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UKRAINE

Selected Issues

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Approved by the European Department

December 21, 2006

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I. THE MACROECONOMIC AND FISCAL IMPACTS OF ENERGY PRICE SHOCKS IN UKRAINE

Core Questions, Issues, and Findings

- **What effect will rising natural gas import prices have on economic activity?** The shock will lower output growth and increase inflation through a variety of channels (¶4−10). The effects can be modeled in several ways, and near-term output growth could be lower by about 0.4 percent, and inflation higher by about 0.8 percent, for a 10 percent increase in the import price of gas (¶11−23).

- **How can energy-sector policies help the economy adjust to rising energy prices?** The authorities' energy-savings plans would reduce the impact on output, and appear achievable based on international experience. Ensuring pass-through of prices will be crucial, however. To this end, existing social programs seem adequate to protect the poor, but the energy sector regulator needs greater independence to set prices in line with costs (¶25−30).

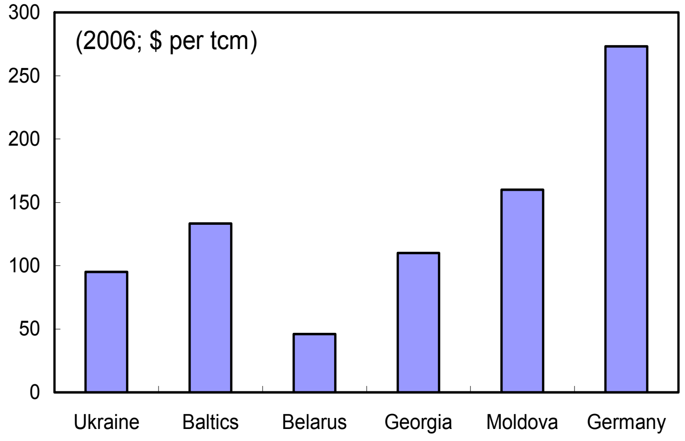
- **How can wage policy help the economy adjust to rising energy prices?** Real wage resistance could lead to a wage-price spiral. Wage restraint could, on the other hand, help lower exchange-rate volatility. The government can help restrain wages via moderate minimum wage increases, and by eliminating backward looking indexation of wages in the public sector (¶31−35).

- **What impact will rising natural gas import prices have on quasi-fiscal deficits in the energy sector?** Pricing below cost recovery, weak enforcement on tariff payment compliance, and other inefficiencies contribute to quasi-fiscal deficits. With partial pass-through of rising gas import prices to consumers and budget services in 2007, the quasi-fiscal deficit for the energy sector as a whole could rise by nearly ½ percent of GDP, to about 3¾ percent of GDP (¶36−45).

- **Is the government's framework for managing state enterprises adequate?** Widespread administrative restraint on prices, and weak commercial orientation have generated a drain on the budget, in the order of 4-5 percent of GDP per year. Further, weak control on external borrowing has created significant contingent liabilities (¶46 to ¶51). Fragmented monitoring and supervision, and auditing and reporting practices that are not comprehensive, should be addressed (¶52−53).

1. **In early 2006, Russia began to increase natural gas import prices for Ukraine toward prices charged in Western Europe.** The agreement reached set Ukraine's gas import price at US$95 per tcm, an increase of 64 percent from the US$59 average that previously prevailed. This is well above the US$48 per tcm price in Belarus, but less than the border prices prevailing in other countries abutting Russia (Figure I.1). An increase of a further US$35 per tcm has already been agreed for 2007. In the medium term, prices are expected to continue to edge toward transit-adjusted European market levels, presently about US$290 per tcm.

Figure I.1. Natural Gas Import Price in Selected Countries



Source: IMF *World Economic Outlook* and country authorities.

2. **The first section of this paper analyses the impact that rising energy import prices might have on growth and inflation in Ukraine using several different methods.** Higher prices for energy essentially amount to a negative productivity shock to the economy, crimping real GDP growth and boosting inflation. The section first sets out theory and then discusses three methods of estimating impacts. The analysis highlights the role that energy efficiency, energy price pass-through, and wage setting can have in mitigating or worsening macroeconomic impacts. The section concludes by discussing international experience in these policy areas, and measures that could be taken to mitigate impacts.

3. **The second section examines how rising gas prices might elevate macro-fiscal risks in Ukraine's state enterprise sector.** Quasi-fiscal deficits (QFDs) and contingent liabilities in the gas, electricity and coal sectors have narrowed over time, led by gradual improvements in administrative and pricing policies (Tchaidze, 2003; and Tiffin, 2005). The second section first examines the potential effect of rising gas import prices on QFDs in different branches of the energy sector, under various assumptions about pass-through of the shock to domestic tariffs. Results suggest that risks could remain sizeable, albeit contained. The section then reviews Ukraine's state enterprise management framework, to shed light on its weaknesses, and examines sources of risk emerging from both energy-enterprises and the state enterprise sector as a whole. The section concludes by outlining some international best practices to help address macro-fiscal risks in state enterprises.

A. The Macroeconomic Effects of Energy Price Shocks in Ukraine[1]

4. **Ukraine is highly vulnerable to gas import price shocks:**

- Similar to other CIS countries, Ukraine is highly inefficient in using energy. For example, energy use per unit of purchasing power parity adjusted (PPP-adjusted) GDP exceeds German figures by a factor of over 3. While Ukraine's efficiency has improved recently at a rate of 4-6 percent per year, at end-2005 it remained at a level similar to that of Poland in the early 1990s (Table I.1).

- Gas is a relatively more important energy source in Ukraine, and imports are the major source of gas supply. Almost half of the primary energy supply in Ukraine is derived from gas, well above the levels observed in countries like Poland and Germany. At the same time, while Ukraine does produce almost ¼ of its needs, its gas imports per unit of PPP-adjusted GDP vastly exceed that in other countries (Table I.1, final column).

Table I.1. Ukraine: Energy Use in International Perspective, 2001-2003

	Energy Use 1/		Gas	Oil	Other	Import Share 2/		Gas Vuln-erability 3/
	1981-85	2001-03	(Share of total primary energy supply)			(Total PES)	(Gas PES)	
Ukraine	...	0.56	0.46	0.12	0.42	0.54	0.78	0.20
Czech	0.37	0.27	0.19	0.20	0.61	0.46	0.99	0.05
Hungary	0.26	0.20	0.43	0.25	0.32	0.70	0.79	0.07
Poland	0.45	0.22	0.12	0.22	0.66	0.35	0.68	0.02
Slovakia	0.44	0.29	0.32	0.17	0.51	0.87	0.96	0.09
Russia	...	0.54	0.53	0.21	0.26	0.04	0.02	0.00
Germany	0.25	0.17	0.22	0.37	0.41	0.70	0.86	0.03
Japan	0.17	0.16	0.13	0.49	0.37	0.83	0.96	0.02
U.S.	0.32	0.23	0.23	0.40	0.37	0.32	0.18	0.01

Source: International Energy Agency.
1/ Kilotonnes of oil equivalent per unit of PPP-adjusted GDP.
2/ PES denotes "primary energy supply".
3/ Imported gas per unit of PPP-adjusted GDP.

Theory—Channels Through Which Growth and Inflation Impacts Arise

5. **A generic production function can illustrate the channels through which energy price shocks can affect output in the medium term.** Following Bruno and Sachs (1985), the output of a three-factor production function—incorporating capital (*K*), labor (*L*), and energy (*E*)—can be measured in several ways:

$$(1) \quad Q = F(K, L, E); \qquad (2) \quad Y = \frac{(PQ - P_E E)}{P}; \qquad (3) \quad V = Q - E$$

---

[1] Prepared by Mark Flanagan.

In equation (1), Q measures gross output. In equation (2), Y is a measure of real income (net output, using the overall price level as a deflator). Equation 3 captures value added (V) or real GDP (net output, using the overall price level to deflate nominal output, and energy prices to deflate energy inputs). If each factor input is employed to the point where its marginal product is equal to its price, and s_K, s_L, and s_E denote the cost shares of capital, labor, and energy in production, the effect of a change in the price of energy on real GDP is given by:

$$(4) \qquad \frac{dV}{dP_E} = s_K \frac{dK}{dP_E} + s_L \frac{dL}{dP_E} - (1 - s_E) \frac{dE}{dP_E}$$

6. **From equation (4), as a first channel, an energy price shock can affect real GDP via the size of the capital stock.** The capital stock channel comprises three effects: (i) a (negative) *income effect* as the rise in the price of energy squeezes profits (the return on capital) inducing firms to wish to employ less capital; (ii) a (positive) *capital substitution effect*, where the decline in the price of capital relative to energy induces an increase in the capital stock; and (iii) a (negative) *capital obsolescence effect*, where the increase in energy prices renders part of the existing capital stock non-profitable for production.

7. **A second channel on the production side has energy-price shocks affecting real GDP through the amount of labor input.** Three effects can work through this channel: (i) a (negative) *labor supply effect*, where the gas price hike reduces the real consumption wage and triggers a negative labor supply response; (ii) a (positive) *labor substitution effect*, where the decline in the price of labor relative to energy spurs an increase in labor input; and (iii) a (negative) *real wage rigidity effect*, where workers maintain their real consumption wage by indexing nominal wages to consumer prices, and firms substitute other factors. This latter effect, through the squeeze it induces on profits, can also produce a second-round impact on GDP through reductions in the level of capital input.

8. **A third channel on the production side involves the impact through the amount of intermediate energy input used.** This comprises two effects: (i) a (positive) substitution effect, where a rise in the relative price of energy spurs a reduction in the use of intermediate energy inputs; and (ii) a (positive) *efficiency effect*, where higher energy prices and/or energy policy changes spur the introduction of more energy-efficient production processes. If these effects dominated, then overall effect on output could even be positive.

9. **An energy price shock would have an impact on inflation through producer's pricing decisions, and through government policy decisions.** With production costs rising, producers would be expected to raise their prices. To the extent, however, that profit margins were high, they could be willing to accept some decline in their mark-up, and a smaller increase in price. At the same time, monetary and fiscal policy settings are crucial in determining the full inflation impact and its persistence. With the shock likely to have some negative impact on aggregate supply, policies which increase aggregate demand would be expected to raise the price level, possibly inducing a price-wage-price spiral. Policies which

reduced demand to offset incipient price pressures could conceivably eliminate some of the inflation impact, but at the cost of slower growth.

10. **Some of these effects are likely to be more important than others in a transition economy like Ukraine.** Ukraine's older capital stock, geared to heavy use of cheap energy, suggests that capital obsolescence and energy-efficiency effects could be crucial. These non-linear and difficult-to-capture impacts introduce a considerable margin of uncertainty into the analysis—as noted, if they dominate, the effect on output could even be positive. At the same time, recent strong wage growth momentum in Ukraine, and legal requirements to raise minimum wages to reach the minimum subsistence wage (which is 25 percent higher and rises with CPI inflation), suggests that the real wage rigidity effect could also be very significant. We will return to the issues of efficiency and wage policy below.

Estimating Growth and Inflation Impacts for Ukraine

11. **A variety of techniques can be employed to estimate the impact of energy price shocks on growth and inflation.** These approaches are explained below. Table I.2 summarizes estimated impacts on growth and inflation of a 10 percent price shock.

Table I.2. Ukraine: Impact of a 10 Percent Gas Price Shock

	Output		Inflation	
	Year 1	Medium term	Year 1	Medium term
	(Percent)			
Statistical approaches				
IMF-VAR	-0.09	-0.47	1.17	1.06
IMF-VAR (Deflator)	-0.43	-0.50	0.56	0.64
Semi-structural methods				
Ready reckoners-direct impacts	-0.30	...	0.60	...
Ready reckoners-full impacts	-0.30	...	0.92	...
World Bank 2006	-0.52	-0.33	...	...
Structural approach				
GEM-energy	-0.74	-0.62	0.19	-0.16
Other				
Vinhas de Souza IS-LM model (2006)	-0.72	...	1.38	...
Institute for Economic Research (2006)	...	-0.92	...	...
Average (unweighted)	-0.44	-0.57	0.80	0.52

Sources: Vinhas de Souza (2006); World Bank (2006); Institute for Economic Research (2006a); and IMF staff estimates.

Statistical methods

12. **Statistical methods use historical data to capture in a reduced form the supply-demand channels outlined above.** Within this approach, vector autoregressions offer two advantages. First, the analyst can look at the response of the economy to the shock even while applying minimal structural assumptions—a triangular decomposition of the residual matrix placing policy variables last and exogenous variables like imported energy prices first can suffice. Second, data requirements are not very onerous, an important consideration in Ukraine. The approach also has an important drawback: analyzing different policy options is conceptually problematic since changing the policy reaction functions would likely change the estimated reduced form relationships. This means, for instance, that improvements in energy efficiency cannot be modeled.

13. **Here we apply a quarterly VAR, estimated over the period 1996:1 to 2005:4.** The variables include real GDP growth, CPI inflation, the change in the real effective exchange rate, the change in the energy import price for Ukraine (with energy priced and measured in kilotons of oil equivalent).[2] Exogenous variables include import growth in Russia and the change in steel prices. All variables are seasonally adjusted. The estimated model is stationary and has two lags. Properties of residuals are reasonable.[3] The real effective exchange rate, the price of steel and CPI inflation have the most significant impacts on growth, while past inflation, the price of imported energy, the real effective exchange rate, and the level of Russian imports have the most significant impacts on inflation.

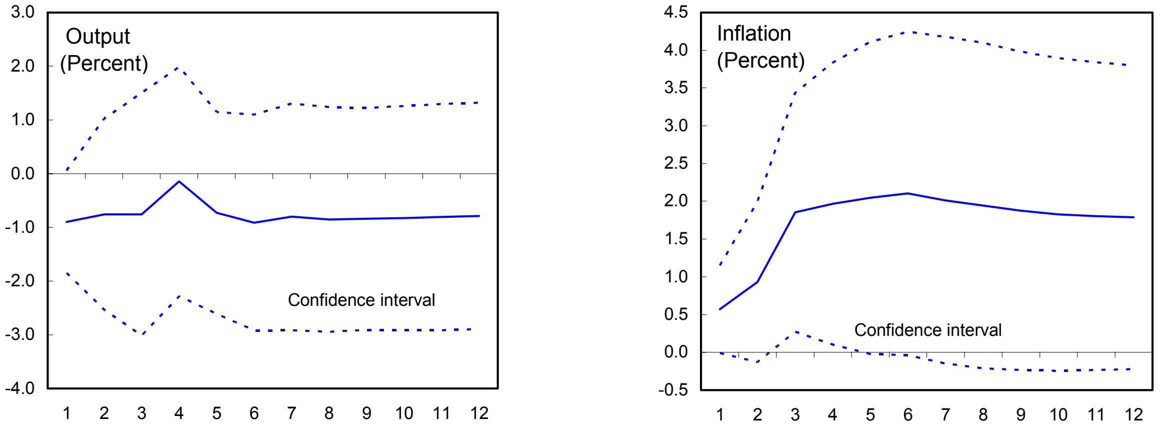
14. **Impulse response functions for growth and inflation provide a window into the historical impact of energy-price shocks in Ukraine**. A 10 percent shock to gas prices (which represents about a 6.7 percent shock to energy prices) reduces output by about 0.1 percent after 4 quarters, and 0.5 percent in the medium term; the same shock raises CPI inflation by 1.2 percent after 4 quarters, and by 1.1 percent in the medium term. The impact on growth is sharp in the first quarter after the price increase and there is a significant peak in inflation after three to four quarters. Otherwise, effects are imprecisely estimated (Figure I.2).

---

[2] The use of energy prices, as opposed to gas prices, should not distort results, since substitutability is high. It has the advantage of increasing the variability in the data, which allows for more precise estimates.

[3] Tests reject heteroskedasticity and autocorrelation, but show some evidence of non-normality. A model using the GDP deflator in place of CPI inflation has somewhat better residual properties, at the cost of less precise estimates.

Figure I.2. Ukraine: Impulse Response Over 12 Quarters to a One Standard Deviation Shock to Energy Prices



Source: IMF staff estimates.

Semi-structural methods

15. **Semi-structural methods attempt to capture the impact of energy price shocks by using selected aspects of the supply-demand channels outlined above.** Two levels of detail can be pursued, one which identifies direct first round impacts of the shock, so-called “ready reckoners,” and another which also seeks to illuminate second round impacts by modeling some behavioral relationships. The approach is quite flexible, allowing consideration of a wide variety of policies, including energy-efficiency improvements.

16. **To develop a direct estimate of the impact on energy prices on real activity, it is convenient to use a measure of real income instead of GDP.** Using (2) above, and again assuming that each factor input is employed to the point where its marginal product is equal to its price, the effect of a change in the price of energy on real income is given by:

$$\frac{d\ln Y}{d\ln P_E} = s_K \frac{d\ln K}{d\ln P_E} + s_L \frac{d\ln L}{d\ln P_E} - s_E \tag{5}$$

The direct effect can then be proxied by s_E, the cost share of energy in production. Essentially, if the price of energy (P_E) goes up and gross output (Q) remains unchanged, real income (Y) has to decline in proportion to the cost share of the energy input in production. The analyst may then layer on assumptions about energy-efficiency savings, or about substitution away from energy, which could be crucial in a transition economy. Since the impact is being measured via real income, it may also make sense to assume some distribution of the shock over time (e.g. due to habit formation in consumption). In any model, however, this “ready reckoner” for the GDP growth response is a local approximation and needs to be recalculated when energy cost shares change significantly.

17. **The first round impacts for Ukraine can thus be identified as follows:**

- **Growth.** Using 2005 data, the share of intermediate gas is about 3 percent of GDP. Thus, through the real income channel, a permanent 10 percent increase in gas prices would lower near-term GDP growth by about 0.3 percent. Assuming that a third of the shock is financed could reduce this to 0.2 percent. With demand likely highly inelastic in the short run—for instance the technologies underlying Ukraine's communal services sector would take years to adapt—energy savings would have very little additional impact.[4]

- **Inflation.** The direct impact can be derived by using the weight of energy products in the CPI basket. The 2006 CPI weights show 1.9 percent dedicated to direct consumption of gas, and a further 5.2 percent to consumption of electricity and heating and cooling. Assuming full pass-through by electricity and heating producers of their gas cost increase (gas represents about 8 percent of electricity and 38 percent of heating inputs), the direct CPI impact of a 10 percent gas price increase is likely to be about 0.6 percent.

18. **To capture second-round inflation and external impacts, one can model the behavior of producers' price mark-up and the adjustment of the current account**:

- **Mark-up.** The share of gas in the production of non-energy CPI components amounts to about 1½ percent. There are no good available estimates of the behavior of the mark-up in Ukraine, and thus one must consider a range of pass-through estimates. If producers pass through half of the gas price increase, the impact on the CPI of a 10 percent increase would amount to 0.07 percent; if they pass through all of the increase, it would amount to 0.14 percent. Company profitability may offer a clue about the outcome: the greater are corporate margins, the more room there is to absorb cost increases. Available data suggest that there was a large decline in margins in 2005, as the government pushed through big increases in the minimum wage and closed tax loopholes.[5] By this metric an estimate of pass-through of half or more would seem reasonable.

- **External adjustment, depreciation and pass-through.** In the medium term, the current account must correct to offset the impact of the gas price shock. The amount of real depreciation necessary will depend on export and import price elasticities. These are estimated to be in the range of 0.6 and 0.3 for Ukraine, suggesting that a 3 percent real depreciation would be needed to offset a 10 percent gas price shock. To the extent that the real depreciation comes about through nominal depreciation, the pass-through to the domestic currency price of imported goods will then effect the overall inflation rate. Estimates of import price pass-through in emerging markets vary (see Leigh and Rossi, 2002); assuming 50 percent price pass-through, given that imports comprise about 12 percent of the consumer basket, a 10 percent nominal depreciation should lead to a 0.6 percent impact on the CPI in Ukraine.

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[4] The World Bank (2005c) uses a similar approach, but includes all gas usage—not just intermediate—in its measure, and adjusts the estimated impact for energy savings, based on oil price demand elasticities in the OECD. Higher prices for gas that is consumed should have no impact on production decisions, unless consumers face a binding finance constraint, and must reduce their total purchases of goods and services in response to the price hike. The high price elasticities used are also open to question since even after the gas price increases, gas remains inexpensive in Ukraine relative to its closest substitute (oil).

[5] The share of profits and mixed income in national income fell by 4.7 percent, while the percentage of profit making firms declined by 5 percent. See also Chapter III, Box III.2.

19. **Combining the first- and second-round impacts, a picture emerges of the full impact of gas price shocks in Ukraine.** For a 10 percent gas price shock, the total growth impact would amount to about 0.3 percent, and the total inflation impact, some 0.9 percent. These estimates can also be used as "ready reckoners" to calculate the impact from larger shocks. Such scaled up estimates should be treated with caution, however: the farther the increase moves the economy away from the initial equilibrium, the more effects ignored by the ready-reckoners—substitution of other factors, capital obsolescence, and efficiency gains—would come into play. That said, for the 60 percent price shock seen in early 2006, the impact could be as much as 1.8 percent on output, and 5⅓ percent on inflation.

Full structural models

20. **Structural models completely specify the microfoundations of the supply and demand channels outlined above.** New Keynesian open economy models represent the state-of-the-art technique.[6,7] In these models, forward-looking consumers and producers maximize their utility and profits. Frictions arise due to habit persistence in consumption and to adjustment costs (in goods pricing, wage contracts, investment and portfolio shifts). Policy assumptions include, in the monetary area, a flexible exchange rate and an inflation-targeting regime. On the fiscal side, the government is assumed to run a balanced budget, collecting taxes and seignorage, and spending on non-traded goods. The models allow for trading of intermediate and final goods, and shocks to the terms of trade.

21. **A challenge posed by this approach is that the analyst must calibrate the model.** The approach is thus most useful and precise when independent research is available on the various underlying parameters (for instance, the elasticity of labor supply or the elasticity of substitution between factors in the production function). The major advantage is the possibility to do policy analysis, at least on the range of issues that the model is capable of addressing (the models need to be solved by numerical simulation, and there is thus a key trade-off between the range of issues that they can cover, and the ability to solve them). The

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[6] See Obstfeld and Rogoff (1996).

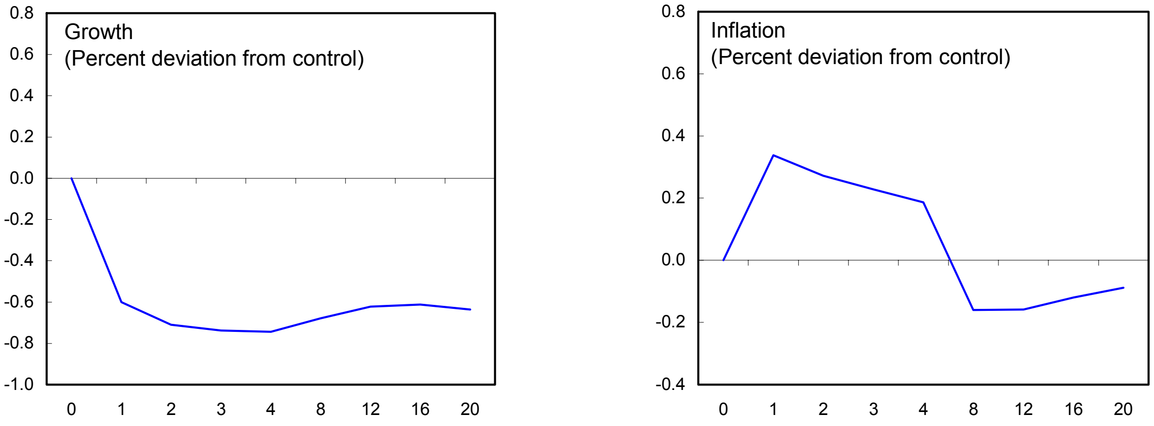
[7] The Kyiv-based Institute for Economic Research has estimated the impact of the shock in Ukraine using an alternative structural approach, a computable general equilibrium (CGE) model. See IER (2006) and Table I.2. One advantage of CGE models is that they allow attention to sectoral impacts, and the IER calculates that the impacts will be greatest in the gas-intensive metallurgy and chemical sectors. The disadvantage is the lack of dynamics—the model essentially gives before and after snapshots.

model also allows one to better consider the non-linear impact—that is, the much larger substitution effects—from large changes in energy prices, as in Ukraine at present.

22. **To operationalize such an approach for Ukraine, one can use the GEM-Energy model developed in Hunt (2005).** Here, energy enters in final consumption and as an intermediate input in the production function, providing two channels through which it can effect inflation and growth. Energy efficiency gains can be explicitly modeled, in the form of substitution away from energy to other factors. The model is calibrated to yield reasonable dynamics in response to various macroeconomic shocks, and similar energy prices across countries. Appendix I.1 presents parameters used to calibrate the model for Ukraine's energy intensities, including assumed elasticities of substitution between energy and other factors.

23. **Impulse response functions for growth are similar to those for the VAR, but for inflation they show a markedly different pattern** (Figure I.3). A 10 percent shock to gas prices reduces output by about ¾ percent after 4 quarters, and 0.6 percent in the medium term. The same shock raises CPI inflation by 0.2 percent after 4 quarters, and *reduces* it by almost the same amount in the medium term. The inflation result reflects the inflation-targeting assumption in GEM, and the output gap that opens up as the economy contracts.

Figure I.3. Ukraine: Response Over 20 Quarters to a 10 Percent Gas Price Shock



Source: IMF staff estimates.

Key Policy Considerations for Growth and Inflation Impacts

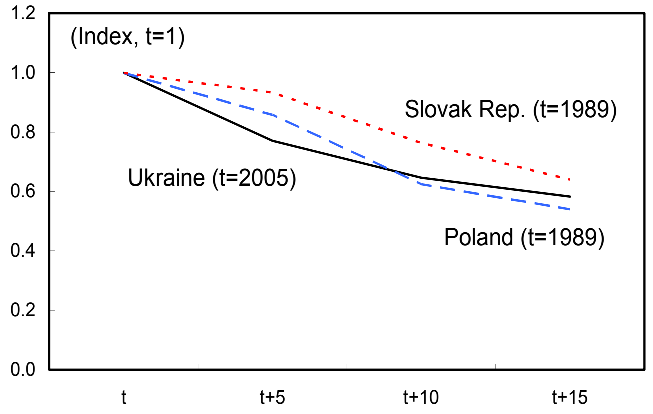
24. **Theory suggests that there are several key policy channels through which the shock's impact on growth and inflation could be either amplified or mitigated.** Chapter II examines the crucial issue of the monetary policy framework: a more flexible exchange rate can help maintain competitiveness, but care must be taken to anchor inflation expectations. This section looks at the role of energy efficiency and wage policy.

Energy efficiency

25. **The role of energy efficiency in mitigating the impact of the shock can be demonstrated within the semi-structural approach.** With intermediate energy use at 3 percent of GDP, a 10 percent price shock would have no impact on GDP if gas use efficiency could improve by 9 percent (i.e. to reduce usage from 3.3 back to 3 percent of GDP). For the 64 percent price shock faced by Ukraine in 2006, the required gas efficiency improvement is 39 percent.[8] Quickly achieving the average total energy efficiency level in Poland, Slovakia, Hungary and the Czech Republic could allow Ukraine to offset a 365 percent gas price shock (i.e. a movement to market prices).

26. **How fast can Ukraine hope to boost energy efficiency?** The authorities aim to improve efficiency by 23 percent over the next 5 years, and 42 percent over 15 years (Ministry of Fuel and Energy, 2006). This would leave Ukraine almost as efficient as the present day Czech and Slovak Republics. In part, the improvement would reflect an economic transition toward less energy-intensive services. However, the plan also identifies savings measures, including: metering; upgrading of district heating systems and gas transit compressor technology; and in the private sector, upgrading of steel and cement making technology. Total investments would amount to about $6 billion through 2010 (6 percent of 2006 GDP). Looking at the experience of Poland and Slovakia, the forecasted pace of change appears attainable (Figure I.4). Ukraine would improve more rapidly at first, but begins in a more wasteful state, with more easy opportunities to improve. Nevertheless, the near-term pace of improvement does not appear to be enough to fully offset the impact of the shock on output.

Figure I.4. Energy Savings Plans in International Perspective



Sources: International Energy Agency; and Ministry of Fuel and Energy (Ukraine).

27. **Improvements in energy efficiency are most likely to come about in an environment where the relative price of energy is rising.** The right price signals are needed to induce the millions of individual decisions by corporations and consumers which together produce a large change in aggregate behavior. Indeed, looking at the government's plans for savings through efficiency related investments, almost all of the identified measures

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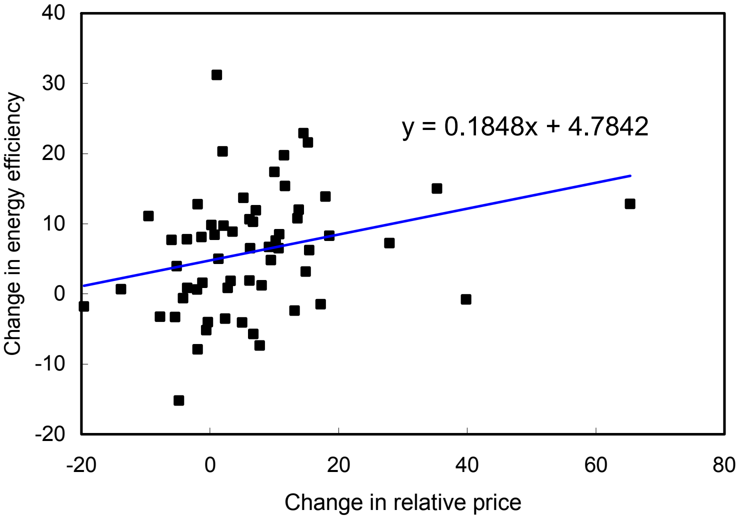
[8] Since gas is about 46 percent of total primary energy supply in Ukraine (see Table I.1), this is equivalent to a 18 percent improvement in overall energy efficiency.

fall into the realm of the private sector, or of public sector energy companies (some of which are expected to be privatized). Looking at the experience of transition and other emerging market economies in the 1990s, a relationship between relative energy price changes and improvements in efficiency is evident (Figure I.5).

