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November 2005
IMF Country Report No. 05/416

Ukraine: Selected Issues

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International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

UKRAINE

Selected Issues

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Approved by European Department

October 18, 2005

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A. Introduction

1. **Following last year's dramatic political events, the incoming Yushchenko administration moved quickly to articulate their new policy goals.** They presented a broad agenda that extended beyond simple macroeconomic stabilization, focusing instead on accelerating Ukraine's institutional transition toward a modern market economy. Much of this agenda is anchored within a medium-term strategy of greater integration with the European Union and global markets. For example, the presidential decree "National Strategy for EU Integration," outlines a ten-year program of far-reaching reform across all the spheres of the EU *Acquis Communitaire*. Within this vision, it is hoped that the development of more market-friendly institutions would help ensure that the growth performance of 2001-2004 could be sustained over the medium term.

2. **This chapter investigates the economic importance of institutions in Ukraine, and attempts to quantify the potential benefits of market-friendly structural reform.** The chapter tackles two questions: to what extent have market-unfriendly institutions hampered economic performance in the past? and what would be the likely pay-off in terms of higher growth and living standards if the new authorities succeed in their medium-term objective to strengthen market-enhancing institutions? Using a cross-country framework, the results suggest that Ukraine has an enviable endowment of natural and human resources, but that the economy has not been able to use these resources efficiently. The results further suggest that this inefficiency arises from the market-unfriendly rules and practices that make up Ukraine's institutional base. Hypothetically, for example, if Ukraine were to possess the type of market institutions prevalent in the countries that recently joined the European Union, income per worker might almost double. This highlights the fact that achieving a high rate of sustainable growth in Ukraine will depend on much more than simply increasing the pace of investment—durable growth will depend instead on the authorities' ability to secure the basic foundations of a modern market economy.

3. Section B of this chapter will review some of the key findings of the development-accounting literature, which has tried to explain the significant differences in income that persist across countries. The section will also introduce the stochastic-frontier approach used in this chapter, outlining its key assumptions and strengths. Section C will present the stochastic-frontier model in more detail, and section D will outline the model's results. Section E will discuss the implications of these results for the specific case of Ukraine, quantifying the likely growth path for Ukraine over the next decade under different reform scenarios. Section F will briefly outline some caveats, particularly as regards data and measurement issues, and section G will conclude.

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[1] Prepared by Andrew Tiffin (EUR).

B. Explaining Cross-Country Differences in Income

Theoretical considerations

4. **A key finding of the development-accounting literature is that international differences in income result mainly from differences in *productivity*, rather than *factor accumulation.*** As outlined in Hall and Jones (1999), McGrattan and Schmitz (1998) and others, the income gap between rich and poor countries is vast, and cannot be explained by differences in capital, labor, or other resources. Instead, the key determinant of an economy's relative income is its level of productivity.

5. **The obvious follow-up issue, therefore, is how to account for such variations in productivity.** Productivity disparities can be broken down into differences in: i) *technology*, representing the sum of available knowledge as to how factors of production can best be combined, and ii) *efficiency*, representing how effectively a country's factors are actually used.

6. **Given the rapid diffusion of knowledge across the globe, explanations that rely on technology gaps to account for large and persistent differences in productivity are generally not plausible.** To illustrate, we might consider the productivity difference between the United States and Ukraine—asking whether this can be explained in terms of efficiency, or whether it reflects instead the less-advanced technology *available* to Ukrainian producers. One way of tackling the question is by expressing the technology gap in terms of time: i.e. estimating how far Ukraine lags behind the United States. Using an estimate from Weil (2005), the average annual growth rate of U.S. productivity over 1960-2000 was 0.81 percent. Taking this growth rate, and assuming that the difference between the two countries is entirely the result of different technology—i.e. assuming that each country uses its resources efficiently—the size of the productivity gap implies that the technology available to Ukraine is over 200 years behind that in the United States.[2] This is clearly unlikely. Similar calculations can be carried out for other countries, and all highlight the same message: unless lags in technology are extremely large, most of the gap between rich and poor countries stems from differences in efficiency, rather than technology.

7. **It should be stressed here that "technology" refers to the sum of knowledge that is implicitly *available* to local producers.** This is conceptually distinct from the technologies that are actually observed in the workplace. Even with equal *ex ante* access to an identical knowledge base, the range of technologies that are adopted *ex post* may vary

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[2] With no differences in country-level efficiency, the productivity ratio between two countries can be expressed as $A_{USA} / A_{UKR} = (1+g)^T$, where A is the level of Total Factor Productivity, g is the rate of technological change, and T represents the length of time that would be required for the lagging country to catch up.

across countries, depending on the particular circumstances of the country in question. Sometimes, this may simply reflect resource differences or comparative advantage. Often, however, it reflects instead country-specific frictions or impediments that prevent the profitable use of the most advanced techniques. In this sense, the presence of obsolete production techniques does not necessarily imply a technology/knowledge gap. Rather, it may reflect an underlying situation in which producers are discouraged from adopting best-practice techniques; either because of burdensome regulations, or because their economic environment is such that they are unable to use these techniques efficiently. In this framework, therefore, the presence of sub-optimal technologies may reflect the underlying structural health of the economy—a *symptom of poor efficiency*, rather than a result of unavailable technology.

8. **The main challenge, therefore, is to explore the reasons behind international differences in efficiency.** Inefficiency may arise from various sources.

- Unproductive activities: such as theft, smuggling, or rent-seeking behavior. This might also include the production of unwanted goods resulting from political decision making, and producer activity designed to prevent theft or expropriation (fences vs. factories).

- Idle resources: reflecting not only unemployment from macroeconomic instability, but also underemployment associated with overstaffed state-run enterprises.

- Misallocation of factors across sectors: which may in turn reflect barriers to mobility; or situations in which factor prices are not equal to marginal productivity.

9. **All of these sources of inefficiency have played a significant role in transition countries, often reflecting the legacy of communist central planning.** Much of what the communist economies produced was of poor quality or dubious value; and compared to general practice in the west, socialist industry often employed several times more inputs (especially energy) to produce the same volume of output. Moreover, in the absence of any incentives to encourage efficiency, much of the "investment" that took place under the old system amounted to little more than waste and theft (Åslund, 2001).

10. **Persistently low levels of efficiency result from an underlying absence of market-friendly institutions.** The definition of "institutions" can vary, but in an economic context the concept generally refers to the set of formal and informal constraints that shape an individual's ability to act productively and cooperatively. Typically, a market-friendly institutional base will include such items as: the rule of law, secure property rights, enforceable contracts, an even-handed and transparent government, and so on. The absence of such institutions will adversely impact the population's willingness to engage in mutually-beneficial trade, or to seek out more efficient productive opportunities.

11. **Theoretically, this point is relatively uncontroversial.** For example, Parente and Prescott (2004), as part of a model that seeks to explain the historical path of income between countries and across time, have highlighted the crucial role of this link between institutions and efficiency—in their *Theory of Relative Efficiencies*, they stress that governments have

historically attempted to favor particular factor owners or interest groups by constraining the technologies or work practices of their citizenry. Inter alia, such practices will often take the form of arbitrary and unaccountable government intervention, with adverse results for overall efficiency. Similarly, Gonzalez (2005) uses a game-theoretic framework to show that, in the absence of effective property rights, agents will often adopt suboptimal technology in order to avoid predatory expropriation by others. He further shows that this outcome may prevail even in a situation where the adoption of efficient technology is costless.

12. **To quantify the level of efficiency in Ukraine and other countries, this chapter will adopt a stochastic frontier framework.** This econometric technique dates back to Aigner, Lovell and Schmidt (1977) and is specifically designed for situations in which agents operate less than optimally. In a production context, where it is most often employed, it typically uses cross-sectional data to estimate a best-practice frontier—i.e., what a firm or country could have produced if it were operating at 100 percent efficiency. The actual output of the country is then measured against this hypothetical benchmark as a guide to its overall level of efficiency.

13. **In a cross-country context, this framework will allow us to decompose each country's total factor productivity (TFP) into the product of two components: i) an efficiency component; and ii) a technology component.** The technology component is assumed common across countries, as countries are all assumed to have equal access to the current stock of productive knowledge. This is not unreasonable, as much of this information is publicly available, and even proprietary information can be accessed through licensing agreements or foreign direct investment. The technology component is further assumed to increase exogenously through time, reflecting the global pace of technological innovation. The efficiency component, on the other hand, is not common across countries, and will vary between 0 and 100 percent—an efficiency level that is less than 100 percent implies that a country is operating inside its production possibilities frontier. *In this framework, therefore, differences in country-level TFP by assumption reflect differences in efficiency.*

Previous literature

14. **There is a large and growing empirical literature that has documented the importance of institutions for growth and income over the long run** (Acemoglu and others 2000; Hall and Jones 1999; Engerman and Sokoloff, 1997; and many others).

15. **However, empirical work that has focused on the key link between institutions and efficiency is somewhat more recent.** Moroney and Lovell (1997) were the first to use stochastic-frontier techniques to compare the performances of OECD and planned economies over the period 1978-1980, with the objective of quantifying the extent to which market economies were more efficient than the planned economies of Eastern Europe. Adkins, Moomaw, and Savides (2002) extend this stochastic-frontier approach by examining the sources of inefficiency across 75 countries, focusing on the role of economic and political institutions. Similarly, Kneller and Stevens (2002) take a panel of 82 countries and examine the impact on efficiency of geography, trade, and various measures of government policy. This chapter goes further by considering a broader set of countries, with a significantly longer dataset, and focusing on the specific implications for Ukraine.

C. Empirical Analysis

Model

16. As mentioned above, **the model used in this chapter is based on a stochastic-frontier framework**. The details of the model, as well as a technical discussion of its econometric assumptions and strengths, are provided in Appendix I. However, a less formal treatment is provided below for convenience.

17. **In line with the stochastic-frontier approach, a country's output can be expressed as the product of two components**:

$$Actual\ Output = Efficiency \times Optimal\ Production \tag{1}$$

The estimated level of optimal production incorporates the latest globally-available technology, and reflects the amount of output that a country *could* produce if it were to use its resources optimally, employing world-class, best-practice techniques. Again, we assume for the moment that all countries have equal access to this technology. Countries differ in their overall productivity, however, through the efficiency term—which is a fraction between 0 and 1. If a country is operating at an efficiency level of 100 percent (efficiency = 1), then it is using all its available inputs in the most productive manner possible, given the current state of worldwide technology. A level below 100 percent represents a situation in which local frictions and impediments cause the country to produce at a point inside and away from the best-practice frontier.

18. **For each country, the (best-practice) level of optimal output will depend on the usual set of inputs.**

$$Optimal\ Output = f\left(physical\ capital;\ human\ capital;\ labor\right) \tag{2}$$

More formally, we assume a human-capital augmented Cobb-Douglass specification, as outlined in Hall and Jones (1998):

$$Optimal\ Output = A_0 e^{\eta t} K_t^{\alpha} (h_t L_t)^{\beta} \tag{3}$$

Where t is a time index, K is the capital stock, L is the labor force, and h is a measure of human capital. In our specification, human capital "multiplies" the effectiveness of the available labor force. We do not assume that $(\alpha + \beta) = 1$, and so allow for the possibility of non-constant returns to scale. However, we do assume a steady rate of global technical progress, η.

19. **The assumption of equal access to a common technology was likely violated for planned economies during the Cold War, when there were numerous legal prohibitions preventing the free flow of technology**. Indeed, in the 1990s part of the early optimism regarding the transition economies stemmed from an expectation that, given their rich factor

endowments, a sudden inflow of new western technology would produce a clear and rapid increase in output. To allow for this possibility, the constant term A_0 is permitted to take a different value for transition countries prior to the fall of the Berlin Wall.

20. **To capture the link between a country's efficiency and its institutional base, we allow the efficiency term to depend directly on a measure of institutional strength**, so that:

$$Efficiency = g\left(Institutional\ Strength\right) \tag{4}$$

The precise econometric specification for the efficiency term is outlined in Appendix I, and the particular measures of institutional strength used in our model are described in more detail below.

Data

21. **Data on inputs and output are taken from a recent cross-country dataset provided by Baier, Dwyer, and Tamura (2004)**, who combine and extend the Penn World Tables (6.1) and the Barro and Lee human-capital dataset (1993) to a produce a panel of 145 countries, accounting for 98 percent of the world population.

22. **Real output per worker is measured in 1985 U.S. dollars, using purchasing-power parity (PPP) exchange rates**. The adjustment for changes in PPP and inflation ensures that the observations are comparable across countries and across time. Real capital per worker is also in 1985 dollars, where the capital stock is estimated using the perpetual inventory method—these estimates in turn are derived from PPP-adjusted investment rates and assume an annual depreciation rate of 7 percent. The data include a broad measure of human capital, which not only measures the average education of the workforce, but also takes into account the average level of workplace experience.[3]

23. **To investigate the impact of market-enhancing institutions on efficiency, we use the indices provided in the World Bank's cross-country governance dataset, as developed and presented in Kaufman and others (2005).** This dataset covers a broad range of countries and provides various country-level measures of institutional strength—the measures are drawn from a combination of expert polls and business surveys. Using individual survey/poll results, the World-Bank authors use an unobserved-components technique to recover an index of five underlying institutional concepts. The areas include:

- Rule of law, which captures the extent to which fair and predictable rules form the basis for economic and social interactions, and the extent to which property rights are protected;

[3] Using a more narrow measure of human capital, which only considers average education, does not materially change our results.

- Political stability, which assesses the perception that government power may be destabilized or overthrown by unconstitutional or violent means;

- Control of corruption, which measures perceptions of corruption, defined as the use of public power for private gain;

- Government effectiveness, which estimates the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service, and the government's credibility in committing to its policies;

- And regulatory quality, which gauges the incidence of market-unfriendly policies such as price controls or poor bank supervision, as well as the burden of excessive regulation.

24. **Each of these indicators is distributed normally, with a mean of zero and a standard deviation of one.** This implies that virtually all scores lie between -2.5 and 2.5, with higher scores corresponding to "better" outcomes. The measures are strongly correlated, however, so distinguishing the separate impact of any single concept is problematic. Therefore, **we define a sixth summary index of "institutional strength,"** derived from a principal-components decomposition of the five indices outlined above.

D. Results

25. **The regressions include data from 1950-2000, and cover 128 countries (excluding members of OPEC).** Following usual practice, the capital share of output is constrained to correspond to actual national-accounts data, so that $\alpha = 0.35$.[4]

26. **The rate of global technological progress is determined exogenously.** Looking at the data, the panel is somewhat unbalanced, with more and more countries included in the later observations. The countries with a longer set of observations tend to be relatively well-developed and wealthy, whereas those with only a few recent observations tend to be less well off. This complicates estimation of the global pace of technological improvement, as the progressive addition of poorer and poorer countries will lead to the appearance of a *negative* rate of growth. So, to address this issue, we first estimate the technological growth rate for the subset of OECD countries. We then assume that this value is the rate of growth for the global (best-practice) frontier, and constrain our model accordingly. The results suggest a pace of technological improvement of about ½ percent per year, broadly comparable to the 0.8 percent estimate provided by Weil (2005). The model is estimated via maximum likelihood.

[4] In a recent paper, Aiyar and Dalgaard (2005) show that, for the purposes of measuring TFP, an assumed Cobb-Douglas production function with identical capital shares across countries serves as an accurate approximation: i.e. the results from this approach are indistinguishable from those that are based on a more complex production function with heterogeneous capital shares. This result mirrors a similar conclusion in Hall and Jones (1996).

