001 and 2007 it equalled 5.7%. This is an encouraging trend that should be sustained to ensure future increases in the international competitiveness of Belarusian agriculture.

**Table 2: Annual rates of TFP growth in Belarus and selected countries/regions of the world (in %)**

Country/region	1992-2000	2001-2007	1992-2007
Sub-Saharan Africa	2.6	2.4	<b>2.5</b>
Latin America & Caribbean	2.9	3.6	<b>3.2</b>
North America	2.3	2.7	<b>2.5</b>
China	5.3	1.4	<b>3.5</b>
Rest of Asia	3.2	1.9	<b>2.6</b>
Western Europe	3.2	0.9	<b>2.1</b>
Central & Eastern Europe	2.9	1.8	<b>2.4</b>
Middle East & North Africa	3.3	1.3	<b>2.3</b>
Oceania	2.9	-1.3	<b>0.9</b>
India	2.7	2.9	<b>2.8</b>
Russia	2.7	5.6	<b>4.0</b>
Ukraine	5.5	2.5	<b>4.1</b>
<b>Belarus</b>	<b>0.5</b>	<b>5.7</b>	<b>2.9</b>
World	3.5	2.3	<b>3.0</b>

Source: von Cramon-Taubadel, S. and O. Nivjevskiy: *Belarusian Agricultural Productivity Growth in International Comparison*. Unpublished Manuscript, Department of Agricultural Economics and Rural Development, Georg-August University of Göttingen, July 2010.

<sup>4</sup> Many studies have demonstrated that investments in agricultural research, education and extension generate very high rates of return. For example, the World Bank's *2008 World Development Report* cites an authoritative survey that estimates an average rate of return of 40% for such investments.

## **5. Conclusions**

Much of agriculture in Belarus is currently not internationally competitive. Domestic agricultural policy masks much of this lack of competitiveness by distorting prices in favour of Belarusian agriculture. However, this policy is expensive and may need to be reformed in the future. Furthermore, increased economic integration with neighbours such as Russia and the EU will increase the exposure of Belarusian agriculture to international competition.

While international agricultural commodity prices are expected to increase in the future, this alone cannot be counted on to improve the competitiveness of Belarusian agriculture. The key to sustainable improvements in competitiveness is increased productivity as a result of research and education in agriculture, and enhanced inflows of technology as a result of foreign investment. Agricultural productivity in Belarus has increased strongly in international comparison in recent years. Maintaining and strengthening this trend is the key to increasing the competitiveness of Belarusian agriculture.