Figure I.5. Energy Efficiency and Pricing in the OECD 1/



Source: International Energy Agency.
1/ Between 1996 and 2000, and between 2000 and 2004

28. **The government of Ukraine has taken important steps to pass through price increases to-date, but much more will need to be done.** With the 2006 increases, industry prices reflect import prices, while the gap for consumers and budget entities has been closed significantly (consumers were 60 percent below import price levels in 2005, but only 30 percent below by the second half of 2006). Bringing consumer prices fully to import price levels (to reflect opportunity costs, generate resources for energy efficiency investments, and minimize quasi-fiscal deficits in the energy sector—see the next section of this Chapter) will require a new round of significant pass-through, not least since import prices are set to rise by close to 40 percent in 2007, and perhaps 100 percent in total over the medium term.

29. **International experience offers some lessons about how to strengthen prospects for achieving full pass-through.** Prolonged periods of price pass-through have not proven to be easy tasks for countries attempting them, with reversals and setbacks common. Experience suggests that the probability of success can be raised by: (i) automatic price setting mechanisms which ensure independence from political interference; and (ii) measures to protect the most vulnerable from the impact (see IMF Fiscal Affairs Department, 2006).

30. **Ukraine has a strong social support system in place, but could yet draw on international experience to improve its own pass-through prospects:**

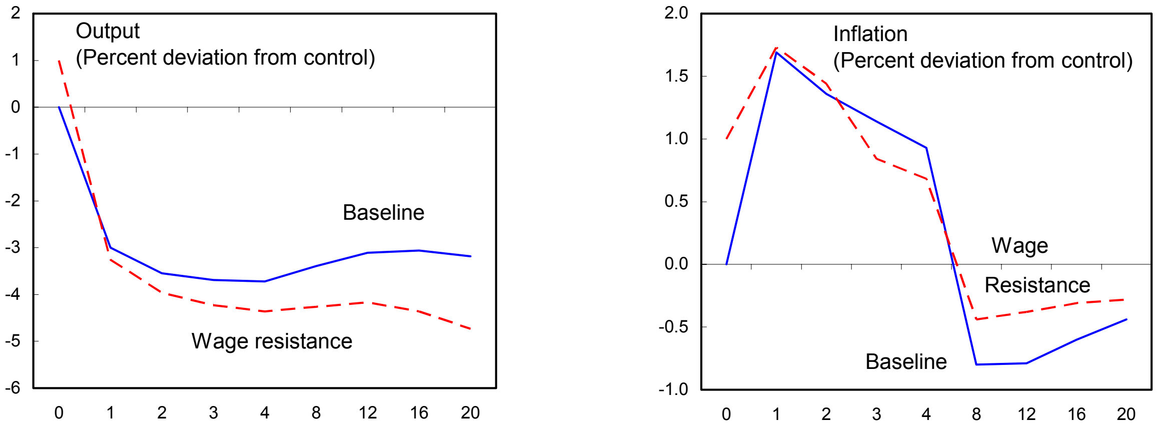
- **Social support mechanisms** are already in place to protect the most vulnerable. The government introduced a graduated (lifeline) tariff in November 2006, where those who have utility payments exceeding 20 percent of their income are eligible for subsidies. The population also began with a very large cushion: in the wake of large wage increases in 2005 and early 2006, a reduction of the household savings rate to that in 2004 would have provided enough resources to cover a full 100 percent increase in gas prices, and full pass-through of this to heating and electricity prices. Indeed, with communal services consuming only 6.6 percent of household budgets, few people qualified for subsidies.

- However, **energy price setting** remains far from automatic in Ukraine, with the regulator's decisions subject to review by various ministries and the Cabinet of Ministers. Its independence needs to be strengthened in law and it needs to be given control over its own resources, both financial and human (see World Bank, 2005a).

Wage adjustment

31. **The GEM-energy-Ukraine model can be used to highlight the potential role of wage setting in amplifying impacts of an energy shock.** Following Hunt (2006), consider a scenario where Ukrainian workers resist a decline in their real wage. Simulating the adapted model under a 50 percent gas price increase (similar to the 2006 shock) suggests that optimizing firms respond by cutting employment and output further (Figure I.6, first panel). This impact may have led industrial countries to overestimate potential output growth in the 1970s, leading to mistakes in monetary policy and an extra inflation impetus (Hunt, 2006). The model suggests that a similar effect could arise in Ukraine (Figure I.6, second panel).

Figure I.6. Ukraine: Energy Price Shock with Real Wage Resistance



Source: IMF staff estimates.

32. **Wage policy could instead help mitigate the shock.** Flexible wages help directly improve competitiveness, and thus reduce the need for nominal exchange-rate adjustment and the depreciation and extra inflation that this can entail. Moreover, balance-sheet mismatches in Ukraine's corporate and household sectors suggest a need to avoid large

exchange-rate movements (Chapter III). Such movements could create financing constraints for firms and households, and even undermine the banking system, with much larger potential impact on aggregate demand and output (see Rosenberg and others, 2005).

33. **Are real wages likely to prove flexible in Ukraine, mitigating the shock?** The government annually sets the minimum wage path, and within year indexation is automatic when CPI changes outpace this. The government also intends over time to set the minimum wage equal to the minimum living standard (the cost of living for a working individual). This standard is presently 25 percent higher than the minimum wage, and is annually indexed to changes in CPI inflation. Indexation and convergence to the minimum living standard could together create a potentially large real wage rigidity. This rigidity could prove immediately problematic in the government sector, and a growing problem for the private sector:

- **Government sector wages.** The whole wage scale rises in line with the minimum wage. Since civil servant's salary package contains substantial non-wage compensation, there is some room to offset changes in minimum wages (and the government was actively pursuing this route in its 2007 budget proposal). However, this can lead to undesirable wage compression, and this route cannot be pursued indefinitely.

- **Private sector and broader public sector wages.** The minimum wage is a potential constraint for industry. Wages are generally set through sector-wide collective bargaining (with the government playing an important role, not least because of its still-extensive set of state enterprises). However, it is not clear how well the minimum wage and sectoral agreements are enforced, and underreporting of wages—for tax evasion purposes—may also imply a margin for flexibility (see World Bank, 2005b). Thus the minimum wage may not be binding in the near-term, but could become so over the medium-term.

34. **A more appropriate minimum wage policy could help prevent a macroeconomically problematic real wage rigidity in Ukraine.** Three steps could be considered: (i) elimination of backward indexation in favor of a forward looking measure; (ii) the use of a price measure excluding energy in calibrating wage increases—this would help ensure that real wages respond to the shock and in a way which could be transparently explained to the public; and (iii) slower convergence of the minimum to the minimum subsistence wage, at least until uncertainty related to rising energy prices abates.

35. **There is some international experience with the use of forward looking ex-energy measures in indexing wages, but this suggests caution**. The Belgian system, imposed in 1994, probably helped reduce real wage growth in the mid-1990s, but mistakes about forward-looking inflation helped push real wages up after 2000 (IMF, 2006). It may thus be advisable in Ukraine, where inflation has been more volatile and forecast errors larger, to avoid automatic indexation altogether. Instead, an annual change could be set based on programmed inflation, excluding energy prices; it could then be split into a first half component, and a discretionary second half component, to be confirmed at mid-year.

B. Macro-Fiscal Vulnerabilities in the Energy-Sector State Enterprises[9]

Quasi-Fiscal Deficits in the Energy Sector

36. **Assessing macro-fiscal risks in the energy sector requires estimating its quasi-fiscal deficit (QFD).** Owing to data constraints, we follow the so-called above-the-line approach used in previous studies (Tchaidze, 2003; Tiffin, 2005; and Saavalainen and ten Berge, 2006). This directly measures quasi-fiscal activities, defined as those that would not prevail in competitive markets without government intervention.[10] They comprise: (i) *mispricing*—the extent to which output prices are set below cost-recovery, either at financial or economic cost to state-owned enterprises (SOEs); (ii) *weak enforcement of payment compliance,* which can act as a de facto transfer to noncompliant consumers; and (iii) *output losses above technically normal levels*—caused mainly by underinvestment and poor management.

37. **The assessment of macro-fiscal risks also evaluates the outlook for the energy sector: QFDs under different scenarios for tariff adjustment.** The scenarios are tailored to each specific energy subsector—gas, electricity and coal—subject to data availability (see Box I.1 for more background on each subsector) The analysis compares cases under which prices are adjusted to ensure cost recovery, as well as cases in which under pricing may continue due to partial tariff adjustment.

QFDs and contingent liabilities in the gas sector

38. **Naftogaz is financially weak, and has accumulated large liabilities.** Already in 2005, prior to the rise in gas import prices, the company incurred a net financial loss of about ½ percent of GDP. Tensions grew further after the gas price hike, especially as Naftogaz was not allowed to immediately raise consumer tariffs (Ernst&Young, 2006). While tariffs were eventually adjusted later in 2006, Naftogaz accumulated net foreign liabilities of about ½ percent of GDP, raising the total stock to 2½ percent of GDP (US$2.5 billion).[11] Most of this debt is not subject to explicit government guarantees, but the request for at least one credit in 2006 was supported by an official comfort letter. Naftogaz has also accumulated tax arrears which are close to 1 percent of GDP at present.

39. **The gas import price shock has put upward pressure on Naftogaz's quasi-fiscal deficit.** An assessment of the QFD using financial costs as a benchmark suggests that QFDs

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[9] Prepared by María González.

[10] As noted by Tchaidze (2003), QFDs mostly entail an implicit subsidy, and can be duplicated by budgetary measures (i.e. an explicit tax, subsidy or direct expenditure).

[11] Naftogaz credit ratings by Fitch remain at a B+/stable outlook, under the expectation that the government will pass through the gas import price shock in 2007.

fell by about 2¼ percent of GDP in 2003-05 to about 1½ percent of GDP, driven by an improvement in payment compliance and a reduction in under-pricing (Table I.3).[12] This trend reversed in 2006, with the QFD rising by ½ percent of GDP to 2 percent of GDP, driven by under-pricing (given the delayed tariff adjustments as gas import prices hiked) and the drop in compliance that followed the tariff increases.

Box I.1. Ukraine's Energy Sector: An Overview

Ukraine's gas sector has been dominated by Naftogaz, the largest state-owned enterprise. Naftogaz is the country's largest firm in terms of assets, and supplied nearly all of Ukraine's gas consumers through end-2005. Traditionally, Naftogaz has supplied households and budgetary units (about 25 percent of total consumption) from domestic gas production, while supplying industrial consumers, including public heating and power firms, with subsidized gas imports. But starting in 2006, as a result of the new gas contract between Ukraine and Russia, gas imports will be handled by UkrGasEnergo (UGE), a joint venture between Naftogaz and the privately-owned RosUkrEnergo (RUE). RUE provides gas at the Ukraine-Russia border to UGE, which sells it and distributes it to industrial consumers, and to heating and power companies. The profits are evenly split between Naftogaz and RUE. The household market, still supplied mostly with domestic gas, remains in Naftogaz's hands.

Ukraine's electricity sector has a large public participation, making it a potential source of macro-fiscal risks. The sector includes state-owned power generation companies, a state-controlled wholesale electricity market, and regional distributors, out of which about half belong to the state. The National Electricity Regulatory Commission (NERC) serves as a regulator, but there are independent licensed traders, with unregulated tariffs (Petri and others, 2002; Tchaidze, 2003). Ukraine's electricity intensity is high by international standards. Electricity SOEs are also linked to other energy-SOEs: most notably, the coal industry is one of the largest electricity consumers in Ukraine, and could be impacted by large upward revisions in electricity tariffs.

Ukraine's coal sector remains mostly state-owned, although government participation is declining. Non-state-owned enterprises produce over 35 percent of Ukraine's coal, and *de facto* control of large parts of the industry lies with certain groups of major industrial consumers of coal (World Bank, 2003b). Coal mines are, however, subject to chronic financial distress and asset stripping, and limited efforts have been made to improve performance. Financial plans agreed between the SOEs and the Ministry of Economy for 2006 foresee losses exceeding ¼ percent of GDP in enterprises overseen by the Ministry of Coal Industry.

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[12] Excess technical losses caused by underinvestment have been assumed to remain constant at 5 percent of total production, following Saavalainen and ten Berge (2006).

40. **Simulations suggest that QFDs could remain significant under a policy of partial tariff adjustment (Table I.3).** If, for example, the government adjusted only the tariffs applying to private industrial consumers in line with rising gas import costs from 2007 onward (leaving those paid by households, government units and heating and power companies unchanged), Naftogaz's QFD would increase to nearly 2½ percent of GDP in 2007. It would rise moderately thereafter, as gas import prices converged to international levels.[13] Losses due to under-pricing would arise for two reasons: (i) in the domestic market, frozen tariffs for households and budgetary units would not compensate rising domestic production and delivery costs (the latter are linked to import gas prices); and (ii) in the industrial market, the lack of adjustment in tariffs for power and heating companies would be at odds with the rising cost of their import supplies.[14]

41. **Tariff adjustment could have a significant positive effect on Naftogaz's financial position.** Tariff setting at economic cost (represented by the benchmark of gas import prices for all types of users), would more than offset production costs, creating a source of financial profit. Even assuming that problems with weak consumer payment compliance and excess technical losses persist, QFDs would gradually decline over the medium term to very moderate levels—some ½ percent of GDP. Moreover, efficient use of financial profits through reinvestment and administrative improvements could both help eliminate technical losses and improve payment compliance, further consolidating the company's financial position, and fully eliminating the QFD in the gas sector.

QFDs in the electricity sector

42. **Electricity QFDs are modest and would remain so even in the absence of tariff adjustment.** QFDs in the sector have declined over time, to just above ½ percent of GDP in 2005-06. This reflects tariff increases for industrial users, which have offset the losses from selling to consumers below cost recovery. Estimates of mispricing can be made on the basis of two groups: (i) retail users (utility companies, budgetary units and households, accounting for about 60 percent of total consumption), which are in the less efficient voltage grid at a cost of US$39 per MWh; and (ii) the industrial sector, connected to the high voltage grid, at an average cost of US$20 per MWh. With tariffs to both groups unchanged, QFDs would remain at ½ percent of GDP (Table I.3).[15]

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[13] Implying an increase of over 25 percent in the US-dollar denominated import gas price between 2007-10.

[14] Even if tariffs to heating and power companies were raised, these would likely not be allowed to pass through such increases to households. Without pass-through, power and heating companies would themselves face QFDs that may be proxied by the losses observed in the case in which gas tariffs are not adjusted.

[15] Data on excess technical losses are unavailable, but could raise the size of the QFD.

43. **Tariff-setting at economic cost should eliminate the QFD in the sector.** Tariffs would then ensure the elimination of cross-subsidization across consumer groups, and offset any remaining losses due to weak consumer payment compliance.[16]

Table I. 3. Ukraine: Quasi-Fiscal Deficits in the Energy Sector 1/

(In percent of GDP, unless otherwise noted)

	2003	2004	2005	2006	2007	2008	2009	2010	2011
A. Energy Sector									
Partial pass-through	**6.0**	**4.5**	**3.0**	**3.4**	**3.8**	**4.0**	**4.3**	**4.3**	**4.0**
B. Gas Sector									
Partial pass-through	3.8	2.7	1.5	2.0	2.4	2.7	3.0	3.0	2.7
Mispricing 2/ 3/ 4/	2.5	1.6	0.5	0.7	0.8	1.2	1.5	1.6	1.4
Payment arrears 5/	0.8	0.6	0.6	1.0	1.1	1.0	1.0	0.9	0.9
Losses 6/	0.5	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5
Tariffs at economic cost 7/	3.8	2.7	1.5	2.0	0.6	0.6	0.5	0.5	0.5
Mispricing 2/ 3/	2.5	1.6	0.5	0.7	-1.3	-1.4	-1.5	-1.4	-1.2
Payment arrears 5/	0.8	0.6	0.6	1.0	1.4	1.4	1.5	1.4	1.3
Losses 6/	0.5	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5
C Electricity Sector									
Partial pass-through	1.0	0.8	0.6	0.6	0.6	0.5	0.5	0.5	0.5
Mispricing	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Payment arrears 5/	0.9	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5
Losses	...	...	...	...	...	...	...	...	...
Tariffs at economic cost	1.0	0.8	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Mispricing	0.1	0.1	0.1	0.0	-0.7	-0.6	-0.6	-0.6	-0.5
Payment arrears 5/	0.9	0.7	0.6	0.5	0.7	0.6	0.6	0.6	0.5
Losses	...	...	...	...	...	...	...	...	...
D. Coal Sector									
Partial pass-through 7/	1.2	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8
Tariffs at economic cost-recovery 6/	1.2	1.1	0.9	0.8	0.0	0.0	0.0	0.0	0.0
Memorandum items									
Nominal GDP (Millions of hryvnias)	267,344	345,113	424,741	505,409	573,708	646,077	724,968	808,552	906,596

Sources: Ukrainian authorities; and staff estimates.

1/ Excludes financial profits attributed to RosUkrEnergo from 2006 onwards for sales of gas to private industrial consumers.

2/ Calculated separately for industrial consumers, (public) heating companies and retail consumers. Industrial consumers and heating companies are supplied from imported gas, with any consumption deficit covered with domestically produced gas. Tariffs are assumed to be VAT-exclusive.

3/ Losses on mispricing to public heating companies accrue fully to Naftogaz, even if supplied with imported gas. This assumption quantifies the (equivalent) quasi-fiscal losses under two possible scenarios: first, domestic tariffs to heating companies are not adjusted, with Naftoga bearing the cost; second, domestic tariffs to power companies are adjusted, but these cannot pass on the adjustment to domestic heating tariffs, incurring themselves a quasi-fiscal loss.

4/ Production cost of imported gas reflects both import gas prices plus delivery cost. Domestic production costs include the extraction royalty and delivery cost, but is VAT exclusive.

5/ Assumes a 5 percent worsening in compliance by residential consumers and communal heating companies when tariffs are adjusted; compliance remains constant under partial pass-through.

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[16] Estimates likely overstate surpluses accruing to SOEs, since they are estimated on the basis of total electricity consumption, including that supplied by private participants.

QFDs in the coal sector

44. **The sector is subject to serious mispricing practices and receives large explicit budgetary subsidies.** Coal prices reflect neither the costs of production nor the cost of alternative energy sources available in the economy. The sector's average production cost of US$29 per ton is about 15 percent higher than the sector's average price (World Bank, 2003b). Coal enterprises require a government subsidy that has declined slowly over time, from nearly 1¼ percent of GDP at the beginning of the decade to about ¾ percent of GDP in 2006. This transfer serves as a proxy of the magnitude of sector's QFD.

45. **Coal price adjustments to ensure cost recovery could eliminate the sector's QFDs and the budgetary transfers.** If rising gas import prices are passed through, substitution by users towards less-expensive coal should help maintain a stable demand for coal. Keeping prices unadjusted, however, could generate an increased need for fiscal transfers. Under a policy of partial pass-through across the various branches in the energy sector, QFDs in the coal SOEs are likely to remain stable over time.

Managing Macro-Fiscal Risks in SOEs: Is Ukraine's Framework Adequate?

46. **Ukraine's SOE sector has a wide range of ownership and management schemes.** In line with Ukraine's Economic Code, enterprises fall into state and communal unitary enterprises, and economic transactors. The first group comprises a number of SOEs with special status (*kazenni*), that are fully controlled by the government, exempt from certain aspects of corporate law, and enjoy guaranteed state orders, as well as "ordinary" SOEs, fully owned by the government, and controlled by ministries or other government agencies, but which have a greater degree of managerial independence (Leonov and Zhuk, 2005). Economic transactors include share-holding companies, limited liability companies and other integrated companies, which must abide by Ukraine's corporate legal framework.[17]

47. **Weak SOE management is at the root of the macro-fiscal risks posed by public enterprises in Ukraine, including in the energy sector**. This section reviews the soundness of the management framework, using an assessment tool prepared by the Fund.[18] To detect sources of vulnerability, it evaluates on a number of quantitative and qualitative criteria in SOEs including: (i) managerial independence; (ii) relations with the government; (iii) governance structure; (iv) financial conditions and sustainability; and (v) other risk factors. A summary of the evaluation is presented in Table I.4.

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[17] As of October 2006, the state had majority participation in 4,428 enterprises, including 9 enterprises subordinated to the Cabinet of Ministers, and 8 natural monopolies, and 419 firms classified as "economic transactors." Communal service companies belonging to local governments were estimated at 14,705 in mid-2002 and are not included in this review.

[18] The framework was first presented in IMF (2004) and later refined in IMF (2005).

Table I.4: Ukraine: Overview of Commercial Orientation of SOEs 1/

Type of Public Enterprise	Managerial Independence						Government relations			
	Pricing policy		Employment policy							
	Prices reflect costs	Subsidies	No civil servants	Market wages	No surplus labor	Only commercial objectives	No loan guarantees 2/		QFAs	Standard tax and regulatory rules
							Explicit	Implicit		
Kazenni	No	Yes	n.a.	No	n.a.	No	Yes	Yes	Yes	No
Ordinary SOE	Depends on SOE	Yes	n.a.	No	n.a.	No	n.a.	Depends on SOE	Yes	Yes
SOCs, 100 percent government share 4/	Depends on SOE	Yes	No	No	n.a.	No	n.a.	Depends on SOE	Depends on SOE	Yes, with some exceptions
of which :Naftogaz 10/	No	Yes	No	No	n.a.	No	No	Yes 8/	Yes	No 9/
SOC, with government share: 4/										
50-100 percent 11/	Depends on SOE	Depends on SOE	No	No	n.a.	Depends on SOE	n.a.	Depends on SOE	Depends on SOE	Yes
0-50 percent	Yes	Depends on SOE	No	Yes	n.a.	Yes	n.a.	Depends on SOE	Depends on SOE	Yes

Type of Public Enterprise	Financial Conditions			Governance structure				Other factors		
	Profitability 3/	Credit-worthiness		Stock listed 7/	Outside audits	Annual reports	Minority rights protected	Contingent Liabilities	Size	
		Debt level 5/	Debt cost 6/						Labor	Sales 12/
Kazenni	n.a.	n.a.	n.a.	No	No	Yes	n.a.	n.a.	n.a	n.a
Ordinary SOE	n.a.	n.a.	n.a.	No	No	Yes	n.a.	Yes/Debt	n.a.	n.a.
SOCs, 100 percent government share 4/	n.a.	n.a.	n.a.	Yes	No	Yes	Depends on SOE	Depends on SOE	n.a	n.a
of which :Naftogaz 10/	-0.1	46.4	0.07	Yes	No	Yes; quality unclear; delayed.	Weak protection	Yes/Debt	172,000	12.4
SOC, with government share: 4/										
50-100 percent 11/	22.9	68.2	n.a.	Yes	No	Yes	Weak protection	Depends on SOE	n.a.	0.7
0-50 percent	n.a.	n.a.	n.a.	Yes	No	Yes	Weak protection	Depends on SOE	n.a.	n.a.

Sources: Ukrainian authorities; Leonov and Zhuk (2005); and staff estimates.

1/ "Yes" means enterprises pass test for exclusion and are deemed commercially run under the criteria.
2/ No guarantees under current governance regime.
3/ Defined as the ratio of net profits to net worth in most recent year available.
4/ State-owned corporation (SOC).
5/ Debt level is defined as total liabilities to total asssets in most recent year in percent.
6/ Debt cost is defined as the ratio of accrued 3-year financial costs to average total debt, including short and long-term debt, in percent.
7/ Includes local listing.
8/ Naftogaz's has been supported by official comfort letters in its credit requests.
9/ Special VAT regime on gas applied to Naftogaz sales. The regime did not explicitly included Naftogaz as a beneficiary, but placed implicit differentiated treatment.
10/ Financial conditions reported with data for 2005.
11/ Financial conditions reported based on 2005 data.
12/ Percent of GDP.

Managerial independence

48. **SOEs have a varying degree of managerial independence—relatively low where the state has majority ownership.** Most types of enterprises fail the test for managerial independence based on one or more of the following elements:

- **Under pricing is widespread**. The *kazenni* have been designed to supply goods and services to the state below cost. Ordinary SOEs and key holding companies also tend to under price, particularly in 'sensitive' sectors, such as energy and household services. As an example, cost recovery rates for water supplied via communal enterprises ranged from 60 to 90 percent in 2003 (Padco, 2003).

- **Employment policies are not fully in line with market practices**. Wage setting is based on labor union agreements for *kazenni* and ordinary SOEs (Leonov and Zhuk, 2005). More independence is given to those companies where government control is looser, but even for these the government has recently imposed restrictions on wages paid.

- **The commercial orientation of Ukrainian SOEs is weak.** Many of the largest companies (including in the energy sector) hold the majority of their market or operate as monopolies. A large fraction of their turnover may be highly reliant on sales to the state and local governments. Studies suggest that managers have little or no experience in defining market-oriented policies, especially at the local level, for instance, the communal service providers (Leonov and Zhuk, 2005).

Relations of the SOEs with the government

49. **In the case of Ukraine, the government and the SOEs do not maintain sufficient distance to prevent the emergence of risks.**

- **Ukraine's government has provided explicit and implicit guarantees to SOEs.** Contingent liabilities could be above US$2.5 billion for Naftogaz alone.[19] Data on the stock of explicit government guarantees to SOEs is not available, since official figures on total state guarantees do not identify the party contracting the loan, but they provide an upper bound for guaranteed SOE debt: as of end-2005, the stock exceeded 1¾ percent of GDP. In 2006, the budget provided for guarantees to SOEs for about ¼ percent of GDP.

- **There are significant fiscal linkages between Ukraine's SOEs and the general government.** First, direct gross annual inflows from SOEs to the budget are large. SOEs contribute an important share of tax collections (partial official figures suggest that, in

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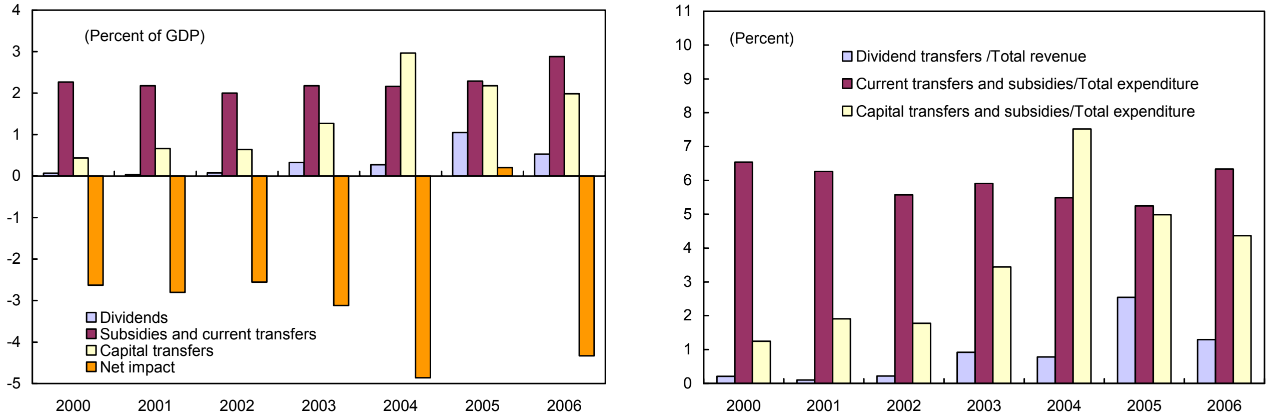
[19] Naftogaz's 2005 financial statement notes that the Ministry of Fuel and Energy provided a letter to support negotiation of a syndicated loan by Naftogaz in 2006, for US$260 million.

2005, remittance of current taxes was at least 5 percent of GDP, some 15 percent of total tax revenues), although accumulation of tax arrears has been frequent in the past.[20] In addition, dividend transfers from SOEs have gained importance over time, both as a share of GDP and in terms of government revenues (Figure I.7). Second, gross transfers from the budget to SOEs have grown recently, to about 5½ percent of GDP in 2005-06.

- **Key elements of the fiscal relation between SOEs and the government are discretionary.** Notably, the policy for SOE dividend transfers to the budget is insufficiently clear. Transfer requirements have been constantly modified by the Cabinet of Ministers, enforcement has been poor (World Bank, 2006),[21] and vagueness in the framework has led to disputes.[22] The same tax regime applies for the private sector and SOEs, but exceptions exist in practice. For example, Naftogaz enjoyed a special VAT zero-rate on imports and sales of gas to intermediate consumers before 2006.[23] Further, the enforcement of SOE tax collection is weak, partly due to the inability of the State Tax Administration to seize assets from key SOEs (ABN AMRO, 2004).

Figure I.7. Ukraine: Impact of SOEs on the General Government Balance



Sources: Ukrainian authorities; and staff estimates.

Financial conditions

50. **State enterprises' financial conditions are closely linked to the macro-fiscal risks they may generate.** The risk-assessment framework calls for evaluating standardized

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[20] Information on the total stock of tax arrears from SOEs is not available.

[21] Profit transfers of 15 percent were required in 2003; but the 2006 financial plans suggest that transfers will be, on average, some 50 percent of the companies' net profits.