Table 1: Maximum-Likelihood Estimates of the Global Production Frontier and Determinants of Technical Efficiency, 1950-2000

		Two-step estimator	One-step estimators					
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Production Frontier								
Constant		7.520 (0.448)**	5.776 (0.125)**	5.475 (0.135)**	5.571 (0.114)**	5.742 (0.118)**	5.502 (0.120)**	5.671 (0.115)**
log(K/L)		0.350 ...	0.350 ...	0.350 ...	0.350 ...	0.350 ...	0.350 ...	0.350 ...
log(h)		0.570 (0.066)**	0.466 (0.054)**	0.637 (0.057)**	0.478 (0.053)**	0.502 (0.051)**	0.559 (0.053)**	0.464 (0.052)**
log(L)		-0.181 (0.033)**	-0.026 (0.010)*	-0.019 (0.012)	-0.009 (0.010)	-0.028 (0.010)**	-0.01 (0.011)	-0.015 (0.010)
time		0.005 ...	0.005	0.005	0.005	0.005	0.005	0.005
Soviet Bloc		0.130 (.076)	-0.268 (0.074)**	-0.428 (0.075)**	-0.262 (0.077)**	-0.218 (0.074)**	-0.318 (0.077)**	-0.279 (0.073)**
(In)efficiency function: $\mu_{it} = z_{it}\delta$								
Constant	δ_0	1.533 (0.035)**	0.768 (0.071)**	0.691 (0.100)**	0.687 (0.061)**	0.778 (0.065)**	0.81 (0.073)**	0.603 (0.067)**
Rule of Law	δ_1	-0.325 (0.033)**	-0.374 (0.034)**					
Political Stability				-0.321 (0.033)**				
Control of Corruption					-0.374 (0.038)**			
Government Effectiveness						-0.377 (0.028)**		
Regulatory Quality							-0.429 (0.035)**	
Institutional Strength								-0.420 (0.033)**
(In)efficiency Variance Function: $\sigma_u^2 = \exp(z_{it}\gamma)$								
γ_0		-1.325 (0.168)**	-1.974 (0.139)**	-1.693 (0.157)**	-1.933 (0.139)**	-2.054 (0.140)**	-1.815 (0.140)**	-2.288 (0.172)**
γ_1		...	-0.597 (0.149)**	-0.564 (0.120)**	-0.597 (0.151)**	-0.630 (0.130)**	-0.766 (0.130)**	-0.733 (0.149)**
Variance of error: $\sigma_v^2 = \exp(constant)$								
Constant		-2.583 (.2735)**	-3.256 (0.231)**	-2.995 (0.215)**	-3.177 (0.183)**	-3.178 (0.214)**	-3.002 (0.204)**	-3.199 (0.203)**
Av. marginal impact of instit. on eff. $(\partial\xi/\partial z)$		...	0.334	0.299	0.321	0.342	0.397	0.378
Log Likelihood		-263.58	-294.63	-368.23	-300.12	-290.09	-329.48	-290.83
H_0 (No Institutional Effect) : $\gamma_1 = \delta_1 = 0$, $\chi^2(2)$		...	302.47**	154.72**	291.50**	311.55**	232.78**	309.53**
H_0 (No heteroskedasticity) : $\gamma_1 = 0$, $\chi^2(1)$		...	26.84**	28.10**	25.53**	37.70**	51.810**	40.82**
No. of Countries		128	128	128	128	128	128	128
No. of Obs.		635	635	634	635	635	635	634

Standard errors in parentheses
* significant at 10%; ** significant at 5%.
Source: Fund staff estimates.

27. **The coefficients are broadly in line with expectations, with the correct sign.** The coefficient on human capital, which represents the elasticity of output with respect to labor (β), ranges from 0.47 – 0.64, providing some evidence of (mild) global decreasing returns to scale. This is confirmed by the fact that the coefficient on labor, which represents an estimate of -(1-α-β), is universally less than zero, although it is not always significant. The coefficient on the Soviet-bloc dummy is negative and significant—again, the dummy allows for the possibility that the planned economies of the Soviet Union and Eastern Europe had only limited access to western technology prior to 1990. The results suggest that, during the cold war, the best-practice technology available to these countries was about 20 – 35 percent less productive than the technology available to the rest of the world; and given the characteristics of central planning within the Eastern bloc, many of these countries would have been operating well within this (reduced) frontier. The finding is broadly consistent with the results of Moroney and Lovell (1997) who conclude that, over 1978-80, the planned economies were at least 25 percent less efficient than the market economies of the west.

28. **Looking at the determinants of efficiency, the institutional coefficients are uniformly significant**; the negative values reflect the fact that an increase in institutional strength is associated with a *decrease* in the *in*efficiency term (See Appendix I). Measuring the quantitative impact of better institutions, the table provides an estimate of the average marginal impact of institutional strength on efficiency. To illustrate, if we look at column (7), the results suggest that a one standard-deviation improvement in the institutional index is associated with a 38 percent improvement in the efficiency ratio—i.e. an efficiency ratio of 0.50 would increase to about 0.69. [5] Specific calculations for Ukraine are covered in more detail below.

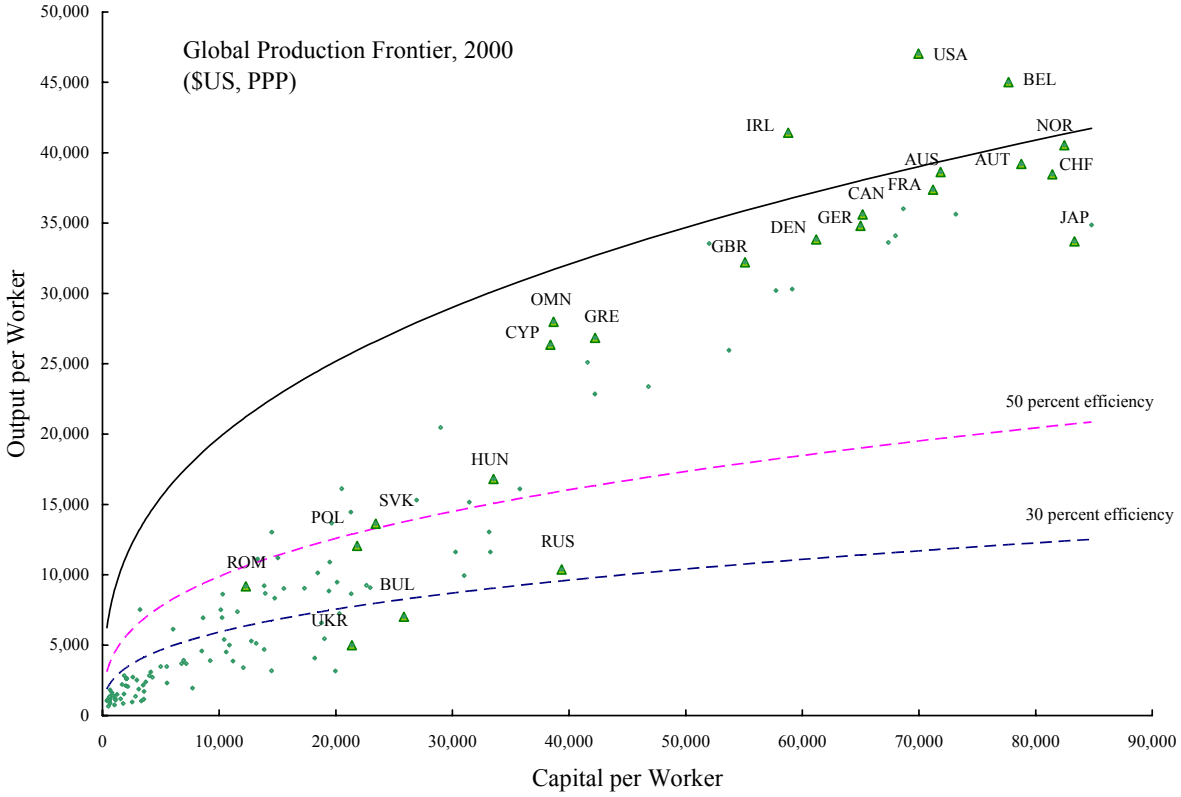
29. **The two-step estimator seems different from the single-step estimator, and suggests that the two-step frontier parameters may indeed be biased upward, as expected** (See Appendix). However, this impact does not appear overly important.

30. **Likelihood ratio tests all support the chosen specification.** The tests uniformly suggest the importance of: (i) modeling inefficiency as a function of the institutional variable; and (ii) allowing for heteroskedasticity.

31. **Figure 1 below provides an illustration of the preferred model, corresponding to column (7).** The independent institutional variable is the summary index of institutional strength, and the frontier is calculated using Ukraine's level of labor and human capital. As shown, the results suggest that Ukraine is operating significantly below potential.

[5] This is a lower bound, given the curvature of the efficiency function.

Figure 1. Ukraine: The Global Best-Practice Frontier



Source: Fund staff estimates.

32. Using the same model to provide estimates of country-specific efficiency, the regional averages for 1990-2000 are as shown below. The average value for Ukraine over the same period was estimated at 29.3 percent.[6]

Table 2. Technical Efficiency Estimates

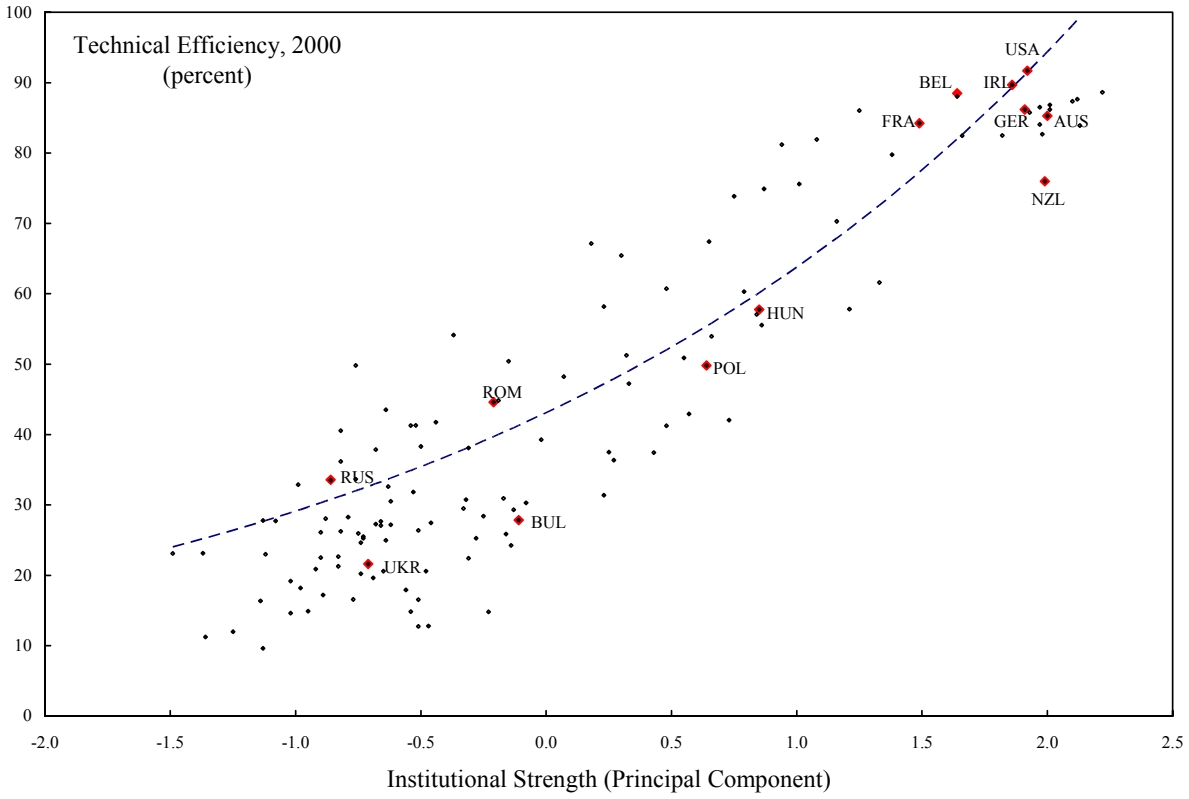
	1990	2000	1990-2000
EU-15	.831	.852	.841
Accession Countries	.580	.541	.560
Candidate Countries	.486	.418	.454
CIS	.464	.233	.343
Ukraine	.485	.220	.293
Worldwide	.636	.549	.592

Source: Fund staff estimates.

[6] The level of technical efficiency is estimated as $\xi_i = E[\exp(-u_i)|\varepsilon_{it}]$ where $\varepsilon_{it} = (v_{it} - u_i)$ is the observed regression error. See Appendix I.

33. To illustrate the impact of institutions, Figure 2 below is also derived from the model in column (7), and shows the relationship between our summary institutional index and efficiency. In the case of Ukraine, the economy's low level of efficiency seems clearly associated with its weak institutional base.

Figure 2. Ukraine: The Impact of Institutional Strength



Source: Fund staff estimates.

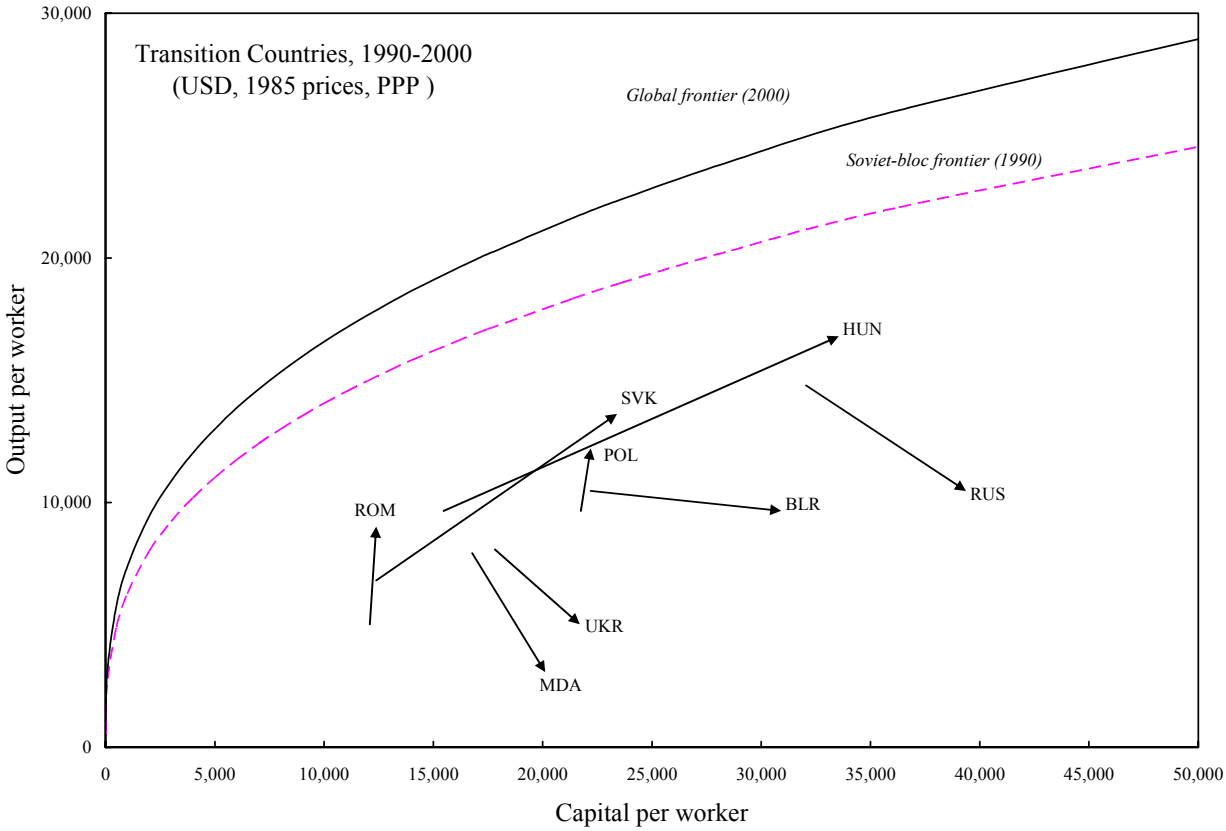
E. Implications and Discussion

34. **Ukraine displayed a significant fall in efficiency over the 1990s**—falling from about 49 percent to 22 percent between 1990 and 2000 (see Table 2). In part, this fall reflects the changing nature of the best-practice frontier. In 1990, the technology available to Ukraine and other eastern-bloc countries was constrained by cold-war considerations, and so Ukraine faced a lower best-practice frontier compared to the rest of the world. When estimating efficiency during this period, therefore, Ukraine (and most other planned economies) are measured against a lower benchmark and so appear relatively less inefficient. By 2000, however, the latest western technology was equally available to all countries, including those in eastern-Europe and the former Soviet Union. Over the 1990s, therefore, these countries faced an inflow of new ideas and techniques and so enjoyed a dramatically-accelerated pace of technological growth, represented by a rapid shift outward of the production possibilities frontier. In this situation, even countries with a steady level of output per worker will appear

to have become less efficient, as in effect they will have failed to take advantage of a new and broad range of post-cold war growth opportunities.

