Rising Food and Energy Prices in Europe and Central Asia
Global markets are again witnessing a period of rising commodity prices. Part of the current increase is attributed to temporary factors, while a portion is attributed to longer term trends in commodity markets. Of immediate concern has been the impact of rising fuel and food prices on global incomes, macroeconomic imbalances and national poverty. Countries that are large net food and fuel importers in global markets are particularly vulnerable to world price changes, as are countries where there is high food and fuel price inflation affecting the poor. This paper presents the possible impact of rising food and fuel prices on ECA countries’ macroeconomic and poverty outcomes. Its purpose is to illustrate the possible short run consequences of rising prices and the countries that are most likely to be significantly affected, both adversely and positively, while noting the importance of medium-term policy and non-policy related factors that could mitigate adverse consequences of commodity price increases. In ECA, low and lower middle income countries tend to be more vulnerable to rising food and fuel prices, while a handful of ECA countries export substantial amounts to world wheat and fuel markets. The paper presents an initial assessment of a still evolving situation. Further analysis at the country level will be undertaken as the situation evolves. Should the need arise, and collaborating with partners, the World Bank stands ready to assist clients in ensuring that food and finance reach the most affected countries, to work with countries in developing their social assistance systems as needed, and to develop and rationalize their agriculture and energy sectors.

Philippe Le Houerou
Vice President
Europe and Central Asia Region
The World Bank
Acknowledgements

This paper was prepared through a cross-sectoral collaborative effort across departments of the World Bank’s Europe and Central Asia Region. Substantive inputs were received from the Human Development (HD), Poverty Reduction and Economic Management (ECSPE), and Sustainable Development Network (SDN) with the overall coordination of ECSPE. The rapid response and effort of managers and staff in the Region are gratefully acknowledged.

Contributors: Roumeen Islam led the writing of the report with contributions from Nicolas Ahouissoussi, Mohamed Ihsan Ajwad, Benu Bidani, Dina Umali Deininger, Sebastian Eckardt, Lire Ersado, Boryana Gotcheva, Mattias Grueninger, Jesko Hentschel, Aylin Isik-Dikmelik, Theo Janse Van Rensburg, Irina Kogay, Holger Kray, Alexander Kremer, Ranjit Lamech, Nadezhda Lepeshko, Kathy Lindert, Yulia Mironova, Snjezana Plevko, Clelia Rontoyanni, Yadviga Semikolenova, Alexander Sharabaroff, Kenneth Simler, Victoria Stroka, Victor Sulla, and Ramya Sundaram. Ricky Ubee and Olga Vybornaia provided excellent research assistance. Suggestions from Chiara Bronchi, Indermit Gill, Ronald Hood, Takuya Kamata, Elena Karaban, Andrew Kircher, Matija Laco, Sanja Madzarevic-Sujster, Martin Raiser, Pedro Rodriguez, Mark Roland Thomas, Eskender Trushin, Willem van Eeghen, Claudia Ines Vasquez, Salman Zaidi, Juan Zalduendo and Sally Zeiljon are deeply appreciated. Bruce Ross Larson edited the Summary. Susana Padilla formatted the document. This report was initiated and produced under the general guidance of Yvonne Tsikata.

# Table of Contents

Summary ......................................................... 1
Introduction .................................................... 9
Section 1. World Commodity Markets and Prices ................. 9
Section 2. Macroeconomic Channels ............................... 11
  2.1. Food and Energy Price Inflation ..................... 11
  2.2. Current Account .................................. 13
  2.3. Output and Growth ................................ 14
  2.4. Fiscal Impact .................................. 17
Section 3. Poverty Impacts and the Response of Social Assistance Systems ......................... 21
Section 4. Vulnerability and Policy Interventions ............. 27
  4.1. Vulnerability .................................. 27
  4.2. Policy Interventions ............................ 28
Section 5. Agriculture in ECA .................................. 30
Section 6. Energy in ECA ...................................... 35
Annex 1. World Bank Support to Clients ......................... 38
  A-1.1 World Bank Support for Fiscal Reform ............. 38
  A-1.2 World Bank Supported Reforms in Social Protection 38
  A-1.3 World Bank Support to Agriculture ............... 39
  A-1.4 World Bank Support to the Energy Sector ......... 40
Annex 2. Terms of Trade and Growth ........................... 42
References: .................................................... 45

List of Boxes .................................................. ii
List of Figures .................................................. ii
List of Tables .................................................. iii
List of Acronyms ............................................... iv
LIST OF BOXES

Box 1: Channels through which Food and Energy Prices Affect Economic Conditions . . . . 7
Box 2: Variation in Evolution of Food Prices in Selected ECA Countries . . . . . . . . . 12
Box 3: Modeling an Increase in the Price of Oil . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 17
Box 4: The Hidden and Rising Fiscal Cost of Cheap Energy in Belarus . . . . . . . . . . . . . 19
Box 5: Global Food Price Crisis and Safety Nets Response:
    Experience of IDA Countries in ECA . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 22
Box 6: Policy Initiatives in Selected ECA Countries . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 28
Box 7: Community Seed Funds in the Kyrgyz Republic . . . . . . . . . . . . . . . . . . . . . . . . . . . . 32
Box 8: Export Restrictions Damage Food Security in the Long Run . . . . . . . . . . . . . . . . . 33
Box 9: Reducing Volatility . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 33

LIST OF FIGURES

Figure I: High Trade Deficits in Food and Energy in Some Countries
    Accompany High Current Account Deficits . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2
Figure II: Some Countries Are Vulnerable in Both Macroeconomic and
    Poverty Outcomes . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3
Figure 1: Energy and Food Price Indices . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9
Figure 2: Wheat Prices Are Still Rising . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 9
Figure 3: High Food and Energy Price Inflation in many ECA Countries, 2010 . . . . . . . . . . . 11
Figure 4: Poorer Countries Have Higher Food Price Inflation . . . . . . . . . . . . . . . . . . . . . . . 11
Figure 5: Some Countries Have Large Trade Deficits in Food and Energy . . . . . . . . . . . . . 13
Figure 6: High Trade Deficits in Food and Energy Accompany
    High Current Account Deficits . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15
Figure 7: Some Countries with a Substantial Dependence on Energy Imports . . . . . . . . . . 16
Figure 8.1: Coverage of Poverty Targeted Programs is Very Low
    in Some ECA Countries . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 25
Figure 8.2: Targeting Accuracy of Poverty Targeted Programs in ECA
    Varies among Countries . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 25
Figure 8.3: Generosity of Poverty Targeted Programs in ECA
    Could be Strengthened in Some Countries . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 25
Figure 9: Some Countries are Vulnerable . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 27

(continued on page iii)
LIST OF FIGURES (continued from page ii)

Figure 10: ECA Countries Use Various Policies ................................................................. 28
Figure 11: Fertilizer Use per Hectare in Selected Countries ............................................. 31
Figure 12: Some ECA Countries May Expand their Wheat Production Significantly .......... 31
Figure 13: An Increase in the Long Run Marginal Cost of Electricity Generation ............. 36
Figure 14: Some ECA Countries Subsidize Households and Others Tax Them ............... 36

LIST OF TABLES

Table 1: The Impact of Increased Food and Energy Prices on the Trade Balance
        May Be Significant ........................................................................................................ 14
Table 2: Oil and Gas Revenues, % Share in Total Fiscal Revenues ................................. 18
Table 3: Oil and Gas Revenues, % of GDP .......................................................................... 18
Table 4: The VAT Effect: Increased Tax Revenues from Food and Energy Imports .......... 18
Table 5: Poverty Impact by Sub-Regional Groupings ....................................................... 23
Table 6: Simulation Results for Poverty Increases Resulting from Higher Food
        and Fuel Price Inflation (US$2.5/Day): ................................................................. 24
Table 7: Energy Use (kg of oil equivalent) per US$1,000 GDP ....................................... 35
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Analytical and Advisory Activities</td>
</tr>
<tr>
<td>ARD</td>
<td>Agriculture and Rural Development</td>
</tr>
<tr>
<td>CASAREM</td>
<td>Central Asia/South Asia Regional Electricity Market</td>
</tr>
<tr>
<td>CIS</td>
<td>Commonwealth of Independent States</td>
</tr>
<tr>
<td>CPI</td>
<td>Consumer Price Inflation</td>
</tr>
<tr>
<td>CSF</td>
<td>Community Seed Fund</td>
</tr>
<tr>
<td>CTF</td>
<td>Clean Technology Fund</td>
</tr>
<tr>
<td>DEC</td>
<td>Development Economics Group, World Bank</td>
</tr>
<tr>
<td>DPO</td>
<td>Development Policy Operation</td>
</tr>
<tr>
<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
</tr>
<tr>
<td>ECA</td>
<td>Europe and Central Asia</td>
</tr>
<tr>
<td>ECAPOV</td>
<td>Poverty in Europe and Central Asia (Data Bank)</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EU CAP</td>
<td>European Union Common Agriculture Policy</td>
</tr>
<tr>
<td>EU10</td>
<td>New Member States</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
</tr>
<tr>
<td>FBP</td>
<td>Family Benefits Program</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GFRP</td>
<td>Global Food Crisis Response Program</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank</td>
</tr>
<tr>
<td>IDA</td>
<td>International Development Association</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>KOE</td>
<td>Energy Use per Capita</td>
</tr>
<tr>
<td>LLMIC</td>
<td>Low and Lower Middle Income Countries</td>
</tr>
<tr>
<td>LRSA</td>
<td>Last Resort Social Assistance</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OGE</td>
<td>Oil and Gas Exporters</td>
</tr>
<tr>
<td>TA</td>
<td>Technical Assistance</td>
</tr>
<tr>
<td>TOT</td>
<td>Terms of Trade</td>
</tr>
<tr>
<td>TSA</td>
<td>Targeted Social Assistance</td>
</tr>
<tr>
<td>VAT</td>
<td>Value Added Tax</td>
</tr>
<tr>
<td>WEO</td>
<td>World Economic Outlook</td>
</tr>
<tr>
<td>WB</td>
<td>World Bank</td>
</tr>
</tbody>
</table>
1. **Non-energy commodity prices rose for eight consecutive months through February, crude oil prices for seven.** The World Bank food price index has matched its peak of 2008 with the energy price index still below the July 2008 peak. The increase in food prices in 2010-11 represents a generalized increase in the prices of several commodities. These commodity market developments reflect a combination of temporary and permanent factors. Rising incomes around the world, and particularly in emerging and developing countries, have increased demand for food and fuel. In addition, supply factors, related to fuel supply constraints and inventories, have affected prices both in the short and longer runs, while policies supporting bio-fuel production have affected grain prices. In the short run, volatile weather conditions (such as the drought in Russia and the floods in Australia) have affected world wheat prices while temporary policy changes by major exporters or importers have tended to push global market prices above longer run trends.

2. **The purpose of this paper is to illustrate the channels through which rising food and energy prices might affect countries in the Europe and Central Asia Region (ECA) in the short run and to indicate which countries are most likely to be significantly affected.** While the focus is mostly on short run effects, the paper notes the importance of medium-term policy and non-policy related factors that could mitigate or magnify the consequences of commodity price increases. The paper presents an initial assessment of a still evolving situation.

3. **As the Region recovers from the effects of the global economic crisis, the global food and fuel price increases represent a boon and an opportunity for commodity exporters but an additional source of vulnerability for many net importers.**

- Persistently high and rising commodity prices will complicate economic management for some ECA countries recovering from the global crisis. During the 2008-09 global economic crisis, growth declined, unemployment increased and wages fell in most ECA countries. Throughout the region, fiscal revenues also fell while countries struggled to contain macroeconomic imbalances and protect the vulnerable. In the recovery from the crisis, governments are trying to rationalize fiscal expenditures to contain deficits, prevent the large external deficits of the pre-crisis era, and support growth, while continuing to protect the poor.

- **In ECA overall, an additional 5.3 million people could become poor.** Five low and lower middle income countries, Armenia, Georgia, the Kyrgyz Republic, Moldova, and Tajikistan could see potentially high increases in their poverty rates as a result of high food and fuel price inflation. They may need to expand coverage and adequacy of their targeted social assistance systems in order to protect the additional poor.

- **Some countries could face additional external financing needs or may need to constrain domestic demand to contain external balances.** The same five countries and Kosovo have an average food and fuel trade deficit of around 16% of GDP and will see current account balances deteriorating with rising food and fuel prices. Among middle income countries, Albania, Belarus, Bosnia-Herzegovina and Montenegro also have double digit food and fuel deficits or double digit current account deficits, or both. These countries may need to find additional external financing for their higher current account deficits or have to reduce domestic demand, for example through tighter fiscal policy.

- **However, commodity exporters, particularly large oil and gas exporters such as Azerbaijan, Kazakhstan and Russia, are benefiting substantially from higher commodity prices which are boosting growth, current account and fiscal balances.**

- **On average, the impact of the current food and fuel price increases on the EU member and accession countries is small.**

- **ECA’s food and fuel sectors are important in world markets.** Moreover, wheat production has the potential to double over the medium-term. To meet their potential, ECA countries will need to invest in and reform policies in their agro-food sectors. Food, and particularly wheat producers, can expand production and exports in a sustainable way, without encroaching on forests and protect-
ed areas. In the energy sector, a concerted effort by government is needed to further improve energy efficiency, to encourage climate smart investments, and to contain fiscal risks.

**Macroeconomic and Poverty Impacts**

4. **The short run impact on domestic food and fuel inflation, current account balances, and fiscal balances is large for some countries.** The medium-term growth impact of higher oil prices is likely to be small as long as prices remain at current levels.

- The first round of food and energy price inflation is highest among the low and lower middle income countries. In this group, food inflation averaged 13% in 2010 and energy inflation averaged 15%. The Kyrgyz Republic had food inflation of 27% in 2010 and Georgia of 23%. For both countries, the weight of food in the CPI is over 40%. Energy inflation is also the highest among the low and lower middle income countries.

- Countries that have net food and fuel trade deficits of close to 10% of GDP or above and that also have substantial current account deficits are considered vulnerable to rising food and fuel prices in terms of external balances (shaded area in the lower left-hand section of Figure I). Most of them also have high fiscal deficits. Among the low and lower middle income countries, these are Armenia, Georgia, Kosovo, the Kyrgyz Republic, Moldova and Tajikistan. Other middle income countries, Albania, Belarus, Bosnia-Herzegovina and Montenegro may also face additional financing needs as they have either double-digit food and fuel trade deficits or double digit current account deficits, or both. However, the effect of rising food and fuel prices on the current accounts of net importers will be mitigated by increases in the prices of their exports. External and fiscal balances of the oil and gas exporters are showing an increasing surplus. Azerbaijan’s current account surplus was over 25% of GDP in 2010, Kazakhstan’s 8% and Russia’s 5% (these countries are represented in the upper right hand corner of Figure I). The EU member and accession countries are less affected that the other groups and are nearer the origin in the figure.

- Oil price increases are likely to have higher adverse effects on output over the medium-term for large net commodity importers which also have high energy intensity of production, though these effects will be small if prices remain at current levels. Countries that fall in this category are Belarus, and four low and lower middle income countries, the Kyrgyz Republic, Moldova, Tajikistan and Ukraine.

5. **Measured at the US$2.5 level a day, an additional 5.3 million people could be made poor in ECA because of the higher food and fuel inflation; most of the higher poverty is due to the food price increase.** The potential overall increase in the poverty rate is 1.3 percentage points for ECA, in the absence of countervailing measures, growth in wages and incomes, or changes in household behavior. The countries in which poverty could increase the most are a group of low and lower middle income countries: potential increases are 9 percentage points for Armenia and Georgia, 11 for the Kyrgyz Republic, around 5 for Moldova and 8 percentage points for Tajikistan.