[22] For joint stock companies, it is under discussion whether profit transfers should be made on the basis of the consolidated financial results or on the basis of the net profits of the parent and subsidiary firms separately.

[23] This regime sought to curtail Naftogaz arrears by shifting the tax liability to the final consumers.

indicators, including profitability, net income, and creditworthiness. Data availability in this area is very limited, both for specific SOEs, as well as for the aggregate. However, existing figures suggest a mixed picture, hinting at a build up of risks (Figure I.7).

- **Ukraine's SOE performance has been generally weak.** The *kazenni*, for example, have long been loss-making enterprises, owing both to their tight dependence on the availability of state orders, and the lack of market incentives they face. Ordinary SOE performance has suffered in the absence of a well-thought incentive scheme for managers, imperfect reporting standards, and monitoring at the ministerial level. There is a relatively high incidence of bankruptcy in SOEs—25 corporations with state share exceeding 25 percent went bankrupt in the first half of 2002 alone (Leonov and Zhuk, 2005).

- **Key indicators suggest weakening financial outturns for the aggregate of the SOEs going forward.** Available official data on a subset of SOEs suggests, for example, than in 2005 the ratio of net profits over turnover reached only 3½ percent—well below the authorities' planned ratio of 6½ percent. For 2006, financial plans agreed between the State Government nearly 3,000 SOEs (excluding state monopolies) project a ratio of net profits over turnover of 3½ percent, adjusted to the weaker outturn observed in the previous year. Moreover, the 2006 financial plans envisage some 180 SOEs to have either net losses or balanced profits by end-year (most of these are in the coal sector).

51. **Indicators for corporations and holding companies eligible for privatization also point at a mix performance and growing risks in 2004-06 (Table I.5):**

- **Despite a reduction in the net accounts payable, overall indebtedness increased.** Net account payable rose in 2004-05, but the firms' position improved in the first quarter of 2006—with a reduction of some US$85 million. The net payable overdue accounts also fell in early 2006, as did wage arrears. But a broader measure of indebtedness—the ratio of total liabilities over assets—suggests that the net obligations continue on a rising trend.

- **Tax compliance has deteriorated marginally.** The share of tax arrears over tax liabilities rose from 9 to 11 percent between 2004 and 2005, and from 38 to 40 percent between the first quarter of 2005 and the first quarter of 2006.

- **Net worth has declined.** Despite the improvement in net accounts payable, net worth has dropped slightly, by about US$100 million in 2004-05 and the first quarter of 2006. The reduction is driven by a large reduction in fixed assets owned by the sector—of some US$200 million—while liabilities have remained roughly constant at US$2.3 billion.

Table I.5. Broad indicators, Enterprises with a Government Share Participation 1/

	In millions of hryvnias				In millions of U.S. dollars			
	2004	2005	2005 Q1	2006 Q1	2004	2005	2005 Q1	2006 Q1
Net income	12,146	12,919	3,367	2,836	2,283	2,521	635	562
Pre-tax income	860	1,042	102	137	162	203	19	27
Net Profit	214	476	-28	49	40	93	-5	10
Accounts payable	6,633	7,129	6,625	6,639	1,247	1,391	1,250	1,315
Accounts payable, overdue	4,234	4,131	4,047	3,949	796	806	764	782
Accounts receivable	2,402	2,280	2,511	2,285	452	445	474	453
Accounts receivable, overdue	536	514	607	495	101	100	115	98
Net accounts payable	4,231	4,849	4,114	4,354	795	946	776	862
Net accounts payable overdue	3,698	3,617	3,440	3,453	695	706	649	684
Accrued taxes	3,013	3,101	801	669	566	605	151	132
Overdue taxes	275	328	306	266	52	64	58	53
Wage arrears	67	31	65	25	13	6	12	5
Liabilities	10,651	12,130	10,608	11,634	2,002	2,367	2,002	2,304
Fixed assets	10,953	11,539	10,658	10,724	2,059	2,252	2,011	2,124
Operating assets	4,988	6,421	4,872	6,339	938	1,253	919	1,255
Long-term financial investment	2,752	2,031	2,717	1,972	517	396	513	390
Net worth	11,019	10,640	10,617	9,991	2,072	2,076	2,004	1,978
Key indicators								
Profitability 2/	1.9	4.5	-0.3	0.5	...	...	...	...
Indebtedness 3/	66.8	67.5	68.3	68.2	...	...	...	...
Return to investment 4/	441.4	636.1	124.0	143.9	...	...	...	...
Memorandum								
Number of enterprises	1,405	1,316	...	1,142	...	...	...	...
Number of employees	196,199	174,411	189,710	...	...	...	...	...
Exchange rate (average)	...	...	...	...	5.3	5.1	5.3	5.1

Source: State Property Fund.

1/ Includes corporations and holding companies with government share of 50 percent or more.
2/ Net profit over net worth.
3/ Liabilties over assets.
4/ Long-term financial investment over net income.

Governance structure

52. **Despite efforts to strengthen SOE oversight and monitoring in Ukraine, weaknesses and fragmentation remain:**

- **There is no higher entity with full oversight of the SOE sector.** The State Property Fund (SPF) manages all state property undergoing privatization. Key strategic firms, such as Naftogaz, remain under direct responsibility of the Cabinet of Ministers. Other state property (such as the *kazenni* and ordinary SOEs) are under the control of ministries and other bodies, which can grant SOE status, reorganize and liquidate state property, and appoint the management independently. The Ministry of Economy is responsible for evaluating SOE performance, but this is not done consistently or thoroughly for all enterprises, or with enough frequency (IMF, 2004; World Bank, 2006).

- **The mechanisms for financial planning and monitoring of SOEs are gradually improving, but key weaknesses persist.** The Economic Code (Article 75) mandates

SOEs to prepare annual and quarterly financial plans, which they submit to the ministries or government bodies that have direct oversight responsibility. Since March 2006, the Ministry of Finance has the explicit mandate to coordinate and agree the financial plans; however, data coverage and content requirements have been continuously modified, and there have been significant delays in the agreement of the plans. This has made performance monitoring by the Ministry of Economy difficult. Further, while SOEs may issue debt on domestic and international markets without prior government approval, they have only recently been required to submit detailed information on their assets and liabilities to the state authority.

- **Efforts are being made to strengthen the audit of SOEs.** In January 2006, amendments to the state auditing law granted authority to the central internal audit body (KRU) to undertake financial and performance audits of SOEs. The KRU is developing methodologies and preparing a work program to audit and strengthen SOE oversight, although this is not fully consistent with the public internal financial control concept adopted as the KRU's long term goal (World Bank, 2006). The Accounting Chamber (SAI) also has authority to audit the SOE's use of budget funds. Finally, independent audits by reputable agencies have started for a few major SOEs participating in international capital markets (including Naftogaz), but these are not mandated by law.

- **The SOE regulatory framework is being strengthened, but some weaknesses may still endanger minority rights.** The Economic Code provides for various types of legal entities, including SOEs (Chapters 8 and 12). Until recently, regulations had important loopholes which led to asset-stripping practices (Leonov and Zhuk, 2005). Public state-owned corporations and state-owned holdings are subject to the general corporate legal framework, but this remains incomplete and ambiguous, and prone to inconsistencies in judicial interpretation (ABN AMRO, 2004). Finally, the inability to seize assets from SOEs continues to raise creditors' risk and minority rights. New laws on holding companies and state property management were approved in 2006, but their full effectiveness remains to be seen.

Other risk factors

53. **Other factors, related to 'strategic importance' may heighten macro-fiscal risks.** The existence of key enterprises, with high turnover and employed labor, creates incentives for the government to protect them in case of failure. For instance, the turnover of Naftogaz (close to 12½ percent of GDP), the size of its labor force (some 172,000 employees) and its central role in the gas market may lead to special attention.

Appendix I.1

Table I.A.1. Key GEM-Energy-Ukraine model parameters

Parameter	GEM-energy-UKR	
	RoW 1/	Home
Production parameters		
Capital share in nontradables	0.290	0.290
Capital share in tradables	0.350	0.350
Energy share in nontradables	0.022	0.062
Energy share in tradables	0.024	0.067
Land share	0.125	0.087
Share of energy in final good	0.035	0.088
Elasticities of substitution		
Nontradable production	1.000	1.000
Tradable production	1.000	1.000
Oil production	0.980	0.200
Domestic and foreign energy, nontradables	100	100
Domestic and foreign energy, tradables	100	100
Energy and tradables in final good	0.175	0.150
Home and foreign energy	10	10
Input substitution	100	100
Home bias		
Nontradable production energy demand	1.00	0.18
Tradable production energy demand	1.00	0.18
Energy in final good	1.00	0.33
Costs		
Adjustment cost on energy in nontradables production	200	200
Adjustment cost on energy in tradables production	200	200
Distribution of energy to intermediate goods producers	0.33	0.33
Distribution of energy to final goods producers	0.33	0.33
Country size	0.98	0.02

Sources: IMF staff estimates.

1/ Rest of world, comprising the CIS states, EU new member states and EU periphery (Southeast Europe and Turkey).

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II. MONETARY AND EXCHANGE RATE POLICY FRAMEWORK—WHERE TO GO FROM HERE?

Core Questions, Issues, and Findings

- **How well is the hryvnia aligned with external fundamentals?** In 2004, with the current-account surplus rising to some 10 percent of GDP, the hryvnia was viewed as significantly undervalued. This chapter's reassessment—based on more recent data and using the macroeconomic balance approach—suggests that the hryvnia's real effective undervaluation has narrowed sharply (¶61−66).

- **Where is Ukraine's real exchange rate likely headed over the longer term?** Results based on dollar-wage and purchasing-power-parity comparisons suggest that—as Ukraine's per capita income catches up to levels in more advanced economies—its real effective exchange rate should appreciate substantially (¶71−76).

- **Why has Ukraine developed a strong affinity for its de facto peg?** After the 1998 financial crisis, policy credibility was low, and the *de facto* peg served well as a monetary anchor. With a benign external environment and generally supporting incomes and fiscal policies, the peg became associated with a period of rapid real growth, while widespread dollarization underpins a fear-of-floating culture (¶81−84).

- **What would it take to make the peg work in Ukraine's changing macroeconomic setting?** The key requirements would be a fiscal policy oriented toward maintaining internal balance combined with a high degree of real wage and price flexibility to facilitate adjustment to shocks to external competitiveness (¶86−90).

- **What are the attractions of a more flexible exchange-rate regime in Ukraine's changing macroeconomic setting?** A more flexible exchange rate would help the NBU gain better control over inflation and facilitate adjustment to external shocks. Greater variability of the exchange rate should also discourage dollarization and excessive risk taking by unhedged borrowers (¶96−97).

- **Is the time auspicious for a move to a new monetary framework?** Domestic and external conditions seem supportive: international reserve levels are comfortable, the exchange rate is better aligned with fundamentals, fiscal and incomes policies are set to tighten over the medium term, and conditions in international markets are benign. Moreover, the NBU has already advanced technical preparations toward introducing inflation targeting. However, the government needs to provide the NBU with a clearer mandate to pursue price stability as its main objective and spur domestic financial market development (¶98−99).

54. **Ukraine's monetary and exchange rate policy framework is at a crossroads.** What constitutes an appropriate monetary and exchange rate policy framework for Ukraine has been the subject of a long-standing debate.[24] Over the last few years, agreement has been reached in principle that Ukraine would benefit from shifting to a more flexible exchange rate and a monetary framework based on inflation targeting. But the appropriate pace for transition to a new framework remains controversial. At the same time, the debate has acquired new urgency given Ukraine's rapidly changing external environment—see, for example, Chapter I on energy price shocks.

55. **This chapter's first section re-assesses Ukraine's equilibrium exchange rate mainly based on the macroeconomic balance approach.** Ukraine's equilibrium exchange rate was last comprehensively assessed in the context of the 2004 Article IV consultation, but much has changed since. With the current-account surplus in 2004 having been projected to rise to some 10 percent of GDP, the analysis at that time pointed to a clear-cut case of substantial real undervaluation of the hryvnia. Since 2004, Ukraine's external position has re-balanced substantially, and this section reviews recent external developments. The section's re-assessment is mainly based on the IMF's macroeconomic balance approach, but also cross-checked with purchasing-power-parity (PPP) and dollar-wage comparisons.

56. **The chapter's second section provides an account of the monetary framework debate.** It first summarizes the current framework's achievements and shortcomings, and then looks at traditional criteria for determining whether a peg or float fits Ukraine's economic characteristics. After discussing the rather stringent policy requirements needed to make the peg work in Ukraine going forward, the section discusses alternative monetary policy strategies under a flexible exchange-rate regime: targeting a monetary aggregate and targeting inflation. The section make a case for inflation targeting as the framework that would be best suited for Ukraine to deal with future challenges. The section concludes by describing the state of the NBU's preparations for inflation targeting and the further steps needed for the transition.

A. Ukraine's Equilibrium Exchange Rate Reconsidered[25]

Recent External Sector Developments

57. **Ukraine's real effective exchange rate (REER) has been appreciating of late, after a long period without a trend.** The recent appreciation is more pronounced when measured by the GDP deflator or unit labor costs, and has essentially returned the REER to levels not seen since prior to the 1998 financial crisis (Figure II.1). Looking at the source of

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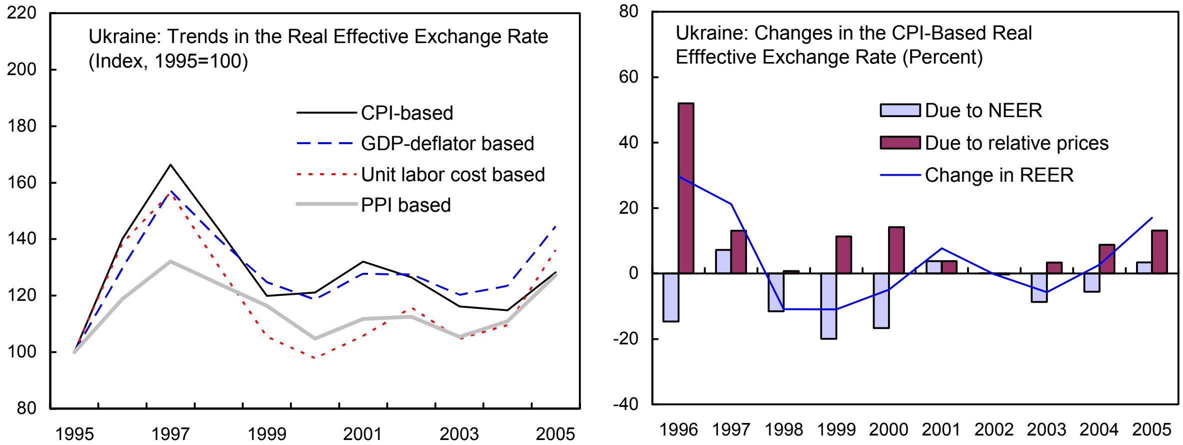
[24] See *Ukraine: Ex Post Assessment of Long-term Use of Fund Resources* (2005), Box 9, for a sketch of the debate on the exchange rate regime between the Ukrainian authorities and the IMF since 1995.

[25] Prepared by Ioannis Halikias and Mark Flanagan.

shifts, with the exchange rate *de facto* pegged to the U.S. dollar since 2000, and Russia also limiting movements of its currency against the dollar, movements in the nominal effective exchange rate have been relatively small. The key factor of late has been high inflation in Ukraine relative to its trading partners.

Figure II.1. Ukraine: Real Effective Exchange Rate Developments



Sources: National Bank of Ukraine; and staff estimates.

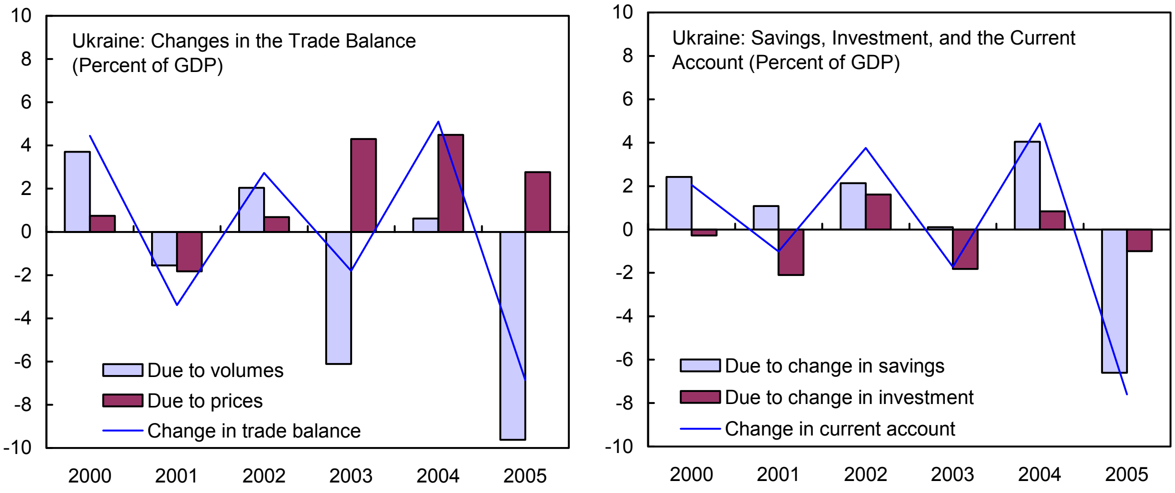
58. **The current account has recently swung widely.** It rose to a surplus of over 10 percent of GDP in 2004, only to dive into deficit of 2 percent of GDP during the first half of 2006. Disaggregations are revealing:

- The income and transfer balance components of the current account have improved steadily by about 1½ percent of GDP since 2000, largely due to higher remittances from Ukrainians working abroad.

- Looking at the trade balance for goods and services (Figure II.2, left panel), shifts in trade prices have been important: the price of Ukraine's major export, steel, rose markedly over the period. However, the dominant factor has been changes in volumes. In the period 2000-02, these can be well explained by real effective exchange-rate movements and by differences between partner import growth and Ukraine's domestic demand growth. The fit is much poorer thereafter, raising questions about the quality of the trade data, an issue discussed in Appendix I.

- Alternatively, tracing changes in the current account to shifts in savings and investment offers some clues about the driving forces behind more recent sharp shifts. The current account swings in 2004-05 were largely driven by shifts in domestic savings (Figure II.2, right panel). These in turn are likely linked to major changes in fiscal and incomes policies, which resulted in the transfer of large amounts of income from high savers (businesses) to heavy spenders (pensioners and wage earners).

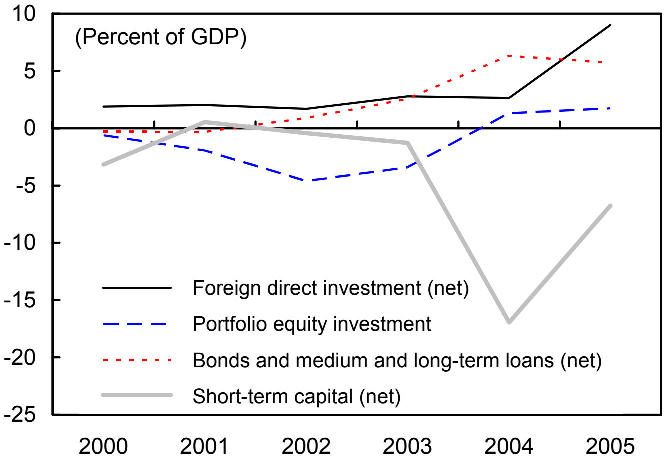
Figure II.2. Ukraine: Evolution of the Trade Balance and Current Account



Sources: National Bank of Ukraine; and staff estimates.

59. **The capital account has improved markedly since 2003** (Figure II.3). Direct investment has especially risen, reflecting large privatizations in 2004-05. Portfolio investment and bonds and medium-term loans have also ratcheted up since 2002, in the latter case reflecting both private and public sector borrowing. The inflows reflect benign world financial markets, but also appear to have an internal demand driven component: Ukraine's banks are seeking funding abroad as they step up foreign-exchange lending to the private sector, particularly for mortgages and car loans (see Chapter III for discussion). Inflows have, however, been partly offset by short-term capital outflows. These are a residual, and thus include all unclassified items. They are thought to reflect the public's demand for foreign-currency cash, as well as capital flight.

Figure II.3. Ukraine: Capital Flows

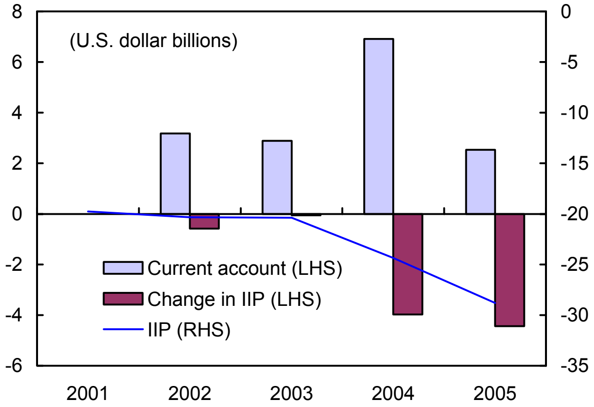


Source: National Bank of Ukraine.

60. **Ukraine's net international position should be improving, but the data tell another story**. Recent current and capital account surpluses have been reflected in a build-up of foreign-exchange reserves, to almost $19 billion (4½ months of import cover) by end-2005. Moreover, the IMF's World Economic Outlook classifies Ukraine as one of the few transition economies that have a net external credit position (i.e., positive cumulative current

account balances since 1992). However, Ukraine's officially measured international investment position (IIP) remains sharply negative, and has been rising of late (Figure II.4). The problem appears to stem from capital flight and foreign-currency cash accumulation, which lead to build up of external assets that are not well captured in IIP measurements. Appendix I reviews problems with Ukraine's IIP data.

Figure II.4. Ukraine: Net International Investment Position

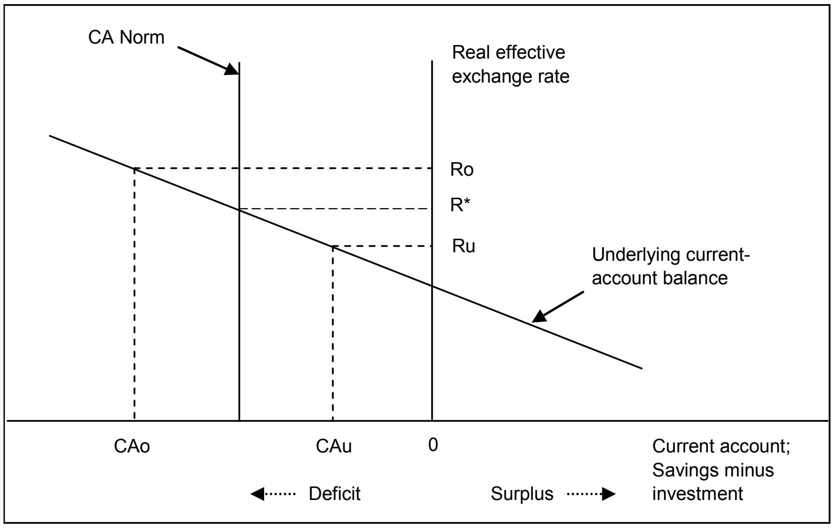


Source: National Bank of Ukraine.

The Macroeconomic Balance Approach

61. **Implementing the macroeconomic balance approach requires three pieces of information** (Figure II.5).[26] First, an estimate of the level of the current account consistent with external balance over the medium term—the so-called current account (CA) norm. Second, an estimate of the level of the current account consistent with internal balance over the medium term—the underlying current account. And third, an estimate of the responsiveness of the current account to the real effective exchange rate over the medium term. To illustrate, for a country with current account deficit CA_u (at real exchange rate R_u), and with a CA norm as depicted in Figure II.5, the real exchange rate would need to appreciate to R* to achieve both external and internal balance. Obviously, there are manifold uncertainties involved in making such estimates. Moreover, in a transition economy like Ukraine, the information needed to establish the equilibrium exchange rate may undergo significant changes over time, for example in the case of large terms-of-trade shocks or significant shifts in fiscal policy. Finally, it may or may not be the case that the estimated CA norm is sustainable, and thus estimates need to be cross-checked for their external sustainability implications.

Figure II.5. Medium-Run Real Exchange Rate Fundamentals


CA Norm
Real effective exchange rate
Ro
R*
Ru
Underlying current-account balance
CAo
CAu
0
Current account; Savings minus investment
◀······ Deficit
Surplus ······▶

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[26] See Isard and Faruqee (1998) and Isard, Faruqee, Kincaid and Fetherston (2001) for full expositions.

Estimating the current-account norm for Ukraine

62. **The explanatory variables that go into the estimation of Ukraine's current account norm are designed to capture the fundamental determinants of savings and investmen**t (see Appendix II, Table II.A.2 for a listing of data sources and transformations):

- **Fiscal balance:** In the absence of full Ricardian equivalence, an improvement in the fiscal balance should raise national saving and improve the current account (see Chinn, 2005 for empirical evidence on this point).
- **Foreign direct investment:** Higher FDI inflows should allow a lower current account balance, either on sustainability grounds or by directly boosting imports.
- **Relative income levels:** Economies lagging in per capita income have higher investment needs that should be reflected in a lower current account balance, while convergence-related growth can facilitate external debt servicing.
- **Demographic variables:** A higher share of the economically inactive population would be expected to lower medium-term saving and the current account balance (see Higgins, 1998).
- **Energy balance:** A sustained increase in energy prices represents an exogenous terms-of-trade shock. This could lower the medium-term current account balance for a net energy importer (e.g. Ukraine).[27]
- **Foreign-exchange reserve coverage:** Under a pegged exchange-rate regime, higher reserves should allow a lower current account balance on sustainability grounds, but the direction of impact is less clear under a float. On the other hand, higher reserves could imply larger interest receipts, pointing to a higher current account balance.[28]
- **Other variables.** Better *governance* and prospective *EU membership* could open the door to a lower risk premium and higher investment.

63. **The estimated current account model covers the period 1994-2005 and uses annual data on 46 countries**. The sample is about evenly split between industrial and transition economies; such broad coverage allows one to exploit substantial cross-country

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[27] The energy balance (as a share of GDP) is used rather than energy prices to help distinguish the impact on the current account between net energy importers and exporters.

[28] To avoid causality problems, lagged reserve coverage is used for estimation purposes. Net foreign assets can best capture solvency considerations and have been widely used in empirical work—see Lane and Milesi-Ferretti (2002) and Chinn and Prasad (2003). Data limitations—explained in Appendix I—preclude the use of this variable here.

variation. The estimation was done in levels using standard least-squares panel techniques. The panel is estimated incorporating fixed effects: while fixed effects could end up capturing mostly cross-country variation in the data, they help mitigate possible omitted variable bias, which may be a problem in a pooled estimation.

64. **The estimation results seem reasonable, and broadly in line with previous empirical work** (Table II.1). The equation fit is good, with an adjusted R^2 of 54 percent, while most parameters of interest are correctly signed, and statistically as well as economically significant. Improvements in the fiscal and energy balances of 1 percent of GDP produce 0.4 and 0.2 percent of GDP improvements in the CA norm. Increased FDI flows of 1 percent of GDP reduce it by ¼ percent of GDP. An extra month of reserve coverage raises the CA norm by 0.1 percent of GDP. Demographic variables turn out borderline significant, yet correctly signed and with non-negligible explanatory power: an increase in the old age dependency ratio and in population growth of 1 percent produce 0.15 and 0.1 percent of GDP deteriorations in the CA norm. However, the relative GDP variable is not statistically significant and is wrongly signed. This has been a typical finding in previous work, with the impact of relative GDP likely absorbed by the country-specific fixed effect due to its limited time variation over short samples.[29]

Table II.1. Model of Current Account Norm

Variable	Fixed effects estimation 1/
Fiscal balance	0.370 ***
FDI	-0.234 ***
Relative GDP	-0.093
Dependency	-0.142 **
Pop. Growth	-0.095 *
Energy balance	0.206 **
Reserve coverage	0.093 *
Constant	4.959
Adjusted R-squared	0.539

Source: IMF staff estimates.
1/ A *, **, ***, indicates significance at the 10, 5, and 1 percent levels, based on standard errors corrected for serial correlation.

65. **Ukraine's estimated current account norm has been consistently in deficit over the estimation period, and is projected to remain so in 2006** (Figure II.6, first panel). From 1996 to 2004, the deficit norm is estimated to have been moderate, without a trend, and ranging between 1¼ and 2½ percent of GDP (95 percent confidence intervals do not rule out that the norm could have been close to a balance, or as much as a 4 percent of GDP deficit during this period). During 2004-06, point estimates suggest that the deficit norm increased, peaking at over 4¼ percent of GDP. Looking at the evolution of the main explanatory variables between the 2002 norm trough and its 2005 peak, the main contributors to the increase are FDI, the fiscal position, the old-age dependency ratio, and the energy balance. Population growth and reserve coverage provided partial offsets.