35. **For the most part, those countries that were not part of the Soviet Union appear to have been able to capitalize on a rapid influx of new technology**, posting significant gains in output per worker and broadly maintaining their overall level of efficiency. For countries such as Romania and Poland, these gains resulted primarily from increases in efficiency rather than factor accumulation, as represented by a vertical upward movement toward the frontier (although in the case of Poland, the net vertical movement conceals a investment collapse and subsequent boom during the 1990s). For countries such as Slovakia and Hungary, output gains were the result of improved efficiency *combined with* significant increases in capital stocks—which in turn reflected dramatic inward flows of foreign direct investment.

Figure 3. Ukraine: Transition and Efficiency During the 1990's



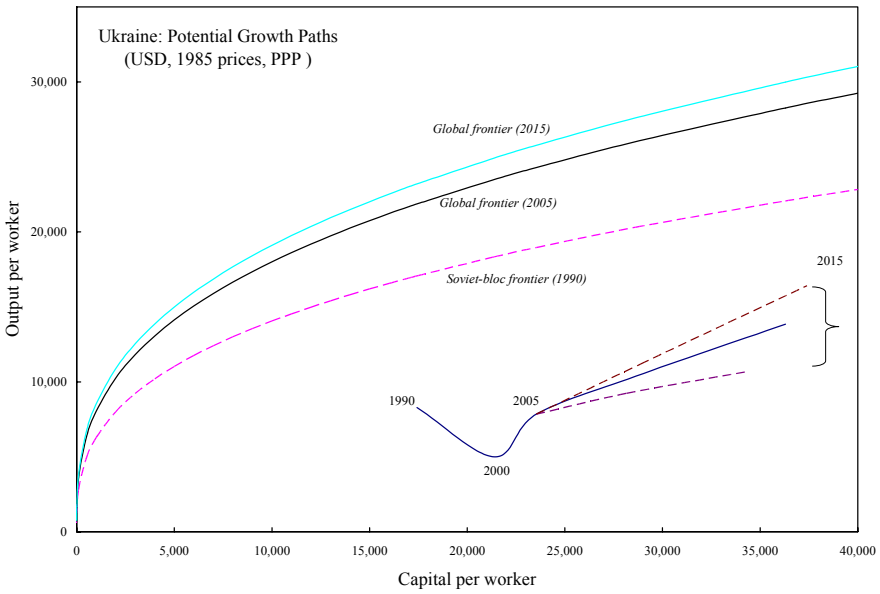
Source: Fund staff estimates.

36. On the other hand, **CIS countries seem to have dealt less well with the sudden exposure to western techniques; producing instead in the same old manner, and showing little productive improvement.** However, this only partly explains Ukraine's falling efficiency. Rather than maintain a steady level of output, Ukraine and other countries

from the CIS actually experienced a serious and sustained contraction in output over the 1990s, despite significant capital investment. The causes of this output fall throughout the former Soviet Union have been studied extensively elsewhere,[7] and reflect in large part the dismantling of the Soviet state's central-planning apparatus—in contrast to other countries in eastern Europe this apparatus was not replaced with a viable alternative. So, rather than moving to a more market-oriented system, the new states of the CIS found themselves without an institutional setup that would foster innovative and productive activity. Instead, they experienced a surge in rent-seeking behavior and uncertainty regarding property rights.

37. **Output in Ukraine has grown rapidly since 2000, owing mostly to greater efficiency, rather than investment.** As shown in Figure 4 below, the nadir of Ukraine's output contraction occurred in 2000. Since then the economy has grown strongly, often surpassing local and international forecasts. The causes of the recovery are outlined in Berengaut and others (2002), and reflect a complex combination of factors, including: a huge boost in competitiveness following the financial crisis of 1998; the availability of significant excess capacity; and a recovery in neighboring Russia. In addition, however, Ukraine's turnaround also reflected the impact of first-generation structural reforms introduced in 1999–2000. These reforms focused initially on the energy sector, and were key in reducing the prevalence of barter payments and arrears. Addressing Ukraine's nonpayment culture in turn helped foster a more efficient allocation of resources and the beginnings of a working financial system. In terms of our model, efficiency in Ukraine increased from 22 percent in 2000 to about 30 percent in 2005.

Figure 4. Ukraine: Alternative Scenarios



Source: Fund staff estimates.

[7] See Berengaut and Elborgh-Woytek (2005).

38. **For 2005, however, it appears that Ukraine's impressive output performance has started to wane.** With a less favorable external environment, with capacity bottlenecks emerging in a number of sectors, with considerable investor uncertainty, and with minimal structural reform over the past few years, the economy has entered a more modest growth phase. This in itself is not surprising, as the remarkable rates of the past few years were likely unsustainable. However, the challenge now facing the authorities is how to best secure a robust and sustainable growth improvement in the immediate future.

39. **Looking forward, lasting improvements in living standards will depend mostly on the authorities' ability to increase Ukraine's efficiency; rather than higher rates of capital accumulation.** This in turn will require a sustained commitment to improved market-oriented institutions, and a renewed effort to push forward long-delayed structural reforms.

40. **In this light, the reform agenda outlined by the new administration, which is anchored within the Ukraine-EU Action Plan, is both timely and appropriate.** The Action Plan covers a wide range of tasks and measures, and by harmonizing Ukrainian standards with those of the EU, it aims to accelerate Ukraine's progress toward a market-based economy that is firmly integrated within Europe and global markets. The potential benefits of such a strategy have been discussed in depth by a number of different commentators (see Havrylyshyn and others, 2000), and should start to accrue well in advance of any potential membership date. In order to gauge the impact of such an effort, we outline a range of reform scenarios below.

41. **The proposed series of institutional reforms could materially boost Ukraine's sustainable growth rates.** The staff's current baseline scenario, which envisages a medium-term annual growth rate of about 5 percent, assumes a moderately successful reform effort. Using the estimated model above, this scenario is consistent with a mild improvement in Ukraine's institutions, so that the economy's overall efficiency level rises from 30 percent to 46 percent over 2005–15. In effect, the baseline scenario assumes that by 2015, Ukraine will have the institutional quality enjoyed by current EU candidate countries such as Romania. Starting from this baseline, it is also possible to project a "low-case" scenario detailing the consequences of an ineffective or incomplete reform effort. If the authorities fail to improve Ukraine's institutional base, so that efficiency levels improve only slightly over the next decade, then the economy may face an average growth rate as low as 2 percent per year. In general terms, this corresponds to the low-case growth scenario illustrated in a previous selected issues paper for Ukraine.[8]

42. **Full implementation of the authorities' EU-centered reform agenda could underpin a high-case growth scenario.** In this scenario, it is assumed that by 2015, Ukraine will have harmonized its internal regulations and standards sufficiently so that it will have

[8] "International Monetary Fund, 2003, *Ukraine—Selected Issues*, Country Report No. 03/173

met all the chief requirements for EU membership. To this end, the scenario assumes that, after ten years, Ukraine will have the institutional quality and efficiency currently enjoyed by recent accession countries such as Poland and Hungary. This corresponds to an increase in efficiency from 30 percent to about 60 percent, which in turn implies an average annual growth rate of about 8.5 percent over the coming decade.

Table 3. Contributions to Long-Run Growth, 2005-2015

Efficiciency	Low case 30 to 36	Baseline 30 to 46	High case 30 to 60
Capital per worker	1.2	1.7	2.1
Human Capital	0.1	0.1	0.1
TFP	1.7	4.2	7.3
o/w Tech progress	0.5	0.5	0.5
o/w Efficiency	1.2	3.8	6.8
Output per worker	3.0	6.0	9.5
Memo Item:			
Real growth rate	2.0	5.0	8.5

Source: Fund staff calculations

F. Caveats

43. **A first concern with this chapter's exercise is the possibility that, rather than measuring the impact of better institutions on higher per capita income, we are capturing instead the reverse effect of higher income on better institutions.** While such reverse causation is theoretically possible, it has little empirical support. This is still an area of ongoing research, but in general, attempts to separate the two effects have generally confirmed the existence of a strong, robust, positive causal relationship running from institutions to income. At the same time, they have found that the feedback relationship from income to institutions is extremely weak, or even negative (see Kaufmann, 2002).

44. **A further possible concern is that the variables under study are often poorly measured, particularly when considering cross-country indicators of institutional strength or capital stocks.** Again, this is a possibility, but the relationship between institutions and productivity is compelling on *a priori* grounds, and has been demonstrated empirically time and again using a wide variety of institutional indicators and capital stock estimates.

45. **A more plausible worry, however, is that such measurement issues are *particularly* acute in the case of the transition countries.** It is almost certainly true that investment was overstated under the communist central planning system, and that a portion of the measured capital stock of socialist countries was so poorly maintained and obsolescent as to be effectively useless. This would bias our estimates for these countries, leading us to underestimate their actual levels of efficiency. It is difficult to know just how much weight to give to this consideration, but a possible guide might be contained within the cold-war

dummy variable. In our model, it is estimated that, during the cold war, the existence of binding technology constraints meant that socialist countries were about 20-35 percent less productive than their counterparts in the west. If, instead, we were to assume that these countries had access to the *same* technology as the rest of the world, then the cold-war dummy would provide a rough approximation of the *actual* factor endowments of these countries—i.e., it would suggest that 20-35 percent of capital in these countries was non-existent in any real sense.

46. **A related concern is the possibility that the results for Ukraine, and other transition countries, are distorted by their large and poorly-measured informal sectors.** In the case of Ukraine, the shadow economy is estimated to have grown significantly during the early 1990's, with the result that output and growth for those years will have been substantially under-reported. Again, this would lead to exaggerate the collapse in output and efficiency in the 1990s, and perhaps to underestimate the level of efficiency over the sample period. This is almost certainly one aspect of the link between institutions and efficiency, as it has often been noted that shadow economies are less important in those countries where government institutions are strong and efficient. And there is reason to believe that this aspect has played an important part in Ukraine's efficiency gains since 2000—it is estimated that, after rising during the early 1990s, the shadow economy's size peaked in 1997 as a proportion of GDP, and that it has been falling ever since. However, this possibility raises a worrying concern. If reforms were to stall in Ukraine, economic activity might once again return into the shadows, which would then bring the observed annual growth rate below even the low-case projection of 2 percent. The presence of a large and active informal sector in Ukraine, therefore, may increase the downside risks of further institutional stagnation.

G. Conclusions

47. **Ukraine is potentially a very wealthy country.** Ukraine has some of the best agricultural land in the world, an enviable range of hydrocarbons and minerals, and a relatively well-developed infrastructure. Literacy is close to 100 percent, and the labor force is educated to the highest technical and scientific levels (World Bank, 2000). Despite these advantages, however, Ukraine's per capita income remains very low.

48. **This chapter has argued that Ukraine's failure to tap its full potential is mainly a result of its market-unfriendly institutional base.** Having inherited a Soviet framework that was ill-suited to the needs of a market economy, Ukraine has been slow in establishing the market-enhancing institutions needed to use its existing resources more efficiently.

49. **The new authorities appear to be poised to tackle the lagging-institution problem, and have articulated a wide-ranging program of reforms**. This program has been anchored within a broader strategy of greater integration with the European Union and global markets.

50. **In quantifying the benefits of market-friendly institutional reform, the chapter's results suggest that durable growth in Ukraine will depend critically on the authorities' ability to secure the foundations of a modern market economy.** Given the size of the gap

between Ukraine's current output and its long-term potential, and given the experience of other countries, the results indicate that a successful effort could well boost Ukraine's long-run growth rate to about 8.5 percent per year. By raising the efficiency with which Ukraine uses its already-substantial resource base, this implies that a successful reform drive might allow a doubling of per capita income within a decade—such a remarkable performance would place Ukraine alongside recent "growth miracle" countries.

STOCHASTIC FRONTIER MODEL

A. The Model

In line with our stochastic-frontier approach, the model assumes that all countries have access to a common global technology, represented by the production function $f(\mathbf{Z}_{it})$. Each country's output (*Y)*, therefore, can be expressed as a function of the production technology

$$Y_{it} = f(\mathbf{Z}_{it})\xi_i \exp(v_{it}) \tag{5}$$

where *i* and *t* are country and time indices, respectively, and $\mathbf{Z}$ represents the country's factors of production. The level of efficiency is represented by ξ, which falls into the range $(0 < \xi \leq 1)$. The stochastic error term, v_{it}, reflects the random character of the frontier, owing to statistical noise, measurement error or other effects not captured by the model.

The model recognizes that countries may differ in their overall productivity through the term ξ. If a country is 100 percent efficient (ξ=1), it is using all available inputs in the most productive manner. Otherwise, local frictions and impediments will cause the country to produce at a point *below* the best-practice frontier. Taking logs, the model can be rewritten as:

$$\log(Y_{it}) = \log[f(\mathbf{Z}_{it})] + v_{it} - u_{it} \tag{6}$$

where we define the *in*efficiency term, $u_{it} = -\log(\xi_{it})$. This term represents the extent to which output falls below the production frontier. The inefficiency and noise terms are distributed $u_{it} \overset{iid}{\sim} \mathrm{N}^{+}\left(\mu_{it}, \sigma_u^2\right)$ and $v_{it} \overset{iid}{\sim} \mathrm{N}\left(0, \sigma_v^2\right)$, respectively, where $\mathrm{N}^{+}(\,)$ represents a normal distribution with a truncated left tail at zero. By restricting u_{it} to a truncated positive normal distribution, we ensure that the efficiency term falls within the range $0 < \xi_{it} \leq 1$. Also, μ_{it} (the mean level of inefficiency u_{it}) is assumed to be a function of the explanatory variables z_{it}, so that:

$$\mu_{it} = z_{it}\delta \tag{7}$$

In our case, we hope to use an explanatory variable (*z*) that captures institutional strength. So, to the extent that an institutional improvement is associated with a *reduction* in the average level of *in*efficiency, we expect that δ will be negative.

Moreover, we allow for heteroskedasticity in the (in)efficiency term by making the variance of u_{it} a function of the same set of regressors, so that

$$\sigma_u^2(\cdot) = \exp(z_{it}\gamma) \tag{8}$$

For the global (potential) production function, $f(\mathbf{Z}_{it})$, we assume a human-capital augmented Cobb-Douglas specification, as outlined in Hall and Jones (1998):

$$f(\mathbf{Z}_{it}) = A_0 e^{\eta t} K_{it}^{\alpha} (h_{it} L_{it})^{\beta} \tag{9}$$

Where *t* is a time index, *K* is the capital stock, *L* is the labor force, and *h* is a measure of human capital. In our specification, human capital "multiplies" the effectiveness of the available labor force. We do not assume that $(\alpha + \beta) = 1$, and so allow for the possibility of non-constant returns to scale. However, we do assume a steady rate of global technical progress, η.

The assumption that all countries have equal access to a common technology was perhaps violated for Eastern-bloc countries during the cold war, when there were numerous legal prohibitions preventing the free flow of technology between east and west. Indeed, in the 1990s part of the early optimism regarding the transition economies stemmed from an expectation that, given their rich factor endowments, a sudden inflow of new western technology would produce a clear and rapid increase in output. To allow for this possibility, the constant term A_0 is permitted to take a different value for transition countries prior to the fall of the Berlin wall.