---

1 Azerbaijan is not visible as its current account balance relative to GDP is extremely large compared to other countries in ECA.
Vulnerability and Policy Responses

6. Countries that are the most vulnerable in terms of both macroeconomic outcomes and potential poverty increases are all low and lower middle income countries: Armenia, Georgia, the Kyrgyz Republic, Moldova and Tajikistan (in Figure II). In addition, Albania, Bosnia-Herzegovina, Kosovo and Montenegro, are vulnerable in terms of facing additional external financing needs, but their potential poverty increase resulting from high food and fuel prices, is small or negligible. In the absence of additional financing, these countries may need to contain aggregate demand. At the same time, vulnerable countries will need to find additional fiscal resources to protect the poor, while expanding their targeted social assistance programs. The policy response to inflation in ECA countries will depend on the persistence of inflation and the outlook for other macroeconomic variables. Tighter monetary policy may be warranted in some countries if inflation pressures persist over the medium-term.

7. The effect of the price shocks on the poor in most ECA countries could be offset by relatively modest increases in fiscal resources which could be distributed through current social safety net programs. Most ECA countries have at least one fairly well targeted social assistance program. By increasing the fiscal resources allocated to these programs, they can increase coverage of the poor and the adequacy of benefits. Over time, as the administrative capacity of these systems improves and overall expenditures are rationalized, there can be fiscal savings. Fully compensating the poorest 20% for higher inflation in the low and lower middle income countries where poverty is expected to increase the most (Armenia, Georgia, the Kyrgyz Republic, Moldova, and Tajikistan), could require up to 1% of their GDP.

8. ECA countries responded to the 2007-08 increase in food and fuel prices in a number of ways, but some policies they adopted have negative long term consequences. Among the most used policies in 2007-08 were trade restrictions on food exports, reduced value-added tax (VAT) rates on food imports, reliance on state procurement and distribution to ease prices, price controls and staggered energy price adjustments. In 2010-11, all of these possibilities are back. However, these policies are mostly not well targeted to the poor. In addition, reductions in VAT rates reduce import prices and raise the fiscal deficit, but do not ensure low consumer prices. Energy subsidies, implicit or explicit, are often not well targeted and worsen the government’s fiscal position. Export restrictions and inappropriate pricing policies (such as price controls) in the agriculture and energy sectors hinder long term adjustment to global market conditions. To the extent possible, expansion of social assistance systems should be the preferred method of protecting the poor.

9. ECA’s medium-term response to higher prices in global food markets should be to expand its agro-food sector in a sustainable way and improve distribution; many countries have already embarked on this process. ECA’s agro-food sector affects both regional and global markets; wheat accounts for 25% of world exports on average. ECA could double its production by increasing the land that is currently under cultivation and increasing yields through better use of inputs and services. Distribution as well as production inefficiencies have further exacerbated food price volatility and inflation in local markets. Important reforms include investing in infrastructure and irrigation, improving post harvest logistics and waste reduction, and eliminating government interventions that preclude adjustment to changed prices.
10. **Exports from ECA's three largest oil exporters account for around 15% of world oil supply and 25% of non-OPEC oil supply.** To contain fiscal pressures, sustain oil and gas production and to be climate smart, many ECA countries will need to rationalize their energy sector policies. Rising fuel prices make reform of pricing policies and reducing energy intensity more urgent. The problem is pressing for countries with large energy trade deficits such as the Kyrgyz Republic at 20% of GDP, followed by Georgia (14%) and Ukraine (11%). In all ECA countries, the energy intensity of GDP has declined significantly since the early part of the last decade, but can be further reduced if ECA adopts policies to enhance its energy efficiency and encourage climate smart investments.

### Bank Support to Clients

11. **The World Bank supported ECA countries during the last commodity price hikes and during the global crisis; it is already involved in measures that will help contain country vulnerabilities to global developments.** ECA countries are facing a more challenging external environment than before the global crisis. The Bank supported countries in their efforts to put in place sustainable macroeconomic policies and to implement measures aimed at short term protection of the poor. Lending, policy advice and analytical work are being used in tandem to meet the goals of macroeconomic stability, growth and poverty reduction. The Bank is working with clients on:

- **Rationalizing public finance and administration.** In many ECA countries, the Bank is supporting sustainable fiscal planning, rationalization of overall expenditures to ensure fiscal sustainability, and tax reform including improvement of tax administration. It is supporting clients in implementing structural reforms in various sectors in order to enhance fiscal sustainability.

- **Enhancing social assistance systems.** The Bank is working with clients to provide greater coverage of the poor, increase the effectiveness of public spending and improve targeting of overall fiscal expenditures.

- **Enhancing productivity and realizing potential in agriculture.** The Bank is supporting improved water management in agriculture, enhanced access to inputs or extensions services and better land administration as part of efforts to enhance productivity. It has also supported efforts to increase access to finance for farmers and to reduce vulnerability to shocks.

- **Energy sector reform and sustainable energy.** The Bank is supporting improvements in energy efficiency, promotion of private investment in the energy sector, and support for renewable energy production and climate change mitigation initiatives.
1. The ECA region was hit hard by the global economic crisis and countries are facing the commodity price hikes of 2010-11 from a different situation than that prevailing at the time of the 2006-2008 commodity price increases. ECA countries were in a much stronger economic situation before the global crisis with growth averaging almost 7% during 2005-08. Fiscal deficits were falling, as was public debt. Capital, available at unprecedentedly low rates, allowed many ECA countries to finance large current account deficits as they grew; remittances buffered trade deficits and provided income support for many. ECA’s strong growth was accompanied by decreasing unemployment and wage increases. Poverty declined dramatically during the 2000s. Rising commodity prices\(^2\) added substantially to commodity exporters’ incomes. The negative impacts of high commodity prices on net importers’ macroeconomies were mitigated by the positive external environment and global liquidity. However, there were within country negative distributional impacts of rising prices and the poor suffered a rise in the cost of their consumption basket.

2. Today, in the changed global and domestic economic conditions, both macroeconomic and within country distributional impacts are potentially more severe, particularly for the poorer countries in ECA. In 2009 most of the ECA countries experienced negative growth rates averaging -3.8%. For many, 2010 was the beginning of the recovery, and the average growth rate was around 3% compared with a world average of 5.1% Recessions have left ECA countries with much higher unemployment rates and lower wages. Fiscal accounts have been put under significant pressures as deficits and debt have increased. The average fiscal balance in 2007 was 1.3% of GDP compared to -5.8% in 2010 (with a maximum deficit of over 9%). The average debt to GDP ratio has jumped 10 percentage points of GDP. For low and lower middle income countries, the fiscal deficit jumped from -1.8% to -5.8% of GDP, these countries are also more vulnerable to the 2010-11 commodity price hikes. Government accounts have been strained by declines in revenues, the need to rationalize expenditures and efforts to protect the poor. Global financial markets are also less liquid; and exports for many ECA countries are just beginning to pick up.

3. In this context, the adjustment to higher commodity prices for many net commodity importers may be harder than it was previously. Countries in ECA will continue to rationalize fiscal spending and manage volatility in a world in which financial markets and growth prospects are more uncertain and risk perceptions are high. The global increase in food and energy prices will have differentiated impacts across ECA countries depending on (a) their status as net commodity exporters or importers; (b) demand and supply responses over time (e.g., for food production and energy efficiency investments) in each country; and (c) initial economic conditions. Internal redistribution from food and energy consumers to producers is expected to result in increased poverty at a time when unemployment is high. At the time of the 2008 commodity price hikes, countries had adopted measures to insulate their economies and/or the poor from these global market developments. Additional policies were adopted to adjust to the 2009 downturn. Not all of these policies were sustainable. ECA countries need to take measures in public finance, demand management, agriculture and energy that prepare them for higher and more volatile food and fuel prices.

4. The purpose of this paper is to illustrate the channels through which rising commodity prices might affect countries in the Europe and Central Asia Region (ECA) in the short run and to indicate which countries are most likely to be significantly affected. While the focus is mostly on short run effects, the paper notes the importance of medium-term policy and non-policy related factors that could mitigate the consequences of commodity price increases. The paper presents an initial assessment of a still evolving situation in which commodity market developments are uncertain. The eventual impacts on growth and poverty will depend on the macroeconomic policy environ-

\(^2\) Commodities include food, raw materials, energy products, metals and minerals.
ment, the duration and volatility of the price increases, social assistance policies and other domestic policies that change the structure of domestic markets. Depending on the nature of the impacts and the initial conditions, appropriate policy responses will differ. Country policy responses in the region can have significant impacts on world markets. For example, in the last food price crisis major exporting countries introduced export taxes, export bans or other restrictions on exports of agricultural products or increased hoarding and these policies affected world as much as national markets.

5. **This paper discusses the effects of the global food and energy price increases on ECA countries from two perspectives: (a) impacts on the macro-economy through inflation, the trade balance, fiscal accounts and growth and (b) distributional impacts within countries** (Box 1). It aims to highlight vulnerabilities to rising commodity prices and discusses some policy interventions to mitigate the impact of rising prices. It puts the ECA experience in the context of the last commodity price increase as well the recent global economic crisis. Section 1 summarizes the state of global commodity markets. Section 2 discusses the main macroeconomic channels through which commodity price increases affect the economy. Section 3 discusses the potential poverty impacts of the price increases and the ability of countries’ social assistance systems to deal with the heightened need for social assistance. It also discusses country responses to the crisis to date with reference to policies followed during the 2008 price hikes. Section 4 examines ECA’s agriculture sector and potential responses to the commodity price increase and price volatility. Section 5 discusses the energy sector. Bank support to ECA countries to help deal with commodity market developments is discussed in Annex 1.
MACROECONOMIC AND POVERTY EFFECTS

Impact on inflation: National inflation levels are affected by rising world prices for commodities. The direct first round effects on overall consumer price inflation depend on the weight of these commodities in the consumption basket; this is higher for lower income countries. Whether these price changes affect core inflation rates (inflation measured without food and energy prices) depends on a number of factors, among them persistence of world inflation, domestic policies and expectations of future price developments. Allowing the first round effects of commodity price inflation to be accommodated would help the adjustment to the jump in commodity prices. However, inflation expectations need to be considered; to the extent that the food and fuel price inflation raise expectations of long term inflation, monetary policy would need to be tightened. The long term increase in commodity prices will feed into domestic inflation depending on the exchange rate and monetary policies followed by countries, the taxes and subsidies they impose on these goods, how integrated or isolated their domestic markets are from world markets, and the nature of domestic production.3

Impact on external balances: Net food and energy importers will see deterioration in their current account balances4 with the magnitude depending on the importance of net food and fuel imports in the economy.5 Current account deficits will need to be financed by an inflow of foreign funds or a reduction in demand. For some vulnerable countries that are adversely affected in the short run, additional donor financing may be needed. Alternatively, domestic demand will need to decline. Net food and energy exporters will face improved external balances. The effect on the current account over time will depend on how overall terms of trade evolve but also the response to the price increase in national markets (such as substitution to other, non imported energy or food sources, or decline in energy consumption and thus imports, or increases in domestic supply), and expectations regarding the permanence of the shock. Diversification of energy sources over the longer run could help reduce the impacts of price volatility in oil markets. Similarly, the national agriculture sector should respond to permanent changes in food prices. Actual responses will be determined in part by country policies in these sectors.

Impact on fiscal balances: Most immediate in terms of nondiscretionary effects are the tax revenue increases that will result from higher energy related income or profits made by oil and gas corporations. Azerbaijan, Kazakhstan and Russia have various taxes on oil and/or gas related income. Another short run positive impact on fiscal accounts comes from rising tax revenues on food and fuel imports which are subject to the VAT. Increases in the value of imports, given tax rates, will raise revenues, given inelastic demand in the short run. However, as demand and supply adjust over time, these revenues could decline. Countries face fiscal pressures because of the rising cost of existing subsidies in the agriculture and energy sectors. Discretionary changes in fiscal policies such as reductions or increases in subsidies have usually accompanied commodity price increases. These include a reduction in taxes (e.g. VAT rates) to cushion the impact on consumers.6 These tend to worsen fiscal balances. To the extent that GDP growth is affected, it will also affect tax revenues.

Impact on growth: Sustained change in the terms of trade (TOT) affects growth as does volatility in the terms of trade. Countries facing an increase in the terms of trade would see higher growth; higher volatility in the terms of trade can be expected to have a dampening effect on growth. Several empirical papers have assessed the impact of changes in the TOT on growth (Annex 1). In addition to the income transfer related to TOT changes, the energy

---

3 Impacts of inflation on other macroeconomic variables such as long term interest rates or the short term impact on the financial sector are not discussed here. Factors constraining pass-through of international prices lower the price elasticity of demand. See also IMF 2008/02.

4 To the extent that food and fuel purchases are determined by long term contracts, the effect of rising prices on expenditures will be muted.

5 Short term price elasticities of oil demand are generally believed to be low. IMF (2005), estimates it to range from 0.03-0.08. Thus income effects tend to dominate oil markets. Even small changes in supply can have large effects on short term prices. If longer term price elasticities are higher than short term ones, then short term prices will tend to overshoot longer term one.

6 See also IMF 2008.
price increase represents a supply shock. Fuel, being a factor of production, also affects growth/GDP through the following channels. The higher cost of oil will reduce the use of oil and producers will substitute to other factors as possible, but will also lower their use of labor and capital. On the demand side, oil price increases will tend to reduce non-oil demand and lower investment in importing countries. In addition, oil price changes affect inflation and exchange rates and therefore (given monetary policy) affect aggregate demand. Estimates of the effects of oil shocks vary but the effects have been found to be asymmetrical between oil price increases which tend to be contractionary and oil price decreases which are less expansionary than increases are contractionary. The short run contractionary effects of oil price increases are enhanced when factors of production cannot be easily reallocated between sectors.

Poverty effects: Inflation in food and fuel prices lowers the purchasing power of poor people as food is often a large share of the poor’s consumption basket. The impact will depend very much on the types of coping mechanisms that are available in the short run.

---

7 For example, higher oil prices may mean higher money demand (real balances fall with inflation) and therefore higher interest rates and lower economic growth. (Brown and Yucel, 2002).

6. **Non-energy commodity prices** rose for eight consecutive months through February, crude oil prices for **seven**. Figure 1 below shows the evolution of world food and energy prices since 2005. The energy price index is still below its July 2008 peak, though the World Bank (WB) food price index had matched the peak of July 2008 by January 2011. The increase in food prices in 2010 represents a generalized increase in the prices of several commodities. In the ECA region, wheat is an important staple. Wheat prices are still below their 2008 peak (Figures 1-2).

7. **Commodity market developments** reflect a combination of temporary and permanent factors. Rising incomes around the world, and particularly in emerging and developing countries have increased demand for food and fuel. In addition, supply factors, related to fuel supply constraints and inventories have affected prices both in the short and over the longer run, while policies regarding biofuels have affected grain prices. In the short run, volatile weather conditions (such as Russia’s drought and Australia’s floods) have significantly affected world wheat supply and prices while temporary policy changes by major exporters or importers have tended to push prices above longer run trends. To the extent that many commodities substitute for each other (e.g. corn versus wheat or rice), increases in the price of one good have translated into increases in the prices of other goods. In the long run, the supply elasticity of food could be substantial both in the ECA region itself and globally, and larger than that of conventional energy forms.\(^9\) In terms of

---

\(^9\) Commodity price booms are usually followed by periods of falling prices as supply conditions adjust, but the substantial decline in commodity prices during 2009 was due in large part to the global economic crisis and slowdown in economic activity. In the case of food, the weather was also favorable.

\(^{10}\) IMF, 2008, Chapter 5
volatility, both food and energy prices have become more volatile today than they have been in the recent past.