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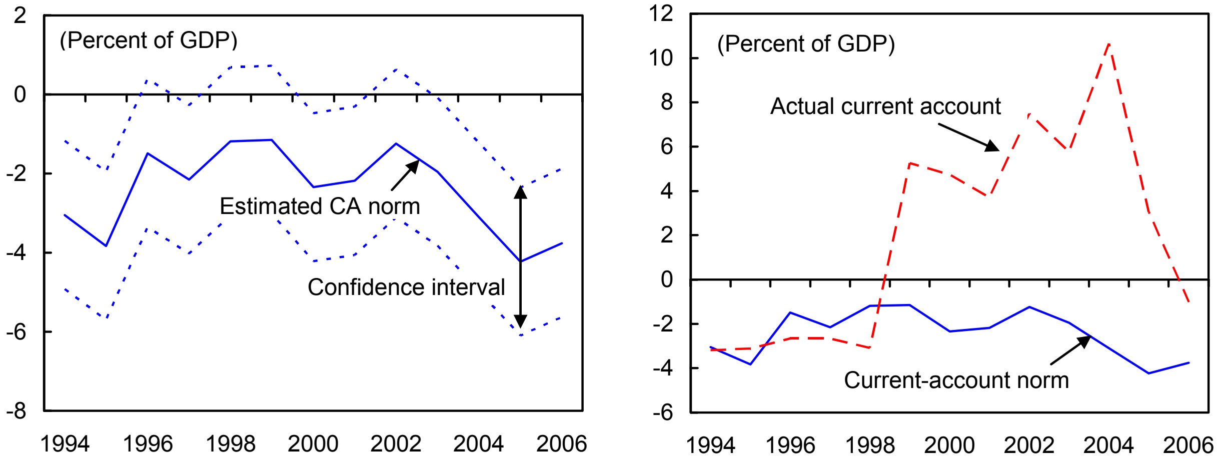
[29] Other variables were dropped from the final specification due to low explanatory power (low statistical or economic significance).

Figure II.6. Ukraine: The Current-Account Norm



Source: Staff estimates.

66. **A comparison of Ukraine's norm and actual current accounts provides a rough indication of the degree of the hryvnia's misalignment during the estimation period** (Figure II.6, second panel). On this basis, it would appear that prior to the 1998 financial crisis the hryvnia was close to equilibrium and may even have become somewhat overvalued. In the crisis aftermath, a large gap opened between the actual and norm current accounts, indicating a substantial overshoot relative to equilibrium. In the context of the *de facto* peg at the new depreciated exchange rate, the currency appears to have remained substantially undervalued. Only in 2005-06 did a major correction of this misalignment take place.

Real exchange rate assessment

67. **Quantitative estimates of real exchange-rate misalignment can be derived using the current account norm and by taking two further steps**. First, an estimate of the underlying current account is needed. This is the actual current account adjusted for the impact of past real exchange-rate changes and corrected for the economy's cyclical position (i.e. the deviation of actual from potential output in both Ukraine and its trading partners). Second, the change in the real exchange rate needed to bring the underlying current account into line with the current account norm must be estimated. This will depend on the responsiveness of import and export volumes to real exchange-rate changes.

68. **Preliminary results from applying the macro balance approach suggest that the hryvnia remains somewhat undervalued.** Staff projects a current account deficit of about 0.2 percent of GDP and an current account norm of 3 percent in 2006 (reflecting the return of FDI to more normal levels, reserve accumulation, and fiscal consolidation, which more than offset continued deterioration of the energy balance). We take the underlying current account to be the actual current account, since there are no well-defined cyclical fluctuations in Ukrainian time-series data, and since there is high uncertainty about lagged exchange-rate effects. Staff estimates for Ukraine suggest that a 1 percent real exchange-rate change will

produce a 0.4 to 0.6 percent increase in the volume of exports and a -0.2 to -0.3 percent decrease for the volume of imports.[30] At the same time, there is reason to assume that the terms of trade would not be affected by exchange-rate movements: the commodity composition of Ukraine's trade suggest local currency pricing for exports and producer currency pricing for imports are reasonable assumptions. Thus, a real appreciation of between 3 and 15 percent would eliminate the projected 2.8 percent of GDP gap (Table II.2).

Table II.2. Ukraine: Real Exchange Rate Assessment

	Elasticity 1/	2006	
		CA norm: lower bound	CA norm upper bound
		(Percent of GDP)	
Current-account norm	...	-1.89	-5.63
Projected current account	...	-1.04	-1.04
Change in current account to reach norm	...	-0.85	-4.59
of which:			
From change in export volumes	0.50	-0.55	-2.96
From change in import volumes	-0.25	-0.30	-1.63
From change in export prices	0.00	0.00	0.00
From change in import prices	0.00	0.00	0.00
		(Percent)	
Change in REER needed to reach norm 2/	...	-2.75	-14.80

Source: Staff estimates.
1/ Mid-point of elasticity range.
2/ A negative sign signals an appreciation.

69. **Looking forward, the extent of real exchange-rate misalignment in Ukraine would be expected to change over time**. The CA norm should be affected by rising energy-import prices, or by rising FDI (in both cases shifting it further into deficit). At the same time, the actual current account balance could be affected by declining terms of trade, reflecting, for example, falling steel export prices (steel products account for some 40 percent of Ukraine's exports and prices are presently significantly above their medium-term trend).

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[30] These are long-run elasticities. They need to be treated with caution since (i) the sample period over which they are estimated is short; (ii) there have been large recent changes in Ukraine's geographic and commodity structure of trade; and (iii) there may be non-linear responses in some industries, reflecting rigid production structures.

Cross check for debt sustainability

70. **The estimated CA norm for Ukraine appears sustainable, especially once the level of foreign assets is accounted for.** Assuming medium-term growth averaging around 5 percent and FDI around present levels, Ukraine's gross external debt ratio should steadily fall for any norm within the estimated confidence interval (Table II.3). Levels of debt, even under the lower bound for the deficit norm, should fall back to about 31 percent of GDP. Using a measure of net foreign assets would provide for an even more favorable calculation, particularly if Ukraine's implicit foreign asset accumulation since 2003 is taken into account, rather than Ukraine's measured IIP.

Table II.3. Ukraine: Sustainability of Current-Account Norm

Scenario	CA norm (deficit) 1/	Debt ratio (2006)	Debt ratio (2016)
	(Percent of GDP)		
Gross debt	1.9	47.9	6.0
	5.6	47.9	31.0
Net debt A 1/	1.9	29.8	-1.0
	5.6	29.8	23.9
Net debt B 2/	1.9	12.0	-8.0
	5.6	12.0	17.0

Source: Staff estimates.
1/ Upper and lower bound of confidence interval.
2/ Initial net debt equal to end-2005 international investment position, plus net current-account change in 2006.
3/ Initial net debt equal to end-2003 international investment position, plus net current-account change in 2004-6.

Assessing Longer-Term Real Exchange-Rate Trends

71. **The macroeconomic balance approach of the previous section cannot address the question of where the real exchange rate is likely to settle in the longer run**. This section briefly addresses this issue, based on two different approaches: a PPP-based methodology, which is fairly straightforward and widely used; and a dollar-wage-based approach.

PPP-based approach

72. **PPP-based measures of the real exchange rate entail a comparison of actual GDP and GDP evaluated at purchasing power parity**. The degree of misalignment is captured by the ratio between actual and PPP-adjusted GDP. The PPP-based approach has the advantage that it allows cross-country comparison of the degree of misalignment, since PPP-adjusted GDP is in theory comparable across countries.[31]

73. **PPP-based measures suggest that the hryvnia is substantially more undervalued than the currencies of other transition economies** (Figure II.7). In 2005, Ukraine's PPP-based real exchange rate suggested a real undervaluation of the hryvnia of about 75 percent, considerably more than in neighboring countries such as Belarus, Russia and Georgia. This

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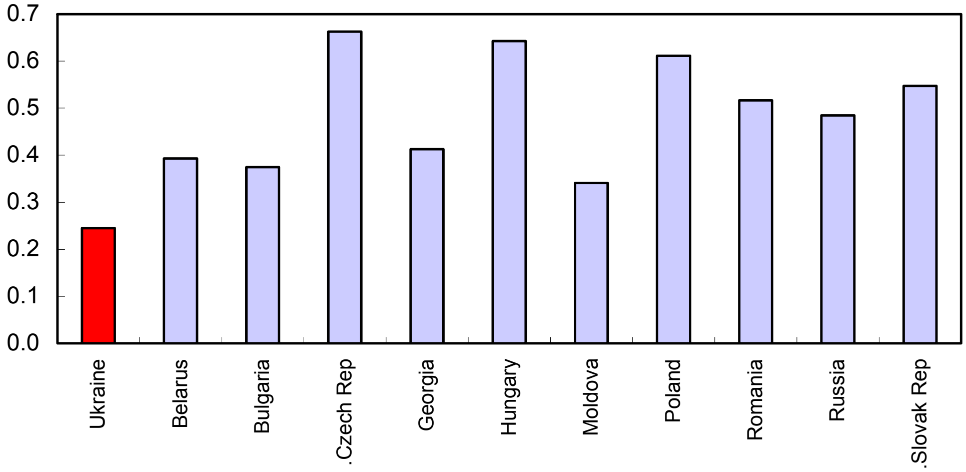
[31] See Cheung, Chinn and Fujii (2006) for a recent application of the approach to China.

divergence appears to have held since 1995. As a point of comparison, the well-known Big Mac index, produced by the Economist magazine (May 22, 2006 issue) suggests an undervaluation of about 45 percent, in line with estimates for Russia and Moldova. Against this backdrop, Box II.1 discusses reasons why a PPP-based misalignment measure may be misleading for Ukraine.

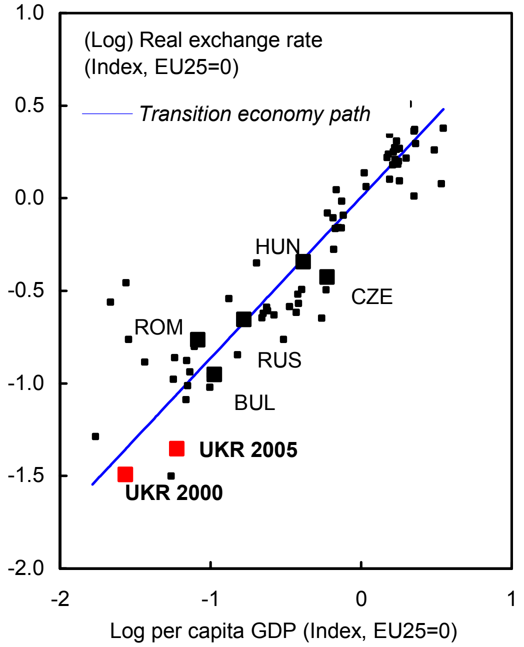
Figure II.7. Transition Economies: Ratio of Actual to PPP-Adjusted GDP



Sources: IMF *International Financial Statistics*; and staff estimates.

74. **Controlling for per-capita income can give a better picture.** A country's real exchange rate should appreciate as per capita GDP rises, since faster wage and productivity growth in the tradables sector should force non-tradable wages and prices to rise, and because income-elastic (and non-tradable) services should be in higher demand. A regression of the real exchange rate on PPP GDP per capita illustrates (Figure II.8). At Ukraine's existing relative per capita income level, its degree of undervaluation would need to decline by only 9 percent to reach the estimated transition-economy path. Thereafter, its degree of undervaluation (as measured by the gap between actual and PPP-adjusted GDP) would be expected to decline by about 0.9 percent for every 1 percent improvement in per capita income. In fact, from 2000 to 2005, only 3⅓ percent of the undervaluation was

Figure II.8. PPP-Based Real Exchange Rate



Sources: IMF *International Financial Statistics*; and staff estimates.

eliminated, and Ukraine moved farther away from the transition path. This perhaps surprising result may reflect the data problems discussed in Box I.1.

Box I.1. Problems with PPP-Based Measures of GDP in Ukraine

PPP-based measures of GDP are constructed by revaluing a country's output at international reference prices. Between revaluation exercises, updated estimates are constructed assuming that the production structure remains the same (that is, by using real growth in the particular economy, along with growth in the reference prices). Problems can arise because: (i) the prices for domestic output may be initially mismeasured; and (ii) the basket of goods may initially be or become incorrect (with too little weight placed on goods with prices closer to world prices). The farther away from the revaluation exercise one gets, the more likely a problem can arise, as economic changes accumulate.

Looking at Ukraine since 2000, the date of the last revaluation exercise, a key problem seems to be the production basket. Specifically, since 2000, the share of unliberalized agriculture in GDP has declined by 3 percentage points, while the share of the liberalized trade and transport sectors have risen by almost 6 percent of GDP. Industry's share has been stable, but the growth rates in industries subject to heavy price control—energy (coal) mining and communal services—have cumulatively amounted to only 15 and 8½ percent. Meanwhile the growth rates in the chemical, metals and machine building industries, large export-oriented sectors where world prices are the norm, have amounted to 88, 67 and 184 percent respectively.

The changes in Ukraine's production basket imply that PPP-based measures of GDP could be overstated. With more of GDP than assumed at prices close to world levels, the PPP mark-up becomes too high.

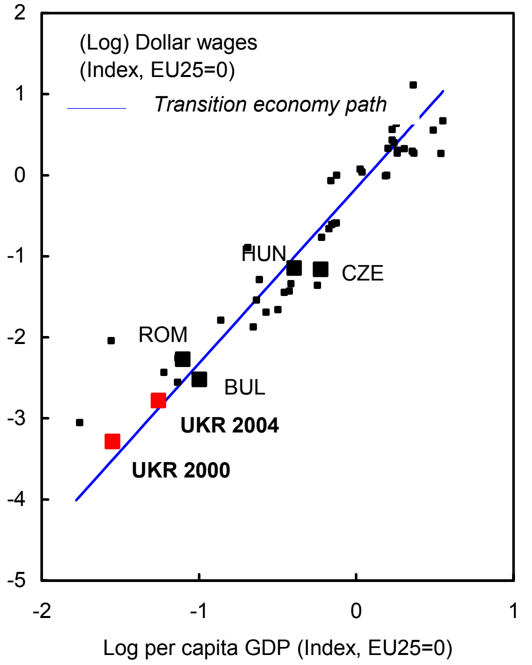
Dollar-wage approach

75. **Dollar-wage-based measures of the real exchange rate rely on a comparison of actual with estimated equilibrium real wages**. The equilibrium level of dollar wages is specified as a function of a number of productivity variables: the country's per capita income, the capital stock, and its level of development. If the actual dollar wage falls short of the equilibrium level, this suggests that the wage rate was "overly" competitive, implying by extension an exchange rate undervalued in real terms, with the degree of undervaluation

captured by the ratio of the actual to the equilibrium dollar wage. The dollar-wage approach was the basis for the last comprehensive IMF assessment of Ukraine's competitiveness.[32]

76. **The simple relationship between dollar wages and per capita income illustrates the broader approach, and provides a point of comparison with PPP-based estimates** (Figure II.9). In this measurement, Ukraine's dollar wages are only 6¼ percent of the EU25 average, suggesting massive real exchange-rate undervaluation from a longer term perspective. However, in both 2000 and 2004, Ukraine's dollar wages have been broadly in line with the estimated transition economy convergence path (which entails dollar wage growth, and real appreciation, of about 1¾ percent per 1 percent increase in PPP-adjusted per capita GDP). By this perspective, the valuation of the hryvnia has been and remains consistent with past transition economy experience and, in this narrow sense, appropriate.

Figure II.9. Dollar-Wage Real Exchange Rate



Sources: ILO; and staff estimates.

B. What Monetary Policy Framework Fits Ukraine?[33]

Ukraine's Present Monetary Policy Framework

77. **The exchange rate to the U.S. dollar has served as the nominal anchor in Ukraine.** Since June 2000, the official exchange rate has moved only very gradually from Hrv/US$ 5.45 to Hrv/US$ 5.05 with the biggest change occurring in April 2005, when the hryvnia appreciated by 4.6 percent. For most of the period, the rate was left unchanged (Figure II.10). The role of the exchange rate as a monetary anchor goes back even further to mid-1996, when the NBU first introduced a band around the U.S. dollar but had to widen and

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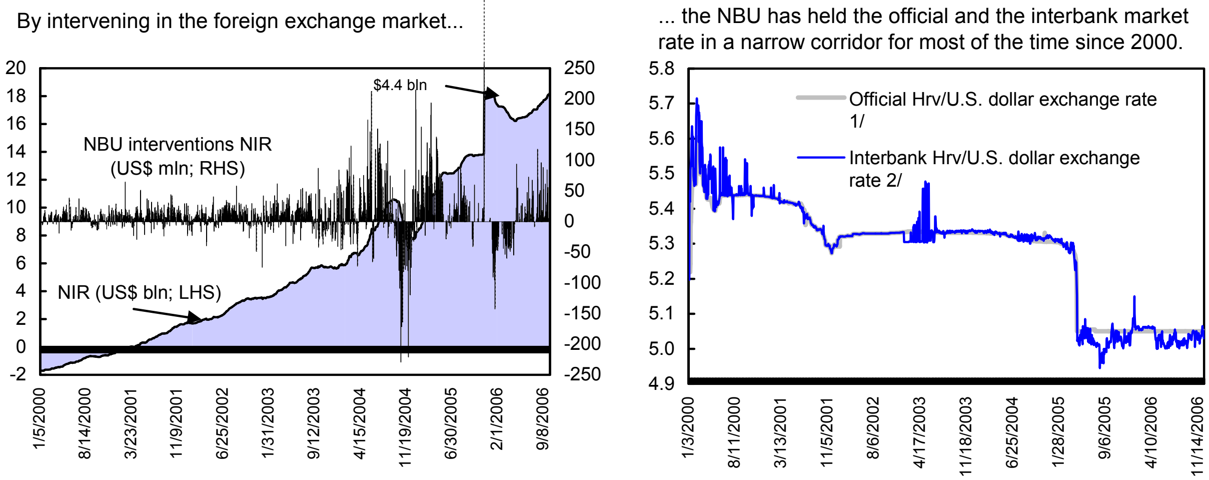
[32] See Tiffin (2004), which in turn builds on previous cross-country work on transition economies in Krajnyák and Zettelmeyer (1998).

[33] Prepared by Andrea Schaechter.

shift it upwards during the 1998-2000 financial crisis. Thus, except for a brief period of a (forced) float in late 1999, monetary policy has targeted the exchange rate for more than a decade.

Figure II.10. Ukraine: The Hrynia/U.S. Dollar Exchange Rate, 2000-06


By intervening in the foreign exchange market...

... the NBU has held the official and the interbank market rate in a narrow corridor for most of the time since 2000.

Sources: National Bank of Ukraine; Bloomberg; and staff estimates.
1/ Determined daily by the NBU, but not necessarily identical with the rate at which the NBU intervenes in the market.
2// Average rate for interbank transactions.

78. **Despite slightly greater nominal exchange-rate flexibility since April 2005, the exchange-rate regime still exhibits the characteristics of a de facto peg.** Since the step revaluation in April 2005, the NBU has held the official rate constant at Hrv/US$ 5.05, except for a short period, from May 31 to July 18, 2005, in which it set the rate at Hrv/US$ 5.055. The interbank exchange rate was allowed to deviate from the official rate by up to 2 percent until September 2005, when the NBU started to target a 1 percent corridor of Hrv/US$ 5.00-5.06 (Figure II.10). Larger fluctuations occurred only sporadically. With an official and de facto corridor of less than 2 percent, the current exchange-rate regime is considered a de facto peg under the IMF's official classification of exchange-rate regimes.[34]

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[34] The IMF *Annual Report on Exchange Arrangements and Exchange Restrictions* provides the classification of exchange rate regimes.

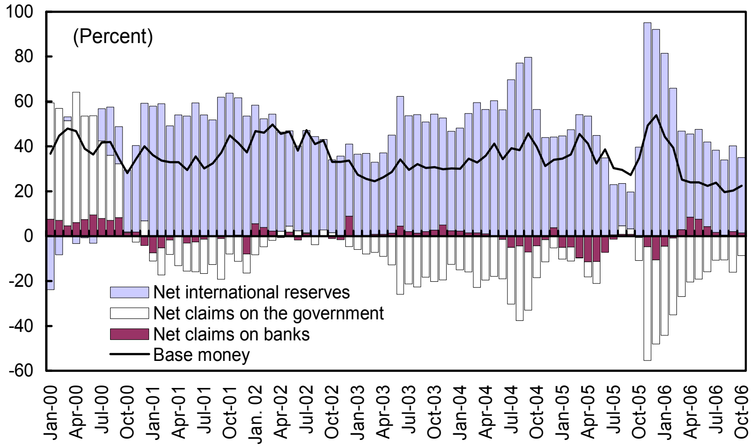
79. **Officially, the peg has been complemented by targets for monetary aggregates, but, in practice, the peg has taken precedence over those targets.** Projected paths for base and broad money have been laid out in the NBU's annual *Monetary Policy Guidelines* (Table II.4). Since for most of the time, base money growth was driven by the NBU's foreign exchange interventions and the government's financing requirements—with little active liquidity management by the NBU (Figure II.11, Table II.5)[35]—base money targets were frequently missed. But despite, at times, deviations from target, the NBU was able to contain inflation to below 15 percent as remonetization was much faster and stronger than predicted.

Table II. 4. Ukraine: Base Money Targets
(Percent change)

	Original Targets 1/	Revised Targets 2/	Outcome
2005 3/	20-26	38-43	53.9
2004 4/	26-32	51-56	34.1
2003	17-20	38-42	30.1
2002	11-13	32-36	33.6
2001	12	18-19	37.4

Sources: National Bank of Ukraine; and IMF *International* Financial Statistics.
1/ Set in *Monetary Policy Guidelines* in Sept. of previous year.
2/ Revised in Sept. of current year.
3/ Revision in Nov. 2005 to 50-55 percent.
4/ Revision in Dec. 2004 to 34-40 percent.

Figure II. 11. Ukraine: Contributions to Base Money Growth



Sources: National Bank of Ukraine; and staff estimates.

Table II.5. Ukraine: Variance Composition of Base Money, 2000-06 (Percent)

	Contribution
Net international reserves	139.7
Net claims on government	-39.7
Net claims on banks	-2.9
Other items net	2.9
Total	100.0

80. **Ukraine's inflation has been volatile and well above that of more advanced transition economies** (Figure II.12). CPI inflation stayed below 15 percent during the past 5½ years, a success when compared to the hyperinflation of the early nineties and the reemergence of inflation to some 30 percent after the financial crisis. But when compared to other transition economies, the record is less favorable. At an average of 9.3 percent over the past 3½ years, inflation in Ukraine was nearly double that of Central and Eastern European countries, though similar to many other CIS countries. Inflation in Ukraine was also highly

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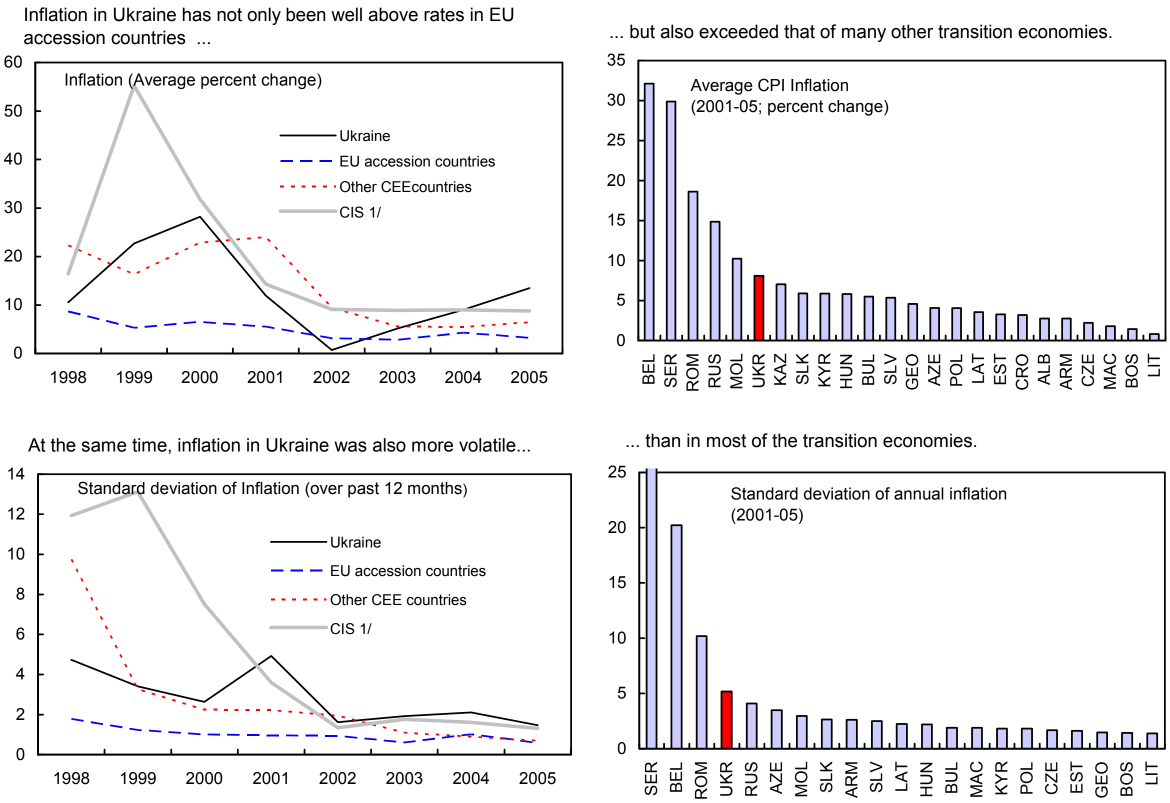
[35] When active NBU policies to change monetary conditions occurred, they aimed mainly on loosening liquidity conditions, for example through lower reserve requirements. Active sterilization operations in times of large excess liquidity happened in 2005, but they were limited in volume and interest rates remained low.

volatile, fluctuating between zero and 15 percent—a range exceeded by only a few other transition countries.

Figure II.12. Transition Economies: Inflation Indicators, 1998-2005



Inflation in Ukraine has not only been well above rates in EU accession countries ...

... but also exceeded that of many other transition economies.

At the same time, inflation in Ukraine was also more volatile...

... than in most of the transition economies.

Sources: National Bank of Ukraine; State Statistics Committee; and staff estimates.
1/ CIS countries excluding Tajikistan, Turkmenistan, and Uzbekistan.

The De Facto Peg: Why it May Have Fit Ukraine in the Past

81. **Ukraine has developed a strong affinity for its pegged exchange-rate regime for several reasons.** Heartened by a successful nominal stabilization after the 1998 crisis, the public has viewed a stable exchange rate as the guarantor of internal and external stability—inflation of below 15 percent compared favorably to the early transition years, and levels of foreign reserves surged to 4½ months of imports. Against this backdrop, many fear that allowing greater fluctuations of the exchange rate would risk undermining the hard-earned trust in the currency with negative balance sheet effects on the economy. In addition to this largely psychological argument, many have questioned Ukraine's readiness to operate under more exchange-rate flexibility: financial markets are underdeveloped, modeling and forecasting capacities for inflation are still being established, and experience with more active monetary policy has been limited.

82. **Ukraine's choice of the exchange-rate regime also mirrors that of many other CIS countries.** Most CIS countries have, over the last few years, limited the fluctuations of their currencies against the U.S. dollar to far less than 5 percent (Table II.6). Experiments with greater exchange-rate fluctuations have been brief and, even though many regimes are still classified as "managed floats" by the IMF, they are de facto "tightly managed floats." Under an IMF classification scheme currently under consideration, they would be classified accordingly. This has left the region without a point of reference in moving to a more flexible exchange and monetary regime. The notable exception is Armenia, which over the past 12 months, has allowed for the greatest exchange-rate variability in the region and on July 1, 2006 announced the adoption of inflation targeting.

Table II.6. CIS Countries: Indicators for the Exchange-Rate Regime

	Exchange rate regime 1/	Reference currency 2/	Maximum range (percent) 3/	Maximum daily volatlity (percent) 4/	Number of daily changes > 1 %	Variation Coefficient of Official Exchange Rate (Average 2001-06) 5/
Armenia	Independent float	Russian ruble	9.6	1.8	9	0.11
Azerbaijan	Peg	U.S. dollar	6.0	0.9	0	0.03
Belarus	Peg	U.S. dollar	0.6	0.2	0	0.19
Georgia	Managed float	U.S. dollar	4.0	1.2	2	0.08
Kazakhstan	Managed float	Russian ruble	10.7	1.1	2	0.07
Kyrgyz Republic	Managed float	U.S. dollar	4.1	1.1	1	0.07
Moldova	Managed float	U.S. dollar	8.1	0.8	0	0.05
Russia	Managed float	U.S. dollar	8.6	1.0	1	0.05
Tajikistan	Managed float	U.S. dollar	6.0	0.5	0	0.11
Ukraine	Peg	U.S. dollar	4.0	1.0	1	0.02
Memorandum item						
Euro area	Independent float	U.S. dollar	11.0	2.0	21	0.15

Sources: IMF *International Financial Statistics; IMF Annual Exchange Rate Arrangements and Restrictions;* and staff calculations.

1/ Classification in *IMF Annual Exchange Rate Arrangements and Restrictions* (2006).
2/ Currency to which the variance is smallest.
3/ Percent deviation of maximum interbank rate from minimum interbank rate from August 2005-July 2006 (using daily interbank rates).
4/ Maximum day-to-day change in interbank exchange rate from August 2005-July 2006 (in percent).
5/ Standard deviation divided by mean.

83. **This preference is partly backed up by traditional arguments on the choice of optimal exchange-rate regimes.** Husain (2006) proposes a template for assessing whether or not a country's economic and financial characteristics make it an appropriate candidate for a pegged or a floating regime (Box II.2). The template uses various indicators that have been identified in the literature as key potential determinants of exchange-rate regime choice: economic diversification, trade integration, financial integration, macroeconomic stability, credibility, and "fear-of-floating" type effects.