Rearranging and taking logs, we get

$$\log\left[\frac{f(\mathbf{Z}_{it})}{L_{it}}\right] = \text{constant} + \alpha k_{it} + \beta h_{it} - (1 - \alpha - \beta) L_{it} + \eta t \tag{10}$$

where *k* is a measure of (log) capital per worker. Defining *y* as (log) output per worker, we then have a regression model:

$$y_{it} = c_0 + c_1 d + c_2 k_{it} + c_3 h_{it} + c_4 L_{it} + c_5 t + v_{it} - u_{it} \tag{11}$$

In this specification, *d* is a cold-war dummy variable for transition countries, $c_2 = \alpha, c_3 = \beta,\ c_4 = -(1 - \alpha - \beta)$, and $c_5 = \eta$. If $c_3 < 0$, there is evidence suggesting decreasing returns to scale.

B. Econometric Considerations

The key goal of the chapter is to account for cross-country differences in efficiency. A number of previous studies, in considering the determinants of efficiency, have used a two-step approach—estimating the production frontier in the first step, and then using the resulting efficiency estimates in a second-stage regression to determine the impact of the variables under study (z)[9].

[9] For example, see Pitt and Lee (1981), and Kalirajan (1981).

Unfortunately, there are a number of problems with such an approach.[10] The main concern is that, if the *z* variables are correlated with the production-function inputs $\mathbf{Z}$, the first-stage regression will suffer from an omitted-variables problem. For example, suppose the model is true and *z* is positively correlated with efficiency (ξ). If efficiency is also positively correlated with some of the inputs (such as human capital), then the estimated frontier coefficients will be biased upward—other things being equal, larger values of *z* will be associated with higher output levels and higher $\mathbf{Z}$, so the effect of a particular input will appear to be larger than is actually the case. This will, in turn, affect the residual (and efficiency) estimates for each country, and so will bias the results of the second-stage regression. Additionally, in the presence of heteroskedasticity where the variance of the *in*efficiency term (σ_u^2) is related to *z*, the second-stage regression may be biased even further. In this case, the problem is that *u* is measured with an error that is correlated with *z*, the regressor in the second-step regression. Failing to account for this relationship will result in estimates that are incorrect.[11]

The only way to avoid such issues is to estimate the production frontier and the determinants of efficiency within a single procedure. The results in this chapter stem from a one-step maximum-likelihood framework, drawing on the methodologies suggested by Battese and Coelli (1995) and extended by Wang and Schmidt (2002). A two-step estimation is also included for comparison.

C. Estimate of Technical Efficiency (Battese and Coelli, 1995)

The stochastic frontier model can be expressed by

$$y_{it} = x_{it}\beta + \varepsilon_{it} \tag{12}$$

Where

$$\varepsilon_{it} = \left(v_{it} - u_{it}\right) = y_{it} - x_{it}\beta \tag{13}$$

We want to estimate the level of technical efficiency, $\xi_{it} = \exp(-u_{it})$. However, we only observe ε_{it}, so first we need to find an expression for the conditional expectation $E\left[\exp(-u_{it})\middle|\varepsilon_{it}\right]$. The density function for v_{it} is the normal $N(0,\sigma_v{}^2)$, whereas the truncated normal density for u_{it} is expressed as

$$f_u(u) = \left[\sqrt{2\pi}\sigma_u \Phi\left(\frac{z\delta}{\sigma_u}\right)\right]^{-1} \exp\left[-\frac{\left(u - z\delta\right)^2}{2\sigma_u{}^2}\right], \quad u \geq 0, \tag{14}$$

Subscripts *i* and *t* have been omitted for convenience of presentation, and $\Phi(\ )$ represents the standard normal distribution function. Therefore, the joint density function for ε_{it} and u_{it} is

[10] See the discussion in Kumbahar and Lovell (2000).

[11] See the discussion in Wang and Schmidt (2002).

$$f_{\varepsilon,u}(\varepsilon,u)=\left[2\pi\sigma_u\sigma_v\Phi\left(\frac{z\delta}{\sigma_u}\right)\right]^{-1}\exp\left[-\frac{1}{2}\frac{\left(u-\mu_*\right)^2}{\sigma_*^{\,2}}+\frac{\left(\varepsilon+z\delta\right)^2}{\left(\sigma_v^{\,2}+\sigma_u^{\,2}\right)}\right],\quad u\geq 0, \tag{15}$$

Where

$$\mu_*=\frac{\sigma_v^{\,2}z\delta-\sigma_u^{\,2}\varepsilon}{\sigma_v^{\,2}+\sigma_u^{\,2}}=(1-\gamma)z\delta-\gamma\varepsilon\quad\text{and}\quad\sigma_*^{\,2}=\frac{\sigma_v^{\,2}\sigma_u^{\,2}}{(\sigma_v^{\,2}+\sigma_u^{\,2})}=\gamma(1-\gamma)\sigma_s^{\,2} \tag{16}$$

$$\sigma_s^{\,2}\equiv\sigma_v^{\,2}+\sigma_u^{\,2}\quad\text{and}\quad\gamma\equiv\sigma_u^{\,2}\Big/\sigma_s^{\,2} \tag{17}$$

It can be shown that, given ε_{it}, the conditional expectation of a country's efficiency, $\xi_{it}=\exp(-u_{it})$, is provided by the expression

$$E\left[\exp(-u)\middle|\varepsilon\right]=\exp(-\mu_*+\frac{1}{2}\sigma_*^{\,2})\left[\Phi\left(\frac{\mu_*}{\sigma_*}-\sigma_*\right)\right]\left[\Phi\left(\frac{\mu_*}{\sigma_*}\right)\right]^{-1} \tag{18}$$

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II. Ukraine: External Risks and Opportunities[12]

A. Introduction

50. **The last few years witnessed a substantial strengthening of Ukraine's external position, which constituted a major contributing factor to the economy's growth rebound**. Supported by a competitive exchange rate and massive terms of trade gains, mainly on account of large increases in world metal prices, the current account surplus reached an unprecedented 10½ percent of GDP in 2004. As a result, and despite some temporary capital outflows around the time of the last presidential election, Ukraine's gross international reserves had risen to $9½ billion at end-2004, equivalent to just under three months of imports, up from under one month of imports in 2000.

51. **During the current year, the above trends have been reversed to some extent**. With world metal prices starting to decline and energy prices rising steeply, and in the wake of a sharp real appreciation of the hryvnia, mainly on account of accelerating inflation, the current account surplus has been shrinking, and the contribution of the external sector to growth has turned negative: for 2005 as a whole, the current account surplus as a share of GDP is projected to shrink to about half its 2004 level. On the other hand, private capital inflows rebounded following the resolution of political uncertainty, and even though FDI flows have remained low so far, the overall capital and financial account balance has turned positive. In all, reserve accumulation has remained robust, with gross official reserves projected to reach a little under four months of imports by year-end.

52. **The broad trends in the balance of payments observed during 2005 are likely to carry over into the medium term as well.** The staff's baseline envisages the current account switching to moderate deficits by the end of the projection period; in turn, the current account deficits are projected to be comfortably financed by capital inflows, especially long-term debt and foreign direct investment. In this setting, gross international reserves should remain at comfortable levels, both in terms of import coverage and in relation to short-term debt. Such a structure of the balance of payments appears more in line with the requirements of an emerging market economy like Ukraine compared with the combination of large current account surpluses and net capital outflows experienced during the first half of this decade. Key factors underpinning the medium-term movements of the balance of payments include an increase in investment, faster productivity growth in Ukraine relative to its main trading partners, and real exchange rate appreciation, mainly accomplished via nominal exchange rate flexibility rather than high inflation. Other factors of a more transitory nature are also likely to contribute, including a decline in the terms of trade, driven by a gradual decline in metal prices (which, however, are assumed to remain significantly above trend throughout the projection period) and, in the near term, rising energy prices, as reflected in the World Economic Outlook (WEO) baseline.

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[12] Prepared by Ioannis Halikias.

53. **The baseline medium-term outlook for Ukraine's balance of payments described above is subject to a number of risks and opportunities, which could entail deviations from the baseline path**. This chapter discusses briefly a number of key external shocks, both on the current and the capital account side of the balance of payments, to which Ukraine is vulnerable over a short- and medium-term horizon. On the current account side, downside risks dominate. By contrast, on the capital account side, opportunities are arguably more important than downside risks. Overall, five broad types of external shocks are identified:

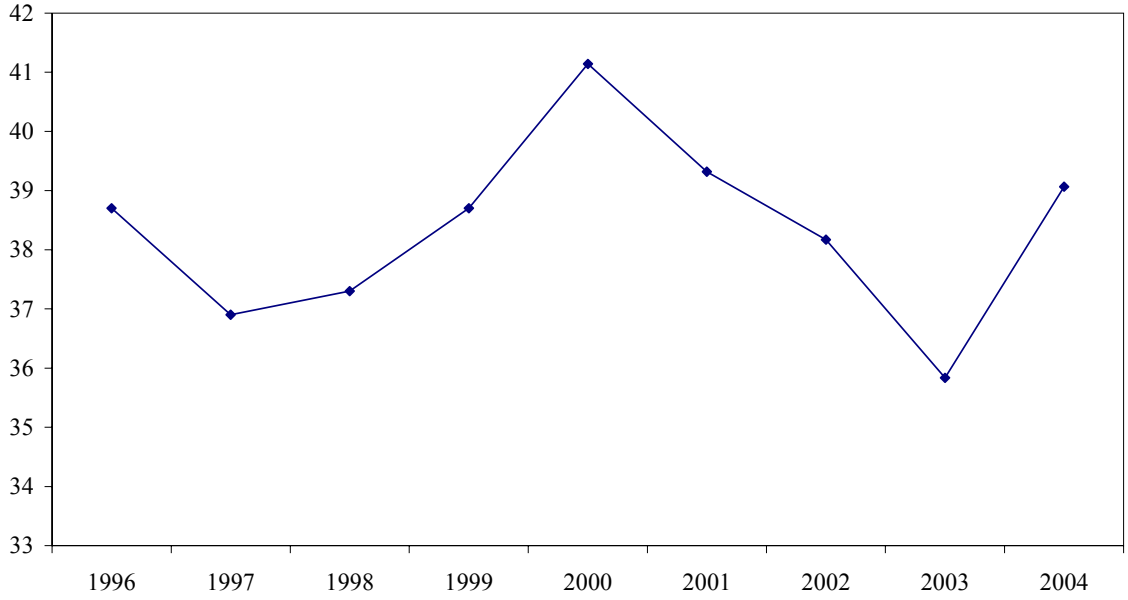
- a sharp decline in metal export prices;
- convergence of energy import prices to world levels;
- an adverse shock to metal export volumes;
- higher FDI and other long-term capital inflows; and
- volatility in private capital flows.

54. The chapter attempts a quantification of the likely impact of the realization of these shocks on Ukraine's balance of payments and key macroeconomic variables, and offers some thoughts on appropriate policy responses, especially in the area of exchange rate policy. Indeed, it turns out that the sensitivity of the economy to the shocks considered hinges crucially on the exchange rate regime in place.

B. A Sharp Decline in Metal Export Prices

55. **Ukraine's external trade is dominated by the metallurgical sector.** In 2004, metals accounted for around 40 percent of Ukraine's total goods exports (Table 1); among metals, steel is by far the dominant export category. The share of metals in total exports has been fairly stable in dollar terms, ranging between 36 and 41percent over the past decade (Figure 1). This is particularly striking given the large shifts in Ukraine's direction of trade over the past decade and a half: this period has witnessed a sharp decline in the relative importance of Russia (historically a major destination of Ukraine's metal exports) among Ukraine's export markets, with its share falling from some 50 percent in the mid-1990s to under 20 percent currently. Ukraine's metal exporters have thus been extremely successful in accessing new markets, in particular the EU and, more recently, China.

Figure 1. Ukraine: Metal Export Share
(In percent)



Sources: National Bank of Ukraine; and staff calculations.

Table 1. Ukraine: Structure of goods exports, 2004

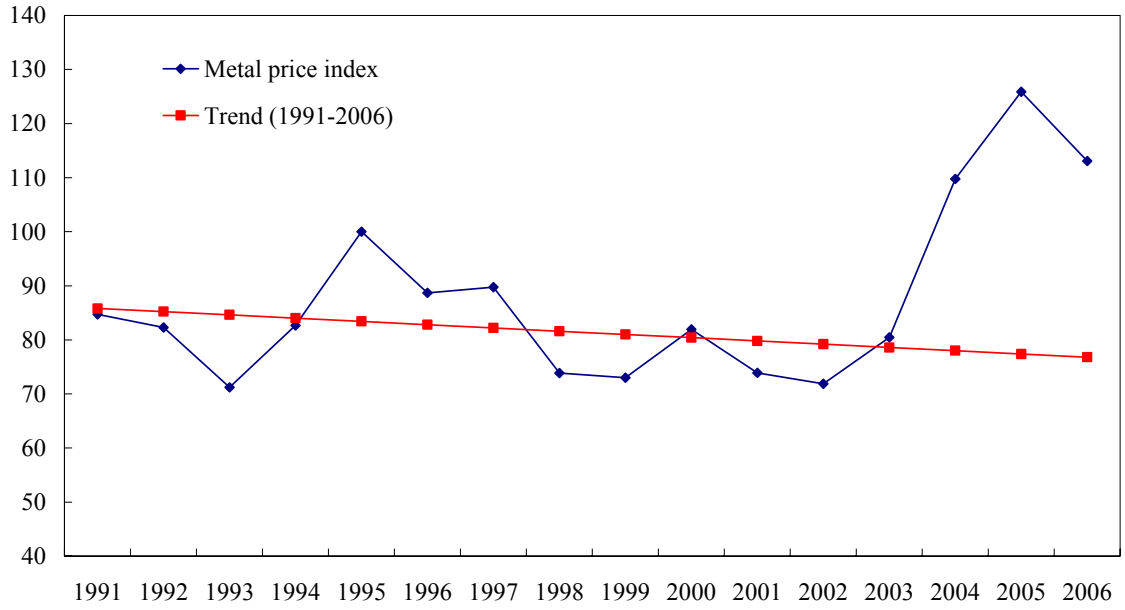
	USD million	Percent of total
Agricultural products	3,473	10.4
Energy	4,067	12.2
Chemicals	3,479	10.4
Timber and wood products	910	2.7
Industrial goods	1,285	3.8
Ferrous and non-ferrous metals	**13,051**	**39.0**
Equipment and machinery	5,660	16.9
Other (incl. informal trade)	1,507	4.5
Total, fob	33,422	100.0

Source: National Bank of Ukraine.

56. **During the last two years, world metal prices have increased sharply**. Driven by the global cyclical upturn in general, and China's explosive industrial demand in particular, metal prices rose on average by 36 percent in 2004. Metal prices continued to rise during the first months of 2005 and, while they have started to come down since the second quarter, the latest WEO projects, on the basis of futures contracts, that, for the year as a whole, they will end up a further substantial, albeit smaller, 15 percent higher on average relative to 2004.

These developments have to be judged against a virtually trendless path for metal prices in the pre-2004 period (Figure 2): estimation over 1991–2003, which allows to capture a full global business cycle, including the cyclical upturn of the 90s and the downturn of the early 00s, yields a very small, and statistically insignificant, negative slope. On this basis, the WEO projection for 2005 would put world metal prices some 50 percent above trend.

Figure 2. Ukraine: Metal Prices
(Index, 1995=100)



Sources: IMF, *World Economic Outlook*; and staff calculations and projections.

57. **The rising world metal prices have been the single most important factor accounting for the sharp widening of Ukraine's external current account surplus**. The improvement in Ukraine's terms of trade resulting from the increased metal prices is estimated to have contributed over 7 percentage points of GDP to the current account surplus, accounting for some 170 percent of the widening of the surplus in 2004.[13] Thus, the terms of trade gains resulting from the metal price increase more than offset the impact of the rapid real GDP growth and higher world energy prices on Ukraine's imports.