8. Among ECA countries, fuel is a principal source of export earnings for Azerbaijan, Russia, Kazakhstan and Turkmenistan. For Tajikistan and Ukraine non-fuel commodity exports are important. Russia, Kazakhstan and Ukraine are also significant wheat exporters that have the potential to affect world markets. However, due to poor weather conditions, Russia was a net importer this year.11

11 Azerbaijan, Kazakhstan, Russia, Turkmenistan and Uzbekistan benefited the most from terms of trade (TOT) changes in 2006-08 while TOT worsened for countries such as Armenia, and Tajikistan.
2.1. Food and Energy Price Inflation

9. Food price inflation varies substantially among ECA countries with poorer countries tending to experience higher inflation rates. Food price inflation was over 20% in two countries in 2010—the Kyrgyz Republic and Georgia. For another nine countries, it was over 10% (Figure 3). For almost a third of ECA countries, the weight of food in the consumption basket used to estimate the CPI is around 50%.\textsuperscript{12,13} For another 20% it accounts for around 40% of the CPI. Thus, any changes in food price inflation have a significant impact on overall inflation rates. Ukraine had food price inflation of 10.6% and the food weight in the CPI was 53.5% while Armenia’s food price inflation was 15.2% and the share of food in the CPI 48%. As a group, the Caucasus experienced the highest food inflation in emerging economies. The first round effect on 2007 current account balances exceeded 1% of GDP in developing countries (IMF, 2008).

\textsuperscript{12} Among the lower income deciles food accounts for a larger share of consumption than for the upper income deciles. In Azerbaijan, food accounted for 66% of the consumption basket of the two lowest income deciles; in Armenia it accounted for 63%.

\textsuperscript{13} Some importing countries did not allow full pass-through of international prices into domestic prices (in 2007, an IMF survey showed that less than half a sample of 43 developing and emerging market countries allowed for full pass-through). In 2007, food price inflation accounted for almost 70% of 2007 headline inflation.
price inflation while the Balkans faced the lowest (see also Box 2). Figure 4 shows that poorer countries tended to have higher food price inflation. The reason for this pattern may be related to differences in the abilities of markets in these countries to respond to supply or demand changes. For example, suppliers in richer countries may have better stocks or distribution systems and can moderate the impact of price shocks.

10. **Energy price inflation also varies substantially across countries, being highest in the low and lower middle income country group (LLMIC), on average.**

Energy price inflation is 25% or more in Moldova and Uzbekistan and around 10% or more in another 13 countries (Figure 3) including the Baltics, and Hungary as well as, Russia, Uzbekistan and Tajikistan. Uzbekistan, which had the lowest food price inflation rate, had the highest energy price inflation rate, whereas the Kyrgyz Republic suffered high inflation rates on both (27% in food and 15% in energy). Montenegro’s decline in energy prices is striking and is the result of a substantial increase in domestic hydro-energy production as well as a decline in business demand reflecting the fall in overall economic activity.

Though the increases in food and energy price inflation are large for many countries, not all countries with very high inflation rates had overall high inflation as the combined weight of energy and food in the CPI is not high. Estonia for example, had high food and energy inflation of 12.1% and 11.6% respectively but overall inflation was only 5.4%.

11. **The impact of world commodity price changes on domestic inflation is affected by several policy related factors.** Policies such as taxes, price controls and subsidies, limit the pass through of international price increases to domestic inflation. In the past for example, some ECA countries temporarily reduced taxes on food/energy, in order to limit price increases. Changes in exchange rates relative to the dollar, and the currency in which com-

---

14 The LLMIC group includes Armenia, Georgia, Kosovo, the Kyrgyz Republic, Moldova, Tajikistan, Ukraine and Uzbekistan.

15 In addition, regulated prices were lowered in 2010, to compensate for large increases in 2009.
Commodity prices are quoted, could have a substantial effect on inflation. Many ECA countries have exchange rates pegged to the euro; if the euro depreciates relative to the dollar, these countries will see an increase in food prices even if world prices do not rise. Countries with flexible exchange rates, if their exchange rates depreciate relative to the dollar, will face the same fate. If monetary policy remains or becomes expansionary, then inflation in food prices may be sustained. It is important to remain alert to inflation risks particularly in the context of both volatile and rising commodity prices, but the inflation risks of monetary easing in ECA countries have to be weighed against the negative effect of monetary tightening on the nascent economic recovery and on countries’ financial systems.

2.2. Current Account

12. The immediate impact of changes in commodity prices on the current account will vary according to whether the country is a net exporter or importer of food and energy products, and the volume of trade in these commodities. Over the longer run, quantities demanded and supplied change in response to price changes; however, in the short run, it is assumed that quantities imported do not adjust as the demand for food and energy tends to be inelastic in the short run. The magnitude of the initial deficits in food and fuel trade balances help provide an estimate of the magnitude of the initial impact of an increase in commodity prices on the current account.

13. Five LLMIC countries, Albania, Armenia, Kosovo, the Kyrgyz Republic, and Tajikistan have food trade deficits around or above 5% of GDP. Among middle income countries (MIC), Bosnia-Herzegovina and Montenegro also fall into the high deficit category where net imports account for 7.1% and -21.7% of GDP respectively. Several ECA countries were net exporters of food in 2010; the top exporters in terms of GDP were Ukraine, Belarus and Serbia. Neither Russia nor Kazakhstan, both top grain producers, were net food exporters; the severe drought in 2010 has led Russia to be a wheat importer this year.

14. Seven LLMIC countries in ECA have energy trade deficits of 7% or more of GDP. In addition, Ukraine, Belarus and Bulgaria are very dependent on energy imports. Apart from the oil and gas exporters (OGE) and Uzbekistan, most EU member and accession countries are less dependent on energy imports, with exceptions being Bulgaria, and Lithuania, both of which have energy trade deficits above 6% of GDP. As food production is widespread but energy production is less so, the variation in the food trade balance is between 2.7 and -8.2% of GDP while that for energy is between 44.8 and -20% of GDP (reflecting standard deviations of 2.96 and 12.40 respectively).

15. Some ECA countries have high combined food and energy trade deficits and their external balances are sensitive to commodity price changes. Five LLMIC, Armenia, Georgia, Kosovo, the Kyrgyz Republic and

---

16 There may be substitution between products and to non-traded items in the short run but these effects are not considered.

17 In some countries, such as Belarus and Ukraine, energy prices are not market determined but the result of agreements between the countries and Russia. However, these prices have been adjusted as world prices have increased in recent years (see Energy Section).

18 Countries that are oil and gas exporters include Azerbaijan, Kazakhstan and Russia.
Tajikistan, and two upper MICs Bosnia-Herzegovina and Montenegro, have the highest food and fuel trade deficits at over 10% of GDP. By contrast, Poland has substantial coal reserves and also imports fuel from Russia based on long term contracts which limit price volatility. Poland also has a small surplus on its food account. Thus Poland is less vulnerable to a food and fuel price shock than are the countries mentioned above. As Figure 5 shows, Azerbaijan, Kazakhstan and Russia have large combined trade surpluses because of the surplus in energy trade. Overall, the impact of energy prices tends to be higher on the current account than the impact of food prices because the production of food tends to be widespread while production of fuel is much more concentrated; consumption of fuel is linked more closely to trade in fuel.

16. **Estimates of the impact of rising food and fuel prices on the trade balance shows substantial potential deterioration for a few countries.** While each country’s overall food and fuel balance depends on the prices and shares of individual commodities in the trade basket, a first approximation of the impact of price increases on the trade balance is done assuming an average increase of 30% in the prices of imports for all countries. Increases in food prices have a positive trade impact on exporters of food. The numbers presented in Table 1 show possible impacts. The table shows that a 30% increase in the value of the net food and fuel import basket raises the trade deficit for five LLMIC, Armenia, Georgia, Kosovo, the Kyrgyz Republic and Tajikistan by over 5 percentage points of GDP. Bosnia-Herzegovina and Montenegro among MICs, also have potentially large impacts on their food and fuel deficits. However, to the extent that there are simultaneous increases in the prices of commodities exported, the impact of rising food and fuel prices on the overall current account balance would be reduced. For example, rising cotton prices mean higher export revenues for Tajikistan while FYR Macedonia benefits from higher prices for metals that it exports.

<table>
<thead>
<tr>
<th>Country</th>
<th>Food and Energy Trade Balance, % GDP</th>
<th>Food and Energy Trade Balance, % GDP, 30% price increase</th>
<th>Change in Food and Energy Trade Balance, % GDP, 30% price increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
<td>45.3</td>
<td>58.9</td>
<td>13.6</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>22.9</td>
<td>29.7</td>
<td>6.9</td>
</tr>
<tr>
<td>Russia</td>
<td>15.6</td>
<td>20.3</td>
<td>4.7</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>9.6</td>
<td>12.5</td>
<td>2.9</td>
</tr>
<tr>
<td>Poland</td>
<td>-1.7</td>
<td>-2.2</td>
<td>-0.5</td>
</tr>
<tr>
<td>Estonia</td>
<td>-2.1</td>
<td>-2.7</td>
<td>-0.6</td>
</tr>
<tr>
<td>Romania</td>
<td>-2.5</td>
<td>-3.2</td>
<td>-0.7</td>
</tr>
<tr>
<td>Hungary</td>
<td>-2.9</td>
<td>-3.8</td>
<td>-0.9</td>
</tr>
<tr>
<td>Serbia</td>
<td>-3.0</td>
<td>-3.8</td>
<td>-0.9</td>
</tr>
<tr>
<td>Turkey</td>
<td>-3.6</td>
<td>-4.7</td>
<td>-1.1</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>-3.9</td>
<td>-5.0</td>
<td>-1.2</td>
</tr>
<tr>
<td>Croatia</td>
<td>-4.8</td>
<td>-6.2</td>
<td>-1.4</td>
</tr>
<tr>
<td>Latvia</td>
<td>-4.8</td>
<td>-6.2</td>
<td>-1.4</td>
</tr>
<tr>
<td>Slovenia</td>
<td>-5.1</td>
<td>-6.6</td>
<td>-1.5</td>
</tr>
<tr>
<td>Lithuania</td>
<td>-5.1</td>
<td>-6.7</td>
<td>-1.5</td>
</tr>
<tr>
<td>Slovakia</td>
<td>-5.7</td>
<td>-7.4</td>
<td>-1.7</td>
</tr>
<tr>
<td>Belarus</td>
<td>-7.2</td>
<td>-9.4</td>
<td>-2.2</td>
</tr>
<tr>
<td>Albania</td>
<td>-7.6</td>
<td>-9.8</td>
<td>-2.3</td>
</tr>
<tr>
<td>Ukraine</td>
<td>-8.3</td>
<td>-10.8</td>
<td>-2.5</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>-8.4</td>
<td>-10.9</td>
<td>-2.5</td>
</tr>
<tr>
<td>Moldova</td>
<td>-8.6</td>
<td>-11.1</td>
<td>-2.6</td>
</tr>
<tr>
<td>FYR Macedonia</td>
<td>-8.6</td>
<td>-11.2</td>
<td>-2.6</td>
</tr>
<tr>
<td>Armenia</td>
<td>-11.4</td>
<td>-14.8</td>
<td>-3.4</td>
</tr>
<tr>
<td>Bosnia-Herzegovina</td>
<td>-12.7</td>
<td>-16.5</td>
<td>-3.8</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>-16.3</td>
<td>-21.2</td>
<td>-4.9</td>
</tr>
<tr>
<td>Kosovo</td>
<td>-16.5</td>
<td>-21.4</td>
<td>-4.9</td>
</tr>
<tr>
<td>Georgia</td>
<td>-17.8</td>
<td>-23.1</td>
<td>-5.3</td>
</tr>
<tr>
<td>Montenegro</td>
<td>-17.8</td>
<td>-23.1</td>
<td>-5.3</td>
</tr>
<tr>
<td>Kyrgyz Republic</td>
<td>-25.2</td>
<td>-32.8</td>
<td>-7.6</td>
</tr>
</tbody>
</table>

Source: World Bank staff estimates based on National Sources

---

19 The terms of trade decline in 2010 is estimated to be 3% for the Kyrgyz Republic, and 3.5% for Tajikistan. Georgia saw an improvement of 2.6%.

20 The correlation between food and fuel prices has also increased over time IMF (2008).

21 To the extent that prices and quantities are set by long term contracts, they will not be affected immediately. It is assumed in this statement that prices adjust fast but quantities take longer to adjust.
17. If the combined deficit in food and energy trade is large and the country already has a substantial current account deficit, then its external account is vulnerable to increases in prices. Countries with high food and fuel trade deficits and high current account deficits may face external financing needs/constraints. In contrast, if the country is running a current account surplus, an increase in the food and energy trade deficit will reduce the surplus (or if large enough turn it into a deficit) but these countries are not considered vulnerable as these changes will not strain external balances. A country that is already borrowing large amounts of funds from abroad to finance domestic demand, may find it difficult to borrow more. Thus, the increase in food and energy prices, assuming that other goods prices are constant, could have a significant impact on those countries that are large net importers of food and energy products and also have large current account deficits.22 In Figure 6, the lower the countries are in the bottom left quadrant, the more vulnerable is their external account to a terms of trade shock. Among these countries are six LLMIC, Armenia, Georgia, Kosovo, the Kyrgyz Republic, Moldova and Tajikistan. Except for the Kyrgyz Republic and Tajikistan, they all have current account deficits of 10% or more in 2010. However, the Kyrgyz Republic and Tajikistan have among the highest deficits in food and fuel (-25.2% and -16.3% respectively). In addition, four other MICs, Albania, Belarus, Bosnia-Herzegovina, and Montenegro have vulnerability on external accounts.23 The EU10 on average will show much smaller impacts on their external accounts and the OGE will reap further benefits from rising fuel prices; two of the OGE also produce substantial amounts of wheat.

2.3. Output and Growth

18. There have been substantial changes in the terms of trade of ECA countries in recent years. Commodity price changes have led to large income transfers between commodity exporters and importers that have differed substantially from year to year, particularly during 2007-2010. In 2008-09, the effect of the downturn in the global economy overtook the underlying trend of rising commodity prices. In 2010, these trends are again visible. In addition, increases in energy prices represent a supply shock to firms as energy is an important factor of production.24 Estimates indicate that Albania’s terms of trade improved 12% in 2009 (thus buffering the decline in economic activity resulting from the global downturn) but deteriorated 12% in 2010. Ukraine, a metal and wheat exporter saw the opposite: a 12.6% decline in the TOT in 2009 was followed by an improvement of 2.9% in 2010. For the OGE exporters, the impact of the TOT improvement was muted by the extent of food imports; Russia, traditionally a wheat exporter, became a net importer of wheat in 2010. The extent and nature of the response in economies depends on how much of the oil price change is perceived to be permanent or temporary and how much the

22 Table A1 in the Annex lists the countries in terms of increasing deficits in food and energy trade and also in terms of their overall current account deficits at end 2010. The third column orders them according to the size of their current account and food and energy trade balances. That is, the country with the smallest deficit (largest surplus) on food and energy and that also has the smallest current account deficit (largest current account surplus) is the least vulnerable.

23 Albania and Montenegro have obtained financing on the Eurobond market to meet financing needs.

24 While there are other explanations for the impact on GDP and growth, this section focuses on these two channels.
increased uncertainty in global markets (reflected in price volatility) will deter investment. Though it is often hard to distinguish between temporary and permanent components of shocks, the recent upsurge in oil (and overall food and fuel) prices is believed to have a strong permanent component due to the factors discussed in Section 1.