84. **When applied to Ukraine's past economic and financial characteristics, the indicators slightly favor a peg over a float for Ukraine (Box II.2):**

- **Economic diversification:** The volatility of the terms of trade has been significant and the correlation between Ukraine's business cycle and world prices for commodities has been strong. This would argue for a more flexible regime. The share of commodities in exports, however, puts Ukraine close to the average of countries and therefore did not strongly favor either regime.

Box II.2. A "Scoreboard" for Ukraine's Exchange-Rate Regime

Using a sample of 51 countries, Husain assigns scores for the suitability of a peg by applying quantitative measures to the literature's standard arguments. For each of the six main arguments, he uses two to three indicators. If a country ranks in the top 10 percentile, this is taken as a strong case for a peg, a ranking in the top 20 percentile as a somewhat less strong case for a peg. Rankings in the bottom 10 and 20 percentiles are seen as strong or somewhat less strong cases for a float.

Applying this methodology and updating some of Husain's indicators provides the following scoring for Ukraine. The findings and comparisons with other transition economies are only indicative though, as they have not been updated and the rating depends on Ukraine's relative position to other countries.

Scorecard for Exchange-Rate Regimes in CIS Countries

	Ukraine	Ukraine *Updated 1/*	Georgia	Kazakhstan	Kyrgyz Republic	Russia
Economic diversification	3	4	2	4	3	3
Trade integration	1	3	3	2	3	3
Financial integration	2	3	1	1	1	3
Macroeconomic stabilization	2	2	2	3	3	4
Credibility	2	2	3	2	2	1
Fear of floating effects	2	2	3	3	2	2
Total	**2.0**	**2.7**	**2.3**	**2.5**	**2.3**	**2.7**

1= strong case for peg; 2= case for peg; 3=neutral; 4=case against peg; 5=strong case against peg

Sources: Husain (2006); and staff estimates.
1/ Data has been updated to mid-2006.

- **Trade integration:** The data on openness to trade and trade pattern concentration suggest that there is no strong case for either a peg or a float. But Ukraine's relatively weak cyclical synchronization over the past six years with its major trading partner Russia, argued against a peg.

- **Financial integration:** Overall, no strong preference for either exchange-rate regime can be derived based on Ukraine's past financial integration. Its access to international financing argued for a float, while the still relatively small (though rapidly rising) stock market argued for a peg. The level of financial intermediation in the past put Ukraine right in the middle of both regimes.

- **Macroeconomic stability:** A relative low degree of capital mobility, highly volatile money velocity, and the ratio of terms-of-trade to velocity all favored pegging.

- **Credibility:** Ukraine's relatively low monetary credibility, as measured by the period the country was below an inflation threshold of 8-10 percent, also supported the case for pegging.

- **Fear-of-floating effects:** While the level of dollarization did not clearly argue for or against pegging, the other two attributes assumed to be linked to fear of floating (correlation between real activity and exchange rate; and pass-through of exchange-rate changes to inflation) argued for pegging.

85. **While these traditional arguments make a case why a peg may have been an acceptable fit for Ukraine in the past, they also suffer from circularity.** In many ways, the existence of the peg created some of the conditions that, in the above analysis, are used to argue for the use of the peg. For example, under the peg and in light of positive terms-of-trade shocks, it was difficult to keep inflation consistently in mid-single digits. This lack of internal stability or credibility of monetary policy is used as an argument for a peg. Two other examples are the underdevelopment of financial markets and the fear of float, which have both, to a large degree, been caused by the peg itself.

Keeping the Peg: What it Would Take to Make it Fit for Future Challenges

86. **Going forward, new challenges could make operating a peg even more complicated.** In the past, the monetary framework has revealed weaknesses in terms of internal and financial stability. Going forward, it will be even more challenging to meet these objectives as the economy becomes more integrated into the world economy and thus more susceptible to capital flow and terms-of-trade shocks. A sharp terms-of-trade deterioration could also pose a serious challenge to external stability, which has not been a concern in the past. Without the nominal exchange rate as an adjustment tool, goods and labor markets would need to adjust flexibly in response to shocks to maintain internal and external stability.

87. **Transition countries that have successfully operated a peg and maintained internal and external stability usually have relatively small, open, and flexible economies** (Table II.7). The Baltics and Bulgaria are examples where a very rigid exchange rate regime was supplemented by rather flexible labor and goods markets, as well as disciplined fiscal frameworks.[36] This helped to contain inflation at 3½ percent on average over the past five years and to maintain competitiveness. In contrast, countries with originally less flexible institutions and policies chose to let the exchange rate play a greater role as an adjustment mechanism, namely the Czech Republic, Hungary, and Poland, which held inflation in the low mid-single digits, and more recently, Armenia and Romania. A number of countries that have allowed only a small degree of exchange-rate flexibility are facing the regime's challenges. For example, Croatia and the Slovak Republic's relatively

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[36] For a comparison of labor market policies institutions in Central and Eastern European Countries, see Schiff and others (2006).

rigid labor markets have contributed to high unemployment. In other countries, such as Moldova, Russia, and Serbia and Montenegro, inflation has remained relatively high, mirroring the inflation control problem under a tightly-managed float.

Table II.7. Transition Economies: De Facto Exchange-Rate Arrangements and Anchors of Monetary Policy (as of July 31, 2006) 1/

	Monetary Policy Framework				
Exchange rate regime	Exchange rate anchor	Monetary aggregate target	IMF supported or other monetary program	Inflation targeting framework	Other
Currency board	Bosnia & Herzegovina (1.2 %) Bulgaria (4.5 %) Estonia 2/ (2.8 %) Lithuania 2/ (0.9 %)				
Peg	Belarus 4/ (18.9 %) Latvia (5.3 %) Macedonia, FYR (0.7 %) Turkmenistan (7.4 %) Ukraine (9.3 %)				
Peg within horizontal bands	Slovenia 3/ (3.9 %)			Hungary 3/ (5.0 %)	
Crawling peg					
Exchange rates within crawling bands					
Tightly managed float			Croatia (2.4 %) Georgia (6.3 %) Moldova (12.1 %) Serbia and Montenegro (12.4 %) Tajikistan (10.2 %)		Kazakhstan (7.0 %) Russia (12.4 %)
Managed float			Azerbaijan (6.2 %) Kyrgyz Republic (3.8	Czech Republic (1.6 %) Romania (12.1 %)	Slovak Republic (6.3 %) Uzbekistan (14.9 %)
Independent float		Albania (2.6 %)		Armenia (4.1 %) Poland (2.1 %)	

Source: IMF *Annual Report on Exchange Arrangements and Exchange Restrictions.*

1/ Average annual CPI inflation from 2003-05 in brackets.
2/ The country participates in the ERM II mechanism of the European monetary system.
3/ The bandwidth is +/- 15 percent.
4/ The band width is adjusted frequently.

88. **Key requirements "for making a peg work" in Ukraine would be a fiscal policy oriented toward price stability and a high degree of wage and price flexibility.** One illustration of the degree of flexibility needed is the adverse medium-term terms-of-trade shock under the staff's baseline scenario (Table II.8). The cumulative terms-of-trade shock is some 20 percent. To maintain external sustainability, staff estimates that the real effective exchange rate needs to remain broadly unchanged over the medium term, in contrast to an estimated 30 percent real appreciation if the terms of trade were to stay constant.[37] Under a flexible exchange rate, adjustment is shared between the exchange rate, monetary, and incomes policies. Under a peg, relative price adjustment would have to come entirely through domestic wages and prices, to which tighter fiscal and incomes policies would need to contribute. This would help reduce aggregate demand and keep the current account sustainable.

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[37] See Chapter I for more details on the macroeconomic effects of the energy price shock.

89. **Table III.8 summarizes the estimated differences in macroeconomic outcomes under fixed and flexible exchange-rate regimes.** It assumes—as an indicator of external sustainability—that the NBU aims to maintain the same level of foreign exchange reserves under both exchange-rate regimes. Under the peg, very tight fiscal and income policies would be needed, which would cause real GDP growth and inflation to significantly undershoot medium-term norms. The estimated cumulated output loss, compared to a scenario in which the exchange rate is used as an adjustment mechanism, is 8 percent. Inflation would have to decelerate much faster under a peg than under a float (and would be cumulatively 20 percent lower for the five year period).

Table II.8. Ukraine: Macroeconomic Framework under an Terms-of-Trade Shock---Outcomes under a Flexible and Fixed Exchange Rate 1/

	2007	2008	2009	2010	2011	Cumulative Change 2007-11
	Differences between a Flexible and Fixed Exchange Rate					
Output and prices						
Real GDP growth (Percent change)	2.5	2.3	1.5	0.7	-0.2	7.8
Consumer prices (Percent change; end of period)	4.7	4.5	2.8	2.3	1.8	19.8
Consumer prices (Percent change; average)	2.4	4.6	3.6	2.5	2.0	19.6
Wages						
Minimum wage (Hryvnias per month; end of period)	75.0	103.0	116.0	148.0	184.0	...
Nominal monthly wages (Percent change; average)	8.9	7.5	4.3	2.7	3.8	36.2
Real monthly wages (Percent change; average)	5.9	2.7	0.6	0.1	1.7	11.5
Public finance (Percent of GDP)						
Cash balance	-1.8	-2.6	-2.5	-2.0	-1.5	...
Public debt (end of period)	1.8	3.5	4.9	6.2	6.6	...
External sector						
Current account balance (Percent of GDP)	0.3	0.0	-0.5	-0.6	-0.8	...
Gross official reserves (Months of imports of goods and services)	0.2	0.1	0.2	0.1	0.0	...
Real effective rate (Percent change) 2/	-4.1	-3.0	1.1	0.2	2.5	-3.2
Goods and services terms of trade (Percent change)	0.0	0.0	0.0	0.0	0.0	0.0

Sources: Ukrainian authorities; and staff estimates and projections.

1/ Assumes a cumulative terms-of-trade deterioration of 18 percent between 2007-11.

2/ Period averages; (+) represents real appreciation; based on GDP deflator and INS trade weights (1999-2001).

90. **In Ukraine, achieving such a high flexibility in macroeconomic policies would be challenging.** Since the government's setting of minimum wages and pensions is closely linked to those in the private sector, its policies would largely determine the lower boundaries for wage and pension growth in the economy. Going forward, political pressures, in light of differing political priorities and upcoming elections, would make steering a tight course, as outlined under the shock scenario, very difficult.

91. **Apart from the unlikely availability of such complementary policies, maintaining a peg would also carry forward the difficulties in achieving internal and financial stability.**

- **Even in the absence of term-of-trade shocks, it may be difficult to achieve low and stable inflation.** As shown in Chapter II.A, the hryvnia, like the currencies of other transition economies, is expected appreciate in real terms over the medium term as structural reforms take place. In the case of a pegged nominal exchange rate, the real appreciation would be achieved through relatively high inflation.

- **It could stifle financial market development and make it difficult to reverse dollarization, thus fostering the buildup of financial sector risks** (see Chapter III). As long as the volatility of inflation remains relatively high compared to the volatility of the real exchange rate, there would not be much incentive to de-dollarize and improve bank risk management. Moreover, the de facto exchange-rate guarantee would continue to favor the issuance of securities in foreign currency over hryvnia, thereby stifling the development of a domestic securities market, which is needed to improve the interest-rate channel of the transmission mechanism.

What Monetary Framework Is a Better Fit for Ukraine? The Options

92. **Shifting to greater exchange-rate flexibility raises the question how monetary policy should operate.** When allowing the hryvnia to fluctuate more freely, two options for a new monetary strategy can be considered: monetary targeting and inflation targeting. This section compares the policy requirements of each and makes a case for inflation targeting as the framework that would be best suited for Ukraine to achieve internal, external, and financial stability.

Monetary targeting

93. **A key requirement for monetary targeting is a strong short-term link between money and inflation—a condition presently not in place in Ukraine.** Over the past years, money demand in Ukraine in the short run fluctuated significantly and, over the medium term followed an unexpected strong upward trend—underestimated by most forecasters, including the IMF. These two factors together contributed to large forecast errors in monetary aggregates (Table II.4). Empirical studies could not identify a strong and stable short-term relationship between money and inflation, even though they did find an impact of money on the inflation process.[38] The main reasons for the lack of money-demand stability are the ongoing structural changes of the economy, including continuing catch-up effects, adjustment of relative prices, and introduction of new financial instruments, as well as the effect of dollarization (including cash holdings in U.S. dollars) and the impact from financial "round-tripping" operations of corporates and bank conglomerates that appear to have inflated monetary aggregates.[39] Since these processes are expected to continue for the foreseeable future, it is unlikely that a money-demand function will emerge that could serve as the operational foundation for money targeting.

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[38] See Leheyda (2005), Lissovolik (2003), and Siliverstovs and Bilan (2005).

[39] The flow-of-funds analysis in Chapter III.B indicates that corporates may have built up external financial asset partly financed by loans from their own banks. These banks, in turn, obtained part of their funding from abroad, including from offshore businesses of the same corporate and financial groups.

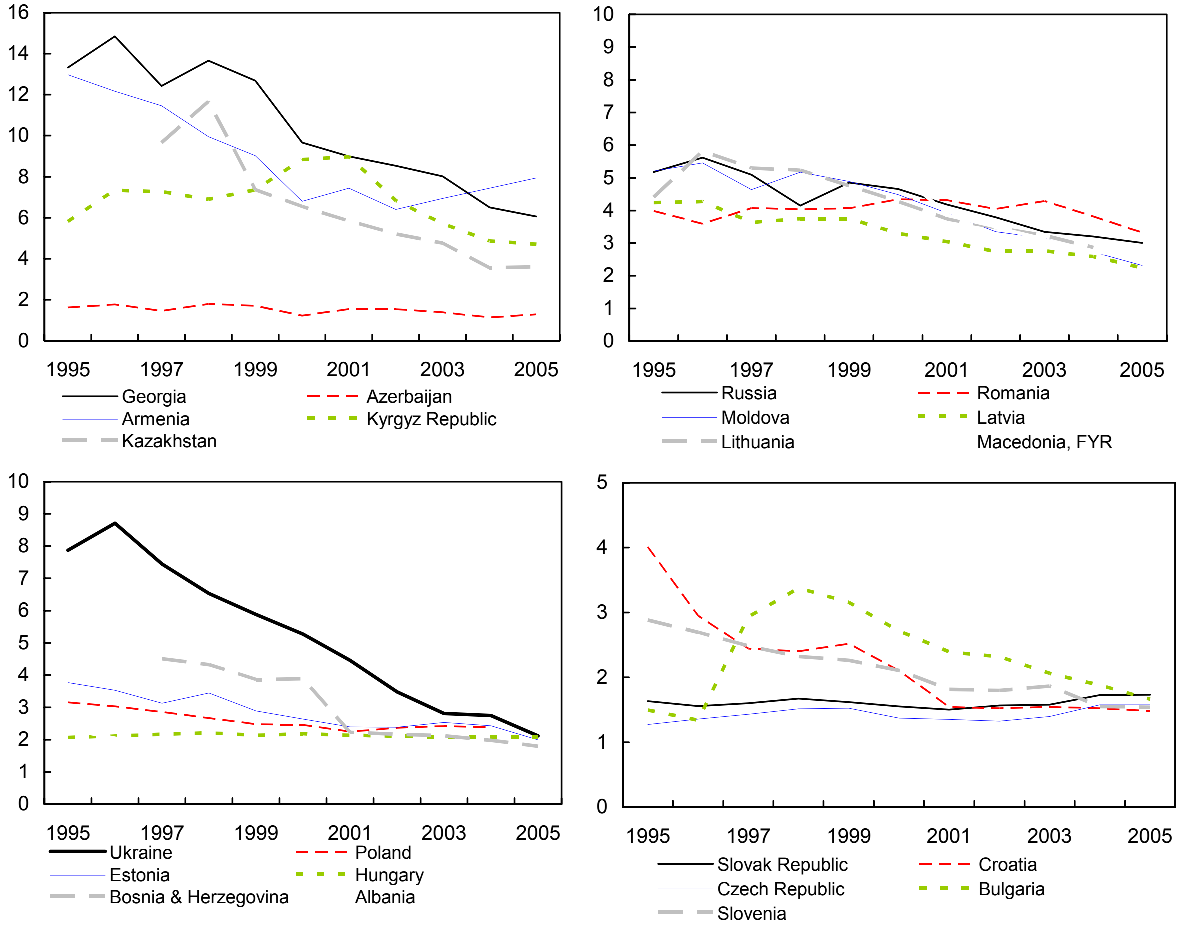
94. **The missing close short-term link between money and inflation was also the cause for disappointing experiences with money targeting in other transition economies.** Money demand has been unstable in most transition economies (Figure II.13 shows large shifts in velocity), and led to the abandonment of the regime by those countries which attempted it. In particular, the Czech Republic and Poland gave up monetary targeting and moved to inflation targeting in 1997/98. Many other transition economies have used money targets as complements to their exchange-rate anchor, but have given prominence to the latter when targets conflicted. Examples, in addition to Ukraine, are Kazakhstan, Kyrgyz Republic, Serbia and Montenegro, and the Slovak Republic. Currently, the only country that officially follows a monetary targeting framework is Albania. There an intermediate target is set for items of the central bank balance sheet (net domestic assets, net credit to the government, and net international reserves). But even in Albania's case, operating the framework is challenging, given the economy's structural changes and the fact that the intermediate targets do not set an upper bound for money growth (because only a floor for net international reserves is defined). As a consequence, the targets have been revised frequently and the Bank of Albania is now preparing to move to inflation targeting.

95. **Nevertheless, money aggregates can serve an important indicator function for monetary policy, in particular in transitioning to inflation targeting.** Even though not well-suited as a target variable with a one year horizon, money could play a role as a leading indicator for the NBU's monetary-policy decisions. Using it as an indicator rather than a target would allow a more flexible treatment of instabilities in the relationship between money and inflation, as it does not bind a central bank to a target path nor would it undermine its credibility in case of repeated target adjustments or misses. In particular, in the transition period to inflation targeting, it could fill a gap, until the interest-rate transmission mechanism has strengthened, by providing easily monitorable guidance. And even after the adoption of full-fledged inflation targeting, many central banks include monetary aggregates in their information set that underlies their inflation projections and policy decisions.

Inflation targeting

96. **Shifting to an inflation-targeting regime seems to be the most promising option for Ukraine to deal with current and future monetary-policy challenges.** First, monetary policy's room for maneuver would increase under a more flexible exchange rate in a way that should help it to regain better control over inflation. An inflation target would provide a new transparent monetary-policy anchor. Second, the greater variability of the real exchange rate should also serve as disincentive for dollarization and excessive risk-taking of the banking sector. Third, greater exchange-rate flexibility would facilitate adjustments to terms-of-trade shocks and buffer the needed fiscal and wage responses. And fourth, changes in Ukraine's economic structure, such as the development of financial markets and capital-account liberalization, would shift financial characteristics in favor of a float.

Figure II.13. Transition Economies: Trends in Velocity of Broad Money 1/



Sources: IMF *World Economic Outlook*; and staff calculations.
1/ Nominal GDP divided by end-year broad money.

97. **Inflation targeting has been successfully adopted by a number of transition and emerging market economies with similar policy challenges.** An analysis of the starting conditions of 13 full-fledged inflation targeting emerging market countries (IMF, 2005) showed that they were far from ideal but improved over time (Table II.9). Moreover, the recent examples of Armenia, Colombia, Peru, Romania, and Turkey indicate that it is indeed feasible to shift to inflation targeting even under difficult circumstances, such as high levels of dollarization and underdeveloped financial markets. The starting conditions of these countries, which are summarized in Table II.10, were not better than those in Ukraine. The effects that the adoption of inflation targeting by emerging market countries had on their economies was studied by IMF (2005) and Roger and Stone (2005). They find that the level and the volatility of inflation dropped significantly once emerging market countries introduced the new regime. Non-inflation targeting emerging market economies were also able to lower inflation and its fluctuations, but they were clearly outperformed by the inflation targeters. These inflation stabilization successes did not come at the expense of real output stabilization, in which inflation targeters also outperformed their peers.

Table II.9. Initial Conditions for Emerging Market Inflation Targeters 1/
(Index; 0 = poor; 1 = ideal)

	Pre-adoption of inflation targeting	Current		Pre-adoption of inflation targeting	Current
Technical infrastructure	**0.29**	**0.97**	**Institutional independence**	**0.59**	**0.72**
Data availability	0.63	0.92	Fiscal obligation	0.77	1.00
Systematic forecast process	0.10	1.00	Operational independence	0.81	0.96
Models capable of conditional forecasts	0.13	1.00	Central bank legal mandate	0.50	0.62
			Governor's job security	0.85	0.85
Financial system health	**0.41**	**0.48**	Fiscal balance in percent of GDP	**0.48**	**0.47**
Bank regulatory capital to risk-weighted assets	0.75	1.00	Public debt in percent of GDP	0.47	0.47
Stock market capitalization to GDP	0.16	0.21	Central bank independence	0.26	0.64
Private bond market capitalization to GDP	0.10	0.07			
Stock market turnover ratio	0.29	0.22	**Economic structure**	0.36	0.46
Currency mismatch	0.92	0.96	Exchange rate pass-through	0.23	0.44
Maturity of bonds	0.23	0.43	Sensitivity to commodity prices	0.35	0.42
			Extent of dollarization	0.69	0.75
			Trade openness	0.18	0.21

Source: IMF *World Economic Outlook,* September 2005, p.176.

1/ Includes Brasil, Chile, Colombia, Czech Republic, Hungary, Israel, Korea, Mexico, Peru, Philippines, Poland, South Africa, and Thailand.

Table II.10. Selected Inflation Targeting Countries: Macroeconomic Indicators at the Time of the Regime Shift

Year before adoption of Inflation Targeting	Ukraine 2005	Armenia 2005	Columbia 1998	Czech Republic 1997	Hungary 2000	Mexico 2000	Peru 2001	Poland 1998	Romania 2004	Turkey 1/ 2004
Inflation										
Real GDP growth (percent change)	2.6	13.9	0.6	-0.7	6.0	6.6	0.2	5.0	8.4	8.9
CPI (period average; percent change)	13.5	0.6	18.7	8.4	9.8	9.5	2.0	11.8	11.9	8.6
CPI (end of period; percent change)	10.3	-0.2	16.7	10.0	...	8.9	-0.1	8.6	9.3	9.4
Monetary and financial variables										
Broad money (percent of GDP)	45.7	16.4	35.6	66.0	46.2	45.0	26.0	36.7	26.2	42.8
Credit to the private sector (percent of GDP)	35.6	8.1	23.5	70.0	32.0	17.2	24.1	22.5	17.5	19.8
Foreign currency deposits as percent of total broad money	23.6	38.5	16.2	11.4	19.7	2.9	67.0	...	4.0	41.2
Foreign currency deposits as percent of total deposits 2/	34.2	63.6	25.6	12.6	23.3	1.9	80.0	15.2	39.5	44.0
Financial system health										
Capital adequacy ratio (percent)	15.0	33.7	10.3	9.5	13.7	13.8	12.8	11.7	18.8	28.8
Stock market capitalization (percent of GDP)	28.7	0.7	17.2	24.1	29.0	20.4	20.2	13.0	17.6	21.4
Bank assets (percent of GDP) 3/	52.3	20.2	38.5	106.8	60.0	53.1	43.1	58.0	37.1	58.3
Domestic interest rate spread (percentage points) 3/	8.3	12.2	4.4	5.5	3.1	8.7	10.5	6.3	14.1	9.6
Fiscal variables										
Fiscal balance (percent of GDP)	-2.4	-2.6	-4.0	-1.2	-2.7	-3.7	-2.6	-2.5	-1.0	-8.1
Total public debt (percent of GDP)	19.4	25.7	22.1	10.5	55.6	23.2	44.3	42.9	23.1	63.5
Domestic debt (percent of GDP)	4.8	2.1	10.6	7.8	30.3	12.3	9.6	...	5.3	46.0
External debt (percent of GDP)	14.6	23.6	11.5	2.7	25.3	10.9	34.7	...	17.8	17.5
Indicators of economic structure										
Nominal GDP (US $ billions)	82.9	4.9	98.4	57.4	47.0	580.5	53.6	172.0	71.4	302.6
Nominal GDP per capita (PPP)	1,747	1,140	2,505	5,545	4,600	5,935	2,047	4,441	3,464	4,289
Current account balance (percent of GDP)	3.1	-3.3	-4.9	-6.2	-8.5	-3.2	-2.2	-4.0	-8.5	-5.2
Trade openness (percent of GDP) 4/	85.9	80.2	31.3	108.7	151.6	42.5	33.5	55.4	86.6	66.8

Sources: IMF *International Financial Statistics*; IMF *World Economic Outlook*; Bloomberg; and staff calculations.

1/ Public external and domestic debt in percent of GNP.
2/ For Poland foreign currency liabilities in percent of total bank liabilities.
3/ Data for 2002 for Czech Republic.
4/ The sum of exports and imports of goods and services in percent of GDP.

Adopting Inflation Targeting: Making the Transition Work

98. **The NBU has committed to gradually move to inflation targeting.** In its *Monetary Policy Guidelines* from September 2005, the NBU articulated its plan to eventually move to inflation targeting and in January 2006, it adopted an Action Plan that outlines a number of operational steps for the preparatory work, many of which have already been taken (Table II.11). However, an official timeframe for taking the key policy decision on greater exchange-rate flexibility does not yet exist.

Table II.11. Ukraine: Moving to Inflation Targeting: Progress Report

Preconditions	Key Achievements	Further Steps Needed 1/
Mandate to pursue price stability	• Drafted a Memorandum of Understanding (MoU) that sets out the roles of the NBU and the government in inflation targeting.	• Agree with the government on the MoU.
	• Submitted draft amendments to the NBU Law that would increase the independence of the NBU.	• Adopt further amendments to the NBU Act that would provide the NBU with a clearer mandate to achieve price stability and allow for greater NBU independence.
Exchange-rate flexibility	• Allowed the hryvnia/U.S. dollar rate to fluctuate in a 1 percent band.	• Draw up concrete operational transition plan, including on the changing role of the exchange rate. • Gradually allow greater exchange-rate flexibility.
Monetary-policy instruments		• Identify key policy rate; assess possibility to introduce an interest rate corridor. • Actively steer a short-term interest rate. • Apply monetary instruments in a consistent, transparent, and market-orient manner.
Capacity to model and forecast	• Developed a small macroeconomic model. • Compiled an inflation report, including inflation forecasts. • Published a business survey, including on inflation expectations.	• Improve macroeconomic modeling. • Develop core inflation indicators.
Communication of monetary policy	• Issued a brochure and an analytical paper on inflation targeting and the transmission mechanism of monetary policy.	• Modernize the NBU website.
	• Issued a monetary-policy report.	• Conduct press conferences and issue press releases on inflation targeting.
	• Held seminars on inflation targeting within the NBU and for commercial banks.	• Issue an Inflation Report.
Financial-market development	• Liberalized the foreign-exchange market in August 2005.	• Government to abolish the foreign-exchange turnover tax. • Develop benchmark government securities. • Simplify procedures for working in the foreign-exchange market.
Banking-sector stability	• Developed a strategy for the medium-term development of the banking sector and supervision.	• Gradually implement more risk-based supervision. • Further tighten banking supervision, regulation, and legislation.

1/ Most of the steps listed here are part of the NBU's Action Plan toward adopting inflation targeting, which was adopted by the NBU Board in January 2006.

99. **Nevertheless, a number of challenges and outstanding operational issues still need to be addressed and this calls for a gradual transition.** The authorities' main concern relates to the risks for the economy from greater exchange-rate flexibility as well as the feasibility to operate inflation targeting given underdeveloped financial markets and the weak transmission mechanism. How these and other issues can possibly be addressed is briefly summarized below.

- **The role of the exchange rate during transition:** Staffs' analysis (see Chapter III.B) suggests that the banking sector is in a position to deal with more exchange-rate flexibility, though very sharp and large adjustments could be risky. The likelihood for such sharp adjustments could be minimized by various policy decisions: First, the NBU should allow the exchange rate to start fluctuating in a gradually widening band, as practiced by many other emerging market economies that have moved to inflation targeting. Since the exchange rate pass-through to prices is relatively high, it can be expected that the exchange rate will continue to play a role even once Ukraine has moved to full-fledged inflation targeting (Ho and McCauley, 2003). And second, starting the transition swiftly would allow the NBU to operate from a position of strength. Its relatively high level of foreign reserves could serve as a buffer for potential excessive fluctuations. In the meantime, the excessive foreign exchange turnover tax of currently 1.3 percent should be eliminated to develop the foreign exchange market.

Box II.3. IMF Technical Assistance Provided to Ukraine in Preparation for Inflation Targeting

The IMF has actively supported the NBU's transition preparations. The efforts over the past three years included technical assistance and sharing of other country experiences. Topics ranged from inflation forecasting, monetary and foreign-currency operations, development of government securities markets, and central bank communication strategy.

IMF Technical Assistance to Ukraine on Inflation Targeting 1/

- *Overview on Preconditions for an Inflation Targeting Framework* (TA mission April 2004; seminar held at the NBU in November 2004).
- *Modeling and Operating Inflation Targeting* (Resident Advisor to the NBU, Nov. 2004-Nov. 2005; since 2006, bi-monthly staff visits).
- *Exchange Rate Issues: Foreign Exchange Risk Management, Dealing with Capital Inflows, Transition between Exchange Rate Regimes, Operational Preparations for Exchange Rate Flexibility* (TA missions in April, July, and December 2005).
- *Public Debt Management Strategy and Debt Market Development*, (TA missions in July 2005 and January 2006).
- *Setting Up an Action Plan for Transiting to Inflation Targeting* (TA mission October 2005).
- *Operational Advice on Improving Monetary Policy Operations* (TA mission February 2006).
- *Monetary Policy Communication Strategy* (TA mission March 2006).
- *Strengthening Banking Supervision* (Resident advisor to the NBU, April-October 2005); *Instruments and Procedures to Deal with Problem Banks* (TA mission April 2005).