58. **The upward trend in world metal prices of the last two years is expected to be reversed in the near future**. The WEO baseline envisages a decline in world metal prices for 2006, which would imply a narrowing of Ukraine's current account surplus. According to

[13] By way of comparison, in 2000–03, with world metal prices much more stable, their corresponding annual contribution to the change in the current account surplus was less than 2 percentage points of GDP in absolute value.

the WEO projections, on which the staff's baseline scenario is based, world metal prices are set to decline by 10 percent on average in 2006, and this downward path is projected to continue into the medium term.

59. **Much larger shocks to world metal prices are quite conceivable**. Substantial as it is, the metal price decline envisaged by the WEO baseline would still leave metal prices more than 30 percent above trend. Among the various global risk factors that could entail a larger decline in world metal prices than currently envisaged, one could include a slowdown in global growth (especially in Europe), a larger impact of oil prices on global metal demand, or a decline in Chinese metal imports (due to higher domestic steel production or a hard landing of the Chinese economy). For the purposes of this chapter, a natural benchmark to consider would be a shock bringing world metal prices back to trend; this would entail a price decline of almost 50 percent relative to 2005 levels. The impact of such a shock on Ukraine's balance of payments and growth will in general depend on the extent to which it feeds into export prices, trade volumes, and domestic demand. The remainder of this section takes up these issues.

60. **Staff analysis views Ukraine's metal exporters as price takers, and treats the impact of metal prices on the external current account as a pure terms of trade shock**. For the purposes of projections, it is assumed that Ukraine's metal supply conditions have no impact on world metal prices, and that therefore Ukrainian exporters take world metal prices as given.[14] This is a typical small country assumption that also reflects the relatively homogeneous nature of the metals in which Ukrainian exporters specialize, notably steel.

61. **With full pass-through of world metal prices to Ukraine's export prices, the pure price impact of the terms of trade shock under consideration can be expected to be quite large**. Even under the assumption of limited response of trade volumes to terms of trade changes, a shock bringing world metal prices back to trend would imply a worsening of the 2006 current account by over 5 percent of GDP relative to its baseline path. This degree of sensitivity of the current account to plausible movements in metal prices underscores some of the policy constraints imparted by a pegged exchange rate in the face of terms of trade shocks, even if the latter could be regarded as purely nominal in nature. Other things equal, defense of the peg against the specific shock under consideration would entail depletion of official reserves to a level some 35 percent below baseline, or equivalent to under 2½ months of imports. Reserve depletion of this magnitude could in turn conceivably undermine the credibility of the peg and the overall policy framework.

62. **There are strong indications that the impact of large terms of trade shocks on Ukraine's economy extends well beyond the direct price effect discussed above**. In particular, full assessment of the impact of the shock under consideration needs to take into account its effect on volumes as well. In the case of Ukraine, it appears reasonable to

[14] This assumption receives support from the results of the NBU's empirical work discussed in the technical annex of this chapter.

conjecture that the effect in question works via both trade volumes and real domestic demand.

- Preliminary empirical work by the NBU[15] provides compelling evidence that movements in the terms of trade reflecting shocks to world metal prices tend to generate a statistically and economically significant output response on behalf of Ukrainian metal exporters. Specifically, the empirical results point to an elasticity of metal export volumes to world metal prices of 0.2; moreover, this effect is estimated to work fairly quickly, with the bulk concentrated in the first three quarters after the metal price shock. On this basis, a return of world metal prices to trend is estimated to result in a deceleration of metal export growth by 6¼ percentage points (and total exports by 2¾ percentage points) relative to the baseline. This would translate into a worsening of Ukraine's current account by over 1 percentage point of GDP (over and above the pure price impact of the terms of trade shock already discussed), and a similar adverse impact on real GDP growth relative to the baseline. If anything, these calculations may underestimate the true impact of an adverse metal price shock, to the extent that the effect in question is asymmetric in nature. While the scope to expand metal production in response to an increase in world prices could be limited by the steel quotas imposed by the EU (a major metal export market for Ukraine) and the emergence of increasingly binding capacity constraints in large parts of Ukraine's metallurgical sector, these factors would not be relevant under conditions of declining world metal prices. Accordingly, the export volume response could well be more pronounced in the downswing than in the upswing phase.

- Empirical investigation of the response of real domestic demand to terms of trade shocks is hampered by the paucity of relevant high-frequency data for Ukraine over a sufficiently long time period. Nonetheless, a terms of trade shock of the magnitude considered in this section would effectively constitute such a large transfer to the rest of the world, equivalent to some 5 percent of GDP, that it would be unlikely to leave real domestic spending unaffected. For reasonable calibrations of the marginal propensity to spend out of transfers between 0.4 and 0.6, in line with evidence from other transition economies and allowing for a substantial import content, would translate into a large impact on GDP growth in the range of 2-3 percentage points relative to the baseline. Taken together with its effect on export volume, the overall impact of the terms of trade shock on real GDP growth could be in the range of 3-4½ percentage points, broadly in line with estimates for other transition and emerging market economies.[16] Once again, important asymmetries could be relevant in this

[15] The methodology and empirical results of this work, which was kindly provided by the NBU balance of payments department staff and discussed with the mission, are summarized in the technical annex.

[16] See, for example, Broda (2001), who concludes that, under a fixed exchange rate regime, a 10 percent terms of trade shock is associated with a short-term impact on real GDP as high as 2 percentage points. This work is summarized in the technical annex.

context as well: while a substantial portion of a terms of trade shock reflecting an *increase* in export prices, to the extent that it is perceived to include a large transitory component, could be optimally absorbed into private saving, pervasive liquidity constraints may limit the scope of dissaving in response to an export price *decline*. On this basis, the response of real domestic demand to terms of trade losses could be much stronger relative to terms of trade gains.

63. **In sum, the terms of trade shock considered is this section has both a price and a volume component, which potentially carry different welfare and policy implications.** The pure price effect is entirely nominal in nature, having a direct impact on the balance of payments and, via international reserves, on monetary aggregates. The trade volume component of the shock, on the other hand, also has a direct contractionary and deflationary impact on the real side of the economy. The empirical analysis of this section has provided indications that both components of the terms of trade shock under consideration can be expected to be quite large.

C. Convergence of Energy Import Prices to World Levels

64. **Discrepancies between Ukraine's import prices and the relevant world levels could prompt a correction, at least over a medium-term horizon**. In particular, to the extent that the prices that Ukraine has to pay for its energy imports are currently significantly below world levels, it can expect to see its import bill rise over time as it becomes increasingly integrated into the international economy, with its energy import prices gradually converging to world levels.

65. **The impact of convergence of Ukraine's energy import prices to world levels on the macroeconomy can be expected to be quite substantial**. As with metals among total exports, energy clearly dominates Ukraine's merchandise imports: in 2004, energy accounted for over 35 percent of total imports in value terms (Table 2).

Table 2. Ukraine: Structure of Goods Imports, 2004

	USD million	Percent of total
Agricultural products	1,909	6.4
Energy	**10,027**	**33.8**
Chemicals	3,835	12.9
Timber and wood products	942	3.2
Industrial goods	1,427	4.8
Ferrrous and non-ferrous metals	1,753	5.9
Equipment and machinery	7,785	26.2
Other (incl. informal trade)	2,013	6.8
Total, fob	29,691	100.0

Source: National Bank of Ukraine.

66. **It should be noted at the outset that the likely impact of the shock considered in this section is in some respects quite different from that of a general increase in world energy prices.** For instance, past staff work[17] has highlighted that the impact of an increase in world oil prices on Ukraine's balance of payments could be much more limited than the sheer share of energy in total imports would suggest. The main reason is that a world oil price increase has tended to boost output growth and import demand in Russia, which remains a major export market for Ukraine; in that sense, Ukraine's direction of trade serves as an effective hedge to global energy price movements. Clearly these considerations do not apply to the type of shock discussed in this section.

67. **In terms of the relation of import prices to world prices, the situation in Ukraine's two main energy import categories is very different.** As regards **oil** imports, convergence in Ukraine's import prices is already quite advanced: while Ukraine's oil import prices remain somewhat below world prices, the difference has been closing fast in recent years. By contrast, Ukraine's **natural gas** import prices remain substantially below, and exhibit virtually no comovement with, world prices.

Oil prices

68. **Until recently, Ukraine's oil prices had been well below world prices, a reflection of preferential contracts with Russia, Ukraine's main oil supplier. In the last two years, however, Ukraine's oil import prices have converged substantially:** during 2003–04, their shortfall relative to world prices has been in the range of 5 to 10 percent, and there are signs that this differential has continued to narrow. In addition, the degree of co-movement between Ukrainian oil import prices and world prices has also tended to increase markedly during the last two years: a change in world prices is now estimated to get fully passed on to Ukrainian prices within a quarter.

69. **In this context, the impact of further convergence of Ukrainian oil import prices to world prices on Ukraine's balance of payments can be expected to be limited.** In particular, full convergence to world oil prices is estimated to subtract some ¼ of a percentage point of GDP from Ukraine's current account surplus. Similarly, the corresponding impact on actual and potential output can be expected to be negligible.

Natural gas prices

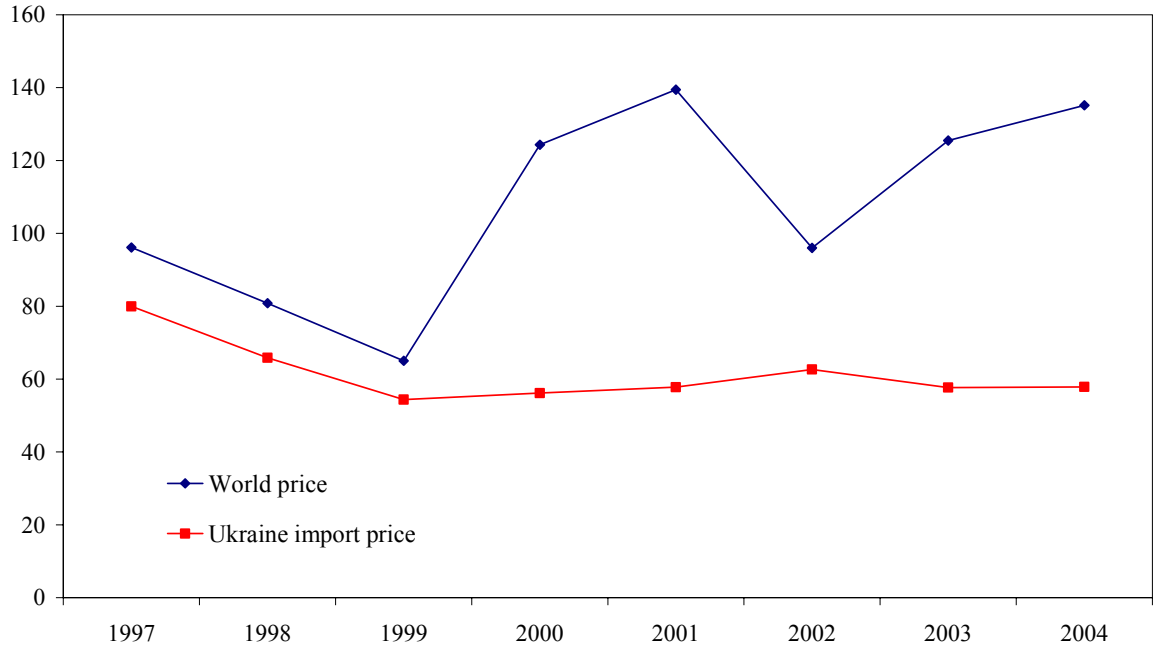
70. **In contrast to oil prices, Ukrainian natural gas import prices remain well below world prices, and there had been no sign of convergence through end-2004.**[18] Over the

[17] International Monetary Fund, 2004, *Ukraine—Selected Issues*, Country Report No. 05/20, Chapter I.

[18] Natural gas is a much less homogeneous commodity relative to oil, and the choice of a reference world price is non-trivial; for the purposes of this section, the time series of the Russian natural gas price, as reported in the WEO database, was used.

past decade, Ukrainian import prices have been about half of world prices, and, if anything, this differential has widened during 2003–04 (Figure 3). A large differential can be observed with regard to both of Ukraine's natural gas suppliers, Russia and Turkmenistan, but became especially pronounced for imports from Turkmenistan during the last two years. Moreover, there is no discernible link between Ukrainian import prices and world prices, whose degree of co-movement has been essentially zero.

Figure 3: Natural Gas Prices
(In dollars per 1000 m3)



Sources: National Bank of Ukraine; and IMF, World Economic Outlook.

71. **Very recently, some signs of convergence between Ukrainian natural gas import prices and world prices are beginning to emerge.** At present, the main risks appear to relate to the price of natural gas imports from Russia. Negotiations over a new natural gas contract with Russia are still in progress, but all indications are that it could include a substantial price increase—press reports are speculating about a price increase as high as threefold, which would bring import prices from this source essentially at world levels. The picture regarding import prices on natural gas from Turkmenistan is less clear-cut. Thus, while a contract signed with Turkmenistan at end-2004 envisaged a price increase of over 20 percent, this price increase was reversed in mid-2005. It is not clear how this situation will evolve in the near future, but, assuming that a large price increase is agreed with Russia, it is hard to see how Turkmenistan's natural gas export prices will remain at their current low level.

72. **Given the existing differential, full convergence of Ukrainian natural gas import prices to world prices is likely to entail a substantial impact on Ukraine's balance of payments.** Full price convergence, which would amount to an increase in Ukraine's average

natural gas import price by over 200 percent, is estimated to reduce Ukraine's current account surplus by over 3½ percentage points of GDP.

73. **There are at least two considerations that could render the above calculations something of an overestimate.** First, actual convergence of Ukraine's energy import prices to world levels could in fact be much more gradual than such calculations envisage: in fact, the recent reversal of the latest price increase on Turkmenistan gas suggests that such convergence may not even be monotonic. Second, the below-market pricing of Ukraine's natural gas imports has as a counterpart, albeit only partial, in below-market pricing on selected Ukrainian exports to Russia and Turkmenistan. As gas import prices are adjusted toward world levels, these types of offset will presumably have to be reconsidered, thus mitigating to some extent the overall impact on Ukraine's balance of payments.

74. **As a relative price shock, the energy price shock considered in this section has much in common with the terms of trade shock analyzed in the previous section.** At the same time, being a supply rather than a demand shock, it carries some distinct features and poses different challenges to the policymaker over different time horizons. Over the short run, its impact can be expected to be both contractionary and inflationary, and in that sense it could pose difficult policy dilemmas. Over the medium term, the permanent nature of the shock suggests a depressing effect on the economy's potential output and a permanent change in its equilibrium real exchange rate. Given the magnitude of the shock as estimated above, both its short- and long-run effects can be expected to be quite significant.

D. Adverse Shock to Metal Export Volumes

75. **Strong growth in metal export volumes has contributed significantly to Ukraine's recent export surge: in 2004, metal export volume growth exceeded 10 percent**. In turn, the growth in metal export volumes has been the result of strong investment in the metallurgical sector that increased its capacity, successive increases in the EU's metal quota, and successful opening of new export markets, notably in Asia.

76. **There are considerable risks that such strong growth in metal export volumes may not be sustained in the near term.** Among other factors, two potential factors could be singled out: (i) a less favorable EU metal quota; and (ii) a slowdown in China's steel import demand.

- Regarding metal exports to the **EU**, the staff's baseline projection assumes that the EU metal quota will be adjusted in line with the EU's overall import demand. In the wake of the EU's enlargement, and with some of the accession countries being major metal exporters themselves, this assumption could turn out to be optimistic. In this context, it may be worth exploring a scenario whereby the EU quota remains unchanged in the near term. With the EU accounting for about a third of Ukraine's trade, and Ukraine's metallurgical sector already operating close to capacity at a level where the EU quota is almost binding, an unchanged EU quota is bound to have a

significant impact on Ukraine's exports relative to the baseline projection. Ignoring second-order effects on import demand,[19] the estimated overall impact of this scenario is to reduce Ukraine's current account surplus by just under 1 percentage point of GDP, with a similar impact on real GDP growth relative to the baseline.

