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The role of oil prices and the real exchange rate in Russia's economy—a cointegration approach

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Despite a lively debate on the importance of oil prices and the real exchange rate for Russia, little empirical research exists on this topic. In this paper, the impact of international oil prices and the real exchange rate on the Russian economy and its fiscal policy are analyzed using vector autoregressive (VAR) modeling and cointegration techniques. The results imply that the Russian economy is influenced significantly by fluctuations in oil prices and the real exchange rate through both long-run equilibrium conditions and short-run direct impacts. Although the underlying growth trend indicates the Russian economy has strengthened in recent years, we find no evidence that the role of oil prices has diminished. *Journal of Comparative Economics* **32** (2) (2004) 315–327. Institute for Economies in Transition (BOFIT), Bank of Finland, PO Box 160, FIN-00101 Helsinki, Finland.

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1. Introduction

During the past ten years, the Russia economy has been subject to exceptionally large fluctuations. The deep output collapse at the beginning of the transition process was followed by a tentative recovery in 1997. In August 1998, the Russian economy was paralyzed by a full-scale financial crisis that sent the ruble's nominal value plummeting over 70% against the US dollar. However, Russia's economy recovered quickly after this

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crisis because the weakened ruble improved the price competitiveness of domestic firms. Eventually, an oil-price-led export boom provided an extra boost to the economy. Although tight fiscal policy and the economic reforms of the Putin administration have improved the situation, the role of international oil prices and the real exchange rate in Russia's growth dynamics remains a key policy issue and a subject of lively debate. The economic publications of the international organizations, e.g., World Bank (2002), IMF (2002a), and OECD (2002b), share the common perception that oil prices and the real exchange rate have major impacts on Russia's macroeconomic performance.[1] Exports correspond to about a third of Russian GDP and roughly half of these export revenues come from energy. The federal budget is heavily dependent on both output developments and energy prices. Several sources assert that revenues from the energy sector account for 30 to 40% of central government total revenues, e.g. OECD (2002a). In 1999–2000, the oil and gas industry, along with related trade and transportation margins, accounted for 20 to 24% of GDP according to Tabata (2002).

Despite the general recognition that oil plays an important role in the Russian economy, little research exists on the effects of oil prices on Russian macroeconomic dynamics. Typically, analyses by the Russian government, international financial institutions, and investment banks focus on Russia's external and fiscal vulnerability, i.e. the country's ability to service its debts. These assessments are often based on simple and straightforward calculations, e.g., how much a one-dollar change in the price of crude oil affects Russia's export or fiscal revenues. Although the level of sophistication of analysis on the impact of oil prices on Russian economy varies, even the most serious studies focus mainly on external balance and fiscal vulnerability under various oil price scenarios without paying much attention to how changes in oil prices affect output, e.g. IMF (2001). Consequently, these exercises treat GDP as exogenous rather than as determined endogenously by taking into account the changes in output due to terms-of-trade shocks caused by energy prices. Moreover, although some papers use a macroeconometric model to examine Russia's economy, they do not cover the particular issue of Russia's dependence on oil price fluctuations, e.g. Gavrilenkov et al. (1999), Basdevant (2000), and Basdevant and Hall (2002). Similarly, the impact of the real exchange rate on GDP is overlooked in the empirical research with the notable exception of a discussion about the possible growth effects of the real exchange rate in Spatafora and Stavrev (2003).

Despite the paucity of empirical work on the actual impacts of oil prices and the real exchange rate on Russia's economy, a relatively clear understanding of the possible channels from commodity prices and the real exchange rate to output emerges, e.g. IMF (2002b). In addition to the direct effect through net exports, high commodity prices and depreciation of the real exchange rate have a positive impact on profits, which promotes domestic demand and investment. Moreover, increased investment raises productivity, which boosts real wages and domestic demand. Investment also contributes positively to current production and profits, which promotes additional economic growth. The difficult part of the analysis concerns the long-run development of the real exchange rate. Although

[1] The discussion of Russia's oil dependence has been enlivened in recent years by the suggestion that a fall in oil prices may have no negative impact on real GDP growth due to a balancing effect by the real exchange rate. However, no published article to date treats this hypothesis properly.