1/ In addition to TA, the IMF has prepared a number of documents for the authorities, including on Ukraine's competitiveness, pros and cons of various exchange-rate regimes and policy requirements, aspects for determining the optimal level of reserves, and issues in determining the weights of currency baskets.

- **Monetary operations:** The NBU already has a complete toolkit of market-oriented monetary policy instruments, including liquidity-absorbing and liquidity-injecting open market operations (Box II.4). But in the past, it has chosen to rely mainly on foreign-exchange interventions and reserve requirements. When transiting to inflation targeting, a short-term policy interest rate should take over from the exchange rate as the operating target. Preparations to set a policy rate, which will be steered in a corridor with standing facilities marking the upper and lower boundaries, are underway.

- **Transmission mechanism:** The lack of a yield curve and an active securities market is also viewed as a hindrance for the effective transmission of interest-rate impulses to bank rates and inflation. Empirical work confirms that the transmission mechanism in Ukraine is still weak (Petryk and Nikolaychuk, 2006; Mykhaylychenko and others, 2004). The findings support the view that the exchange rate (and monetary indicators) could continue to play some role in the transition period and stress the need for the government to pursue a public debt management strategy with the objective to develop domestic securities markets. But at the same time, the corporate securities market is already growing quickly, albeit from a low base, thus supporting the transmission mechanism. Moreover, much of the missing link in the past was caused by the lack of an active NBU interest-rate policy and is expected to strengthen as the NBU policy changes. Empirical studies have found the transmission mechanism to become stronger under more flexible exchange rates and financial market development (Ganev and others, 2002; Tiemann, 2004).

- **Institutional changes:** Institutional changes can help support the creation of a new transparent nominal anchor under an inflation targeting regime. These include legal changes that would provide the NBU with a clearer mandate to pursue the objective of price stability. Efforts to increase the NBU's communication with the public, including by issuing an inflation report, are already under way.

- **The inflation target itself:** Against the backdrop of expected large shocks to energy prices (in particular resulting from adjustments of gas import prices, but also due to oil price developments), targeting a core inflation index that excludes energy could be advantageous. The NBU and the State Statistics Committee are preparing such indices. At the same time, a transparent and predictable government policy on administrative price changes is needed to avoid undermining the NBU's credibility in case of inflation target misses that derive from specific administrative price adjustments.

Box II.4. The NBU's Toolkit of Monetary Policy Instruments

The NBU has a wide range of market-oriented policy instruments in its arsenal, but has relied mainly on foreign-exchange interventions and changes in required reserves.

Foreign-exchange interventions: Under the de facto peg, the main liquidity impact has come from NBU interventions in the spot foreign-exchange market. Currently, the NBU intervenes to keep the hrvnia in a band of Hrv/US$5.00-5.06.

Reserve requirements: Banks need to hold unremunerated required reserves for all demand, time, and savings deposits. The reserve ratios are differentiated by maturity and currency denomination and relatively low at an effective rate of 2.2 percent (down from 6.8 percent in April 2006). Currently, banks have to maintain the entire amount of required reserves on a daily basis; cash in vault is excluded from the reserve calculation. In the past, the NBU frequently changed all of the required reserve criteria to affect banks' liquidity conditions.

Standing facilities: The NBU operates two marginal overnight lending facilities: one against collateral and one without collateral. The latter is priced at 100 basis points above the fomer. There are several restrictions on the amount and frequency of bank borrowings, some of which are linked to banks' credit quality. Banks use uncollateralized overnight loans frequently, often toward the end of the month to fulfill reserve requirements. The NBU also has deposit facilities at its disposal, at various maturities (2-7 days, 8-21 days, and 22-30 days), but due to the low interest rates banks have rarely used them (Box table).

Money market instruments: The NBU can inject liquidity through refinancing loans for up to one year, repurchase arrangements, and outright operations. None of the operations has been frequently used and tenders are typically announced ad hoc. While the NBU also sets a discount rate, no transactions are conducted at that rate. To absorb liquidity, the NBU can offer deposits and NBU certificates of deposits, with maturities up to one year. In 2004-05, the NBU issued CDs quite frequently, though the volumes were usually quite low (the largest stock outstanding was Hrv4.8 billion or 7.5 percent of base money in June 2005). NBU CDs were auctioned and maturities ranged from 1-270 days, on average about 60 days.

Ukraine: NBU Monetary Policy Operations, Jan. 2005-Nov. 2006

	Interest rate		Amount		Number of banks	
	2005	2006	2005	2006	2005	2006
Standing facilities	(Percent)		(Millions of hryvnias)			
Overnight loans (collateralized)	12.0	10.7	394	1,104	8	5
Overnight loans (uncollateralized)	15.0	12.7	10,757	4,428	44	40
Deposit facility	4.5	1.0	157	6,135	3	8
Money market operations						
NBU loans	12.9	10.9	232	888	12	21
Repurchase agreements	12.0	10.8	613	1,305	0	1
NBU CDs	3.8	4.7	14,788	60	27	2
Reverse repurchase agreements	1.0	0.0	2,300	0	1	0

Sources: National Bank of Ukraine; and staff estimates.

Appendix II.1. External Sector Data Issues

Trade Data Issues

There have been several possible discrepancies in recent Ukrainian trade data. During 2004, customs data for goods imports fell some \$4½ billion (or 15 percent) short of the corresponding data based on banking sources. For surging exports, concerns have been expressed about over-reporting. During 2005, exports were much weaker than projected, declining in volume terms by 8½ percent, far short of model-based forecasts (5 percent).

Comparing Ukrainian data with the IMF's Direction of Trade (DOT) Statistics suggests that under-reporting may have been an issue in some instances (Table II.A.1). For 2004 imports, the DOT data exceed that reported by Ukrainian customs (but fall well short of the banking data). For 2004 exports, the DOT data do show a substantial jump, and, if anything, exports may have been *under*-reported. Export under-reporting could also be an issue in 2005: if the DOT number is the "true" export number, export volume growth would be much closer, but still somewhat below the model-based projection.

Table II.A.1. Ukraine: Trade Data

	2004	2005
	(In \$ millions)	
Imports (customs data)	29,691	36,159
Imports (DOT data)	31,274	39,929
Discrepancy (in percent)	-5.1	-9.4
Exports (Ukrainian data)	32,629	33,959
Exports (DOT data)	34,238	36,628
Discrepancy (in percent)	-4.9	-7.9

Sources: IMF *Direction of Trade* statistics and National Bank of Ukraine

A disaggregated look at exports in 2005 reveals specific areas of concern. For machinery and equipment, the decline was far too steep to be explained on competitiveness grounds alone. This is an area where export under-reporting may have been most prevalent. For metal exports (predominantly steel), the value/volume decomposition is open to question: whereas official data imply that Ukraine's steel export prices (in dollars), increased by a robust 17 percent, commercially available indices such as Bloomberg point to a decline.

Tax evasion and capital flight probably underlie trade data discrepancies. Under-invoicing of imports to the customs authorities may relate to purely domestic transactions that are reported as imports to avoid payment of VAT. Over-reporting of exports may also reflect tax motivations. However, the bulk of the discrepancy between bank and customs import data in 2004 is considered to reflect capital flight—and was accordingly classified under short-term capital flows in the balance of payments.

Improving trade data is clearly an issue that needs to be addressed in the context of improvements of Ukraine's national accounts statistics.

International Investment Position (IIP) Data

There has been a persistent discrepancy between the reported changes in stocks of external assets and liabilities on the one hand, and the corresponding balance of payments flows on the other. From a quantitative perspective, the discrepancy is very large: the net cumulative short-term capital outflow between 2000 and 2005 amounted to $18.2 billion, against a recorded overall net external liability position of $28.8 billion at end-2005.

In Ukraine, short-term capital flows (which in the past included some transactions misclassified under equity investment) are not taken into account in compiling the IIP. Scant information on these transactions does not allow their classification into appropriate IIP categories. Progress in this area is important to get a better sense of the types of capital movements involved, and possibly shed some light on whether there is also an issue of misclassification of current transactions that could account for some of the above trade puzzles.

Appendix II.2. Macroeconomic Balance Approach: Variable Definitions and Data Sources

Dependent variable: Current account as a ratio to GDP (source: IMF *World Economic Outlook*).

Explanatory factor	Variable definition	Data source
Fiscal balance	General government balance as a ratio to GDP	WEO
Foreign direct investment	Net FDI as a ratio to GDP	WEO
Relative income	PPP-based per capita income as a share of the U.S. level	WEO
Demographics	Share of 65 and older in the population; population growth rate	World Bank, WDI
Commodity terms of trade	Energy balance as a ratio to GDP	WEO and country desks
Reserve coverage	Official reserves in months of imports of goods and services	WEO

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III. FINANCIAL DOLLARIZATION IN UKRAINE—ROOTS AND RISKS

Core Questions, Issues, and Findings

- **What are the drivers of financial dollarization in Ukraine?** Despite improved macroeconomic fundamentals, deposit and loan dollarization in Ukraine has remained substantial, edging up over the last two years (¶103−104). This seems to reflect several factors including lingering doubts about the credibility of government policies, volatile inflation combined with an exchange-rate peg, and, more recently, rising foreign-bank ownership (¶105−115).

- **What are the risks associated with financial dollarization in Ukraine?** Loan dollarization combined with an ongoing credit boom has contributed to significant balance-sheet mismatches, resulting in increased foreign-currency induced credit and liquidity risks to the banking sector (¶124-138). Credit risks stem from rising foreign-currency loans to borrowers without foreign-currency income or hedges. This risk is exacerbated by relatively high corporate debt levels, given the easier access to external financing. Banks' foreign-currency liquidity risks stem from their surging borrowing from abroad, partly at short maturities, to fund longer-maturity loans.

- **What can be done to reduce vulnerabilities from dollarization?** The NBU has already taken steps, including by tightening quality standards for bank capital and introducing higher provisioning requirements for unhedged borrowers (¶139). But more should be done (¶142-148). An information campaign to raise public awareness of exchange-rate risks would be key. Moreover, bank risk management practices should be strengthened by issuing NBU guidelines on foreign-currency risk management and mortgage lending, setting upper limits on debt service-to-income and loan-to-value ratios, and strictly enforcing collateral valuation rules. And until risk management practices improve further, an additional buffer to shocks should be built by increasing the minimum capital-adequacy ratio from 10 to 12 percent.

- **What can be done to contain financial dollarization in Ukraine?** Heavy-handed administrative bans on foreign-exchange lending, while seemingly attractive in the short run, cannot address the underlying roots of dollarization and may well raise new doubts about policy credibility and consistency (¶121-122). A medium-term strategy that raises the attractiveness of domestic-currency denominated assets is needed (¶116-120). In particular, shifting to inflation targeting could help anchor inflation expectations and strengthen confidence in the domestic currency. The government should also rely more on domestic sources of financing and foster the development of capital markets to increase the availability of domestic-currency denominated securities (¶123).

100. **Financial dollarization and associated banking-sector vulnerabilities are growing concerns on Ukraine's policy agenda.** Since 1999, dollarization has remained substantial and persistent, notwithstanding improvements in underlying macroeconomic fundamentals. Both deposit and loan dollarization have edged up over the last two years. Some financial dollarization is to be expected, and may in fact be desirable, particularly in an economy for which confidence in the local currency had been destroyed at some point, such as in Ukraine in the early-to-mid 1990s due to hyperinflation. It is also a logical counterpart to greater economic openness for a small economy. But too high a level is of concern to policy makers because it can lead to balance-sheet mismatches and, particularly if combined with a misaligned exchange rate, give rise to financial-sector vulnerabilities. It has also been argued that high levels of financial dollarization undermine the effectiveness of exchange-rate adjustments to buffer real shocks, increase pass-through of exchange-rate changes to prices, and constrain a central bank's ability to act as lender of last resort.[40]

101. **The first section of this chapter discusses some of the possible drivers of financial dollarization in Ukraine.** Factors that drive dollarization seem to include weaknesses in public institutions of economic management, relatively volatile CPI inflation combined with the de facto pegged exchange rate, and more recently, foreign ownership in the banking sector. The section concludes by identifying a range of possible measures to promote the use of the domestic currency as a store of value in an effort to reduce dollarization.

102. **The second section focuses on the risks to the banking sector associated with financial dollarization.** It points out that balance-sheet mismatches have widened in the private sector, largely on account of significant borrowing by households and corporates in foreign currency. The section begins with an assessment of the foreign-exchange exposure of the non-bank private sector and then highlights the associated risks created for the banking sector, including through the use of stress testing. It concludes with a discussion of policy options to reduce balance-sheet risks until such time as dollarization itself can be reduced.

A. Dealing With the Roots of Financial Dollarization in Ukraine[41]

Background

103. **Despite an improvement in underlying macroeconomic fundamentals since 1999, Ukraine continues to experience significant financial dollarization**.[42] The ratio of foreign-

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[40] IMF (2003) discusses this issue for a broad sample of emerging market countries.

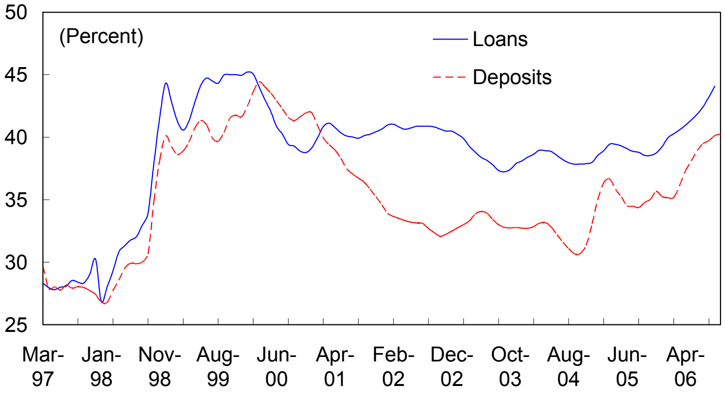
[41] Prepared by Jeff Chelsky.

[42] Dollarization generally takes one of two forms—currency substitution or asset substitution. Currency substitution (or "real dollarization") occurs when foreign currency is used in place of domestic currency to conduct day-to-day transactions, (e.g., in wage contracts and domestic prices) and is often a response to high

(continued)

Figure III.1. Ukraine: Financial Dollarization

(Foreign-currency deposits and loans as a share of total, 3-months moving average)

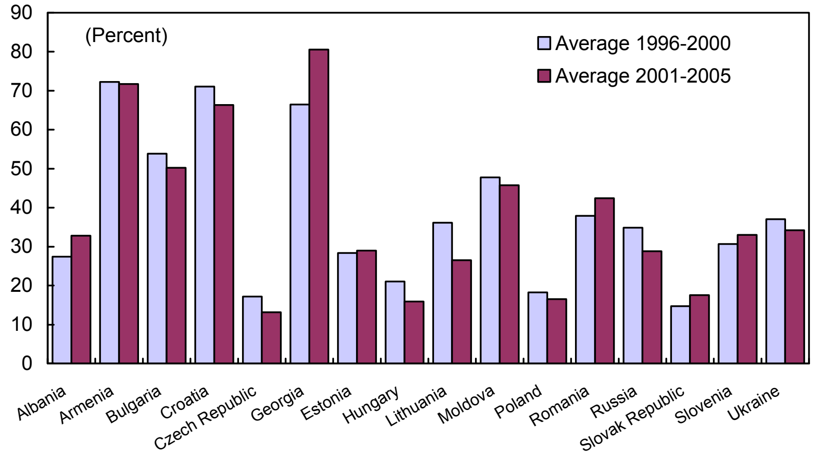


Sources: National Bank of Ukraine; and staff estimates.

currency deposits to total deposits in commercial banks has averaged 35.3 percent since January 1997, with loan dollarization rates somewhat higher at 38.7 percent. This masks significant inter-temporal variation, particularly for deposit dollarization (Figure III.1). After averaging 28 percent in 1997, deposit dollarization rates increased sharply in the second half of 1998 as the hryvnia experienced a large depreciation and inflation soared. The dollarization rate peaked at about 45 percent at the start of 2000, followed by a period of relatively steady decline with rates falling to just over 30 percent in the second half of 2004. This coincided with a period of exchange-rate stability. Financial dollarization rates have trended upwards since then, reaching almost 40 percent in October 2006.

104. **Financial dollarization in Ukraine over the past decade is roughly in line with the average for other comparable transition economies** (Figure III.2). However, unlike many other transition economies, Ukraine has not experienced a decline, on average, in financial dollarization since 2001. Rather, it has experienced an average annual increase of 0.2 percentage points in dollarization rates between 2001 and 2005, compared with an average annual decline in dollarization rates of around 2 percentage points per year over the same period for transition economies as a group.

Figure III.2. Financial Dollarization Rates for Selected Emerging Market and Transition Economies



Source: IMF *International Financial Statistics;* and staff estimates.
1/ Most recent year data is 2004.

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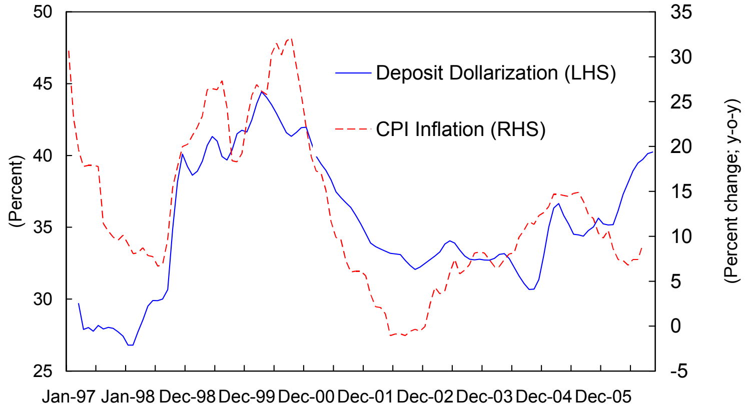
inflation or hyper inflation. Asset substitution (or "financial dollarization") occurs when agents use foreign currency as a store of value and hold interest-bearing financial assets in foreign currency. The latter form, which Ize and Yeyati (2003) contend accounts for the bulk of total measured dollarization, is the focus of this paper.

Factors Driving Dollarization in Ukraine

105. **High and rising inflation can lead to currency substitution and financial dollarization as residents seek to protect their purchasing power and asset value.** However, for many highly-dollarized emerging markets, the relationship has tended to be asymmetrical, with declines in inflation not generally associated with significant declines in dollarization.[43] Ukraine demonstrates some of this behavior, particularly between 1998 and 2002 (Figure III.3). The pattern is somewhat looser thereafter, with dollarization rates rising with a marked lag as inflation trended up starting in early 2002.

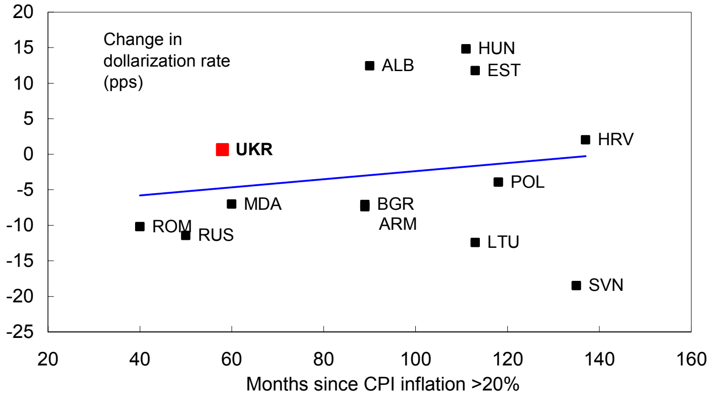
Figure III.3. Ukraine: Financial Dollarization and CPI Inflation



Sources: *International Financial Statistics;* and staff estimates.

106. **It has been suggested that downward inertia in financial dollarization as inflation declines could be explained by lingering memories of high inflation or a persistent fear of recurrence.** But even allowing for some degree of behavioral inertia, this should fade over time as macroeconomic stability is established. However, Figure III.4 suggests that for most transition countries, dollarization does not appear to decline significantly over time following periods of high inflation. Ukraine, in particular, shows little change in the level of financial dollarization almost 60 months after high inflation. The subsequent rebound of inflation starting in 2002 (albeit to moderate levels) makes it difficult to assess the impact of inflation memory as it may have rekindled memories of high inflation.

Figure III.4. Financial Dollarization and Inflation Memory 1/



Source: IMF *International Financial Statistics;* and staff estimates.
1/ Dollarization rate is defined as ratio of foreign currency deposits to total deposits.

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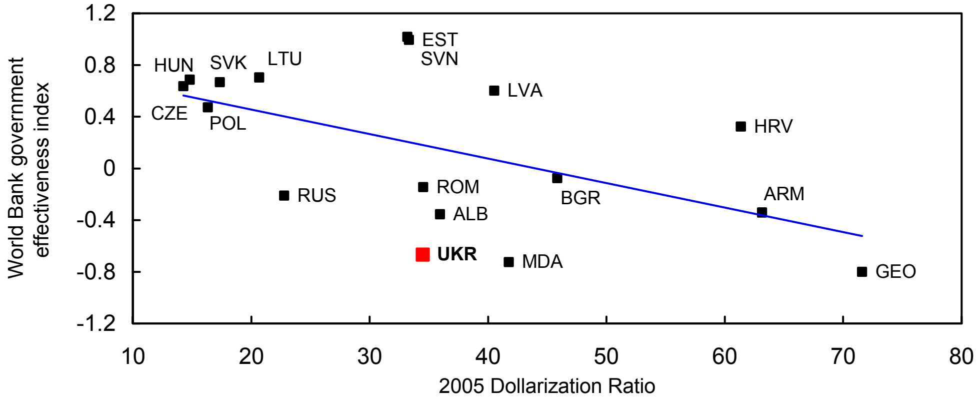
[43] For example, see IMF (2003).

107. **A lack of confidence in the quality of institutions of economic management can undermine confidence in the domestic currency and provide an incentive to hold assets in foreign currency.** The World Bank produces a summary indicator of "Government Effectiveness" which measures public perceptions of the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressure, and the credibility of the government's commitment to policies.[44] The World Bank indices are calculated every two years beginning in 1996 and range from -2.5 to 2.5, with a higher rating implying better governance. Figure III.5 compares "Government Effectiveness" ratings with dollarization rates for transition economies and suggests that greater government effectiveness is correlated with a lower rate of financial dollarization.[45] In fact, the regression line in Figure III.5 suggests that Ukraine should have an even higher level of dollarization than it currently does.

Figure III.5. Government Effectiveness and Dollarization



Sources: IMF *International Financial Statistics;* staff estimates; and World Bank.

108. **One might expect the presence of foreign banks to contribute to a higher level of financial dollarization**, particularly if foreign banks rely on their parents for (relatively inexpensive) financing or if lenders find it relatively easy to pass on currency risk to less sophisticated (particularly household) borrowers. This would show up in the form of a preference for lending in foreign currency, and given prudential requirements, would be mirrored, to some extent, on the deposit side. However, according to Figure III.6, cross-country data for 2003 do not confirm this hypothesis.

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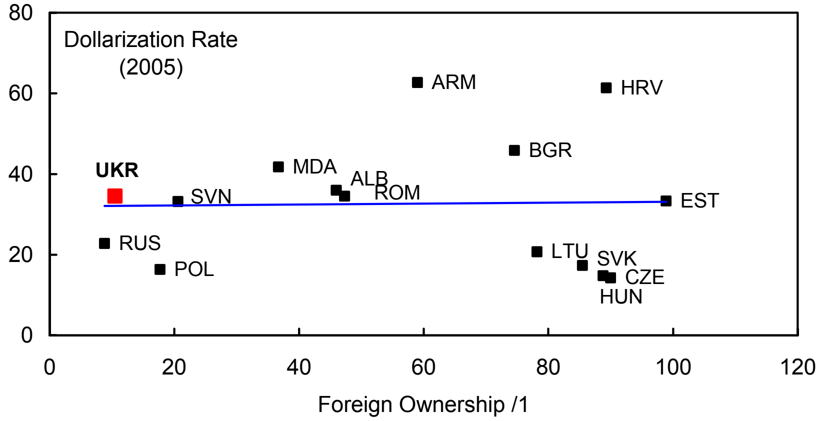
[44] Kaufmann and others (2005). Information on the methodology behind the construction of these indicators is available at www.worldbank.org/wbi/governance.

[45] The empirical link between dollarization and institutional quality has received considerable support in the literature. See, for example, De Nicolo and others (2003).

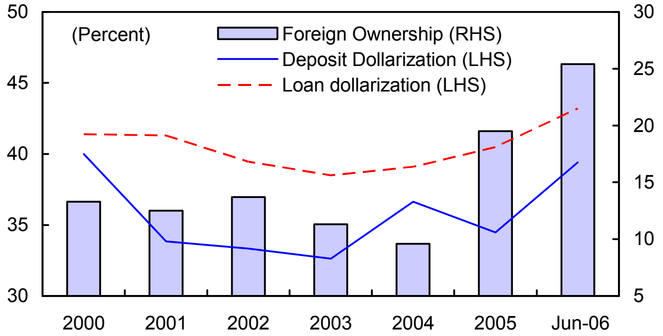
Figure III.6. Financial Dollarization and Foreign Ownership of Banks



Sources: IMF *International Financial Statistics; and s*taff estimates.
1/ Share of banking sector more than 50% foreign owned (2003).

109. **That said, for Ukraine a relationship has emerged more recently between foreign ownership in the banking sector and financial dollarization** (Figure III.7), with dollarization rising strongly starting in 2005 alongside a rapidly increasing foreign presence in the banking sector. In fact, during the first half of 2006, almost 60 percent of loans to households were denominated in foreign currency—up more than 40 percentage points since January 2001. This was driven in part by more favorable interest rates for foreign currency loans between 4 and 5 percentage points better, on average, since early 2004.

Figure III.7. Ukraine: Dollarization and Foreign Ownership in Banking Sector



Sources: NBU; IMF *International Financial Statistics;* and staff estimates.
1/ Share of foreign-owned bank capital in total statutory capital.

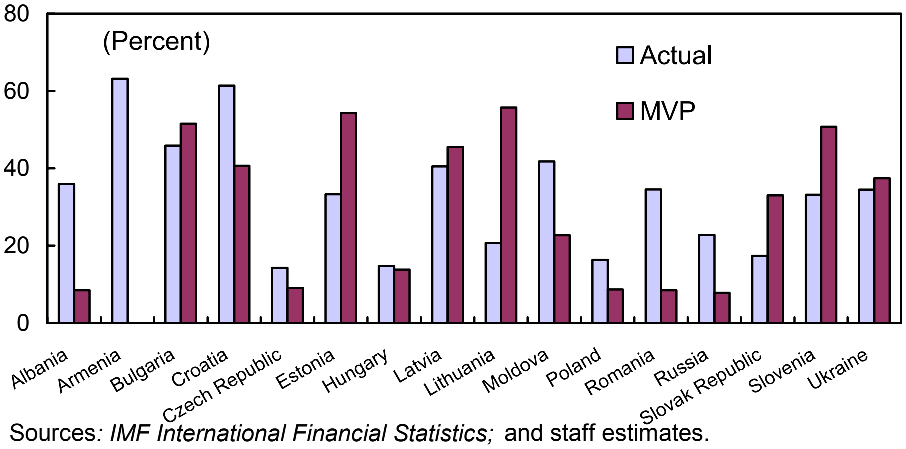
The Minimum Variance Portfolio Model

110. **Financial dollarization could also be a response of asset holders to the relative riskiness of holding assets denominated in domestic versus foreign currency.** This is the motivation behind the minimum-variance portfolio approach (MVP model) advanced by Ize and Levy Yeyati (1998). Here financial dollarization is attributed to the relative volatility of inflation (increasing the riskiness of domestic-currency assets) and the real exchange rate (increasing the riskiness of foreign-currency assets in domestic currency). Risk-averse resident depositors and borrowers choose the currency composition of their deposits and loans to optimize the risk-return profile of their portfolio, in terms of the local consumption

basket.[46] In effect, financial dollarization decreases when inflation volatility declines relative to real exchange-rate volatility.

111. **Ukraine fits the MVP model empirically—that is, the actual dollarization level is roughly consistent with MVP dollarization.** Applying the MVP model to Ukraine, monthly inflation and real exchange-rate volatility between January 2002 and December 2005 imply that the financial dollarization ratio would be about 37 percent compared with actual dollarization of 34 percent in 2005. The MVP model also approximates actual dollarization for Bulgaria, Hungary and Latvia, but is less successful at approximating the financial dollarization ratios of other transition countries (Figure III.8). Other factors likely play a relatively greater role in these countries, for example foreign-currency remittances in the cases of Albania and Moldova may explain why actual dollarization clearly exceeds what is predicted by the MVP model.

Figure III.8. Actual and MVP Dollarization



Sources*: IMF International Financial Statistics;* and staff estimates.

112. **That the MVP estimate is higher for Ukraine than the average for transition countries is not surprising given that Ukraine's CPI inflation is 3.5 times more volatile than the transition country average** (Figure III.9). This may partly reflect the fact that its CPI is dominated by food prices which are strongly seasonal and subject to large supply shocks. Ukraine's de facto fixed exchange rate likely also contributes to inflation volatility since prices must adjust to shocks in the absence of nominal exchange-rate movements.