- In recent years, **China** has become an increasingly important destination of Ukraine's metal exports (especially steel), accounting for some 7½ percent of these exports in volume terms in 2004. Thus, a slowdown in China's metal import demand would have a non-trivial impact on Ukraine's trade. Relevant risks in this area include a slowdown in China's overall growth or, more likely, a decline in its net importer status in the global steel market.[20] The prospect of China becoming a net exporter of steel in the world market could have implications for Ukraine's exports well beyond the shrinking of the Chinese market. In particular, losses in export market shares in the rest of Asia, in view of China's substantial comparative advantages in these markets, not least due to significantly lower transport costs, also need to be taken into consideration. The potential impact on Ukraine's balance of payments of losses in this market segment could also be substantial, as Asia (excluding China) currently accounts for over 10 percent of Ukraine's total merchandise exports, with over 80 percent of this share consisting of metals. Quantifying the overall impact of the "China" risk factor on Ukraine's balance of payments is not straightforward: for the purposes of this section, the shock in question was calibrated as zero volume growth in China's total steel imports, and similarly zero volume growth in Ukraine's exports to the rest of Asia relative to the respective 2004 levels. This calibration could be on the optimistic side, as significantly negative metal export volume growth to the Asian market is quite conceivable. On the other hand, this calibration of the shock rules out the possibility that Ukrainian metal exporters could be successful in increasing their shares in other markets: while this strategy was key to the re-orientation of Ukraine's trade away from CIS trading partners (especially Russia) in the mid- to late 1990s, the presence of steel quotas in the EU (Ukraine's single most important export market) creates significant constraints in this regard. The estimated overall impact of the shock to China's still imports would reduce Ukraine's current account surplus by some 1½ of a percentage point of GDP, and real GDP growth to a similar extent.

77. **The above calculations suggest that Ukraine's balance of payments and real economy are quite sensitive to plausible exogenous shocks to metal export volume.** Moreover, the shocks discussed in this section, and in particular shocks to China's steel import demand, need to be assessed in conjunction with the types of shocks discussed in section II, as they are bound to result in large declines in world metal prices. Thus, a more

[19] Empirical work by the NBU staff suggests that the explanatory power of imports for metal exports to non-CIS countries is minimal.

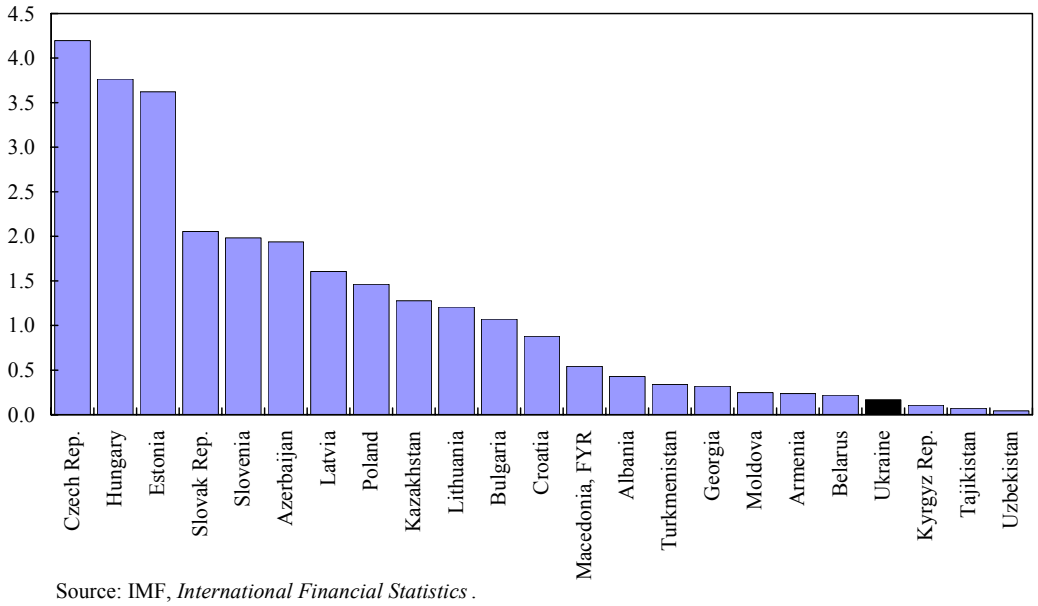
[20] Already in the first five months of 2005, China's domestic steel production is reportedly up by over 30 percent.

accurate picture of the overall importance of metal export volume shocks can be obtained by adding the estimated impact calculated in this section to the corresponding effects of world metal price shocks.

E. Increase in Foreign Direct Investment Inflows

78. **Foreign direct investment (FDI) inflows to Ukraine, either as a share of GDP or in per capita terms, have been among the lowest for transition economies** (see Figure 4 for an international comparison of FDI per capita). The staff's baseline medium-term projection envisages a substantial increase in FDI inflows, by a cumulative 260 percent relative to their current level by the end of the WEO forecasting horizon. This projected increase in FDI inflows reflects relatively favorable privatization assumptions, even though the privatization component of FDI inflows to Ukraine has so far been negligible.[21] This baseline FDI projection, along with the upside risk scenario discussed below, are calibrated on the basis of the experience in other transition economies. For the baseline in particular, it is assumed that by the end of the WEO forecasting horizon Ukraine will have reached the level of FDI (in per capita terms) currently enjoyed by moderate reformers among transition economies.[22]

Figure 4: Cumulative FDI Per Capita, 1992-2004
(In US$ thousand)



Source: IMF, *International Financial Statistics* .

[21] Even the substantial privatizations of 2004 were reflected in the balance of payments mainly as long-term loans rather than as FDI inflows.

[22] An unweighted average of Bulgaria and Romania was used in this regard.

79. **The choice of an appropriate benchmark against which the size of FDI inflows to an emerging market economy should be judged is a non-trivial issue**. While population is a typical benchmark used in the literature to compare FDI flows across countries, it can be argued that GDP may also be used as a relevant benchmark to judge a country's success to attract foreign capital and as a basis to project future FDI flows. The choice of benchmark ultimately depends to a large extent on the objectives motivating foreign investors. To the extent that the key objective motivating foreign investors is the expansion of their global export capacity, the availability of a skilled, low-cost labor force would be a key consideration—and this could be proxied by population. If, on the other hand, foreign investors are mainly aiming at expanding sales to the consumer base of the host country, the host country's consumption capacity could be the more relevant factor—proxied by GDP.[23] The latter pattern of FDI flows is generally viewed as presupposing substantial progress with structural reforms and a threshold level of per capita income; on both counts, it appears unlikely that, at least in the near future, foreign investment aimed at capturing domestic consumption will constitute a substantial component of FDI flows to Ukraine, where the share of consumer goods in total imports remains extremely low. It should also be noted that, among the likely candidates for privatization, export-oriented firms, especially in the energy and metallurgical sectors, clearly dominate. Overall, the baseline medium-term scenario, while envisaging a substantial increase in FDI flows in per capita terms, keeps FDI broadly constant as a share of GDP.

80. **While the baseline FDI projection can be regarded as plausible, it can be argued that Ukraine has considerable upside potential in this area.** Indeed, the baseline scenario would still leave Ukraine within the group of transition economies with a below-average record in attracting FDI. Given its natural and human resources, its proximity to key European markets, and assuming successful implementation of its structural reform agenda that could put it on the road to EU accession, Ukraine could be in a position to perform much better in attracting foreign capital.[24]

81. **The experience of other transition economies suggests that per capita FDI inflows much higher than envisaged for Ukraine under the baseline scenario are quite possible, provided that strong macroeconomic fundamentals and an appropriate institutional framework are in place.** For Ukraine, such an upside scenario would have to entail a return to macroeconomic stability, especially on the inflation front, a quick resolution of uncertainties regarding the re-privatization process, and full implementation of the authorities' ambitious structural reform agenda. For the purposes of this section, this upside

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[23] See, for example, Hanson, Mataloni Jr, and Slaughter (2001) on U. S. firms, and Buch, Kleinert, Lipponer, and Toubal (2005) on German firms.

[24] This should not be interpreted to indicate that the baseline is entirely without downside risks. Stalling of structural reforms, and in particular lingering uncertainties regarding re-privatization, could leave FDI near its very low levels of the recent past, at least during the early part of the projection period.

scenario is calibrated in a manner consistent with the high-growth scenario discussed in Chapter I. In comparative terms, it is assumed that, by the end of the WEO forecasting horizon, Ukraine will have reached the level of FDI (in per capita terms) currently enjoyed by some of the more (but not the most) successful transition economies in this regard. Specifically, transition economies that currently draw FDI in excess of $2,000 per person are dropped from the sample, and the calibration is based on the average of the countries that currently attract between $1,000 to $2,000 per person.[25]

82. **The upside-risk scenario outlined above would imply a substantial impact on Ukraine's balance of payments relative to the medium-term baseline.** Specifically, such a scenario would entail, other things equal, an positive impact on the balance of payments of almost 2½ percentage points of GDP by the end of the WEO forecasting horizon. This would translate into a level of gross international reserves some 25 percent above the baseline scenario by the end of the projection period. The effects in question would be even larger in the presence of a positive relation between FDI inflows and export performance, which has been documented for other emerging market economies.

83. **Beyond their impact on the balance of payments, which is essentially nominal in nature, the above positive shock to FDI inflows can have a sizable impact on real GDP growth**. The precise mechanisms through which such an impact could make itself felt would depend on the nature of the capital inflows involved, but possible transmission channels could include a direct positive impact of higher FDI inflows on domestic investment, and a more indirect effect on total factor productivity growth, via an alleviation of financing constraints on enterprises and/or embodied technical progress.[26] While these effects are notoriously difficult to quantify *ex ante*, experience in other countries suggests that they can be quite substantial. In this setting, a shock to FDI inflows would have an impact on the demand side of the economy over the short term, and a more medium term impact on potential output an the equilibrium exchange rate. Macroeconomic policymakers would therefore need to take into account both short-term stabilization objectives and at the same time the need to facilitate the economy's transition to a new equilibrium exchange rate, particularly in the presence of pervasive labor and product market rigidities.

84. **Beyond uncertainties related to the underlying medium-term path of FDI inflows, the potential volatility of such inflows should also be taken into account in formulating macroeconomic policies.** As large public enterprises come up for privatization, FDI inflows could become extremely variable from one period to the next.[27] Other transition

[25] This set of counties include, in ascending order of FDI per capita, Latvia, Lithuania, Poland, Slovenia, Azerbaijan, and the Slovak Republic.

[26] Foreign capital flows to Ukraine's tradable goods sector, particularly of an "evergreen" nature, could be especially important in this regard.

[27] For instance, official estimates of the proceeds from the re-privatization of just one steel company are in excess of $2 billion.

economies have found themselves in a similar situation as they embarked in a process of reform and economic restructuring. Under such circumstances, the macroeconomic policy response would need to safeguard monetary control in the face of potentially very large capital flow volatility.

F. Volatility in Private Capital Flows

85. **A salient development in Ukraine's capital account in recent years has been the significant increase in the share of private capital flows in total gross flows**. Thus, the Ukrainian public sector has been turning to private foreign investors to finance a steadily increasing share of its financing requirement. Since Ukraine re-entered the sovereign eurobond market in 2003, it has issued a total of $2.1 billion in eurobonds over the 2003–04 period. Still more recently, private foreign investors have become dominant in the domestic currency sovereign securities market as well: total private capital flows in this market amounted to $400 million in 2004, and are expected to well exceed $1 billion in 2005. Private investors are also responsible for the sharp increase in debt-creating capital flows to the Ukrainian private sector, both at the long end (net inflows) and at the short end of the maturity spectrum: in 2004 alone, private long-term capital inflows amounted to $2 billion, while short-term capital outflows exceeded $8½ billion.[28]

86. **These flow developments are clearly reflected in Ukraine's stocks of foreign assets and liabilities, which highlight the country's increased external exposure**. Thus, Ukraine's public sector, while it has seen its overall debt ratio steadily decline in recent years, has increased its indebtedness to commercial creditors from $2½ billion to $4 billion between 2002 and 2004.[29] Over the same period, private external debt rose from $11¾ billion to $17½ billion. In all, Ukraine's net external liability position (not including the stock of FDI) stood at $9½ billion, some 13 percent of GDP, at end-2004. This net exposure is very high by international standards, and renders Ukraine highly vulnerable to currency and rollover risk.

87. **While in many ways a sign of Ukraine's closer integration into global financial and capital markets, and as such a welcome development, increased reliance in private foreign financing also carries considerable risk**. For one, it is fairly well established that private external financing is characterized by higher rollover risk relative to official financing. Second, as a substantial part of the external liabilities are dollarized, a sudden reversal of investor sentiment would entail major risks, in view of the large aggregate asset-liability mismatch mentioned above; and the pervasive domestic liability dollarization would

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[28] The sharp increase in long-term inflows (almost entirely composed of loans) reflected in part the increased privatization activity. The political crisis of the last months of the year was mainly responsible for the surge in short-term capital outflows.

[29] Over the same period, public indebtedness to official creditors declined from $5½ billion to $5 billion (or from13 to 7¾ percent of GDP).

compound these problems for the Ukrainian banking system and the economy as a whole. Given the nature of balance sheet mismatches, a "sudden stop" in capital inflows can be particularly costly for the Ukrainian economy.

88. **While the foregoing focuses on the downside risks to private capital inflows, it should be emphasized that upside risks in this area are at least as important,** as illustrated recently by the surge in the participation by foreign investors in the hryvnia-denominated government paper market. Moreover, the implications of a surge in private capital inflows can be much more benign than those of a sudden stop. In principle, to the extent that they entirely reflect improved fundamentals of the Ukrainian economy, they can be easily accommodated without substantial implications for the authorities' broader macroeconomic objectives. On the other hand, to the extent that they reflect serious underlying disequilibria, including large exchange rate misalignments, they could prove destabilizing and should be cause for policy concerns.

89. **Such risks to private capital flows, which reflect shocks to portfolio preferences that can go in both directions, are particularly difficult to quantify, as they depend to a large extent on confidence factors that are not easy to model.** Merely by way of illustration, it may be useful to calibrate possible future portfolio shocks on the basis of the broad patterns of the near-crisis around the time of the last presidential elections in late 2004. A natural way to capture a portfolio shock of this type would be to look at the change in reserves due to the shock as a percent of broad money: on the basis of staff's estimate of the impact of the end-2004 crisis on reserves, the portfolio shock in question was relatively moderate—with lost reserves amounting to some 13 percent of broad money. Calibrating to the baseline path for the balance of payment, a portfolio shock of similar magnitude can be estimated to result in a level of reserves some 30 percent above or below baseline, depending on the direction of the shock in question, on the assumption of no offsetting policy action.

G. Policy Implications

90. **This section offers some observations on the question of the appropriate policy response to the types of external shocks that are the subject of this chapter, paying particular attention to exchange rate policy issues.** Indeed, it turns out that the impact of these shocks on the Ukrainian economy can hinge crucially on the exchange rate regime in place: for the majority of the shocks under consideration, greater exchange rate flexibility can go some way toward insulating the economy from downside risks and allow it to take full advantage of upside risks.

