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Productivity Growth and the Revival of Russian Agriculture

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What Is the Issue?

Russia's agricultural output fell during the country's transition from a planned to a market economy in the early 1990s but has rebounded strongly since the late 1990s. The production increase contributed to Russia reducing its large imports of meat and other livestock products and becoming a major grain exporter. By 2011-14, Russia supplied 12 percent of world wheat exports. Yet, the causes of the resumed growth are unclear.

Has the revival of Russian agriculture stemmed from the adoption of new technologies and processes that boosted total factor productivity (TFP)? TFP is the ratio of total output to total aggregate inputs and is a more comprehensive measure of agricultural performance than crop yields or labor productivity because it accounts for all measureable resources of production (land, labor, materials, capital) instead of only land or labor.

Russia's districts responded in different ways to the new agricultural opportunities following the transition to a market economy, and so a district-level evaluation of productivity growth is critical to understanding the country's agricultural revival. If the growth revival was due to TFP, then which districts in Russia are driving national TFP growth and in which commodities are they specializing? To answer these questions, this study evaluates agricultural output, input, and TFP trends in Russia at the national and subnational (district) levels during 1994-2013.

What Did the Study Find?

The sharp decline in Russia's agricultural output and use of inputs (land, labor, materials, and capital) as the sector transitioned to a market economy affected all Russian districts rather equally. Greater specialization in output across districts has been a common feature of Russia's subsequent agricultural recovery. Since 2000, the South district has increased production of wheat, corn, and sunflower seed while decreasing production of potatoes and eggs. The Central district has traditionally been the country's biggest producer of sugar beets and is now the largest meat producer. Greater specialization for some districts has been achieved not so much by increasing output of particular commodities but rather by decreasing production.

At the national level, output growth rebounded in the early 2000s, but input use continued to drop until 2005. Once input growth resumed, on average across Russian districts, national TFP showed modest growth through 2013.

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While overall TFP growth improved nationwide, the pattern of agricultural recovery varied widely across districts. The South and Central districts accounted for a combined 39 percent of Russia's aggregate TFP growth in 1994-99 and 51 percent in 2009-13. The South in particular stands apart from other districts by its early and sharp rebound in agricultural output, input use, and TFP growth following the transition. Since 1998, TFP growth has accounted for 69 percent of the South's 5.2-percent average annual increase in output. Relative to other districts, the South appears to have benefited from advantages in soil and climate, geography (such as proximity to the major grain-exporting ports on the Black Sea), institutions, infrastructure, and the emergence of a new type of vertically integrated producer (agroholdings).

By 2013, the other agriculturally important district in Russia, the Volga, had not yet recovered from the transition. Moreover, Russia's remaining districts in the northern and eastern parts of the country experienced stagnant (less than 1 percent per year) or negative output growth. Thus, while the South has been key to Russia's agricultural revival, progress in other districts will be crucial for accelerating future national growth.

How Was the Study Conducted?

To evaluate Russia's agricultural productivity growth from 1994 to 2013, ERS researchers applied growth-accounting estimation to construct output, input, and TFP quantity indexes for each Russian district and at the national level, using a unique dataset drawn from Russia's Ministry of Agriculture and Federal Service of State Statistics. TFP growth is defined as the difference between agricultural output growth and the weighted sum of land, labor, capital, and materials growth in the sector. Each input's aggregation weight is obtained from its relative share of total expenditures; each output's aggregation weight is obtained from its relative share of total revenues. A comprehensive dataset was assembled to identify whether TFP was the primary source of Russia's resumed agricultural growth, which districts achieved the fastest TFP growth, and in which commodities they specialized.