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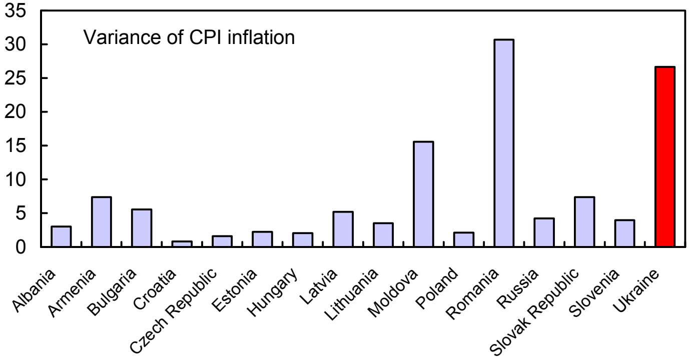
[46] The minimum-variance portfolio (MVP) is measured as MVP = [Var (π) + Cov (π, s)]/[Var (π) +Var (s)+ 2Cov (π, s)], with: π = inflation; s = change in the real exchange rate. Ize and Levy-Yeyati find empirical support for this model by regressing actual financial (deposit) dollarization on underlying dollarization as determined by the MVP model. Using quarterly CPI and exchange rate data for 1990-95, they find that the MVP model tracks actual financial dollarization for a group of 46 industrial, emerging, and developing countries.

Among transition countries, those with fixed rates demonstrated around 15 percent more inflation volatility, on average, than those with floating ones.[47]

Figure III.9. Inflation Volatility, 2002-05



Source: IMF *International Financial Statistics.*

113. **One hypothesis is that the higher volatility of inflation in Ukraine is affected by volatility in its terms of trade combined with a pegged exchange rate and a reluctance on the part of the authorities to sterilize the sizable capital flows that result.[48]** Table III.1 shows the correlation coefficients for (one year) lagged percent changes in the terms of trade and CPI inflation. While there is considerable variation among countries, those with fixed exchange rates show, on average, no correlation between changes in the terms of trade and inflation. Those with floating rates, show a negative one. However, among the former group, Ukraine has a coefficient of 0.3 percent, suggesting a relatively modest relationship between its terms of trade and inflation.

Table III.1. Correlation Between Lagged Percent Change in Terms of Trade and CPI Inflation, 2000-05

Floating exchange rate regime	Correlation coefficient, 2000-05	Fixed exchange rate regime	Correlation coefficient, 2000-05
Albania	-0.54	Bulgaria	-0.83
Armenia	0.37	Croatia	-0.48
Czech Republic	-0.91	Estonia	0.26
Georgia	0.23	Hungary	-0.88
Moldova	-0.39	Latvia	0.58
Poland	-0.61	Lithuania	0.94
Slovak Republic	0.15	Russia	0.31
		Slovenia	-0.08
Average	**-0.24**	Ukraine	0.30
		Average	**0.01**

Sources: IMF *International Financial Statistics*; and staff estimates.

114. **While inflation may be volatile, Ukraine's real exchange rate is relatively more stable.** It is only somewhat over 1.5 times more volatile than the average for transition economies (Figure III.10). The de facto peg of the hryvnia to the USD is likely a major factor

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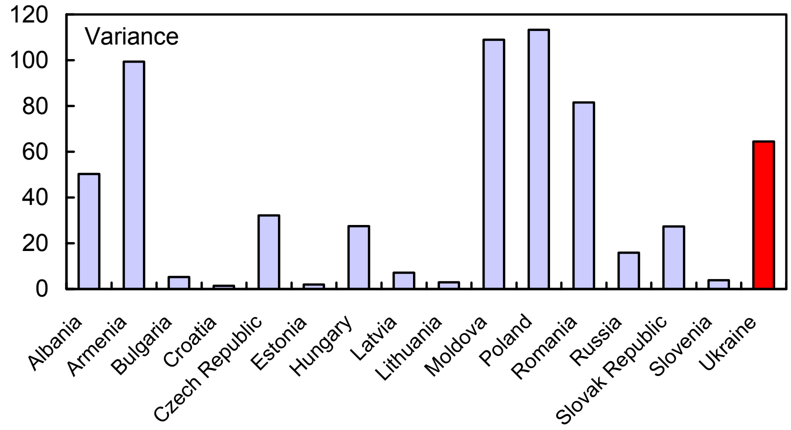
[47] Between January 2001 and December 2005, based on monthly rates, year over year. Regime classification is based on IMF *Classification on Exchange Arrangements and Monetary Frameworks* (see http://www.imf.org/external/np/mfd/er/index.asp). The sample excludes Romania which shifted from a crawling band to a managed floating with no predetermined path in the middle of the period (2003).

[48] Ukraine's terms of trade experienced a swing of almost 25 percent between 2002 and 2005.

in explaining this relative stability. Specifically, real exchange rates are more volatile under floating rather than a fixed exchange-rate regimes. Mussa (1986) attributes this to sluggishness in the adjustment of nominal price levels relative to the speed of adjustment of the nominal exchange rate under a floating regime.[49] Empirical support for a more volatile real exchange rate under a floating regime is also found in Broda (2001) where the author computes the response of various macroeconomic variables to a terms-of-trade shock for a sample of 74 developing countries. He finds that, in response to a positive terms-of-trade shock, the real exchange rate appreciates immediately and significantly under a floating regime whereas under a peg, the appreciation is small and delayed.

Figure III.10. Real Exchange Rate Volatility, 2002-05



Source: IMF *International Financial Statistics.*

115. **An important caveat to the MVP model pertains to the relationship between the exchange-rate regime and inflation volatility.** Specifically, while a floating exchange rate is expected to raise real exchange-rate volatility (and thereby reduce the incentive to hold assets in foreign currency), high pass of from movements in the nominal exchange rate to prices can increase the volatility of inflation (and thereby increase the incentive to hold assets in foreign currency). There are many factors that influence exchange rate pass-through to inflation. For example, *real* dollarization (i.e., the use of foreign currency for conducting day-to-day transactions) can increase pass-through. At the extreme, if all prices are in foreign currency (i.e., total *real* dollarization), there is complete pass-through to domestic prices of nominal exchange-rate movements to prices, effectively dampening any movement in the real exchange rate. In such cases, stabilizing the nominal exchange-rate may be the only way to stabilize inflation and reduce the incentive for financial dollarization. Levy Yeyati (2006)

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[49] The author tests this empirically for pairs of countries with similar and moderate inflation rates and shows that there are substantial and systematic differences in the behavior of real exchange rates under the fixed versus flexible nominal exchange-rate regimes.

finds a significant correlation between real and financial dollarization for emerging market and developing economies suggesting that this problem is not negligible.

Reducing Financial Dollarization in Ukraine

Tackling the roots of dollarization

116. **Any effort to sustainably reduce domestic dollarization hinges on convincing residents that the local currency represents a "quality" product as a store of value.** In Ukraine, there is clearly scope to improve confidence in the domestic currency, including by entrenching central bank independence and clarifying the primacy of its mandate to pursue price stability.

117. **Countries seeking to reduce financial dollarization have introduced a range of policies, some of which have been more market-friendly and less distorting than others.** But whatever polices are adopted, it should be kept in mind that dollarization is usually a rational response to weaknesses elsewhere in a country's institutional and/or economic policy framework. Therefore, efforts to achieve a sustainable reduction in dollarization must address the root causes of dollarization (e.g., excessive inflation volatility, lack of confidence in domestic institutions or economic management, macroeconomic instability) rather than its symptoms. Policy makers must also remain sensitive to unintended negative impacts. For example, while the presence of foreign banks may contribute to financial dollarization, its also brings with it enormous benefits in terms of financial deepening, improved access to capital and domestic competition. Therefore, any effort to contain their contribution to financial dollarization should at the same time not erode their positive attributes.

118. **The correlation between dollarization and institutional quality implies that improving transparency and accountability in government operations can contribute to a reduction in financial dollarization.** The climate for private-sector activity remains problematic as entrepreneurs are confronted with complex regulations, bureaucratic discretion, and corruption. There has been some recent, but marginal, progress in reform of market institutions. For example, according to Transparency International's Corruption Perceptions Index, Ukraine continued to improve its score to 2.8 out of 10 in 2006, up from its low of 1.5 in 2000. However, this score is still quite low, and much remains to be done. The importance of addressing these weaknesses goes well beyond the contribution that reform can make to reducing financial dollarization, extending to improvements in growth, employment, and living standards.[50]

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[50] Tiffin (2006) discusses in more depth the cost in terms of economic performance of Ukraine's "market unfriendly" institutional base. A more general discussion of the importance of institutions to economic growth can be found in IMF (2005b).

119. **The authorities' intention to adopt an inflation-targeting regime, if realized, should help reduce financial dollarization.**[51] The adoption of inflation targeting has been shown to be successful in anchoring inflation expectations, having a dampening effect on the volatility of inflation in emerging markets. Based on analysis of 13 emerging market inflation targeters, IMF (2005a) estimates that inflation targeting was associated with a reduction in the standard deviation of average inflation of 3.6 percentage points relative to other strategies adopted by other emerging market countries. The finding of a statistically significant decline in inflation volatility is relatively robust across country groupings. According to the MVP model discussed above, this, combined with an increase in real exchange-rate volatility, should help reduce financial dollarization.[52]

120. **If pass-through of nominal exchange-rate movements to prices is not excessive, a more flexible exchange-rate regime will enhance real exchange-rate volatility, thereby reducing incentives to hold financial assets in foreign currency.** While there is considerable uncertainty about the extent of pass-through in Ukraine, some general results suggest how pass-through can be reduced. Baquiero and others (2003) show that for a group of 16 small open economies that have experienced significant reductions in inflation, exchange rate pass-through weakens as the inflation rate decreases. This result is found for all countries in the sample, including[53] with flexible exchange rates. Ukraine's intention to eventually adopt inflation targeting therefore bodes well as a means to ensure that high pass-through does not undermine efforts to reduce financial dollarization.

Prudential, regulatory, and administrative alternatives

121. **Regulatory controls or restrictions on holding foreign currency deposits have been tried in several emerging markets.** At the extreme, some countries have forced

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[51] Financial dollarization does present Ukraine with challenges in implementing an inflation-targeting regime given the potential balance sheet effects of greater exchange rate flexibility. However, other emerging markets with dollarization rates similar to, or greater than, that of Ukraine have successfully managed these risks despite concerns over high pass-through of exchange-rate movements to prices. Peru, for example, with a dollarization rate more than twice that of Ukraine when it adopted inflation targeting in 2002, is a good example of how inflation targeting can be pragmatically introduced into an environment of high dollarization such that the inflation-targeting regime and the authorities' de-dollarization strategy are mutually reinforcing (see Armas and Grippa (2006) for an interesting discussion of this experience). More recently, Indonesia (2005), Romania (2005) and Turkey (2006)—all with dollarization rates over 30 percent—have also introduced inflation targeting. While too soon to draw conclusions from these experiences, the application of an inflation-targeting framework to these countries will no doubt be of interest to Ukraine.

[52] Interestingly, of the four transition countries that recorded an increase in their dollarization rates between 2001 and 2005 (Albania, Estonia, Latvia, and Ukraine), only Albania had a flexible exchange-rate regime. All other transition economies with flexible exchange-rate regimes experienced declines in dollarization rates, ranging from 1.3 (Poland) to 17.7 (Slovak Republic) percentage points.

[53] Including six emerging market economies.

conversions of foreign-currency denominated deposits (Bolivia and Mexico, 1982; Peru, 1985). While such an approach has the benefit of quickly reducing the dollarization ratio, the reputation cost to the authorities is generally large and policy reversals soon followed. Slightly less severe approaches such as prohibiting foreign-currency deposits have been tried. However, experience indicates that such approaches are more likely to drive foreign-currency assets off shore than to promote the use of the domestic currency as a store of value.

122. **A number of approaches have been adopted to encourage lending in domestic rather than foreign currency.** While many of these were adopted primarily as a means of dealing with foreign-exchange risk, they have some potential to reduce dollarization.[54] Each have their own associated costs and benefits. They also have differing, and non-negligible, requirements for effective administration, monitoring and enforcement. For example:

- *Higher provisioning requirements for foreign-currency loans and stricter requirements for borrowers to prove that they have reliable flows of foreign-currency income* have been adopted in many jurisdictions, including Ukraine. Such measures have clear benefits as a means of dealing with direct and indirect foreign-exchange risk although to date, there has been little empirical work to assess the effectiveness of these mechanisms to reduce financial dollarization.

- *An outright prohibition on foreign-currency lending could be quite costly and is thus not recommended.* Such a measure can easily interfere with legitimate economic activity. Moreover, it could result in lending shifting to less well-regulated or managed intermediaries and it has the potential to undermine financial intermediation.

123. **Among the more market-friendly policy options available is to increase the availability of reliable financial assets denominated in domestic currency.** Ukraine has a clear shortage of such instruments. For example, the stock of Ukrainian government securities held outside the central bank is low when compared with other countries in the region. A public debt management strategy that focuses on the development of domestic debt instruments could therefore have benefits in terms of reducing financial dollarization. On the private-sector side, passage of the Joint Stock Company Law and institutional development of the pension fund system would also help enhance the availability of domestic-currency denominated assets.

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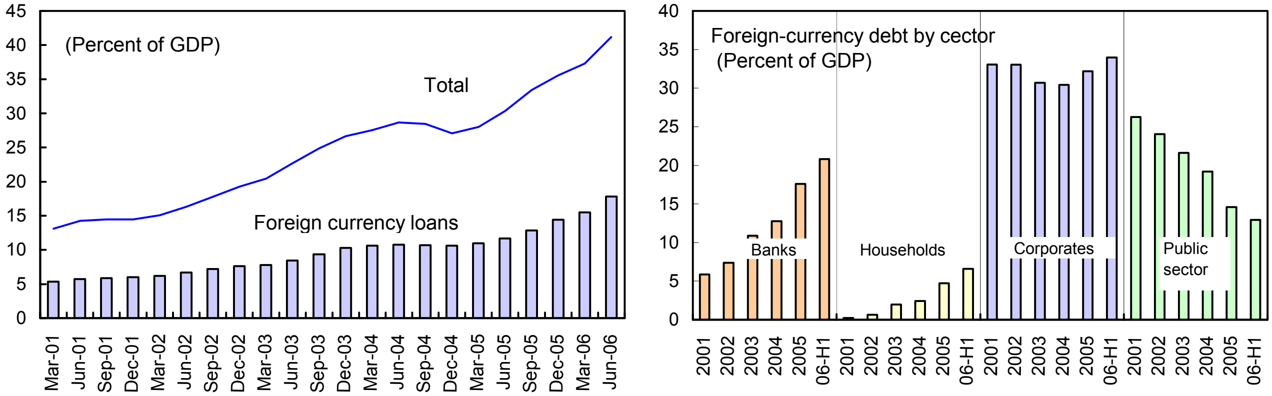
[54] See Chapter III.B for a discussion of prudential responses to financial dollarization.

B. Balance-Sheet Vulnerabilities: Coping with Rising Risks from Dollarization[55]

Background

124. **Balance sheet mismatches have widened for all sectors of the economy except for the public sector.** Bank loans to households, of which most are denominated in foreign currency, have provided new momentum to the lending boom. Surging real household incomes have raised access to and appetite for bank lending. At the same time, banks have started to compete more fiercely over market shares, including because of the influx of foreign banks since the Orange Revolution. By mid-2006, households' foreign-currency debt had jumped to 7 percent of GDP, up by 4¼ percentage points over the past 18 months (Figure III.11). Since corporates' demand for bank and foreign funding also remained very strong, their foreign-currency debt surged likewise to some 34 percent of GDP. Banks' foreign-currency liabilities more than doubled to 21 percent of GDP over the past 2½ years. These developments come against a much-narrowed undervaluation gap of the hryvnia (see Chapter II). In contrast to the private sector, public external debt levels have come down continuously to 13 percent of GDP by mid-2006 and the outlook for the external debt dynamics over the medium term is positive.

Figure III.11. Ukraine: Indicators of Dollarization, 2001-06


Ukraine's credit boom has also raised the indebtedness in foreign currency...

... for the private sector, while the public sector's foreign-currency debt has dropped sharply.

Sources: National Bank of Ukraine; Ministry of Finance; and staff estimates.

125. **The key risks that have arisen for banks are foreign-currency induced credit and liquidity risks.** Banks' direct open foreign-exchange positions are small, but their indirect credit risk is significant, since most of their borrowers' foreign-currency debt is unhedged. Hedging in Ukraine has been perceived as too costly in light of the de facto pegged exchange-rate regime and several distortions that have prevented the development of hedging instruments: a 1.3 percent non-cash foreign-currency transaction tax and, until August 2005,

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[55] Prepared by Elina Ribakova, Andrea Schaechter, and Dimitry Sologub.

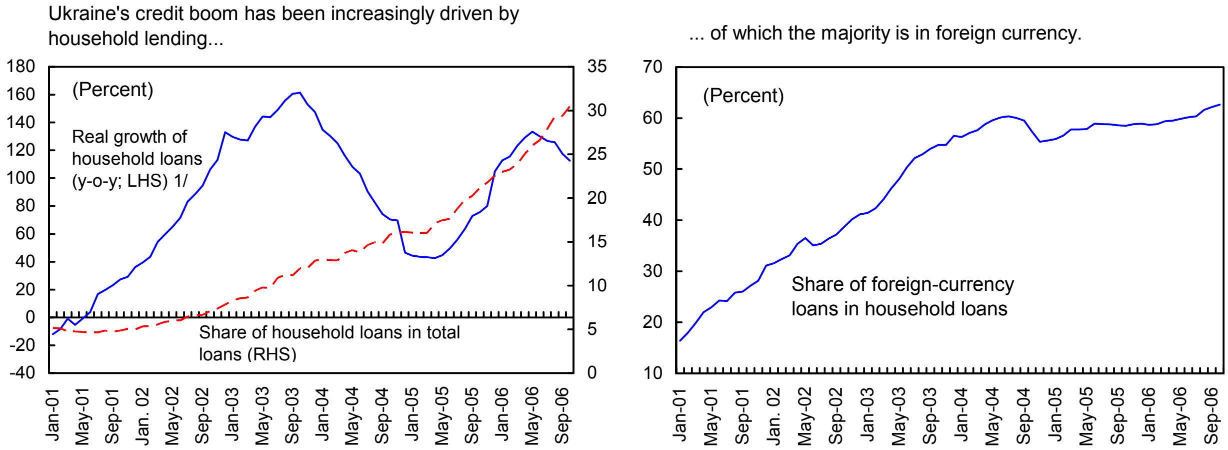
the prohibition of forward operations other than for hedging trading activities. In addition to credit risk, banks also face rising foreign funding risks. The majority of foreign-currency bank loans have been extended at long maturities, in particular mortgage and consumer loans. At the same time, banks' funding for these activities has come increasingly through loans from abroad, often at short maturities, which has heightened banks' liquidity risks. By end-July 2006, banks' short foreign currency liabilities exceeded short-term foreign currency denominated assets by 30 percent.

Foreign-Exchange Rate Risk of the Household and Corporate Sectors

Households

126. **Households borrow predominantly in foreign currency.** With the surge in household borrowing (Figure III.12), the sector's foreign-currency debt has nearly tripled over the past 18 months. Mortgage lending, of which 80 percent is denominated in U.S. dollars, has been the fastest rising segment, accounting for about one third of household loans at end-June 2006.

Figure III.12. Ukraine: Bank Loans to Households, 2001-06



Ukraine's credit boom has been increasingly driven by household lending...

... of which the majority is in foreign currency.

Sources: National Bank of Ukraine; and staff estimates.
1/ Deflated by CPI inflation.

127. **Surging household foreign-currency debt has significantly increased foreign-currency induced credit risk for the banking sector:**

- **Most households are unaware of the risks and unhedged.** With no significant exchange-rate fluctuations since 2000, the decision for foreign-currency denominated loans has been in most cases made solely based on interest costs. Only a small part of household loans is backed by foreign-currency income, including dollar wages and remittances, while most banks reportedly also lend to households without foreign-exchange income or assets. At the same time, the household sector's stock of foreign-currency assets, while large, can serve only as a partial hedge. Households' officially reported foreign-currency assets and estimated foreign-currency cash holdings vastly exceed the sector's foreign-currency debt.[56] However, those households with foreign-currency assets are typically not those with foreign-currency debt.

- **The quality of banks' risk management practices, in particular, for foreign-currency household loans is uneven.** The acceleration in household lending to more than 100 percent in real terms and the fight for market shares has raised doubts about appropriate risk management in a number of banks. Only few banks have already introduced credit-scoring models, data on borrowers' credit history is still weak, and the thoroughness in checking borrowers' information on income and collateral varies widely. Also, in the absence of guidelines on mortgage and consumer lending, many smaller banks extend loans at or close to loan-to-value ratios of 100 percent and apply rather high debt-to-income ratios.

- **Moreover, foreign-currency exposures from mortgage lending may not be appropriately backed.** Most banks view their mortgage loan book as well-hedged, since the vast majority of real estate in Ukraine is priced in U.S. dollars and housing supply shortages suggest upside potential for real estate prices. But this strategy may backfire. It assumes that recovery costs have been fully priced into mortgage lending rates. But in practice foreclosures have been costly and long-drawn out processes owing to weak creditors' rights (though in the recent past, most mortgage loans have been fully recovered because of surging property prices). Should an overshooting exchange rate coincide with a collapse of real estate price, banks' collateral may prove to be vastly overvalued.

128. **However, two factors have also mitigated banks' risks from foreign-currency loans to households:**

- **While rapidly rising, household foreign-currency loans still make up only a relatively small share of banks' loan books.** At 19 percent of total bank loans and 14 percent of total bank assets, foreign-currency household loans alone should not pose a risk to the aggregate banking sector. However, exposures vary across banks and need to be viewed in conjunction with risks from corporate loans in foreign currency.

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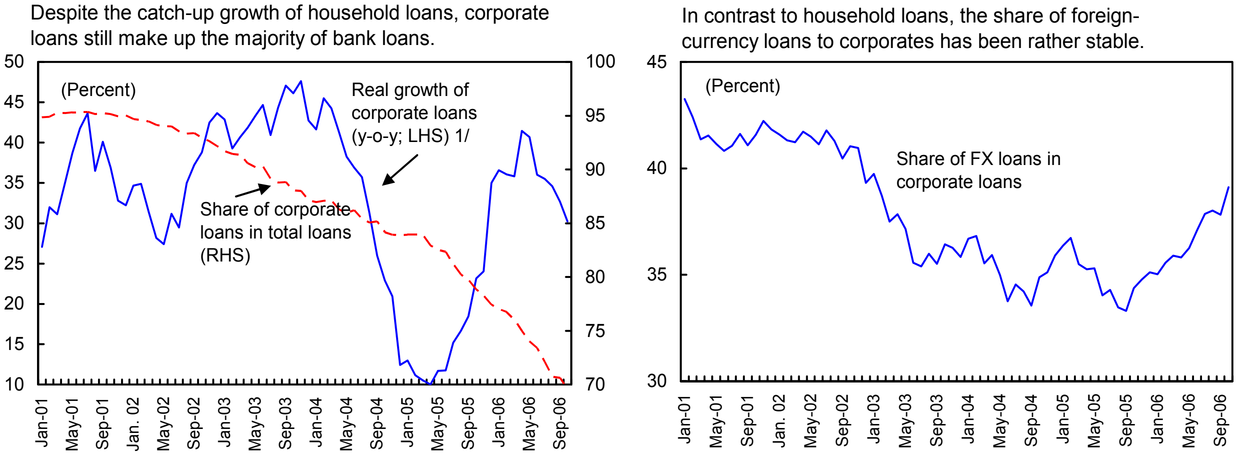
[56] For the economy as a whole estimates for foreign-currency cash holdings range from US$10 to US$20 billion; staff calculations based on foreign-exchange market data and remittances broadly confirm this. However, these estimates are high when compared to Russia, where they range from US$10 to US$45 billion (Oomes and Ohnsorge, 2005). In per capita terms, Ukraine's foreign-currency cash holdings would be threefold those of Russia's despite similar macroeconomic performances and access to banking services.

- **Higher provisioning requirements provide some safeguard.** Since many banks also lend to households without foreign-currency income, the NBU introduced higher provisioning requirements for loans to these borrowers, which took effect January 2006. The provisioning rates are set at 2 percent (instead of 1 percent) for loans classified as "standard", 7 percent (instead of 5 percent) for "watch" loans, 25 percent (instead of 20 percent) for "sub-standard" loans, and 60 percent (instead of 50 percent) for "doubtful" loans.

Corporates

129. **The corporate sector's debt in foreign currency is high, considering Ukraine's state of economic development.** Even though overshadowed recently by the boom in household loans, the corporate sector still makes up the largest segment of bank loans (70 percent) (Figure III.13). In contrast to households, the share of foreign-currency loans has leveled off over the past few years at 38 percent, but foreign-currency loans have continued to rise faster than nominal GDP. At the same time, corporates have gained access to external financing, which has raised the ratio of foreign-currency debt to GDP by 4 percentage points over the past 18 months. Ratios of 51 percent for total corporate debt-to-GDP and 21 percent for external debt-to-GDP at mid-2006 are already similar to those of more advanced transition economies (Figure III.14).

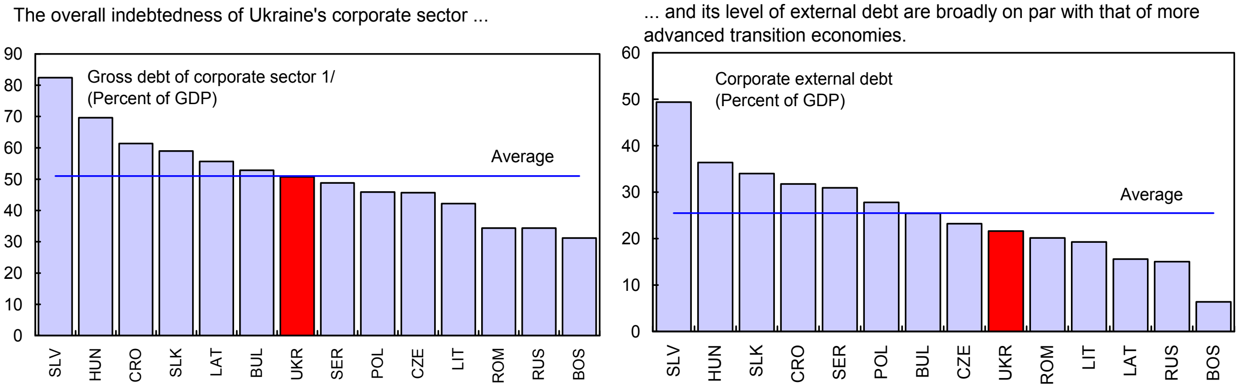
Figure III.13. Ukraine: Bank Loans to Corporates, 2001-06


Despite the catch-up growth of household loans, corporate loans still make up the majority of bank loans.

In contrast to household loans, the share of foreign-currency loans to corporates has been rather stable.

Sources: National Bank of Ukraine; and staff estimates.
1/ Deflated by CPI inflation.

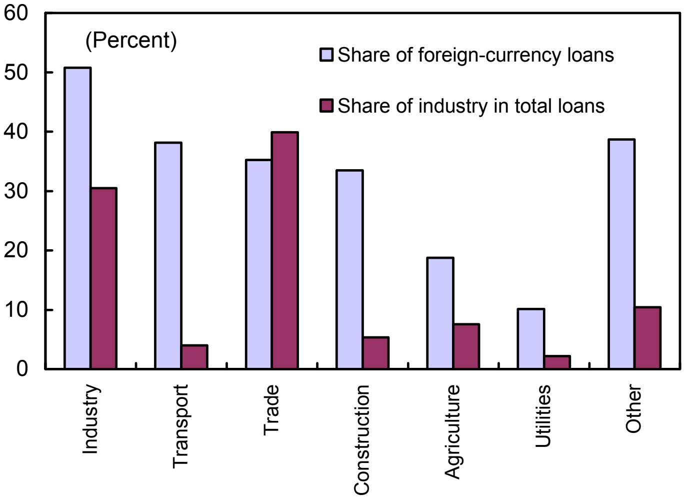
Figure III.14. Transition Countries: Corporate Sector Debt, 2005



Sources: IMF *International Financial Statistics*; and staff estimates.
1/ Includes corporates' sector external debt and bank loans to enterprises. Does not include other debt instruments, such as corporate bonds.

130. **Foreign currency-denominated debt is not merely a phenomenon of sectors that are naturally hedged by foreign-exchange incomes.** The highest share of foreign-currency loans can be found in the industry, transport, and trade sectors, all of which obtain a fair amount of their resources through export activities (Figure III.15). But more than one third of loans to the construction and other sectors are also denominated in foreign currency, exposing them to considerable foreign-currency risks.[57] Since loan concentration to an industry or few borrowers is high in a number of banks, it is a particular concern. On the other hand, banks' exposures to state-owned enterprises do not pose a systemic risk to the sector, since total lending to public enterprises accounts for only 4 percent of total loans (however, some banks have much larger exposures).

Figure III.15. Ukraine: Foreign-Currency Loans by Industry, 2005



Sources: National Bank of Ukraine; and staff estimates.

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[57] For a detailed analysis about the quasi-fiscal risks from state-owned enterprises in Ukraine, see Chapter I.B.