91. **Given the demand-side nature of the *terms of trade shock* and the *metal export volume shock* considered above, it is natural to expect that similar policy responses would be appropriate.** Faced with such shocks, greater exchange rate flexibility carries strong advantages. Even if one were to focus only on their impact on the balance of payments, it is difficult to see how the monetary authority can accommodate deflationary shocks of this magnitude under a pegged exchange regime without considerable strain: the estimated depletion of foreign exchange reserves that could be required in an attempt to defend the exchange rate would render such a strategy particularly problematic. In the event,

the estimated large degree of sensitivity of the real economy to both shocks in question considerably strengthens the case for exchange rate flexibility on welfare grounds, as a mechanism that could cushion the impact of these shocks and stabilize the real economy. Empirical work on other emerging market economies, discussed in the technical annex to this chapter, underscores the potency of flexible exchange regimes in this regard.[30]

92. **Other macroeconomic policy instruments constitute very imperfect substitutes to exchange rate flexibility in coping with the shocks in question**. This is particularly true of fiscal policy, exclusive reliance on which in the face of these shocks would entail major policy dilemmas. While fiscal tightening could help restore external balance by restricting domestic demand (and support real exchange rate depreciation), it would only exacerbate the deflationary impact of the shock on the domestic economy. Similarly, fiscal expansion could succeed at stabilizing the domestic economy, but only at the expense of worsening the external imbalance.

93. **On the other hand, structural reforms in the area of labor and product markets can usefully complement exchange rate flexibility in insulating the real economy from the shocks under consideration**. Progress with reducing labor and product market rigidities, and strengthening market-enhacing institutions more generally, can provide greater scope for wages and relative prices to adjust in the face of these shocks, thus bringing about part of the required real exchange rate adjustment. Clearly, the larger the degree of flexibility of labor and product markets that reform can attain, the smaller the needed change in the nominal exchange rate in response to a given shock of the type considered here. The authorities' ambitious structural reform agenda could thus prove particularly useful in this area.

94. **While also a real shock, the supply-side nature of the *energy import price shock* introduces some *short-run* tradeoffs with regard to the choice of an appropriate monetary policy regime, including the desired degree of exchange rate flexibility**. Over this short horizon, the policymaker's relative preferences between various policy objectives become relevant: a relatively large weight on inflation could render defending the peg preferable in order to limit the short-run effect on prices to the first-round impact of the shock; a larger weight on output and employment, on the other hand, could tilt the advantage toward some nominal depreciation. **Over a *medium- to longer-term* horizon, however, these tradeoffs become less meaningful**. As the ultimate steady state entails a lower equilibrium real exchange rate, there could be advantages to allow the nominal exchange rate to play a central role in the adjustment, especially to the extent that labor and product market rigidities are important. If, on the other hand, convergence of energy import prices were to take place at a relatively gradual pace, there could be some scope to rely on wages and prices

[30] In particular, based on a large sample of emerging market economies, Broda (2001) provides strong evidence that adverse terms of trade shocks tend to entail a large negative impact on real GDP under fixed exchange rate regimes; by contrast, flexible exchange rate regimes tend to fully insulate the real economy in the face of such shocks.

for part of the necessary real exchange correction, creating some room to move to nominal exchange rate flexibility more gradually.

95. **While traditional macroeconomic policies cannot substitute for nominal exchange rate flexibility in response to the energy price shock under consideration, structural reforms could once again prove particularly useful**. First, as discussed above, greater labor and product market flexibility can reduce the burden on the nominal exchange rate in bringing abour a given real exchange rate adjustment. Second, and perhaps more important for the issue at hand, targeted efforts aimed at increasing the Ukrainian economy's energy efficiency from its currently extremely low level,[31] itself in large part a reflection of the very low energy prices it has had to pay, can reduce the impact on potential output and the equilibrium real exchange rate, and hence the needed real exchange rate adjustment in response to a given energy import price shock. These considerations underscore the importance of the efforts at addressing energy efficiency that are currently under way, with strong World Bank support.

96. **Exchange rate flexibility would appear to carry distinct advantages in response to *FDI shocks*.** First, it could help cushion the economy against the short-run demand impact (nominal and real) of the shocks in question. Second, it could facilitate the economy's transition to a new equilibrium exchange rate over the medium terms, particularly in the presence of pervasive labor and product market rigidities. Third, it could help the economy cope with potentially very large volatility of inflows (partly reflecting the uneven timing of the planned privatizations), and the monetary authorities retain control of monetary conditions, by allowing a combination of changes in reserves and nominal exchange rate adjustment.

97. **Given the entirely nominal nature of *portfolio shocks*, it may not be surprising that the optimal policy response could be quite different.** Indeed, there is a broad consensus that a credible exchange rate peg can effectively insulate the economy from shocks of this type. In operational terms, as far as the conduct of monetary policy is concerned, this implies that the central bank should stand ready to accumulate or run down reserves to defend the peg in the face of a pure portfolio shock; and given that the shock in question should in principle be fully reflected in money demand, it need not (indeed should not) attempt to sterilize the associated capital flows. This is essentially the approach the NBU successfully pursued in the context of the end-2004 near-crisis. These considerations notwithstanding, two important caveats need to be borne in mind:

- **The notion that the optimal strategy in response to a portfolio shock is to defend the peg does not imply that this strategy is also feasible.** In this regard, a crucial asymmetry should be emphasized. Given that the central bank does not need to sterilize a portfolio shock that leads to capital *inflows*, defense of the peg does not

[31] Ukraine currently ranks among the ten most energy-inefficient countries in the world, as measured by the ratio of energy consumption to GDP.

pose any constraint on the optimal policy: in principle there is no limit on the amount of reserves that a central bank can accumulate in these circumstances. On the other hand, the feasibility of maintaining the peg under condition of capital *outflows* clearly hinges on reserve adequacy: if reserves were to decline below a critical threshold, the credibility of the overall strategy could come into question. While the NBU was successful in defending the peg in late 2004, a sharper or more persistent shock might be more difficult to deal with. These considerations provide a strong motivation for building up reserves to adequate levels in tranquil times.

- **The optimality of defending the peg in response to a portfolio shock presupposes that the level of the exchange rate itself is appropriate.** To the extent that the exchange rate is widely perceived to be misaligned, this can itself generate excessive short-term capital flows of a speculative nature that could be ultimately destabilizing. This pattern is clearly reflected in the recent large-scale inflows of funds to the hryvnia government paper market that began last year and have exploded so far during 2005. In such circumstances, a correction of the underlying misalignment is key to addressing the resulting vulnerabilities.

98. **The imposition of controls on capital flows is sometimes viewed as a possible shield against the above risks**. In Ukraine's case, the effectiveness of such a response invites considerable skepticism. On the one hand, the recent restriction on short-term capital inflows via setting minimum maturity thresholds for the instruments concerned appears largely symbolic in nature: the relevant instruments issued by the authorities are already of longer maturity than the threshold prescribed by the regulation; more generally, international experience suggests that such controls are unlikely to effectively restrict capital inflows motivated by favorable yield differentials and/or expectations of hryvnia appreciation on a sustained basis. On the other hand, the effectiveness of existing controls on capital outflows is similarly questionable, given the existence of numerous loopholes through which the controls in question can be easily circumvented. Among these, the most important is a scheme that allows capital outflows on the basis of declaring fictitious capital gains on holdings of (typically unlisted and very often non-existent) shares. This scheme is not restricted by existing legislation, and provides an avenue for large-scale capital flight, which has exceeded $1 billion (and sometimes approached $2 billion) per year since the early 2000s.

99. **With the effectiveness of controls highly questionable, and in the context of the recent large-scale foreign purchases of hryvnia government paper, a tighter fiscal stance is sometimes proposed as a first-best approach to reduce the risks posed by potential capital flow volatility.** The effectiveness of this option is also questionable, however. In a fundamental sense, and however desirable fiscal consolidation may be on other grounds, this approach would be addressing a symptom rather than the root cause of the problem: to the extent that the inflows in question reflect perceptions of hryvnia undervaluation, short-term foreign capital would probably be diverted toward other instruments, possibly shifting the associated risks to an already heavily exposed private sector. To the extent that these short-term inflows are mainly driven by a wide perception of hryvnia undervaluation, a useful complementary policy option could be a move to

meaningful (and symmetric) exchange rate flexibility: by introducing a sufficient amount of uncertainty about short-term movements in the exchange rate, it could remove the perception of a permanently fixed peg, thus dampening foreign investor incentives, while also impacting substantially the built-in incentives for external financing on the part of both the public and the private sector.

H. Summary and Concluding Remarks

100. **This chapter addressed a number of potential upside and downside risks to Ukraine's medium-term balance of payments outlook, along with possible policy responses.** For the purposes of this chapter, "risk" is used to capture both potential problems down the road and potential opportunities arising from Ukraine's growing integration in the world economy; the policy discussion aimed at ways to limit the impact of the former and take as full advantage of the latter as possible. On the current account side, risks to world metal prices, Ukraine's energy import prices, and export market growth were discussed. On the capital account side, the discussion focused on (symmetric) risks to FDI flows, as well as some of the implications of private capital flow volatility. In general, the analysis documented that all these potential shocks could have a pronounced impact both on Ukraine's balance of payments and on the macroeconomy more broadly.

101. **The types of shocks examined, while of considerable topical interest in the current juncture, also reflect salient features of Ukraine's economy.** They relate, *inter alia*, to its limited degree of trade diversification, its sensitivity to world commodity prices, and they early stages of its integration in world capital markets. As such, the issues covered in this study, are likely to re-emerge as part of Ukraine's policy agenda in one form or another, and thus warrant serious consideration.

102. **A few words of caution on the empirical and analytical strategy employed in this chapter are clearly warranted.** While the simulations employed relied to the extent possible on econometric analysis, in some cases they had to resort to calibration methods; while an attempt was made to keep the calibrations as meaningful and realistic as possible, they are by definition arbitrary—comprehensive sensitivity analysis would be clearly beneficial. Moreover, for the most part, the analysis focused on the direct impact of the shocks under consideration, to the detriment of a more comprehensive general equilibrium treatment; such an approach was judged to be beyond the scope of this chapter, but could clearly be useful in checking the robustness of the analytical and policy conclusions.

103. **The effects of each the shocks under consideration were for the most part discussed in isolation from each other.** This was mainly done for the sake of clarity, but should not be interpreted as implying a presumption that the shocks in question are likely to be mutually independent—indeed, the chapter briefly takes up the issue of the interaction between metal export market growth and world metal prices. In this regard, a question that carries particular analytical and policy interest and should be explored further relates to the interaction between the current and capital account shocks discussed in this chapter. While it is generally thought that the availability of external financing can help mitigate the impact of adverse current account shocks, the structure of Ukraine's trade and its level of financial

development could in fact imply the opposite: certain current account shocks could lead to tighter international collateral constraints, with the capital account actually amplifying the impact of the original shock.

104. **A key policy conclusion that emerges from this chapter is that the impact of the shocks under consideration on Ukraine's economy hinges crucially on the exchange rate regime in place.** For the types of shocks examined, with the possible exception of portfolio shocks, it was found that exchange rate flexibility could play a particularly useful role in cushioning the impact of adverse shocks and allowing Ukraine to take full advantage of key upside risks. Moreover, in most cases, it was concluded that other macroeconomic policies can only serve as poor substitutes to nominal exchange rate flexibility to achieve the desirable adjustment: while a particular macroeconomic policy mix can help support the adjustment process, at least some degree of exchange rate flexibility was found to constitute an indispensable component of the optimal policy response.

Technical Annex

105. This annex summarizes a number of key empirical results that have been used as inputs to the simulations of this chapter. The focus is on the following areas: (i) the pass-through of changes in world metal prices to Ukraine's export prices; (ii) the impact of terms of trade changes on Ukraine's export volumes; (iii) international evidence on the impact of terms of trade changes on the macroeconomy, and real activity in particular, in emerging market economies, depending on the exchange rate regime in place.

106. The Ukraine-specific empirical results relate to econometric work currently in progress at the NBU,[32] which was kindly made available by the staff of the NBU's balance of payments department. This work attempts to identify the key determinants of the main components of Ukraine's current account transactions, including the magnitude of the relevant impact and the lags with which it is felt. Specifically, it examines separately the determinants of volumes and prices of exports and imports, along with the respective components of metals and energy. For the most part, trade with other CIS countries and with the rest of the world is examined separately, in order to identify potentially different transmission channels. Given that the relevant input for the purposes of this chapter relates to metal exports, the latter set of estimates is primarily relied on.

107. In terms of methodology, the NBU's empirical work relates on vector autoregressive methods, incorporating an error-correction technique to capture long-term relationships among the variables of interest; given the limited availability of data, a number of the parameters of the long-run cointegrated vectors cannot be estimated directly, and are instead calibrated on the basis of results from other transition economies. The estimation covers the period 1997-2005, in order to minimize structural instabilities relating to the early phases of transition. Even so, the impact of specific structural changes within the estimation period is controlled for via dummy variables (affecting both intercept and slope): among these structural changes, the 1998 currency crisis and the VAT reform of 2001 turn out statistically significant.[33]

Pass-through of world metal prices to Ukraine's export prices

108. The pricing behavior of Ukrainian metal exporters is of particular interest for the purposes of this chapter. In this regard, the distinction between local currency pricing and producer currency pricing carries significant implications for macroeconomic adjustment, and has been the subject of a large body of empirical work. In this regard, the increasing recognition that the choice of pricing mechanism should be viewed as an endogenous

[32] National Bank of Ukraine (2005).

[33] Other factors controlled for, but which turn out to carry lower explanatory power, include the introduction in 1999-2002, and elimination in 2003, of the "Mining and Smelting Experiment" law and the period immediately preceding the latest presidential election.

decision by optimizing agents substantially complicates the empirical strategy.[34] The VAR methodology of the NBU study, which allows for explicit Granger causality testing, partly addresses these endogeneity problems.

109. The results of the NBU's empirical work suggests that Ukraine's export prices (PX_ROW) are driven to a large extent by consumer prices in its main export markets (CPI_ROW) and by world metal prices (P_me). Specifically, the results can be summarized as follows (stars denote statistical significance at conventional significance levels):

Dependent variable: PX_ROW

Factors	Elasticity	Lags
CPIer_ROW	**1.21 ***	**0-2**
P_me	**0.34 ***	**2-4**

The estimation results lend support to the view of Ukrainian exporters as price takers in international markets, with the elasticity of export prices to the foreign CPI very close to 1. With respect to world metal prices, the estimated elasticity of 0.34 is essentially identical to the share of metals in Ukraine's total exports, strongly suggesting a **one-to-one pass-through of world metal prices to Ukraine's export prices**. The estimated lag structure indicates that the bulk of the effect in question is felt within a year. In terms of causality, the estimation results suggests that world prices Granger cause Ukrainian export prices.

Impact of terms of trade on export volumes

110. The NBU study also addresses the determinants of Ukraine's metal export volumes, another key input to this chapter's simulations. In particular, metal export volume (X_ROWm) is shown to depend on partner country real GDP (GDP_ROW), the real exchange rate (REER_ROW), and world metal prices (P_me) as follows:

Dependent variable: X_ROWm

Factors	Elasticity	Lags
GDP_ROW	**2.01 ***	**0-2**
REER_ROW	**-0.51 ***	**0-2**
P_ME	**0.22 ***	**0-3**

The estimated elasticity of metal export volume to world GDP is significantly greater than 1, consistent with import growth in Ukraine's partner countries above GDP growth, and steady

[34] See, for example, Engel (2005).

gains in Ukraine's export market share in the area of metals. The elasticity of metal export volume to the real effective exchange rate is significantly negative, and significantly higher in absolute value relative to non-metal exports (not shown)—-0.5 versus -0.2. Finally, the estimation results suggest that Ukrainian metal exporters significantly adjust their export volume in response to changes in world metal prices; the effect in question works fairly quickly, being completed within 3 quarters.

Terms of trade changes and the macroeconomy: International evidence

111. The impact of terms of trade changes on key macroeconomic variables, and the relevance of the exchange rate regime in this regard, have been the subject of extensive theoretical and empirical work. In what follows, the empirical results of an influential study by Broda[35] are summarized, to provide broader perspective to Ukraine's case.