19. **ECA countries’ growth impacts will be differentiated by the particular commodities they export and import, the value of exports and imports and the evolution of market conditions over time, and, in the case of energy, on the energy intensity of GDP.** For example, even if the rise in the price of oil has a negative immediate impact on importers, many of them export commodities such as metals or cotton whose prices are also rising; the rise in these prices would mitigate the negative effects for food and fuel importers. The longer run impacts may differ from the immediate or shorter run impacts. Box 3 examines the impact of an oil price shock on the GDP of ECA countries. Models examining the effect of oil price shocks give varying results because of the different assumptions they make and the magnitude of the price changes they examine. The two most important (non-policy) channels considered are the TOT effect and the importance of energy in production. The net trade in fuel (in this case oil) reflects the magnitude of the overall effect on income from energy price changes. The energy intensity of GDP reflects the importance of GDP in the production process and thus the magnitude of the shock to production.

20. **The energy intensity of GDP has declined over time for ECA countries on average, but some still have high energy intensity, reflecting countries’ different economic structures, energy pricing policies and technological efficiency in energy use.** Countries that are more energy intensive are more vulnerable to an oil price shock, as the effect on production from high oil prices will be greater in these countries. In addition, the larger the net energy trade deficit, the greater the TOT impact. Taken together, these two aspects are important determinants of fuel price increases on output. Kazakhstan, Ukraine, Turkmenistan and Uzbekistan have energy use per value of GDP, far above the other ECA countries. Figure 7 shows ECA countries along two dimensions: net trade in energy as a ratio to GDP and energy intensity. Among the OGE, Azerbaijan, Kazakhstan and Russia are very energy intensive (they are not shown as they are energy exporters. The further down countries are in the lower right hand corner, the more vulnerable they are to a negative GDP from the oil price increases. These countries are Belarus, the Kyrgyz Republic, Moldova, Tajikistan, and Ukraine. On average, the EU 10 countries are the least vulnerable.

2.4. Fiscal Impact

21. **The fiscal impact of the food and energy price increases is large and positive for energy exporters.** The fiscal impact of food and fuel price increases depends on some non-discretionary (or automatic) changes in revenues: however, usually governments adopt fiscal policies to mitigate the impact of rising prices in revenues. This section will briefly consider both aspects. The most obvious sources of fiscal impacts are three: taxation of profits/revenues of energy companies, subsidization of consumption of food and energy, income support in production (e.g.

---

25 The net trade in food and fuel would be a wider proxy for the magnitude of the overall commodity TOT effect on growth.

32 This statement reflects the importance of oil in their economies but does not account for compensating TOT effects.
A World Bank macroeconomic model was used to examine the impact of an oil price shock on GDP and growth in ECA countries, assuming that this is a permanent shock. Oil prices averaged US$79 a barrel in 2010, up from around US$62 a barrel in 2009. In this scenario it is assumed that oil prices will rise further to average US$85 in 2011 and vary between US$90 and US$95 during 2011-2015, compared to a baseline view that sees the long run equilibrium price of oil at US$83 /bbl in real terms. The baseline projections for the terms of trade in the model assume that other commodity prices will also evolve according to trend. The impact of an oil price shock depicts a scenario where the baseline oil price increases by US$10 over and above the projected baseline trend over the entire period; i.e. it is a permanent shock. The model is linear in its effects. Simulations indicate that both the impact and longer term effects on GDP and GDP growth are relatively small, with GDP levels in the ECA region declining by about 0.06% in 2012; the effects rise to a cumulative 0.12% by 2015. An implication of the linearity of the model is that another US$10 increase in the price of oil could double the impact on GDP and so on. The effects are negligible as oil exporters such as Azerbaijan, Kazakhstan and Russia make up for GDP losses in oil-importing countries elsewhere in the region.

The impact on the EU12 (EU10 plus Croatia plus Turkey) is also marginal, while the impact on the oil exporters is positive and larger, the impact on large net oil importers negative. The baseline simulations also project an increase in other commodity prices, not just oil. Thus, the oil shock occurs in a context of rising commodity prices overall which is a more realistic scenario than assuming that all other prices are constant. These model outcomes reflect the impact of changes in the respective country’s overall TOT and the global (trade) transmission mechanisms.

The impact of the oil price shock on the ECA region is on par with what happens in developing countries in aggregate. Other estimates show much larger effects because (a) they assume that the prices of other commodities do not change; (b) they assume much larger increases in the price of oil; and (c) some take account of asymmetric adjustment costs. In addition, some estimates include the costs of variability in the TOT. Estimates of the effect of a similar increase in oil prices have been around 0.4% of GDP for the US. Another paper (Jimenez-Rodriguez and Sanchez, 2004) estimates that in the pre-2008 period output losses resulting from a doubling of oil prices would be in the range of up to 3-5% in individual euro area countries. However, at present, indications are that oil prices are unlikely to double from their 2009 levels, even if they have risen substantially in 2010. Some other estimates (conducted prior to the 2006-08 boom) have found GDP would be 0.4% lower in a year in OECD countries if oil prices increased US$10 a barrel. In addition, some estimates include the costs of variability in the TOT.

It is important to note that in the oil shock scenario analysis, it was assumed that oil prices change by US$10/barrel above the expected baseline trend increase in the price of oil and other commodities. In reality, many commodity prices tend to move in tandem, and the impact on a respective country’s terms of trade could be exacerbated/softened depending on how other prices respond when oil price change. Also, it was assumed that exchange rates remain unchanged from the baseline scenario.

26 Baseline assumptions, DEC, WB.
27 Baseline projections are taken from the WB (2011a).
28 Recent evidence using nonlinear specifications for OECD countries found large impacts when oil prices doubled.
29 It is important to note that in the oil shock scenario analysis, it was assumed that oil prices change by US$10/barrel above the expected baseline trend increase in the price of oil and other commodities. In reality, many commodity prices tend to move in tandem, and the impact on a respective country’s terms of trade could be exacerbated/softened depending on how other prices respond when oil price change. Also, it was assumed that exchange rates remain unchanged from the baseline scenario.
30 This study uses both linear and non-linear estimation.
Table 2: Oil and Gas Revenues, % Share in Total Fiscal Revenues

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
<td>22.0</td>
<td>12.9</td>
<td>39.9</td>
<td>44.3</td>
<td>38.0</td>
<td>39.2</td>
<td>49.3</td>
<td>53.1</td>
<td>73.9</td>
<td>65.8</td>
<td>75.5</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>14.8</td>
<td>18.8</td>
<td>15.5</td>
<td>21.4</td>
<td>26.3</td>
<td>33.1</td>
<td>35.0</td>
<td>27.6</td>
<td>42.8</td>
<td>35.2</td>
<td>41.4</td>
</tr>
<tr>
<td>Russia</td>
<td>—</td>
<td>16.2</td>
<td>15.1</td>
<td>15.0</td>
<td>31.2</td>
<td>24.3</td>
<td>27.5</td>
<td>26.5</td>
<td>26.8</td>
<td>22.1</td>
<td>25.0</td>
</tr>
<tr>
<td>Average</td>
<td>18.4</td>
<td>16.1</td>
<td>23.5</td>
<td>26.9</td>
<td>31.7</td>
<td>32.4</td>
<td>37.6</td>
<td>36.0</td>
<td>45.8</td>
<td>41.7</td>
<td>44.7</td>
</tr>
</tbody>
</table>

Source: World Bank staff; National Sources

Table 3: Oil and Gas Revenues, % of GDP

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azerbaijan</td>
<td>4.5</td>
<td>2.4</td>
<td>10.8</td>
<td>12.3</td>
<td>10.2</td>
<td>9.9</td>
<td>13.4</td>
<td>15.2</td>
<td>38.3</td>
<td>27.4</td>
<td>36.6</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>3.2</td>
<td>4.7</td>
<td>3.5</td>
<td>5.3</td>
<td>6.2</td>
<td>9.4</td>
<td>10.0</td>
<td>8.1</td>
<td>12.3</td>
<td>8.1</td>
<td>11.4</td>
</tr>
<tr>
<td>Russia</td>
<td>—</td>
<td>6.5</td>
<td>7.5</td>
<td>6.0</td>
<td>12.4</td>
<td>10.2</td>
<td>11.1</td>
<td>10.6</td>
<td>10.4</td>
<td>7.6</td>
<td>8.6</td>
</tr>
<tr>
<td>Average</td>
<td>3.8</td>
<td>4.5</td>
<td>7.3</td>
<td>7.9</td>
<td>9.6</td>
<td>9.8</td>
<td>11.5</td>
<td>11.3</td>
<td>19.8</td>
<td>14.3</td>
<td>17.8</td>
</tr>
</tbody>
</table>

Source: World Bank staff; National Sources

prices continuing to rise, the major oil exporters will have a chance to replenish the reserves they had put aside from oil revenues before the global crisis. They may also use these revenues to mitigate the negative distributional impact of rising oil prices within the countries. All three countries will need to ensure that their oil funds are used strategically and that reserves are built up to handle volatility in markets when needed. In these countries, an important issue will be potential currency appreciation and its effect on other exports.

22. **Higher prices for food and fuel, whose demand is relatively inelastic in the short run, mean higher VAT revenues.** In ECA countries, VAT revenues increase with increases in the value of imports; the quantities imported of food and fuel are assumed to be mostly unchanged in the short run, but as imports adjust, the “VAT effect” declines. Over the longer run, the price changes are expected to be moderated by changes in demand or supply. Table 4 on the next page shows how an increase of 30% in the value of imports could have a substantial increase in VAT revenues. In the table below, it is assumed that imports are at their 2010 levels but that commodity prices increase by 30%. This is not as large an increase as it may seem given current commodity price increases. The price of oil was as low as US$62 a barrel in 2009 and is already expected to average around US$85 in 2011. The table shows that a 30% increase in the food and energy import value could

33 In Russia’s case for example, the oil stabilization fund was used to fund the large fiscal stimulus during 2008-09.

34 This could be due to an increase in dollar prices or a combination of a currency depreciation relative to the dollar and an increase in the dollar price of imports.
raise VAT revenues by around 1% of GDP in the countries below. The larger the initial import bill, the greater will be the potential positive impact on revenues, all else given. However, changes in demand and supply conditions will change imports over time; if they are reduced, then the “VAT effect” declines. Some countries have reduced VAT rates in previous years in order to mitigate the impact of rising food and fuel prices on consumers. In that case, the table reflects the loss in revenues resulting from a decline in taxes proportionate to the price increase. Any increase in VAT revenues could be better used to increase transfers to poor households in targeted social assistance systems, and to raise coverage and adequacy of these systems.

23. The fiscal impact of subsidies and transfers based on current prices will increase and adjustments will be needed to maintain a neutral fiscal impact. Governments in many countries provide subsidies and transfers in various forms for food consumption, agricultural production and energy consumption. The cost of maintaining consumption subsidies (preventing pass through of prices) increases when the market price of the commodity increases.35 This

---

**Box 4: The Hidden and Rising Fiscal Cost of Cheap Energy in Belarus**

In Belarus, the energy market is substantially affected by rising prices for energy imports from Russia. Belarus is heavily reliant on natural gas imports from Russia which it obtains at below market prices. Belarus generates about 97% of its electricity from natural gas based thermal power plants, while 87% of its heat generation is based on natural gas. While import prices for natural gas and oil continue to be below European market prices, as a result of Russia’s drive to introduce market-based prices for its energy exports to the CIS countries (Albania, Azerbaijan, Belarus, Georgia, Kazakhstan, Kosovo, Moldova, the Kyrgyz Republic, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan), import prices of natural gas more than tripled over the past 5 years, presenting the sector with significant challenges.

Reluctance to pass through increases in production costs to residential consumers has led to a deterioration of cost recovery levels on electricity, gas and heat supplied to residential consumers and has undermined the financial viability of the sector. Energy tariffs for residential consumers have remained flat in real terms since 2005 keeping household expenditures on utility services in Belarus below 10% of household income, much lower than in most countries in the region. Low prices have undermined the financial viability and sustainability of the sector. Operating losses incurred by utility companies have grown to 1.7% of GDP in 2009. They are compensated for these losses through a complex, non-transparent system of subsidies accounting for 0.3% of GDP and, to a larger extent, cross subsidization between commercial and residential consumers, accounting for 2% of GDP in 2009.

While imposing a rising fiscal cost, energy subsidies are untargeted and largely inequitable. They benefit the higher income population that has higher per capita consumption of energy. 45% of total energy subsidies for utilities flows to the top 30% households in the income distribution compared to 15% for the poorest 30% of households. Households in urban areas receive 82% of the subsidy. In addition, persistent under-pricing has deprived energy suppliers of the financing needed to carry out routine maintenance activities and investments reducing efficiency and reliability of energy supply. Low energy prices also distort price signals to households leading to energy inefficient consumption patterns while cross-subsidies between commercial and residential consumers impose an implicit tax on the business sector, adding to an already large tax burden.

Responding to growing fiscal pressures, the Government has begun to address these challenges. With energy costs expected to rise, the importance of higher energy prices has been well recognized in Belarus. To restore the financial viability of the sector, the State Program for the Development of the Belarusian Energy System (2011-2015) in August 2010 calls for a comprehensive tariff reform and gradual elimination of cross-subsidization in natural gas supply by 2013, and in electricity and heat supply by 2014. If implemented as planned, these reforms will generate significant fiscal savings, but they will require steep increases in tariffs that will hurt the poorer households, necessitating compensating increases in the coverage and adequacy of targeted social assistance.

---

35 In 2008, the IMF estimated food and fuel subsidies to amount to around 2% of GDP in Ukraine and 6% of GDP in Turkmenistan (IMF 2008, Chapter 3).
is a source of fiscal strain. In some ECA countries for example, consumption of energy is subsidized, particularly for households. Box 4 illustrates the nature of some of the quasi fiscal issues in the energy sector.

24. **Additional discretionary measures to protect consumers (or agriculture producers) will raise fiscal costs.** Another source of fiscal strain is the adoption of new policies to protect different groups in response to food and fuel price increases. For example, countries may reduce taxes on food and fuel. Also, more people may become eligible for government supplied food at prices that do not reflect costs of purchasing and storing food, when market prices rise. Many ECA countries increased public sector wages and pensions during the last commodity price surge (2006-08), an action that was a source of unsustainable fiscal expansion. In the ensuing global crisis, fiscal revenues plummeted. These policies strained fiscal budgets when tax revenues fell in 2009 and many are being reversed.

Many ECA countries are under pressure to contain expenditures.

25. **Countries with the largest fiscal deficits/debt will be under the greatest strain to rationalize fiscal systems, (for example, by reducing subsidies) when fuel prices rise or if GDP rises less than expected.** Georgia, the Kyrgyz Republic, Tajikistan, and Ukraine have had deficits close to 6% of GDP or above in 2010. In addition, Albania (around a 5% deficit), and the Kyrgyz Republic have debt to GDP ratios over 60%, while Armenia and Georgia have ratios of 40% and 45% respectively. Some of the highest deficit countries are in the EU but their economies are less vulnerable to oil price shocks and, these countries have smaller subsidies to energy and food than do some of the lower income countries. Among the fiscally vulnerable countries, countries as diverse as the Kyrgyz Republic and Ukraine both have high fiscal deficits and significant subsidies, often implicit, for fuel.
26. The food price increases are exacerbating the weakened conditions of many households affected by unemployment and lower wages in the global crisis. The 2010-11 food and energy price increases, if sustained, could have a stronger negative impact on poverty than did the 2006-08 price increases as they are occurring at a time when ECA countries are just beginning to recover from the global economic crisis. The first round of price increases occurred at a time when GDP growth had been strong for a while, labor markets were tight, wages were rising and remittances were high. In 2009-10, the situation has been very different. In order to cope with unemployment, wage cuts and lower transfers from many sources, households reduced savings, increased borrowing, or reduced consumption (of both goods and services such as health). Food consumption declined—either in quality or quantity. Crisis Response Surveys in six countries indicate that food expenditures were cut during the 2009 crisis\(^{36}\) and households put off expenditures that could be delayed (e.g. health visits, extra expenditures for education, and so on).