131. **In principle, the large stock of foreign-currency assets could partly offset corporates' foreign-currency risk, but whether those assets would be available in times of distress is unclear.** According to official data from the net international investment position and bank balance sheets, Ukraine's corporate sector is a large net debtor in foreign currency (at about 30 percent of GDP) and would therefore be vulnerable in case of a sharp hryvnia depreciation. However, these official net debt numbers are likely largely overestimated as they are not consistent with the large current-account surpluses that Ukraine enjoyed since 2000. Just for the years 2003-05, we estimate the unreported accumulation of external assets at 12½ percent of GDP (column 10 in Table III.2). Together with an earlier accumulated stock of foreign-currency assets, including foreign currency-cash, the corporate sector would have only a very small net external debt position. But since data on the maturity and distribution of corporates' foreign-currency assets are not available, one cannot take an informed view on how many of those assets would be available to hedge corporates' foreign-exchange risks. The convoluted ownership structures of corporate and banking groups further complicates the analysis (Box III.1).

132. **Another indication that corporates may have become more vulnerable to shocks is their reduced profitability—though data quality is poor.** Box III.2 summarizes a few financial indicators, which show that the corporate sector's profitability deteriorated in 2005-06, due to a higher tax burden, the jump in gas import prices, and the slowdown in real growth. Reduced profit margins and expected further energy price increases make some industries vulnerable to exchange-rate fluctuations.

Table III.2. Ukraine: Corporate Sector Flow of Funds, 2003-05

	Flows			Changes in stocks								
	Gross savings	Gross invest-ment	Net lending	Currency & deposits	Net domestic loans	Net foreign loans	Net securities	Net equity	Reported net acquisition of financial assets	Data gap between flows and stocks	Reported acquisition of foreign assets 1/	Estimated total acquisition of foreign assets 1/ 2/
	1	2	3=1-2	4	5	6	7	8	9=4+5+6+7+8	10=3-9	11	12=10+11
(Millions of hrvnias)												
2003	50,067	45,661	4,406	16,101	-22,178	-1,872	-340	1,329	-6,959	11,365	12,570	23,935
2004	90,688	42,398	48,290	64,456	-16,457	-10,767	-3,411	-4,465	29,357	18,934	57,906	76,840
2005	66,797	61,910	4,887	32,832	-38,701	-10,494	-2,166	11,392	-7,137	12,023	25,936	37,959
(Percent of GDP)												
2003	18.7	17.1	1.6	6.0	-8.3	-0.7	-0.1	0.5	-2.6	4.3	4.7	9.0
2004	26.3	12.3	14.0	18.7	-4.8	-3.1	-1.0	-1.3	8.5	5.5	16.8	22.3
2005	15.7	14.6	1.2	7.7	-9.1	-2.5	-0.5	2.7	-1.7	2.8	6.1	8.9

Sources: Ukrainian authorities; and staff estimates.

1/ Excludes foreign direct investment.

2/ Assumes that all unaccounted financial assets purchases are foreign asset purchases.

Box III.1. Ukraine's Corporate and Banking Sectors: Close Ties

Ownership structures of Ukraine's corporate sector are convoluted. A business group typically includes companies operating in diverse industries without clear strategic integration. Many of the smaller Ukrainian banks are "pocket banks" and operate as treasuries for these business groups. In the financial sector, the conglomerates often also include other financial entities, such as insurance companies or security traders. Since only a fraction of the businesses are public, the ownership structures are often opaque. This complicates the NBU's monitoring of related-party lending limits and, combined with weaknesses in accounting, banks' credit risk assessments.

Progress in improving transparency is ongoing, but has so far been slow. On the one hand, new legal requirements have been adopted that require greater information disclosure, including NBU regulations on publishing quarterly the main bank owners, a new law that prohibits the operation of banks as closed stock companies, and tighter requirements for corporates traded on the stock exchange. In addition, there are market forces to improve transparency: competition has forced some conglomerates to focus on core businesses, while the need for external funding has improved their accounting and reporting. On the other hand, the strong representation of business interests in parliament has delayed adoption of laws that would contribute to greater transparency. The key remaining weaknesses include reporting requirements for public companies as well as shortcomings in accounting standards and auditing practices.

Vulnerabilities of the Banking Sector

133. **This section assesses banks' vulnerabilities to two types of risks: foreign currency-induced credit and liquidity risks.** Two other risks—direct foreign-currency risk and interest-rate risk—are not analyzed since they are well-contained at this stage. Banks have been well within the boundaries set by tight NBU regulations on open foreign-currency positions (30 percent of bank regulatory capital; 20 percent of capital for long open positions and 10 percent for short positions). Moreover, interest-rate risk is currently estimated to be small.[58] To analyze indirect credit risk, we conduct stress tests for the banking sector as a whole and bank-by-bank for the largest banks in the system. The analysis draws on publicly available data from the NBU, banks' annual reports, and Bankscope.

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[58] Based on very limited data, staff calculations find maturity gaps for the banking sector to be contained, with little risk for large losses from interest-rate changes. Stress tests by the NBU also find rather limited exposures.

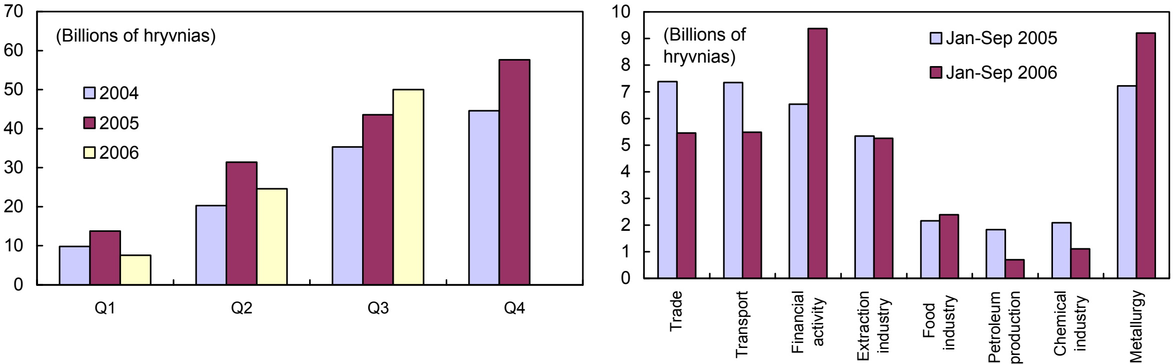
Box III.2. The Corporate Sector: Recent Developments in its Financial Results

Financial results of corporates are widely regarded to have deteriorated in 2005-06. Corporates' overall financial results (before taxes) increased by 29 percent in 2005, which also lowered the share of loss-making enterprises in the economy. However, the profit of profitable corporates diminished by 2 percent. Thus, the improved reported financial results can be traced back to tighter reporting discipline of companies that in 2004 reported losses (reportedly as part of tax evasion practices). In 2006, the corporate sector's financial position continued to deteriorate in the first half of the year but then recovered quickly in the third quarter mainly due to a jump in profits of metallurgical enterprises (see Box chart). The share of loss-making firms has risen from 33 percent to some 36 percent through the first nine months of 2006. The sectors that suffered most include the trade, transport, and the chemical industry, while the profitability in financial, metal, and food industries has picked up this year (Box chart).

National accounts data confirm the negative trends in overall corporates' profitability. The share of 'gross operating surplus and mixed income' in gross value added has decreased from 44.2 percent in 2004 to 39.5 percent in 2005 and 35.6 percent in the first half of 2006.

Nevertheless, official data on businesses' financials need to be interpreted with caution. The convoluted ownership structure of corporates (Box III.1), weaknesses in reporting and accounting, and the continued presence of tax evasion make it difficult to get a full picture of the sector.

Ukraine: Corporate Sector Profitability, 2004-06



Sources: State Statistices Committee; and staff estimates.

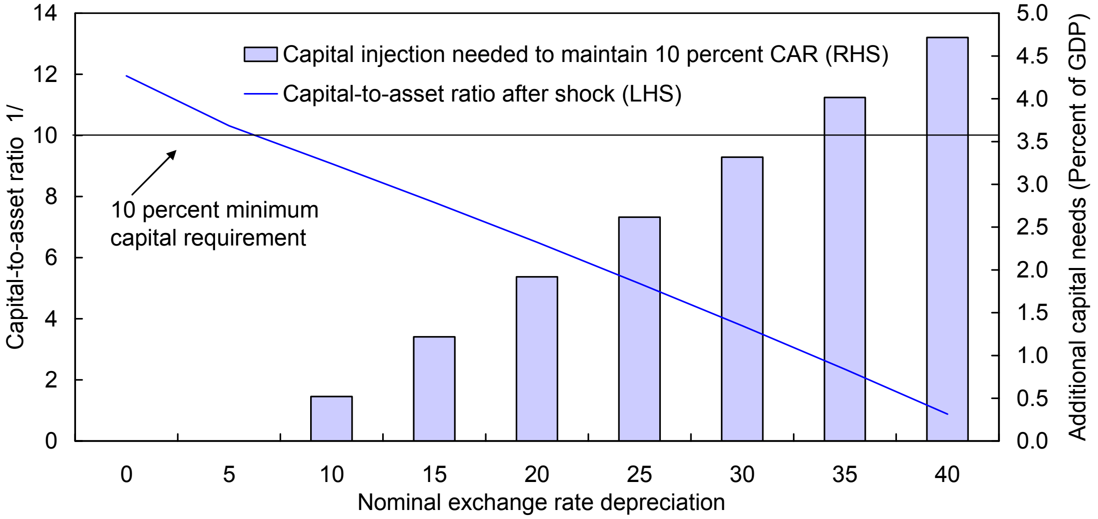
Foreign-currency-induced credit risk

134. **Stress tests for the banking sector, indicate that the system is well-positioned to withstand orderly exchange-rate fluctuations, but would be vulnerable to a sharp hryvnia depreciation.** A key assumption for testing banks' resilience is the relationship between exchange-rate movements and nonperforming loans (NPLs). While this is difficult to gauge for Ukraine, we assume, broadly in line with international experience for dollarized economies (see e.g., Cayazzo and others, 2006), that a 20 percent depreciation of the hryvnia

would increase banks' NPLs by 30 percent and would require additional provisions of about 15 percent of loans in foreign exchange. As a result of this shock, the sectors' capital-to-asset ratio would plummet from the current 12 percent to 6.5 percent. A 5 percent depreciation, on the other hand, would leave the capital-to-asset ratio close to 10 percent (Figure III.16).

Figure III.16. Ukraine: Sensitivity Analysis for Currency-Induced Credit Risk, June 2006

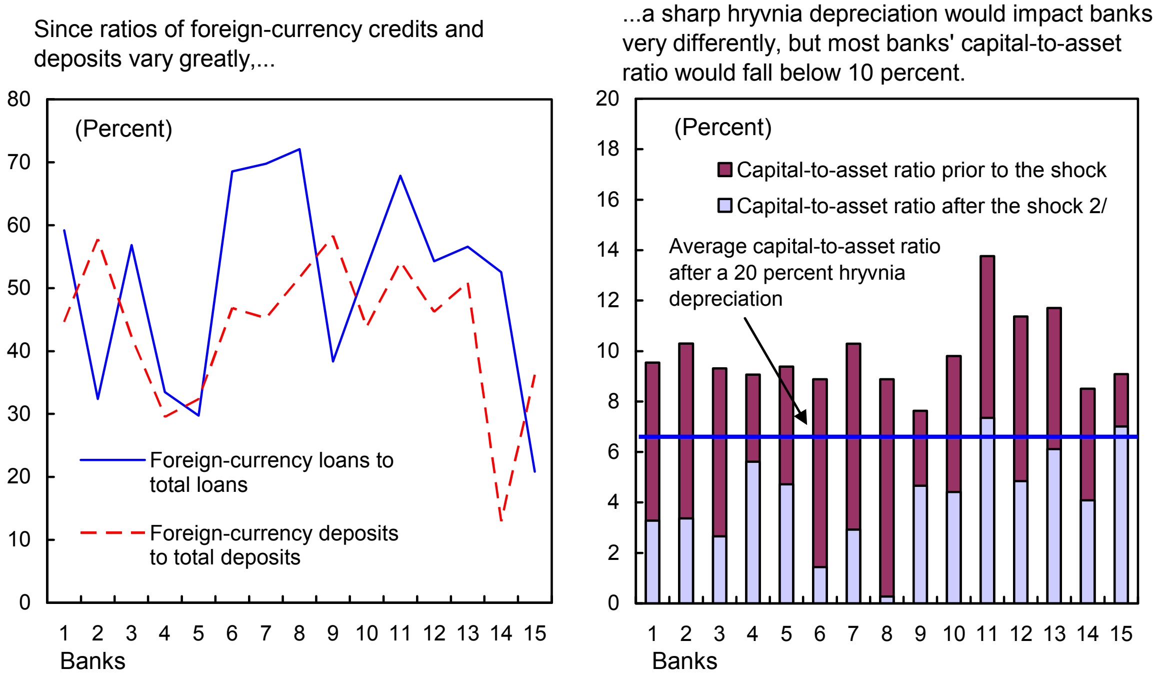
The chart shows by how much a hryvnia depreciation (horizontal axis) would reduce the banking sector's capital-to-asset ratio (CAR) (LHS) and how much extra capital would be needed to keep the ratio at 10 percent (RHS).



Sources: National Bank of Ukraine; and staff calculations.
1/ Calculations are for the ratio of capital to total book value of assets, while the minimum capital-to- adequacy ratio (CAR) of 10 percent is a ratio of capital to risk-weighted assets.

135. **Stress tests for individual banks show a great dispersion in banks' vulnerabilities.** Data for the largest 15 banks in Ukraine, which account for 60 percent of total banking sector assets, indicate that not only their share of foreign-currency loans varies widely across banks—from 20 percent to 70 percent—but also their capital buffers to withstand shocks (from 8 percent to 14 percent). Applying the above described 20 percent depreciation shock to individual banks indicates that for 13 of the largest 15 banks the capital-to-asset ratio would fall below 10 percent, depending largely on their reported shares of foreign-exchange loans and the share of loans in total bank assets (Figure III.17). These results need to be interpreted with caution, however. Without more information about the quality of banks' loan portfolios, including on the hedges of their borrowers and the degree of loan collateralization, the calculations may over-simplify.

Figure III.17. Ukraine: Bank-by-Bank Sensitivitities to Exchange-Rate Changes, 2005 1/


Since ratios of foreign-currency credits and deposits vary greatly,...

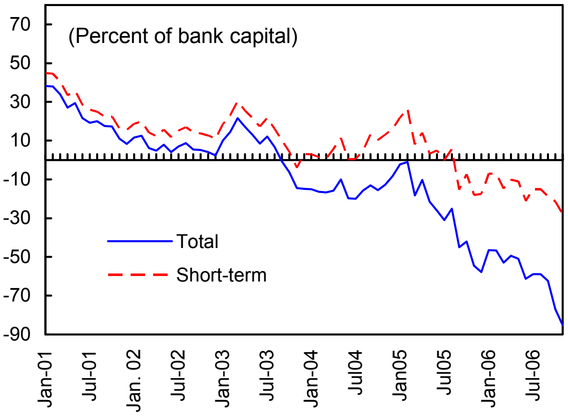
...a sharp hryvnia depreciation would impact banks very differently, but most banks' capital-to-asset ratio would fall below 10 percent.

Sources: Annual Reports of Ukrainian banks; and staff estimates.
1/ Largest 15 banks for which data was available (in random order).
2/ Assumes that a 20 percent hryvnia depreciation, raises NPLs by 30 percent, requiring additional provisions of 15 percent of foreign-currency loans.

Foreign-currency liquidity risk

136. **Banks' negative and rising net foreign asset position is testimony to increasing foreign-currency liquidity risk.** In September 2003, banks' net foreign asset position turned negative for the first time and has since dropped to 85 percent of bank capital at end-October 2006, making banks more vulnerable to foreign-currency funding risk. A particular concern are short-term funds (one third of net foreign assets) which could be withdrawn quickly in times of distress (Figure III.18). Demand and supply factors are behind the drop in net foreign assets. Banks' demand for foreign funds has increased as the expansion of foreign-currency credits in Ukraine surpassed the increase in foreign-currency deposits. At the same time, the influx of foreign banks into the system has intensified competition and raised the supply of foreign

Figure III.18. Ukraine: Banks' Net Foreign Assets, 2001-06



Sources: National Bank of Ukraine; and staff estimates.

funds from parent banks. The latter may eventually contribute to a more stable funding base over the medium term.

137. **Large banks, however, have increasingly gained access to long-term external funding, thus mitigating foreign-currency liquidity risks.** In September 2006, the total outstanding amount of Ukrainian banks' eurobonds was US$1.6 billion, accounting for about one quarter of banks' outstanding foreign liabilities. Since the first issues a few years ago, maturities have increased up to 10 years. As the ratings and spreads indicate, the bonds have been well received by investors (Table III.3). Until now, eurobonds were issued mostly by the top 10 banks, however issues by some medium-sized banks are expected in the near future. This would allow banks to move from short-term borrowing to longer maturities in order to ensure the stability of their funding.

Table 3. Ukraine: Outstanding Eurobond Issues by Domestic Commerical Banks, September 2006.

							Rating			
Bank Short Name	Amount issued (US$ mill.)	Issue Date	Maturity date	Maturity in years	Years from today	Coupon 2/	Moody's	S&P	Fitch	Spread to US Treasury (bp)
Bank Nadra	100	11/4/2005	11/7/2008	3.0	2.1	9.5	B1	...	B-	453
Privatbank	100	12/19/2003	12/19/2006	3.0	0.3	10.875	...	...	B	195
Privatbank 1/	150	2/9/2006	2/9/2016	10.0	9.4	8.75	Ba3	...	...	505
Exim Bank Ukraine	250	9/23/2004	9/23/2009	5.0	3.0	7.75	Ba2	...	BB-	260
Exim Bank Ukraine	350	9/7/2006	9/7/2011	5.0	5.0	7.65	Ba2	...	BB-	291
Exim Bank Ukraine	250	10/4/2005	10/4/2012	7.0	6.1	6.8	Ba2	...	BB-	306
Exim Bank Ukraine 1/	95	2/9/2006	2/9/2016	10.0	9.4	8.4	Ba2	...	B	321
Ukrsibbank	100	4/5/2004	4/5/2007	3.0	0.6	10.5	Ba2	...	BB-	152
Ukrsibbank	125	6/29/2005	7/14/2008	3.0	1.8	8.95	Ba2	...	BB-	230
Ukrsots Bank	100	6/6/2005	6/6/2008	3.0	1.7	9	Ba3+	B+	B-	278

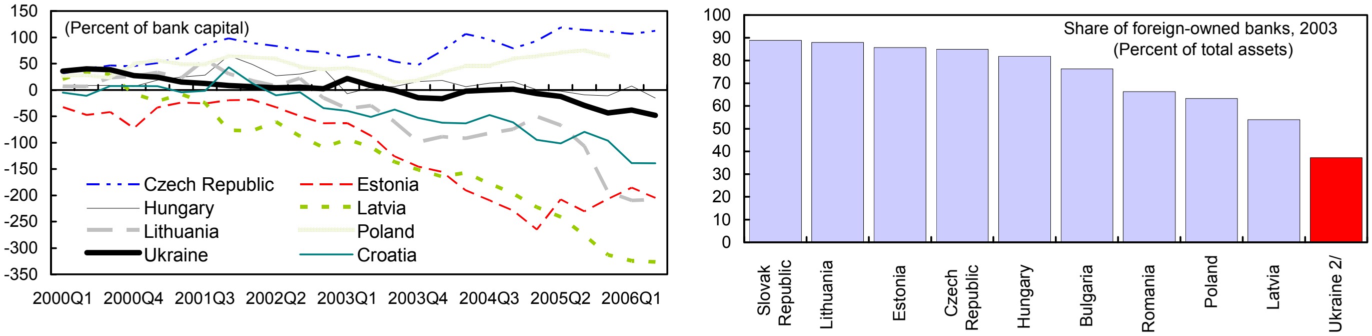
Source: Bloomberg, September 16, 2006.
1/ Callable.
2/ All bonds with semi-annual coupons.

138. **Most other transition economies experienced a similar decline in banks' net foreign assets, but often backed by much higher shares of foreign bank ownership.** In many emerging European economies, the surge in banks' foreign liabilities was associated with banks' borrowing from their foreign parents. Ukraine's net foreign assets position still compares favorably to most of its peers, but at the same time rising foreign bank penetration is also a much more recent phenomenon (Figure III.19). The Ukrainian banking sector may thus not be able to count on the same degree of parent-subsidiary funding, which is assumed to be more stable than pure market-based short-term financing.

Figure III.19. Selected Emerging Markets: Developments in Banks' Net Foreign Assets, 2000-06

The drop in NFA that Ukrainian banks experienced recently, is a common development among European emerging markets...

... but the higher share of foreign bank ownership in these countries, potentially allows for more stable funding.



Sources: European Central Bank; IMF *International Financial Statistics;* and staff estimates.
1/ Data for 2001 from Barth, Caprio, and Levine (2006) "Bank Regulation and Supervision" database.
2/ Data for 2006.

Measures to Reduce Balance-Sheet Weaknesses from Dollarization

139. **The NBU has already adopted a host of measures but more should be done.** Table III.4 summarizes the key steps that the NBU has taken over the past 18 months to tackle vulnerabilities in the banking system that derive specifically from foreign-currency risks and more generally from the credit boom.

140. **Two generic policy responses are available.** The first set of measures aims at reducing financial dollarization per se. Policies would include allowing greater exchange-rate flexibility and moving to inflation targeting, flanked by fostering the availability and attractiveness of hryvnia assets and liabilities. Recommendations along those lines are discussed in Section III.A. The second set of measures aims at reducing the vulnerabilities from dollarization and includes legal, regulatory, and supervisory banking measures, which are discussed below. The measures are listed in the order of speed and ease with which they could be introduced.

141. **Outright prohibition of foreign-currency loans, as an extreme response, is not advisable.** One major concern is that a ban on foreign-currency loans could encourage shifts into less well-regulated and managed institutions or less transparent new instruments. Moreover, a prohibition could have a negative impact on overall financial intermediation and its role for economic growth, because currency substitution cannot be expected to reverse quickly and fully. Thus, so far none of the transition economies facing similar problems as Ukraine has undertaken the drastic step of prohibiting loan dollarization, but most have adhered to a subset of measures listed below.

Table III.4. NBU Key Measures to Mitigate Vulnerabilities in the Banking Sector, 2005-06

Issues	Key Measures Taken by the NBU Since 2005	Date
Foreign-currency risk	Increase of provisioning requirements for loans in foreign-currency to borrowers without foreign-currency income.	Jul-05
	Reduction of limit on overall net open foreign-currency position from 35 percent to 30 percent.	Aug-05
	Lifting of prohibitions on foreign-exchange forward operations and operations on both sides of the foreign-exchange market within one day.	Aug-05
	Conducting of stress tests by supervisors.	Mid-2006
	Differentiation of reserve requirements by currency of deposits.	Sep-06
Liquidity risk	Submission of draft amendments to Banking Act that would tighten the early withdrawal of deposits in crisis times.	
	Changes in banks' reporting requirements to better monitor liquidity risks.	Mid-2006
Capital requirements	Increase in minimum required bank capital. (For new banks: EUR 10 million. For existing banks: EUR 8 million for universal banks; EUR 5 million for regional banks; EUR 1.5 million for cooperative banks)	Nov-05/2007
	Tightening of definition of capital.	2005
Transparency/ related-party lending	Setting up of credit bureaus.	2005
	Adoption of law that bans banks to operate as closed joint-stock and limited liability banks.	Oct-06
	Reduction of limit on total related-party lending from 40 percent to 30 percent of capital.	Sep-05
	Requirement to quarterly publish bank owners with a share of more than 10 percent.	Nov-05
	Submission of draft amendments to the Banking Law to require identification of ultimate bank owners.	2005
	Setup of database to better track bank ownership.	Underway

Source: National Bank of Ukraine.

Measures to address foreign currency-induced credit risk[59]

142. **An educational campaign could raise borrowers' awareness of foreign-currency risks.** Given the lack of understanding among retail borrowers about foreign-exchange risks, a public information campaign could assist borrowers in making better-informed decisions about bank borrowing. Country examples of such campaigns are Poland and Hungary, where banks are required to discuss the risks with their customers and information on foreign-currency risks is posted on the web pages of the financial supervisory authorities.

143. **Guidelines for managing currency-induced credit risk, including on mortgage lending, should aim to strengthen banks' risk-management practices.**

- Given sharply rising mortgage lending in Ukraine, guidelines or regulations on loan-to-value (LTV) and debt-to-income (DTI) ratios would be key. Empirical studies demonstrate that loans with high LTV- and DTI-ratios tend to have higher probabilities of default and loss severity.[60] Many supervisors have therefore issued prudential guidelines that set limits on these ratios and require banks to regularly report to the supervisors on their trends. In developed financial markets, where securitization plays an important role in mortgage financing, limits on LTV and DTI ratios are also prescribed in order to make loans eligible for security issues (for example covered bond legislation in Europe). Recently, emerging market economies have also started to introduce such measures, for example Romania where they have been set at 35 percent for DTI and 75 percent for LTV.

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[59] For a cross country study of measures to reduce foreign-exchange risk see Hilbers and others (2005), Cayazzo and others (2006), and Enoch and Otker-Robe (2006). See also Goldstein and Turner (2004), Gulde and others (2004), and Mar Cacha and Morales (2003).

[60] See, for example, Quercia and Stegman (1992).

- More generally, guidelines by the banking supervisor should assist banks in improving their foreign-currency risk management practices; for example, as practiced in Austria and Croatia. Such guidelines should also ask banks to conduct regular stress tests on the effects of potential exchange-rate movements and report their findings to the NBU. A key responsibility for the NBU's on-site supervision would be to assess whether banks' credit risks are in line with the issued guidelines.

144. **While the NBU is already very strict on its risk-weights for foreign-currency loans in calculating capital-adequacy ratios, the considered further increase would be a welcome step.** The NBU already assigns a risk-weight of 100 percent to all loans to households and enterprises in foreign currency in the calculation of the risk-weighted capital-asset ratio. It has contemplated an increase in the risk-weight to above 100 percent (possibly 110 percent), similar to practices in Georgia (200 percent) and those considered in Croatia.

145. **Provisioning requirements could be raised further.** Ukraine's differentiated provisioning requirements for hedged and unhedged borrowers have been a good step to address banks' vulnerabilities—in particular, the strict interpretation of all household borrowers as unhedged borrowers, except those with explicit dollar incomes. Nevertheless, the buildup of provisions has not kept pace with the buildup of banks' vulnerabilities and a further increase in provisioning ratios, as considered by the NBU, could help close that gap.

146. **At least temporarily, the minimum capital-adequacy ratio should be increased.** An increase in the capital-adequacy ratio (CAR) has two key advantages over higher provisions (see also Box III.3). First, it would provide buffers for all types of shocks, not only foreign currency-induced credit risk. And second, it would be easier to monitor than provisioning requirements for unhedged borrowers. The downside of higher minimum CARs are higher costs, even for those banks that conduct appropriate risk management. On balance and in light of the current vulnerabilities of the Ukrainian banking sector, the NBU should at least temporarily raise the minimum CARs from 10 to 12 percent until banks' risk management practices have improved. A minimum CAR of 12 percent would be in line with practices in other emerging market economies, where banking sectors have considerable exposures to shocks. For example, the Baltic countries had for many years minimum CARs of 12 percent or above and have lowered them only after the banking sectors strengthened. Today, minimum CARs are still at 12 percent in Bulgaria, Romania, Kazakhstan, and

Albania. Over the medium term, the NBU could then move to more risk-based supervision, where bank-specific capital requirements would be better matched with bank-specific risks.

Box III.3. Capital or Provisions— What is the Better Buffer for Foreign Currency-Induced Credit Risk?

While the theory suggests that capital should be used for unexpected losses and provisions for expected losses, the choice depends on the institutional context. Provisions should be calculated for expected losses by multiplying borrowers probability of default (PD) by loss at default (LGD) and exposure at default (EAD) (PD*LGD*EAD). To the extent that expected exchange-rate fluctuations affect any of these factors, higher provisions are warranted. For unexpected, but plausible exchange-rate movements, capital buffers should be used.

However, there are important institutional considerations. In some countries, the supervisors find it easier to implement higher provisions. In others, where the International Financial Reporting Standards (IFRS) are implemented, accounting definition for provisions can conflict with prudential recommendations. Under the IFRS, provisions should only be made for impaired loans where there is an evidence of loss. Hence, provisions for a possible movement in the exchange rate would not be acceptable under the IFRS.

Measures to address foreign-currency liquidity risk

147. **Foreign-currency liquidity risk can be mitigated in several ways:**

- In Ukraine, all liquidity requirements are currently independent of the currency denomination. To provide greater assurance against a withdrawal of foreign-currency deposits and ensure that banks internalize foreign-currency liquidity risk, the NBU could require banks to hold a certain share of liquidity in foreign currency.

- The long-delayed adoption of amendments to the Banking Act, which would spell out options for the NBU in crisis times—including to temporarily suspend deposit withdrawals—would be a key factor in mitigating liquidity risk. This should be accompanied by liquidity crisis management plans in each bank and for the banking sector as a whole.

- Moreover, a master agreement on the use of fixed-term deposits, including penalties for early withdrawal, could help the dispersion of such longer-term instruments.

Other legal and regulatory measures

148. **Other institutional improvements would also help reduce bank vulnerabilities.** The two key long-standing recommendations, which go beyond addressing foreign-currency induced credit risk, include: (i) to raise transparency of bank ownership and strictly enforce

related party-lending limits; and (ii) to facilitate banks' credit risk-assessment practices by improving the functioning of the credit bureaus and strengthening accounting and reporting standards for corporates. Finally, while interest-rate risk is still limited, the NBU should implement the Basel Committee's recommendations on how to mitigate interest-rate risk.[61]

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[61] BIS, Principles for the Management and Supervision of Interest Rate Risk (2004).

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