27. At the same time, governments used fiscal measures to protect households against income losses. In the period prior to the crisis, during the 2006-08 food and energy price increases, many ECA governments were also increasing pensions and public sector wages. Given the significant weight of the public sector in these economies, and the prevalence of poor pensioners, these measures, though untargeted for the most part and unsustainable, did alleviate the potential poverty impacts of rising food prices. Many ECA countries also took the opportunity to begin to rationalize their social assistance systems, improving targeting and coverage of the poor (see Box 5 on next page and Box 6 in Section 4). The programs of particular interest are the Last Resort Social Assistance programs (LRSA).\(^{37}\) The reforms initiated will take time to be implemented fully. Against this background, rising food and energy prices constitute a further negative shock to already poor households and strained fiscal systems. In addition, by lowering real incomes, they are expected to throw additional people into poverty.

28. Simulations based on the most recent household survey data in each country indicate that average household consumption in ECA may have fallen by as much as 5.3% in real terms.\(^{38}\) Food prices account for a large part of that shock (4.1% of the 5.3%), with the balance coming from higher energy prices (Table 5). Because poor people allocate a larger share of their budgets to food, the simulated decline in real consumption from the food price increase is approximately 5.7% in the poorest quintile, with losses reaching 7.0% when both food and energy price increases are considered. Unless counteractive measures are taken, the combined food and energy price shocks have the potential to increase the extreme poverty rate (below US$2.5/day) in ECA from 5.5% to 6.7%. If this occurs it would translate to an additional 5.3 million people in ECA living on less than US$2.5 per day. Growth in incomes and wages in 2011 will mitigate this impact. As shown in Table 5, the food price shock is responsible for most of the increase in poverty across all sub-regions within ECA, as food is a much larger share of the consumption basket of the poorest than is energy.

29. The projected impact across ECA countries is heterogeneous, reflecting not only the differences in food and energy price inflation but also the differing conditions across countries. The negative impacts are expected to be most pronounced in the low-income CIS countries of Central Asia and the Southern Caucasus, which are among the poorest in ECA, with people having high food budget shares and where relatively large shares of the

---

37 This is the largest program that is targeted in a country and with the primary objective of poverty alleviation.
38 See Annex 2 for a description of the simulation methodology and data used. These estimates do not differentiate between net producers and consumers of food: poor net producers may gain. The poverty impacts are greater if they are net consumers of commodities, and if other coping mechanisms fail (e.g. they do not have savings or cannot borrow), and they do not substitute towards cheaper alternatives.
Box 5: Global Food Price Crisis and Safety Net Response: Experience of IDA Countries in ECA

The implications of higher food prices for low-income ECA countries, where food represents a substantial part of the household consumption basket (50-60%), have been significant. The impact of the food crisis has been most severely felt in the three poorest countries in the region – Moldova, the Kyrgyz Republic, and Tajikistan. In 2007, food price inflation in the Kyrgyz Republic hit a record high among ECA countries at 31.5%; in Tajikistan, it reached 27.5%. With 28% of its population living in poverty, a sudden increase in food prices by 24% in May 2008 compared to 2007 led to serious food security and safety net concerns in Moldova. The governments of all three IDA countries requested World Bank assistance on an emergency basis and obtained financing for safety nets and nutritional supplements under the Global Food Response Program (GFRP).39

The response of the World Bank in Moldova, The Kyrgyz Republic, and Tajikistan built on active programs agreed with the governments. The approach to addressing the issue was the same in each case: adding financing to ongoing Health and Social Protection projects. Since these projects were already in place, they provided a convenient way to deliver additional and rapid financing to mitigate the impact of the crisis. In addition, existing client relations and the extensive knowledge base that had already been developed with these operations facilitated the process.

The Kyrgyz Republic already operated a moderately well targeted program, the Unified Monthly Benefit (UMB). In June 2008, the World Bank rapidly mobilized additional financing of US$6 million under the active Health and Social Protection Project (SWAP) to assist Kyrgyz Republic in two ways: (i) to protect and improve the health and nutritional status of vulnerable populations by providing nutritional supplements and nutrition education to pregnant/lactating women and infants and young children; and (ii) to help poor families mitigate the food price shocks and protect consumption by scaling up and strengthening targeted cash transfers. The cash transfer component was designed to “top up” the monthly payments under the UMB program to compensate the poor for the loss of purchasing power living due to rising food prices. The European Commission supported this program. Higher institutional safety net capacity in Kyrgyz Republic, due to the existing UMB, greatly facilitated the GFRP involvement.

In contrast, the state of existing safety net system in Moldova did not offer the same opportunities for scaling up. At the time of the crisis, Moldova was spending nearly 1.4% of GDP on 15 cash transfer programs, none of which were well targeted to the poor. However, Moldova operated a network of specialized institutions that provided social services to vulnerable groups; this network served as a basis for leveraging the GFRP response. The WB’s Health Services and Social Assistance Project received an additional financing of US$7 million under the Food Price Crisis Response Trust Fund. Though topping up a targeted program would have been preferable, this alternative did succeed in providing additional funding for nutritional supplies reaching vulnerable groups, such as orphans, the disabled and elderly. Moldova has also begun the process

(continued on page 23)

39 The program was set up by the Bank in 2008 following the approval of US$1.2 billion in funds for the most vulnerable and poorest countries. This initiative complemented the efforts of the United Nations High-Task Force on food security.
of establishing an LRSA program in response to the 2008 crisis. The number of households covered in the pilot program has increased from around 20,000 to 50,000 during 2010. The WB is planning technical assistance for expansion of this program.

Tajikistan did not operate an effective safety net that could be leveraged to protect the poor when the food crisis hit in 2008 and Tajikistan was only spending less than 1% of GDP on safety nets. The benefits mainly included gas/energy subsidies and a cash transfer program. None of the programs were well-targeted or could trace distribution of benefits. Lack of a functional safety net system presented a challenge for the implementation of the GFRP response. However, Tajikistan received US$4 million in additional financing for the Community and Basic Health Project in July 2008 to support the provision of nutrition supplements and nutrition education, and to improve the monitoring of children under five in primary care centers. Decades of malnutrition of women and children had already led to widespread micronutrient, vitamin A, and iodine deficiencies. The food crisis raised fears that the extent and depth of this problem could intensify. The additional financing thus focused on the provision of maternal and child nutritional supplements and the involvement proved effective. Moreover, 1,200 primary care facilities received weighing equipment. To improve the effectiveness of the existing safety net system, the Government has just launched a pilot testing the scoring formula (proxy-means test), and consolidated the two largest social assistance programs into a single one, targeted to the poorest 20% of the population.

*Source: World Bank (2011)*

Table 5: Poverty Impact by Sub-Regional Groupings

<table>
<thead>
<tr>
<th></th>
<th>All ECA</th>
<th>EU-10</th>
<th>Low-income CIS</th>
<th>Middle-income CIS</th>
<th>Western Balkans</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty rate at US$2.5/day (%)</td>
<td>5.6</td>
<td>1.9</td>
<td>32.9</td>
<td>1</td>
<td>8.8</td>
</tr>
<tr>
<td><strong>Food inflation only</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in poverty rate at US$2.5/day (% pts)</td>
<td>1</td>
<td>0.3</td>
<td>7.8</td>
<td>0.4</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Food and energy inflation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in poverty rate at US$2.5/day (% pts)</td>
<td>1.3</td>
<td>0.4</td>
<td>9.4</td>
<td>0.5</td>
<td>0.9</td>
</tr>
</tbody>
</table>

*Source: ECA Databank (ECAPOV), World Bank; WB Simulations*

EU-10 countries are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia

Low income CIS countries are: Kyrgyz Republic and Tajikistan

Middle income countries are: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kosovo, Moldova, Russia, Turkmenistan, Ukraine, Uzbekistan

Western Balkans countries are: Albania, Bosnia-Herzegovina, Croatia, FYR Macedonia, Montenegro, Serbia, Kosovo

30. Higher food and energy prices may also lead to substantial increases in the number of poor people unless countervailing actions are taken, though the poverty rate increase would be small in large middle-income countries such as Ukraine, Turkey and Russia. Food and energy price increases in these countries exceeded 10%, but were still substantially lower than those in the Southern Caucasus and Central Asian countries. Because poverty rates are much lower in these countries, the proportion of the population vulnerable to falling into poverty or extreme poverty from a price shock is much smaller, ranging from 0.2 to 1.6 percentage points. Despite the small impact in proportional terms, these populous countries would contribute large numbers of the “new poor.” It is estimated that the number of extreme poor could increase by 1.2 million in Turkey, 600,000 in Russia, and 100,000 in Ukraine. However, these effects would be muted as wages and employment grow. For example, for Russia, there are indications that growth in wages and pensions have mitigated the potential poverty impact of high prices.

40 All the poverty references are for poverty measured at people living below the US$2.5 a day level.
31. The poverty impacts in the EU New Member States and Western Balkans are expected to be modest in comparison to the effects on their neighbors. In general, food price inflation has been much lower in these countries: less than 5% in about half of the countries, and surpassing 10% only in Estonia (11.6%) and Serbia (10.7%). Compared to other ECA countries, the EU-10, and to some extent the Western Balkans, tend to have lower food budget shares, lower initial poverty rates, and lower shares of the population that are only slightly above the poverty line. Among these countries the most negative impacts are expected to have occurred in Estonia, where higher food and energy prices could increase extreme poverty by 1.5 percentage points, and Romania, where the corresponding estimate is 0.9 percentage points.

32. In the aggregate for the ECA region, the amount required to compensate poor households for the losses associated with energy and food price shocks is marginal, but there are large differences across countries. The compensation needed to offset the negative shocks on the poor is a function of the effectiveness of the social assistance programs and the proportion of the increase in the aggregate poverty gap. It is estimated that approximately 0.1% of the ECA region’s overall GDP would be needed to compensate the poor based on the magnitude of the price shocks and effectiveness of the existing programs. In most of the countries, the effect of the price shocks on the extreme and moderate poor could be offset by modest transfers and could be distributed by the current social safety net programs. The ECA average monetary loss masks significant regional and country level differences. In addition the US$2.5 poverty line implies different levels of poverty in different ECA countries. For example, in low income countries, a much larger share of the population will be defined as “poor” using

### Table 6: Simulation Results for Poverty Increases Resulting from Higher Food and Energy Price Inflation (US$2.5/Day)

<table>
<thead>
<tr>
<th>Country</th>
<th>Food and Energy Price Increases</th>
<th>Food Price Increases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increase</td>
<td>Increase</td>
</tr>
<tr>
<td></td>
<td>Headcount Ratio (% points)</td>
<td>Number of poor in 1,000s</td>
</tr>
<tr>
<td>Albania</td>
<td>1.8</td>
<td>57</td>
</tr>
<tr>
<td>Armenia</td>
<td>9.4</td>
<td>290</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>1.56</td>
<td>137</td>
</tr>
<tr>
<td>Belarus</td>
<td>0.12</td>
<td>11</td>
</tr>
<tr>
<td>Bosnia Herzegovina</td>
<td>0.06</td>
<td>2</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0.57</td>
<td>43</td>
</tr>
<tr>
<td>Croatia</td>
<td>0.07</td>
<td>3</td>
</tr>
<tr>
<td>Estonia</td>
<td>1.46</td>
<td>20</td>
</tr>
<tr>
<td>FYR Macedonia</td>
<td>0.31</td>
<td>6</td>
</tr>
<tr>
<td>Georgia</td>
<td>9.11</td>
<td>388</td>
</tr>
<tr>
<td>Hungary</td>
<td>0.21</td>
<td>21</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>1.47</td>
<td>233</td>
</tr>
<tr>
<td>Kosovo</td>
<td>2.09</td>
<td>38</td>
</tr>
<tr>
<td>Kyrgyz Republic</td>
<td>11.37</td>
<td>605</td>
</tr>
<tr>
<td>Latvia</td>
<td>0.39</td>
<td>9</td>
</tr>
<tr>
<td>Lithuania</td>
<td>0.28</td>
<td>9</td>
</tr>
<tr>
<td>Moldova</td>
<td>4.85</td>
<td>175</td>
</tr>
<tr>
<td>Montenegro</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Poland</td>
<td>0.14</td>
<td>54</td>
</tr>
<tr>
<td>Romania</td>
<td>0.92</td>
<td>198</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>0.42</td>
<td>603</td>
</tr>
<tr>
<td>Serbia</td>
<td>0.75</td>
<td>55</td>
</tr>
<tr>
<td>Slovenia</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>8.43</td>
<td>586</td>
</tr>
<tr>
<td>Turkey</td>
<td>1.6</td>
<td>1,193</td>
</tr>
<tr>
<td>Ukraine</td>
<td>0.24</td>
<td>111</td>
</tr>
</tbody>
</table>

Source: ECA Databank (ECAPOV), World Bank

Note: Simulations reflect the increase in poverty rates from food and fuel price inflation at the rates experienced in 2010.
this measure as opposed to higher income countries. In the low and lower middle income countries where poverty is expected to increase the most (Armenia, Georgia, the Kyrgyz Republic, Moldova, and Tajikistan), the additional fiscal cost of compensating the poorest 20% of households for the food and fuel price increases would be up to 1% of their GDP.

33. In ECA countries, the capacities of social assistance programs to help buffer the price shocks vary widely. Safety nets can be leveraged as important crisis response mechanisms. However, the ability of countries to respond with speed depends critically on the capacity of core social assistance systems before a crisis hits. Three aspects of social assistance systems that determine their ability to protect the poor are coverage, targeting and generosity. Coverage in this case refers to the portion of the poorest quintile receiving transfers. Generosity refers to how much the transfer represents of post transfer consumption. Targeting refers to the portion of fiscal expenditures reaching the poorest. These are shown in Figures 8.1-8.3. Fortunately, most countries in ECA have at least one well targeted safety net program, and many also have additional

Figure 8.1: Coverage of Poverty Targeted Programs Is Very Low in Some ECA Countries

Figure 8.2: Targeting Accuracy of Poverty Targeted Programs in ECA Varies among Countries

Figure 8.3: Generosity of Poverty Targeted Programs in ECA Could Be Strengthened in Some Countries
programs to protect vulnerable groups such as children and the disabled.

34. Among the ECA countries that are expected to be the most affected by higher food prices, Armenia and Georgia are best positioned to provide safety nets for the poor. Both countries have well-established targeted cash transfer programs – the Family Benefits Program (FPB) in Armenia, and the Targeted Social Assistance (TSA) program in Georgia. The Armenia FPB program covers about 40% of individuals in the poorest quintile, while the Georgia TSA program covers about 20% (Figure 8.1). In addition, both programs have good targeting accuracy, transferring more than 55% of total social assistance benefits to the poorest quintile (see Figure 8.2). Finally, both programs also have reasonable generosity. A little more than 50% of the consumption of beneficiaries of Georgia’s TSA program comes from the TSA transfer, while about 30% of the consumption of beneficiaries of Armenia’s FRB program is from the transfer (see Figure 8.3). Both Armenia’s FPB program as well as Georgia’s TSA program responded robustly to the food-fuel-financial crisis of 2008. The Kyrgyz Republic UMB program has reasonable coverage and targeting accuracy, but very low generosity.
4.1. Vulnerability

Countries in ECA are considered most vulnerable to the food and energy price shocks if they could have large increases in poverty rates due to high inflation and if, at the same time, the impact on their macroeconomic accounts is potentially significant. In ECA, current account imbalances preceding the last crisis magnified the region’s vulnerability to external shocks. During the global crisis, current account imbalances improved in ECA countries because consumption (and therefore imports) tended to fall so sharply that they outweighed the decline in exports caused by lower external demand. As the ECA economies have recovered, so has consumption. Current account deficits have remained lower than in the pre-crisis period, but they have been rising in many. The food and energy price increases will have a negative impact on many countries’ external balances; the higher the overall deficit to begin with, the greater the vulnerability to shocks and the greater the additional financing need. In terms of fiscal vulnerabilities, countries with higher deficits are considered more vulnerable from a macroeconomic perspective, particularly countries with higher deficits that also may have high potential increases in poverty rates. The distribution of ECA countries along macroeconomic and poverty dimensions is shown in Figure 9.

42 The Macro Vulnerability Indicator is based on WB staff estimates.

41 Even if the food and energy trade balance is in deficit, the current account may be in surplus (and vice versa). A higher food and fuel deficit may reduce the surplus; however, it is assumed that a country facing a lower overall surplus is much less vulnerable to external shocks (e.g. the risk of capital outflows) than a country with a deficit. In Table A1 in Annex 2, the countries that will face the strongest external financing pressures are listed at the bottom of the column Combined Ordering. To the extent that these countries’ export prices increase along with food and fuel prices, their potential vulnerability is reduced.

In assessing vulnerabilities, it is important to differentiate among three groups of countries: EU member and accession countries, some particularly vulnerable low and lower middle income countries, and the OGE. Countries that are deemed the most vulnerable to the food and energy price increases from an overall macroeconomic and distributional perspective are the low and lower middle income countries: Armenia, Georgia, the Kyrgyz Republic, Moldova, and Tajikistan. They are represented in the shaded upper right hand segment of Figure 9. There are countries that are potential vulnerable on their macroeconomic outcomes but are not expected to have high poverty increases. These are Albania, Bosnia-Herzegovina, Kosovo and Montenegro. If food and fuel prices continue to increase substantially, they could face deteriorating external balances. EU countries are the least vulnerable. Their macroeconomic position reflects mostly many of the EU
member and accession countries’ larger fiscal deficits, but the impact of additional price increases is on average small. The OGE countries are the least vulnerable, and are, in fact, outliers.

4.2. Policy Interventions

37. Governments in ECA countries tried to soften the impact of food prices through a range of interventions in response to the 2008 commodity price hikes. These were aimed at protecting domestic consumers of food and energy. These include export quotas (for food exporting countries), domestic (formal and informal) price controls, greater use of state procurement at lower-than-market prices, and topping up existing social assistance and other transfers. In a couple of countries, however, import VAT was reduced to help lower imported grain prices. For energy price increases, the favored response by Governments was primarily to stagger domestic price increases.

38. In response to the current hike in commodity prices, some, but not all governments have adopted new policies (at the time of writing) to manage the effects on their economies. However, the situation is still evolving and countries may adopt policies to protect the poor or contain macroeconomic impacts. A number of countries have adopted plans or strategies to improve productivity and/or efficiency in the agriculture and energy sectors (Section 4 and 5); some of these strategies/plans began in connection with EU accession or in response to fast rising food and energy prices in the pre-crisis period. Box 6 below summarizes some initiatives.

Box 6: Policy Initiatives in Selected ECA Countries

| Armenia | has had an Energy Efficiency Action Plan since 2010 and a new taxation system was introduced to enhance efficiency in 2010. Additional fiscal resources were allocated to pensions and to family benefits to offset gas tariff increases in 2010. |
| Azerbaijan | has had subsidies for fertilizers, fuel, seeds, seedlings, hectares under wheat and rice cultivation during 2007-2010. In Dec 2010 it temporarily suspended the VAT on wheat imports and the exemption is provided until Aug 2011. |
| Belarus | has controls over prices of foodstuffs and regulates agricultural products. In Aug 2010, a government resolution set targets for energy efficiency and diversification. The government envisions reducing energy intensity of GDP by 50% in 2015 relative to the 2005 level and to reduce the share of renewable energy from 20% in 2009 to 32-34% in 2020. The average gas import price increased by 25%; household tariffs did not increase but industrial consumers saw an increase higher than the increase in prices. For heating, subsidies are provided from local budgets amounting to 0.25% of GDP on average p.a. during 2007-2010. 10.7% of households received a food subsidy in 2010. |
| Bulgaria | has an energy efficiency strategy in place in 2010. Means tested heating allowances and social assistance for individuals and families exist. |

---

43 World Bank (2008).
Croatia has undertaken several energy efficiency measures. It also has a subsidy on diesel for farmers, and has reduced the excise tax on derivatives.

Georgia. The Tbilisi municipality has opened groceries giving a 20% discount on basic products for the vulnerable. Subsidies were estimated at 11.1 million for 2011; this is a one time transfer of US$11 per person to cover the energy bill.

Kazakhstan imposed a ban on exports of selected food items on Oct 2010, excepting exports to Belarus and Russia; a new law gives government the power to set price caps on socially important food items for a period of up to 90 days. They have adopted some reforms to enhance energy efficiency in public institutions.

The Kyrgyz Republic has compensation payments to the poor for high food prices and is planning other interventions.

Latvia has adopted some energy efficiency initiatives related to EU accession; it has a subsidy on diesel used by farmers and other agricultural subsidies, a subsidy for biofuel and food subsidies in place.

FYR Macedonia reduced the import tariff on sugar from 30% to 5%; it has a GEF project restructured to focus on energy efficiency; agriculture subsidies were increased from 0.3% of GDP in 2006 to 1.5% in 2010.

Moldova has banned wheat exports until the next harvest; compensation for energy expenditures were 0.5% of GDP and recently another .35% of GDP subsidy has been added for a total of 0.85% of GDP.

Poland has ongoing energy efficiency initiatives for EU compliance; an energy subsidy for vulnerable consumers has been launched and allocations to the government program “support for a meal” were increased in 2010.

Romania means tested subsidies for residential consumers for heating remain as well as producer subsidies for heating but it has cut a small surcharge on gasoline. There are ongoing EU related energy efficiency initiatives.

Russia has imposed an export ban on wheat and other grains from Aug. 15th to end-June 2011; the existing Trade Law was amended to allow government to set price caps on socially important food products for a maximum period of 90 days; gasoline taxes have been raised, transport taxes lowered; the government is selling from its stockpile in drought affected areas; it has adopted some energy efficiency initiatives; and household energy tariffs slowly being raised to cover costs.

Tajikistan. An export restriction of locally produced wheat to neighboring countries was introduced by one region; there are energy efficiency initiatives in place and it aims to cover costs for gas by 2011; one region has been exempted from VAT payment on a delivery of coal; energy tariff increases are planned.

Turkmenistan prohibited fertilizer exports; the state has established monthly quantities of water, salt, gas and electricity to be delivered free of charge to poor households until 2030.

Turkey temporarily eased the beef import duty; a law on food distribution is to be enacted in March 2011 which aims to reduce volatility and improve distribution; the consumption tax on oil products was raised in Jan 2010; efforts to enhance energy efficiency are underway.

Ukraine has adopted quotas on grain exports through March 2011; the list of socially important food whose prices are controlled was extended to include buckwheat; the excise on gasoline was increased and the transportation duty reduced; began increasing tariffs for gas, electricity and heat, introduced fines for nonpayment; households received an additional 0.5% of GDP for gas costs.

Uzbekistan does not allow grain/flour/rice exports since 1994, though occasionally the government may decide to export some grain and flour; export of locally produced cooking oil is suspended; government is keeping prices low by selling more flour from state resources; for 2011, the government adopted a program of farmland reservation for grain, vegetables, fruits, and forage for cattle breeding to ensure self-sufficiency in food; heating tariffs continue to be increased; there is a 2011-15, program aimed at power sector modernization.
39. **Agricultural prices in ECA are spiking upwards for the second time in three years; not only are prices rising but the variance of price levels for grains, sugar and rice has increased substantially.** At the beginning of 2011, food prices were back to the 2008 peak levels. In terms of individual commodities, the world wheat price is still below its 2008 peak and the maize price has surpassed it. As in 2008, the 2011 the price peak for food is related to the evolution of energy prices. Energy and fossil fuel fertilizers are an important input in agriculture; also biofuel production is increasing pressures on international food markets. In 2011 price increases are more widespread across a large number of commodities than they were in 2008 and are not driven only by cereals. In January 2011, short term food price volatility reached the highest levels since the 1970s. Increasing volatility and market anxiety is due to weather related shocks which hamper the supply side of the market and to energy price volatility. In addition, reported natural disasters are increasing globally and the impact of climate change on agriculture has started to emerge.

40. **Lower agricultural production in some ECA countries contributed to the 2010 global price increases.** In 2010, planting intentions were slow to materialize in many Central and Eastern European countries because of the weather. Heavy October rains in Bulgaria, Hungary and Poland delayed sowing. In Belarus, Moldova, Russia and Ukraine, aggregate cereal production was about 25% lower than in the previous year and the lowest level since 2005. The sharpest decline was in Russia where the cereal crop fell by 1/3rd compared to the level of the previous year. Flood and hail damage affected output in Moldova and Ukraine and Russia suffered from drought and hot weather.

41. **High agricultural prices do not always boost agricultural incomes for several reasons.** In the previous price hike, high commodity prices did not always substantially raise agricultural incomes and the 2011 response may be similar. While countries in ECA differ in terms of agricultural structure and policies a number of factors might hinder farmers from gaining when agricultural prices rise. These include:

- **Imperfect price transmission:** High international grain prices often transmit only to a limited extent to the farm gate because (i) many farmers, particularly smaller ones, do not have storage facilities and thus need to sell their produce right at harvest time when prices are the lowest, and/or (ii) policy measures such as export bans may keep domestic prices low.

- **Increases in prices for farm inputs:** Dramatic increases in the prices for tradable inputs such as energy, fertilizer, and pesticides increased the variable cost of agricultural production by an estimated 20%. Farmers may not be able to pay for the more costly fertilizer.

- **Increases in land use prices:** In many ECA countries, land rent prices are determined in grain price equivalents and thus increase alongside with grain wholesale prices, irrespective of whether these lead to increases in farm-gate prices. Even when land prices are not explicitly determined in grain prices equivalents, grain prices have an impact on prices paid for the lease/purchase of agricultural land.

- **Increases in costs of feeding livestock:** Increased grain prices mean higher cost of feed for livestock and dairy farmers.

---

44 FAO (2010).
45 The EU’s aggregate cereal output in 2010 is estimated to have been 6% lower than that of the previous year.
46 For example, small farmers may not have access to credit to finance more expensive fertilizers even if their marginal product is positive.
47 Moreover, in many countries, there is a very unequal distribution of farm size; in Romania for example, less than 10% of the farms cultivate more than 90% of the land.
48 The Bank’s ECA Agriculture and Rural Development group has entered into a research partnership with the Leibnitz Institute for Agricultural Development, Germany, to assess agricultural price shock transmission among selected ECA countries, among them those constituting main grain producers and those most vulnerable to food price shocks.
42. Despite these weaknesses that constrain short term price responsiveness in ECA, a large untapped potential exists to respond to price increases over the medium term. ECA could enhance its status as a supplier of global scale and enhance its role as a buffer to commodity price shocks. It has land areas that can be brought into agricultural production (with relatively good infrastructure) and huge yield gaps compared to its peers in higher income countries. The lower bound of arable land expansion potential in Belarus, Kazakhstan and Ukraine, without encroaching on the forests and protected areas, is estimated at 10-15 million hectares. While most land areas would not require irrigation as ECA enjoys a temperate climate without serious environmental constraints, there will be some areas that would need investment in irrigation and development of on-farm and post-harvest logistics.

43. Even on current areas of cultivated land, ECA may significantly increase its grain production. Simply by an intensification of production, ECA (through optimized technologies, e.g., use of fertilizers, modern seeds, agronomic skills) could more than double its output and make it less volatile. For example, fertilizer use in ECA is much below that in Western Europe (Figure 11), and farm practices are much less sophisticated. These factors translate into highly volatile production and exports from the northern Black Sea Region. This region has recently increased its export positions for some agricultural commodities, especially grains, compared to the traditional producers such as Australia, Canada, the EU and the USA. Kazakhstan, Russia, and Ukraine have emerged as three of the top nine exporters of wheat, currently accounting for about 25% of global exports of wheat and wheat flour, and Ukraine has become the world’s largest exporter of sunflower oil. Figure 12 below shows wheat production potential using additional land in the three main exporters. Meeting ECA countries’ export potential in agriculture means a substantial increase in world food supply. Policies that enhance efficiency and improve distribution would support these objectives.

44. Though stakeholders demand bold immediate responses to the currently emerging food price spike, in agriculture itself, there is a very limited set of short

---

49 EBRD, and FAO (2008), Deininger and Byerlee (2011).
term remedies. This is partly because of the long production cycles in agriculture – ECA countries typically produce one annual grain harvest. The time needed for a meaningful supply response to price increases is also a function of when the price increase occurs. Grain is usually planted in fall with a harvest taking place the following summer with a limited window available for optimal fertilizer application. Livestock production activities typically require prior investments in production technology and/or livestock. In larger scale, export oriented crop production, the two short term interventions with the greatest impact would be the use (or provision) of high quality seed and of chemical fertilizers to farmers but the application of both is only possible at particular times, logistically difficult, and must be considered against a set of appropriate social and environmental safeguards. In smaller scale crop production, where short-term interventions mainly aim at strengthening the role of local agriculture as a buffer against price shocks, targeted provision of seed and fertilizer assistance has proven to be an effective short term measure as in the Kyrgyz Republic and Tajikistan (see Box 7).

45. In response to rising world food prices, many countries have adopted policies which have hindered them from realizing their potential in the past. Policies reducing domestic product prices through trade restrictions (e.g. export restrictions in Kazakhstan, Russia and Ukraine), input availability (e.g. Uzbekistan’s fertilizer export provisions that reduced fertilizer availability in Tajikistan) and reduction in access to high-quality modern seeds (as in Moldova or Tajikistan) due to overly stringent phyto-sanitary requirements act as disincentives to a positive supply response. Investments in productivity-enhancing public goods are needed too, but when policies discourage private investments, the returns of public investments are diminished. Access to services and markets differ among countries and between small and large farms within countries. Moreover, growing demand for food must be met against a backdrop of rising global temperatures and changing patterns of precipitation. ECA is developing strategies and policies for climate change mitigation that would have a very significant effect on the food system – ECA countries recognize that the challenge of feeding a larger global population must be met while delivering a steep reduction in greenhouse gas emissions.

47. Commitment to a framework for reform over the a medium-term in ECA would contribute to achieving both (a) a significantly enhanced contribution of ECA to global commodity markets and (b) an improved resilience to price shocks in ECA’s local/regional food systems. Such a framework would need to be centered around:

Box 7: Community Seed Funds in the Kyrgyz Republic

Limited access to quality seeds and fertilizer remains a well recognized constraint to food security in the Kyrgyz Republic. Under the GFRP additional financing for the Agriculture Investments and Services Project (US$4.0 million) was provided to further develop the Community Seed Fund (CSF) program. This has proven to be a sustainable institutional arrangement to ensure community-driven access to quality seeds for farmers. New CSFs are supported throughout the country under a WB-financed project and in cooperation with a number of other donors and local NGOs. A National Federation of Community Seed Funds was formed and is responsible for continued monitoring, operational support, liaison with donors, and promotion of the interests of the CSFs at the national level.

Although the CSFs primary objective is poverty alleviation, they also demonstrate the value of good seed and inputs and provide a sustainable, self-help approach whereby farmers, who, even if they do not have access to cash, can still obtain seed and fertilizer. CSFs receive improved seeds for wheat, maize, oilseeds, vegetables and fodder crops such as lucerne, sainfoin, barley and oats. Each year the equivalent of 120% of the seed and fertilizer value received must be returned to the CSF for subsequent distribution to new members. Of the CSFs already established, about 80% have maintained or increased the value of their funds, and most have now replenished the initial seed provided with new seed and/or have swapped seed for other species or inputs. A number of CSFs have also established substantial savings funds for other activities, and some of the more successful are now registering as formal cooperatives. Over a period of two years, the total number of beneficiaries and the acreage covered has more than doubled and the 12,000 beneficiary families would represent an aggregate grain production of about 80,000 tons.
• Improving policies and governance of agro-food systems to encourage investment. This means (a) eliminating government intervention in markets that preclude market adjustments to changed conditions (Ukraine export quotas), providing better public services; (b) institutional development and regulatory reforms (e.g., land markets, risk management, finance); (c) linking smaller farmers to markets through infrastructure provision or support of infrastructure provision; (d) improving environmental sustainability.

• Investing in knowledge, science, and technology to enhance productivity and reduce yield volatility and to allow sustainable production increases. Agriculture is an increasingly knowledge intensive field. Agricultural information and knowledge systems (see Box 10), including advisory services and adaptive agricultural research, spreading best practice, promoting investment in new long-term adaptive agricultural research (higher yield, adapted and/or weather tolerant production techniques) are necessary to raise the limits of sustainable production, and reduce output volatility.

• Promoting investments in post-harvest logistics and reducing waste. Logistical capacities and efficiency constitute a critical bottleneck for reaching the potential

Box 8: Export Restrictions Damage Food Security in the Long Run

On October 4, 2010, Ukraine imposed grain export quotas that are expected to be in place until the end of March 2011. This measure was motivated by concerns over increasing grain and bread prices and the need to secure food supplies. However, both on food security grounds as well as from an economic perspective, export quotas are not desirable. Export quotas have proven to be of limited effect in controlling domestic prices as producers tend to hold back grain from domestic markets if they understand the measure to be temporary, and farmers reduce production in order to keep future prices high. In addition, processors may not transmit cheaper input prices to consumers, but instead, increase their profit margin. Importing countries tend to match export restrictions by reducing import barriers in order to reduce prices for their consumers. When governments keep producer prices down, producers lack incentives to undertake investments necessary to increase production, thus limiting the supply response that would be needed to reduce the global price level over the longer run and reducing the amount of grain available for domestic consumption and exports in the future. Export restrictions also damage a country’s reputation as an attractive investment location and reliable supplier of global markets, further reducing investments and business opportunities. Therefore, ironically, export restrictions based on food security concerns reduce a country’s food security in the long run and can damage a country’s overall economic development.

Box 9: Reducing Volatility

**Investment in Irrigation and Employment**

The Irrigation Rehabilitation Emergency Project in Armenia, effective since October 2009, support investments in irrigation systems to enhance agricultural productivity, reduce production volatility, and stimulate short term employment. The project has been designed to improve water use efficiency by rehabilitating 83 km of irrigation canals to reduce water losses while fostering immediate rural employment. Since October 2009, 50 km of canals have already been rehabilitated and water losses have been reduced by 12%; a further reduction to 20% is expected by the end of the project. As a result, the increase in the irrigated area is expected to be about 7,000 ha by June 2011.

**Cell-phone Based Weather Forecasting**

Turkey’s Kastamonu Province initiated an agricultural early warning service in spring 2008 to help farmers cope with changing climate affecting the productivity of apple orchards. In recent years, fruit trees seemed to bud earlier in spring while occasional frost lingered later. As a result frost risk was rising and overall apple production had been in decline. Protecting an orchard from overnight frost is a laborious task. An accurately-targeted intervention can save crops that would otherwise be destroyed. The provincial directorate of agriculture designed an information system that provides farmers with accurate overnight warnings of (continued on page 34)
level of production and exports in many ECA countries. Grain storage and transport logistics (e.g. availability of rail cars) constitute a main hurdle in both Russia and Ukraine’s efforts to ship larger amounts to international ports. In ECA, waste reduction measures are needed to reduce pressure on resources needed for food production, and to lower greenhouse gas emissions.

- **Investing in irrigation and land administration.** Improving the functioning of land markets and tenure security through Land Administration Systems will promote investment by facilitating access to credit. Reflecting past collectivization and restitution processes, ECA farmers still have considerable difficulties in securing sufficient investment and operational capital. In South East Europe and Central Asia there is an increasing need to adjust production techniques and systems to meet water resource management challenges. Many irrigation systems have deteriorated due to inadequate operation and maintenance.

**Box 9 (continued from page 33)**

frost risk through SMS texts. These warnings draw on the national weather forecast, a history of local data that enables “tuning” of regional forecasts to local conditions, and local measuring stations that set off cell phone alarms if temperatures drop into the danger zone. With these three layers of information, frost risks have been accurately targeted, false alarms avoided, and farmers in the program have not lost crops since the program began.

Following this example, a World Bank team sought to undertake a simpler program in the Kyrgyz Republic. Normally, Kyrgyz Republic farmers must manage on one-day forecasts delivered on television. In this pilot, farmers regularly received forecasts 3 days ahead by cell phone. Jalal-Abad experienced a rainy and cold spring, and many farmers had difficulty identifying when to plant, or did not succeed in planting at all. But all farmers who were recipients of SMS weather messages under the WB pilot succeeded in planting their crops. Farmers not originally included in the pilot have asked to join.
ECA countries have been facing rising oil and gas prices since global economic conditions have improved. In February 2011, international oil prices surged past US$100 per barrel for the first time since 2008 though they are still below the July 2008 peak. By January 2009, they declined to one third of their peak level. Since then, global oil prices have been increasing steadily at an average monthly rate of 1.7% over the past twelve months, to above US$100 in early February 2011. Prices for natural gas have registered a similar evolution. The average EU pipeline import price tripled between 2002 and 2008 to above US$400 per thousand cubic meters (mcm). This in turn stimulated a significant increase of gas prices in intra-CIS trade. Until 2005, countries in the CIS had been able to secure imported gas at below market prices. The subsequent decline in gas prices in early 2009 eased CIS prices. However, as European gas prices adjust to the benchmark of oil and oil product prices over the next few months, ECA countries are likely to face increasing pressures for further adjustments of import prices to international gas market levels. To the extent that their prices move together, all countries are affected by oil price increases. Some countries, such as Moldova, import much more gas than oil, while others, such as the Kyrgyz Republic and Bulgaria import more oil than gas. Historically, these two prices have tended to move together though sometimes with a lag or lead.

In ECA, high energy intensity underscores the countries’ vulnerability to increases in energy prices. The high energy intensity in ECA countries implies that rising energy prices will affect production more in ECA than other regions. ECA countries’ level of energy intensity, though it has declined substantially over time is on average five times that of the countries in Western Europe. Today the low and middle income country average energy intensity in ECA is greater than in other regions and double the high-income OECD average. Turkmenistan, Ukraine, and Uzbekistan have high energy intensities—more than 450 Kg of oil equivalent (koe) to produce US$1,000 of GDP (constant 2005 PPP). The energy intensity in net energy importers such as Belarus, the Kyrgyz Republic, Moldova, Tajikistan, and Ukraine was higher than 250 Koe/US$1,000 GDP or more in 2007, far above the 144 Koe/US$1000 GDP of most countries in Central Europe and higher than the all ECA average. The Balkan countries and the CIS show the lowest energy intensity, and also are the ones that have reduced energy intensity the least in the last two decades (Table 7). The OGE exporters have high energy intensities, such as Russia at 340 koe/US$1,000 GDP and Kazakhstan at 418 koe/US$1,000 GDP in 2007, the last year for which comparable data are available.

### Table 7: Energy Use (kg of oil equivalent) per US$1,000 GDP

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LLMC</td>
<td>742.6</td>
<td>789.7</td>
<td>539.8</td>
<td>492.2</td>
<td>459.8</td>
</tr>
<tr>
<td>UMIC</td>
<td>403.6</td>
<td>277.7</td>
<td>254.6</td>
<td>254.7</td>
<td>240.6</td>
</tr>
<tr>
<td>Balkans</td>
<td>159.2</td>
<td>158.7</td>
<td>147.4</td>
<td>164</td>
<td>158</td>
</tr>
<tr>
<td>Caucasus</td>
<td>651.6</td>
<td>424.1</td>
<td>282.9</td>
<td>231.6</td>
<td>182.7</td>
</tr>
<tr>
<td>CIS</td>
<td>159.2</td>
<td>158.7</td>
<td>147.4</td>
<td>164</td>
<td>158</td>
</tr>
<tr>
<td>EU10+2</td>
<td>651.6</td>
<td>424.1</td>
<td>282.9</td>
<td>231.6</td>
<td>182.7</td>
</tr>
<tr>
<td>EU</td>
<td>163.1</td>
<td>140.5</td>
<td>134.7</td>
<td>130.3</td>
<td>125.0</td>
</tr>
<tr>
<td>All ECA</td>
<td>434.6</td>
<td>298.7</td>
<td>264.1</td>
<td>261.3</td>
<td>247.4</td>
</tr>
</tbody>
</table>

Source: World Development Indicators, World Bank

Note: The numbers are for GDP measured at 2005 PPP prices in USD. Averages are weighted by GDP. EU10+2 includes Croatia and Turkey.

Energy policies in many ECA countries are not sustainable in view of the rising costs of energy and the need for efficiency enhancing investments. Increasing gas prices will have an impact on electricity costs across
the region. The long run marginal cost of generation will rise from roughly 7.5 to 8.5 cents/kWh, excluding costs associated with transmission and distribution (these are shown by the red and dotted green lines respectively). This estimate is based on the construction of a new gas fired combined cycle power plant assuming a gas price increase from US$250 to the forecasted US$350 per thousand cubic meters in 2011. Although most of the countries in Eastern Europe were covering their long run marginal cost of generation in 2010 (see Figure 13), if the long-run marginal cost of generation were to increase, many of the countries would need to increase electricity tariffs to adequately cover long run marginal costs.

50. **Increasing electricity cost would threaten the financial viability of the power sector, unless consumer prices are adjusted accordingly.** During the 2008 price hike and the onset of the economic crisis some governments postponed tariff increases in order to protect customers. In Ukraine, for example, the Government capped tariffs for all customers and moved certain industrial customers into the subsidized tariff category. The situation was made worse by currency depreciation in energy importing countries. Because of falling revenues and rising costs, the profitability of power sector companies in countries such as Armenia, Romania and Ukraine declined significantly. Per capita residential electricity and heat consumption vary substantially across ECA countries, partly reflecting their pricing policies. In some countries, there is also substantial cross subsidization of household energy consumption (Figure 14). If energy companies are not allowed to recoup the high cost of energy, quasi-fiscal liabilities may accumulate. In some countries, this has already been an issue.

51. **In view of the expected increase in energy prices, some policy reforms are imperative in ECA countries and many have begun the process of reform.** Key among the reform areas are:

![Figure 13: An Increase in the Long Run Marginal Cost of Electricity Generation Will Require Price Adjustments for Many Countries](image1)

![Figure 14: Some ECA Countries Subsidize Households and Others Tax Them](image2)
• **Improving Energy Efficiency.** Investing in energy efficiency will reduce import dependence in ECA, lower vulnerability to energy price increases and lower greenhouse gas emissions. Investment in energy efficiency could be higher in ECA if energy prices were not kept artificially low and there was payment discipline, there was more competition among contractors and service companies and fewer financing constraints.

• **Industry Responses – Meeting Investment Needs.** The revenue projections (both fiscal and corporate) suggest that the oil and gas producing countries should have the financial capacity to meet future investment needs in their energy sectors. However, effective management of these resources must be a priority if these countries are to sustain their current levels of production. For instance, developments to support a steady increase oil and gas production in the region are estimated to require capital investment averaging more than US$56 billion per year over the next twenty years. Although capital investments increased before the economic crisis, they are still well below the required levels. This highlights the large financial challenges for the sector in the short to medium term.

• **Investing in Renewable Energy.** ECA countries, particularly the EU accession countries, have begun investing in renewable energy. In view of rising prices for fossil fuels, volatility in the price of energy and the imperative to reduce greenhouse gas emissions, ECA countries would benefit from exploring alternative energy sources.
Bank support to clients cover several key areas such as fiscal reform, social assistance reform, agriculture and energy sector reform.

A-1.1 World Bank Support for Fiscal Reform

The Bank is supporting ECA clients through analytical work, policy advice and lending to rationalize their fiscal systems. This involves both policy and institutional reforms. Key analytical work on public expenditures and functional organization of government is aimed at identifying sustainable efficiency gains, strategic allocation of public resources to support growth and enhancing efforts to protect the poor. Through a combination of Technical Assistance, Development Policy Loans, Knowledge Products and Policy Dialogue, the Bank is working with clients towards (a) more sustainable fiscal planning through appropriate instruments, including fiscal rules and multi-annual fiscal frameworks, (b) making policy and structural changes that will help contain overall budgets and debt and (c) policy changes that rationalize expenditure allocations and taxation patterns and (d) tax administration. The Bank has been supporting clients to put in place systems to better track expenditures (e.g. Treasury systems, public employment registers) and achieve sustainable savings (e.g. through optimization of work processes and procurement reforms). The Bank is also advising clients to organize their budgets on a programmatic basis and to link programs to policy objectives and measurable results. On the revenue side, the Bank is assisting clients in moving towards more efficient revenue administration systems (e.g. risk-based audits, e-filing), which increase revenue collection, while cutting administrative costs for the public sector and reducing compliance costs for taxpayers. At the same time, the Bank, together with other partners, has been working with clients to rationalize tax policies and the system of transfers and subsidies.

a) Bank assistance for fiscal reform has included:

- Public expenditure reviews and Development Policy Operations (DPOs) with a focus on rationalization of public spending, sustainability of public finances, efficiency gains in public administration, and structural reforms to ensure fiscal sustainability in Bosnia-Herzegovina, Croatia, Latvia, Russia, Romania, Serbia, Poland and Turkey. In Belarus, an ongoing public expenditure review supports the Government in identifying efficiency gains in selected areas of the budget, and providing options for expenditure and revenue policies that are better aligned to the envisaged structural reform agenda of the country.
- An ongoing functional review in Romania which analyzes 12 key sectors of government, among these, the Cabinet and General Secretariat of the Government, public finance management, transport, education, agriculture and competition policy have been completed.
- Technical assistance for efficiency gains in work process optimization in Armenia; program-based budgeting and performance-oriented budgeting in Albania and the Russian Federation; advisory support to the Russian Government in monitoring the effectiveness of public expenditure through performance indicators for programs and sub-national governments.
- Investment lending/grants for Treasury modernization in Albania, Russia and Ukraine.
- Technical assistance and investment lending for revenue administration modernization in Croatia, the Czech Republic, Kazakhstan, Russia, and Ukraine.

A-1.2 World Bank Supported Reforms in Social Protection

World Bank support to governments has focused on improving social assistance systems and support for employment generation.

a) Social assistance reform has included:

- Supporting Albania through various lending instruments followed by a Program for Results. The reforms include improving benefits administration, improving targeting accuracy and increasing coverage among the extreme poor for the last resort social assistance program (LRSA).
In Croatia, Bank support for the government’s actions to improve the targeting of non-contributory social welfare programs.

In Latvia WB support for the expansion of the LRSA program by increasing eligibility thresholds (leading to increased coverage and generosity).

In FYR Macedonia WB help focusing on improving benefits administration through the development of an integrated database for all cash benefits with the ultimate goal of consolidation of fragmented programs. The WB also supports the introduction of a conditional cash transfer program.

In Moldova, through technical assistance, Bank support for improved benefits administration and the expansion of the LRSA program, and enhanced implementation capacity among other things.

Together with the other donors, supporting ongoing reforms that the government of Tajikistan is undertaking to improve the social assistance system.

**b) Support for employment generation overall has included:**

- Lending to Armenia during the crisis. The Government protected or increased spending on the priority social programs such as pensions, last-resort social assistance, unemployment benefits, and public works programs.

- Lending to Bosnia-Herzegovina to introduce means-testing for all types of non-contributory social assistance. Planned support includes support to improve the targeting accuracy of the LRSA, family and child benefits, and disability assistance.

- In Latvia, WB support to the Workplaces with Stipends program.

**A-1.3 World Bank Support to Agriculture**

ECA’s lending program in the agriculture sector has covered three main areas, enhancing agricultural productivity, linking farmers to markets and value chain development, and reducing vulnerability.

**a) Enhancing agricultural productivity:**

- Supporting access to inputs in the Kyrgyz Republic through the GFRP – Agricultural Investments and Services Project. Similarly Tajikistan also received funding through GFRP in 2008 and the Russia Trust Fund in 2010 to provide agricultural production inputs and critical livestock-related inputs to the poorest farmers and female-headed households.

- Support to the Kyrgyz Republic for agricultural investments and services aiming to improve the institutional and infrastructure environment for more productive, profitable and sustainable livestock and crop production and reducing the economic impact of the zoonotic disease burden in the human population.

- Project Support to Armenia to improve productivity and sustainability of pasture/livestock livelihood systems in selected communities.

- Technical assistance for improved water management: In Romania, to achieve more economic use of irrigation resources through changes in farmers’ and the Land Reclamation Agency’s behavior and increase agricultural productivity in project area.

- Support to Serbia in implementing an irrigation project to address a range of interconnected sector issues by financing rehabilitation of flood control, irrigation and drainage infrastructure, providing support in raising the technical capacity of weather-forecasting, and supporting preparation of water-related legislation.

- In Kazakhstan an irrigation project aims to improve water resources management in the Kazakh part of the Syr Darya Basin by increasing the timely irrigation water supply to agricultural areas, increasing fisheries production, and enhancing human safety and environment. The WB also provides support to Albania and Bosnia-Herzegovina to promote institutional development for sustainable water management and rehabilitation and modernization of irrigation and drainage systems.

- Supporting better land administration in Romania to complete the property title registration of land assets in rural areas and to improve the security of land rights and reduce transaction costs on rural land markets.

- Support to Russia to improve its land administration as well as Armenia and Tajikistan for sustainable land management.

**b) Linking farmers to markets and value chain development:**

- Project support to Azerbaijan, Uzbekistan and Kazakhstan aims to improve access to finance to farmers.
In Tajikistan a project provides a credit line to ginner for purchasing seed cotton.

Support to government of Romania to modernize its agricultural knowledge and information systems to comply with the agricultural acquis communautaire and to help the agro-food sector take advantage of the benefits and opportunities arising from EU membership. Uzbekistan’s rural enterprise support project aims at increasing the productivity and financial and environmental sustainability of agriculture and the profitability of agribusiness. The WB also provides support to Kyrgyz Republic and Moldova for promoting agribusiness development.

c) Reducing vulnerability:

Under the GFRP, Moldova provided cash transfers to social institutions to meet their additional food budget needs and distributed food packages to pregnant women and children under 2. The Kyrgyz Republic agricultural productivity project, in addition to improving access to finance, supports strengthening hydrometeorology and sending weather forecasts to farmers.

d) Other World Bank Assistance including knowledge products in agriculture

Several knowledge products provide client support:

Impact of climate change on agriculture (South East Europe, Caucasus) and water resources (South East Europe, Azerbaijan); Agriculture Sector Reviews (e.g., Ukraine, Kyrgyz Republic); Price Shock Transmission and Impact of Food Crisis on Central Asia and Role of Kazakhstan, Russia, and Ukraine.

Technical assistance for Turkey Food Safety; Moldova Food Security; EU CAP programming in several ECCU4/5 countries; Romania Functional Review towards policy and institutional reform; Establishment of Eurasian Center for Food Security in Russia.

A-1-4. World Bank Support to the Energy Sector

The energy sector program focuses on improving existing infrastructure in power generation and transmission and enhancing energy efficiency through both the supply and demand side. Several projects also aim to promote the use of renewable energy, thereby improving the diversification of the energy mix and reducing the dependence on fossil fuels. At the same time, the current program also includes emergency projects supporting Tajikistan and Kyrgyz Republic in meeting their domestic energy demand.

a) WB activities can be summarized as follows:

Supporting supply efficiency through hydro and thermal rehabilitation (Ukraine, Turkey); transmission and distribution upgrading to support loss reduction (Kazakhstan, Turkey; Ukraine, Serbia, Georgia, Tajikistan, Azerbaijan, and Georgia), and district heating infrastructure (Croatia, Moldova, Belarus, Armenia).

Support for climate change mitigation programs using Clean Technology Fund (CTF) concessional resources to promote low-carbon programs and projects (Turkey); Carbon Finance programs (Russia, Uzbekistan); technical assistance to finance wholesale emission reduction projects through the sale of Assigned Amount Units in, the Czech Republic, Latvia, Poland, and Ukraine).

Renewable energy and energy efficiency initiatives are receiving accelerated attention to mitigate greenhouse gas emissions. Wholesale approaches through financial intermediaries and energy efficiency funds are supported in Bulgaria, Croatia, FYR Macedonia, Turkey and Ukraine; Global Environment Facility programs exist in (Armenia, Croatia and Poland) Development Policy Loans support energy efficiency programs (Poland and Turkey) while technical assistance and reviews support the Western Balkans, Poland, and Russia.

Loans to support the establishment of an integrated regional market in the Energy Community of South East Europe (Albania, Bosnia-Herzegovina, FYR Macedonia, Montenegro, Romania, Serbia and Turkey), and to support the Central Asia/South Asia Regional Electricity Market (CASAREM).

Promoting private sector investment through the provision of Partial Risk Guarantees to promote electricity distribution privatization (Romania and Albania), technical assistance to support governments in privatizing infrastructure services, and design private-public partnerships, and guarantees to private investors (Kosovo, Tajikistan, Montenegro).
<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>CAB, % GDP</th>
<th>Food and energy trade balance, % GDP</th>
<th>Combined Ordering</th>
<th>Food trade balance, % GDP</th>
<th>Energy trade balance, % GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Azerbaijan</td>
<td>27.5</td>
<td>1 Azerbaijan</td>
<td>1 Azerbaijan</td>
<td>1 Ukraine</td>
<td>1 Azerbaijan</td>
</tr>
<tr>
<td>2</td>
<td>Georgia</td>
<td>-10.0</td>
<td>23 Armenia</td>
<td>23 Belarus</td>
<td>23 Armenia</td>
<td>23 Belarus</td>
</tr>
<tr>
<td>3</td>
<td>Armenia</td>
<td>-14.3</td>
<td>26 Kosovo</td>
<td>26 Armenia</td>
<td>26 Bosnia-Herzegovina</td>
<td>26 Kosovo</td>
</tr>
<tr>
<td>4</td>
<td>Georgia</td>
<td>-16.0</td>
<td>27 Georgia</td>
<td>27 Georgia</td>
<td>27 Tajikistan</td>
<td>27 Ukraine</td>
</tr>
<tr>
<td>5</td>
<td>Kosovo</td>
<td>-26.2</td>
<td>29 Kyrgyz Republic</td>
<td>29 Montenegro</td>
<td>29 Montenegro</td>
<td>29 Kyrgyz Republic</td>
</tr>
<tr>
<td>6</td>
<td>Georgia</td>
<td>-16.0</td>
<td>27 Georgia</td>
<td>27 Georgia</td>
<td>27 Tajikistan</td>
<td>27 Ukraine</td>
</tr>
<tr>
<td>7</td>
<td>Kosovo</td>
<td>-26.2</td>
<td>29 Kyrgyz Republic</td>
<td>29 Montenegro</td>
<td>29 Montenegro</td>
<td>29 Kyrgyz Republic</td>
</tr>
<tr>
<td>8</td>
<td>Armenia</td>
<td>-14.3</td>
<td>26 Kosovo</td>
<td>26 Armenia</td>
<td>26 Bosnia-Herzegovina</td>
<td>26 Kosovo</td>
</tr>
<tr>
<td>9</td>
<td>Georgia</td>
<td>-16.0</td>
<td>27 Georgia</td>
<td>27 Georgia</td>
<td>27 Tajikistan</td>
<td>27 Ukraine</td>
</tr>
<tr>
<td>10</td>
<td>Kosovo</td>
<td>-26.2</td>
<td>29 Kyrgyz Republic</td>
<td>29 Montenegro</td>
<td>29 Montenegro</td>
<td>29 Kyrgyz Republic</td>
</tr>
<tr>
<td>11</td>
<td>Armenia</td>
<td>-14.3</td>
<td>26 Kosovo</td>
<td>26 Armenia</td>
<td>26 Bosnia-Herzegovina</td>
<td>26 Kosovo</td>
</tr>
<tr>
<td>12</td>
<td>Georgia</td>
<td>-16.0</td>
<td>27 Georgia</td>
<td>27 Georgia</td>
<td>27 Tajikistan</td>
<td>27 Ukraine</td>
</tr>
<tr>
<td>13</td>
<td>Kosovo</td>
<td>-26.2</td>
<td>29 Kyrgyz Republic</td>
<td>29 Montenegro</td>
<td>29 Montenegro</td>
<td>29 Kyrgyz Republic</td>
</tr>
<tr>
<td>14</td>
<td>Armenia</td>
<td>-14.3</td>
<td>26 Kosovo</td>
<td>26 Armenia</td>
<td>26 Bosnia-Herzegovina</td>
<td>26 Kosovo</td>
</tr>
<tr>
<td>15</td>
<td>Georgia</td>
<td>-16.0</td>
<td>27 Georgia</td>
<td>27 Georgia</td>
<td>27 Tajikistan</td>
<td>27 Ukraine</td>
</tr>
<tr>
<td>16</td>
<td>Kosovo</td>
<td>-26.2</td>
<td>29 Kyrgyz Republic</td>
<td>29 Montenegro</td>
<td>29 Montenegro</td>
<td>29 Kyrgyz Republic</td>
</tr>
</tbody>
</table>
Several papers have been written about the impact of changes in the terms of trade on growth. Easterly, Pritchett and Summers (1993) document the key role that terms of trade play in influencing long run growth and Barro and Sala-i-Martin (1995) find that the growth effects of terms of trade are comparable with that of educational attainment, public expenditures on education, and human capital. Broda and Tille (2003) find that improvements in the terms of trade lead to higher growth and conversely. Across countries, it is estimated that about 10% of the variation in GDP growth and 25% of the variation in growth volatility can be explained by observed differences in the volatility of terms of trade changes (Easterly et al, 1993, Hnatkovska and Loayza, 2005). Some papers address the impact of terms of trade changes in different conditions. For example, Loayza and Raddatz (2007) find that the impact of terms of trade shocks depend on other characteristics of the economy. For example, more open countries are more affected by terms of trade changes, particularly negative ones. Financial depth in domestic markets serves to reduce the impact of negative shocks and complements trade and financial openness. In addition, labor market flexibility dampens the effect of negative terms of trade shocks; ease of firm entry magnifies the positive impact of terms of trade shocks. Macroeconomic policies also play a significant role in determining the effects of terms of trade shocks. Broda and Tille (2003) find that the exchange rate regime has a significant impact on how changes in the terms of trade affect output growth. They find that countries with a flexible exchange rate will have much milder contractions in their output in response to a negative terms of trade development, than countries with a fixed exchange rate. For example, in many of the CIS states that benefited from high commodity prices and little spare capacity in 2006-08, monetary policy was constrained in affecting inflation and slowing overheating because of inflexible exchange rate regimes. Mendoza (1995) estimates that terms of trade shocks account for nearly half of GDP variability.

ANNEX 2. TERMS OF TRADE AND GROWTH
Methodology for simulating poverty impacts of food and energy price increases

The impact of the increase in food and energy price shocks on the welfare of the population is simulated using the household loss approach developed by Freund and Wallich (1995), which was originally designed for estimating the impact of energy tariffs on welfare. In this model, the consumption loss for households is a function of (1) the increase in the prices of the commodities in question, (2) the share of household consumption allocated to those commodities, and (3) the substitution effect expressed as an ability to reduce the consumption following the price shocks. The analysis presented here uses household-specific budget shares from the most recent household survey and country-specific food and energy price inflation rates for 2010. For the present analysis it is assumed that poor households are not able to substitute commodities in response to changes in relative prices (see Sulla and Tiongson 2008), and therefore the substitution elasticity is set to zero. A household’s total loss from the increase in food and energy prices is based on the loss in nominal income due to food and energy inflation. The changes in poverty rates and poverty gap indicators are estimated based on the simulated consumption aggregate equal to the initial consumption aggregated of the households’ minus the estimated loss of the consumption due to the price shocks.

The loss in welfare for each household is calculated as follows:

\[ \text{Loss} = Q_0(p - p_0)(1 + e^*(p - p_0)/p_0), \]

where \( \text{Loss} \) is the monetary loss of the households due to increase in the prices, \( Q \) is quantity consumed, \( p \) is price, \( e \) is the price elasticity of demand, the subscripts 0 and 1 refer to the periods before and after the price change, respectively. As quantities of the households’ utilities consumption are not available in the HBS, the loss is calculated using the expenditures on utilities (from the HBS) and the residential tariffs, as follows:

\[ \text{Loss} = EXP_0^*(p - p_0)/(p_0^*(1 + e^*(p - p_0)/2p_0)), \]

where \( \text{EXP} \) is households’ expenditure for the analyzed utility component. We used 3 alternative levels of elasticity (e) for the analysis: 0, -0.4 and -0.285.

The simulations provide a first order estimation of the impact of the food and energy price shocks. Furthermore, because of data limitations, several caveats should be noted. In particular, (1) the model does not take into account any gains in income that may be realized by households that produce and sell food commodities that are increasing in price; (2) substitution effects, such as switching to relatively less expensive commodities, are not considered; (3) second order effects such as nominal wage increases or mitigating policies that often follow price shocks are not included; and (4) the indirect impact of higher energy prices on other goods (which use energy as an intermediate input) are not included. Because of limitations (1) – (3), the simulation model is likely to overestimate the impact of the food price shock, especially in rural areas. In contrast, limitation (4) is likely to understate the welfare impact of energy price increases.

The poverty headcount rates and poverty gap indicators are the main welfare indicators used in this analysis. The headcount index is the %age of the total population living in households below the corresponding international
The poverty gap index takes into account both the incidence and the depth of poverty. Specifically, the poverty gap is the headcount index multiplied times the “consumption gap” between the average total consumption for households classified as living in poverty and the poverty line, as a proportion of the poverty line. Thus the poverty gap is sensitive to both changes in poverty incidence and changes in the average income of those who remain poor.

Data Sources
The microdata for the simulations come from the *ECA Household Survey Data Archive*. The ECA data bank includes standardized nationally representative household budget surveys for 25 countries, covering close to 95% of the ECA population. The standardized consumption aggregates are constructed based on the methodology developed by Deaton and Zaidi (2002), using a uniform set of consumption components that are deflated for spatial price differences within the country (for most countries), and over time using the CPI. Household consumption per capita is converted to international dollar terms using ICP conversion factors and national CPI data. The standard ECA poverty lines of US$2.5 and US$5.00 per day have been used for this analysis (see Alam and Sulla (2008) for the discussion on the method of estimation). For each country, the most recent household budget or LSMS survey has been used, with the majority of the survey data collected in 2008 and 2009.
REFERENCES


Roberts-Schweitzer, Eluned (2009), Leveraging Safety Nets and Nutritional Supplements in Crisis: Initial Responses to the Global Food Price Crisis in Kyrgyz Republic, Moldova, and Tajikistan, World Bank, Washington DC.


Rising Food and Energy Prices

in Europe and Central Asia

Copyright © 2011
Europe and Central Asia Region
The World Bank
1818 H Street, NW
Washington, DC 20433, U.S.A.
All rights reserved
Manufactured in the United States of America
First Printing: April 2011