112. The study in question uses an unrestricted VAR to estimate the impact of a 10 percent decline in the terms of trade in the large sample of emerging market economies. Specifically, impulse response functions are estimated for the response of real GDP, the real effective exchange rate, and the CPI. The study distinguishes between fixed and flexible exchange rate regimes, on the basis of a combination of the Fund's de jure classification and a de facto classification.[36] The impulse responses for the two groups of countries, over a 10-quarter horizon, are as follows:

Fixed exchange rate regimes

Quarter	0	1	2	3	4	5	6	7	8	9
GDP	**-0.7 ***	**-1.4 ***	**-2.1 ***	**-1.0 ***	**-0.6**	**-0.4**	**-0.5**	**-0.7**	**-0.8**	**-0.8**
REER	**0.0**	**0.0**	**1.5**	**2.2**	**1.6**	**1.6**	**1.4**	**1.2**	**1.4**	**1.5**
CPI	**-0.1**	**-0.1**	**-0.5**	**-0.6**	**-0.8**	**-0.9**	**-1.0**	**-1.1**	**-1.3**	**-1.5**

[35] Broda (2001).

[36] The de facto classification, based on exchange rate and foreign reserve volatility, is derived from Calvo and Reinhart (2000).

Flexible exchange rate regimes

Quarter	0	1	2	3	4	5	6	7	8	9
GDP	**-0.2**	**-0.5**	**-0.4**	**-0.3**	**-0.2**	**-0.2**	**-0.1**	**-0.1**	**-0.2**	**-0.2**
REER	**4.5 ***	**5.5 ***	**4.8 ***	**6.1 ***	**4.1 ***	**4.0 ***	**4.3 ***	**4.1 ***	**4.3 ***	**4.2***
CPI	**0.9 ***	**2.0 ***	**2.1 ***	**1.2**	**1.0**	**0.8**	**0.7**	**0.7**	**0.6**	**0.5**

113. The contrast between the two exchange rate regimes in terms of the economy's response to a terms of trade shock is striking, and entirely consistent with economic theory. Under a fixed exchange rate regime, the negative terms of trade shock has a strong and immediate adverse effect on real activity, with real GDP remaining well below trend during the first year after the shock. On the other hand, the fixity of the nominal exchange rate results in an effect on the real exchange rate and the CPI insignificantly different from zero throughout the simulation period. By contrast, a flexible exchange rate completely insulates the real economy from a terms of trade shock, with the effect on real GDP remaining insignificantly different from zero throughout the simulation period. Instead, the adjustment is carried out by the real effective exchange rate (throughout the simulation period) and the CPI (during the first three quarters after the shock).

114. Subsequent work has demonstrated that the results of Broda (2001) are generally robust to different definitions of the exchange regime, different specifications, and differerent empirical methodologies. In particular, Edwards and Levy Yeyati (2005) confirm that the conclusion of greater insulation of the real economy under flexible exchange exchange rates in the face of terms of trade shocks carries through if one uses a pure de jure or defacto exchange rate regime classification. Importantly, this latter paper documents substantial asymmetries in the impact of terms of trade shocks on economic activity under fixed exchange rates, with the impact of negative shocks turning out significantly stronger than the impact of a positive shock. This suggests that imposing symmetry on the effect in question could, if anything, understate the magnitude of the effect on real GDP, under a fixed exchange rate regime, of an adverse terms of trade shock of the type considered in this chapter.

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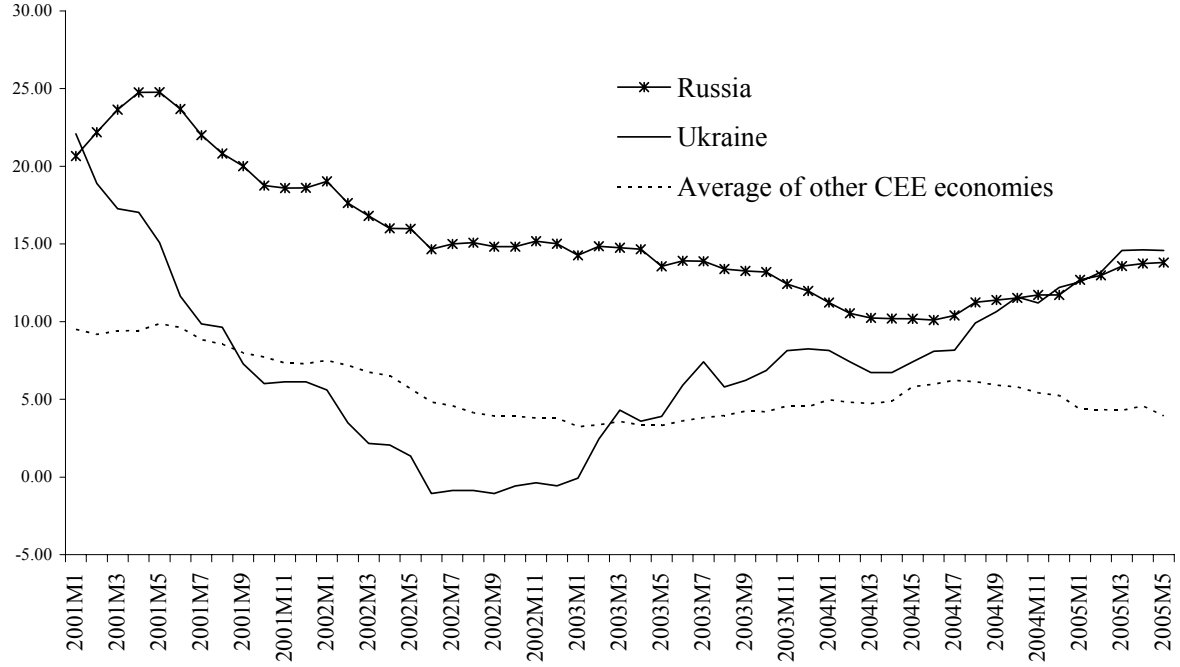
III. Inflation Persistence: Is There a Role for Relative Prices? [37]

A. Introduction

115. **Inflation in Ukraine is now higher than in its neighboring countries.** It has been on the rise since its sharp deceleration in 2001–02, and has not shown significant signs of receding. This chapter seeks to assess and explain inflation persistence in Ukraine and in neighboring countries with a focus on relative price adjustments.

Figure 1. CPI inflation in Selected Central/Eastern European and Transition Economies, 2001-05
(12-month, in percent)



Source: IFS and Fund staff estimates.

116. **Relative price adjustments are inherent to transition economies' transformation to market economies and may constraint the policy response.** In this regard, a key question is whether inflation is simply the result of insufficiently tight financial and/or income policies, or whether it stems from adjustments in relative prices. Coorey, Mecagni, and Offerdal (1996), Cottarelli, Griffiths, and Moghadam (1998) found that relative price adjustments contributed to inflation in transition economies. De Broeck, De Masi and Koen (1995) and De Masi and Koen (1995) found that relative price adjustments may take place over a prolonged period of time, even following rapid liberalization. Relative price

[37] Prepared by Marco Rossi.

adjustments may therefore still be relevant today, affecting the scope for disinflationary policy making. While the impact on inflation of changes in velocity and/or the money supply stemming from monetization of fiscal deficits and/or, depending on the exchange rate regime, from the balance of payments could be addressed through appropriate financial policies, the impact of changes in relative prices, which are inevitable and temporary as the structure of the economy changes during the transition to a market economy, may need to be accommodated.

117. **This chapter is organized as follows.** Section B looks at inflation persistence in Ukraine and other neighboring countries. Section C discusses the possible determinants of inflation persistence both in Ukraine and in a cross-country set up. Section D concludes.

B. Inflation Persistence

118. **A univariate analysis is conducted on a panel of central/eastern European countries and Russia.**[38] A simple regression of monthly seasonally-adjusted CPI inflation on its lag and a constant is estimated for the period January 1996–June 2005.

[1] $$\pi_t = \alpha + \beta\pi_{t-1} + \varepsilon_t$$

Since least-square estimators are significantly downward biased in autoregressive models, estimates of β are calculated using Andrews' (1993) median unbiased estimator. Two scalar measures of persistence, which summarize the effect of a unit shock to inflation occurring at time *t* over future inflation, are then calculated by replicating the estimation over rolling samples of 60 observations.

119. **These measures of persistence are:**

$$CIR = \frac{1}{1-\beta}$$

that is, the cumulative impulse response, which measures the total cumulative effect of a unit shock to inflation on its entire future; and

$$Halflife = \left| \frac{\log \frac{1}{2}}{\log \beta} \right|$$

that is, the half life of a unit shock, which indicates the length of time necessary to halve the magnitude of the original shock to inflation.

[38] Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Russia, Slovak Republic, and Ukraine.

120. **Table 1 reports the results.** Inflation persistence in Ukraine has decreased somewhat over the last several years, with the cumulative impulse response and half life coming down from 2½ percent to about 2 percent and from about 1¾ months to just over 1 month, respectively. Ukraine, together with Russia, Poland and Romania, has the highest inflation persistence among sample countries: for this latter group the average cumulative impulse response is between 1 and 1½ percent and the average half life is about ½ a month.[39] Inflation persistence in Ukraine is comparable to that for Turkey, but much lower than estimated for Brazil—half life of about 4 months (Celasum, Gelos and Prati, 2003).

Table 1. Inflation Persistence—Cross-country Comparison, 2002-05

	Bulgaria	Czech Republic	Estonia	Hungary	Lituania	Latvia	Poland	Romania	Russia	Slovak Republic	Ukraine	Average 1/
I. Estimates of cumulative impulse response (in percent)												
2002	3.41	1.53	1.60	1.79	1.03	1.07	2.73	2.04	1.21	1.15	2.64	1.65
2003	2.58	1.49	1.52	1.66	0.89	1.00	2.93	2.39	1.89	1.10	2.53	1.46
2004	1.86	1.48	1.60	1.49	0.95	1.25	2.96	2.50	2.97	1.06	2.65	1.38
2005	1.52	1.28	1.44	1.79	0.99	1.39	2.40	2.62	2.54	1.05	1.96	1.35
II. Estimates of the half life of a unit shock (in months)												
2002	2.81	0.75	0.83	1.00	0.24	0.29	1.96	1.24	0.46	0.39	1.85	0.90
2003	1.79	0.71	0.75	0.88	0.12	0.16	2.19	1.59	1.34	0.34	1.73	0.68
2004	1.06	0.69	0.82	0.72	0.12	0.49	2.23	1.72	2.28	0.29	1.68	0.60
2005	0.75	0.52	0.67	1.00	0.12	0.63	1.60	1.84	1.75	0.28	1.16	0.57

1/Average excluding Ukraine, Russia, Poland and Romania.

121. **The same procedure is applied to the main CPI components in Ukraine: food, nonfood, and services.** Figure 2 shows that, as expected, persistence in the main CPI components follows a path similar to that for the whole index.[40] It also shows that persistence does no longer differ across components.

[39] These estimates are consistent with those performed by Leigh (2005) for Hungary, Poland and the Czech Republic.

[40] The horizontal axis indicates the end of the regression window.

C. Determinants of Inflation

122. **A few broad groups of factors could explain inflation persistence.**[41]

- *Money growth.* That ultimately growth in monetary aggregates is a driving force behind inflation is not controversial. In transition economies, it has been shown that it has fueled inflation particularly during the first phases of transition as fiscal obligations were monetized (Bruno, 1993 and Fischer, Sahay, and Vegh, 1995). Lack of a credible fiscal stance may also contribute to deteriorate market confidence, increase velocity, and, hence, impact inflation. Also, and depending on the exchange rate regime, the balance of payments can affect inflation via the money supply.

- *Wage growth*. Wage increases, beyond productivity gains, impact prices not only directly by increasing costs, but also indirectly by pressuring domestic demand. This is particularly relevant in countries, like Ukraine, in which the share of wage costs in production costs is relatively low, while the share of wages in household disposable income is relatively high. At a relatively low level of income per capita, household expenditure is biased toward basic items. This, as is the case in Ukraine, is reflected in the large share of food items in the CPI basket (about 60 percent). Indeed, the recent surge in inflation has been attributed to a large extent to the substantial rise in wage and pension expenditure provided for in the 2005 budget.[42] *Output growth.* In economies whose production infrastructure has not received an appropriate level of new investment, capacity constraints can be frequently hit. A measure of the distance between current production and its trend can proxy for the likelihood that bottlenecks in specific sectors emerge with attendant inflationary pressures.

- *Real exchange rate appreciation.* Many transition economies have endured strong pressures on their real exchange rate. These pressures may stem from an initial misalignment of the real exchange rate, which in many cases resulted from setting the nominal exchange rate at a too low level out of concerns about competitiveness. But it can also result from Balassa-Samuelson effects and/or simply from surges in domestic absorption stemming from higher levels of income. In the case in which these pressures are not accommodated through nominal appreciation, inflation tends to rise above its level in trading partners.

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[41] Among these factors we do not explicitly include the fiscal balance for several reasons. The fiscal balance, particularly in a country with a shallow government securities market, affects inflation ultimately through its impact on the money supply, including through money velocity. Moreover, the fiscal balance *per se* does not say much about its quality, which can have, *ceteris paribus*, its own impact on inflation. An example is the 2005 budget, which, although targeting a relatively low deficit, provided for massive increases in wages and pensions. Inclusions of these variables should help take into account the fiscal policy impact.

[42] See Giucci and Bilan (2005).

Figure 2a. Ukraine: Inflation Persistence in CPI Components, 2002-05
(Estimates of cumulative impulse response, in percent)

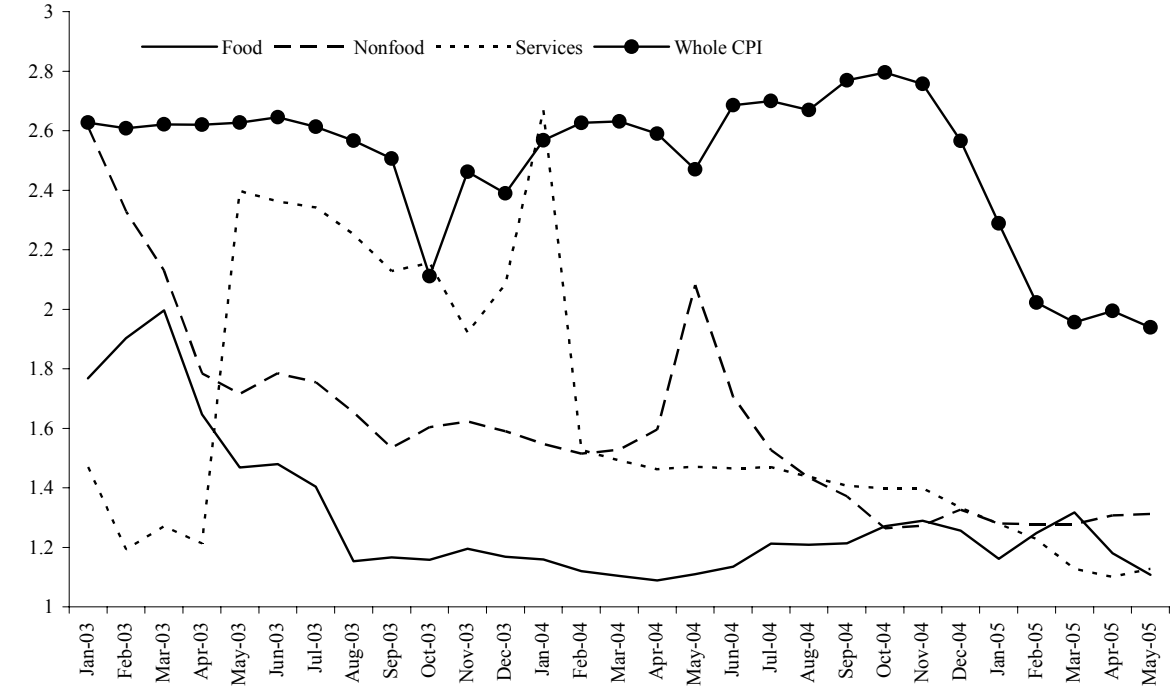
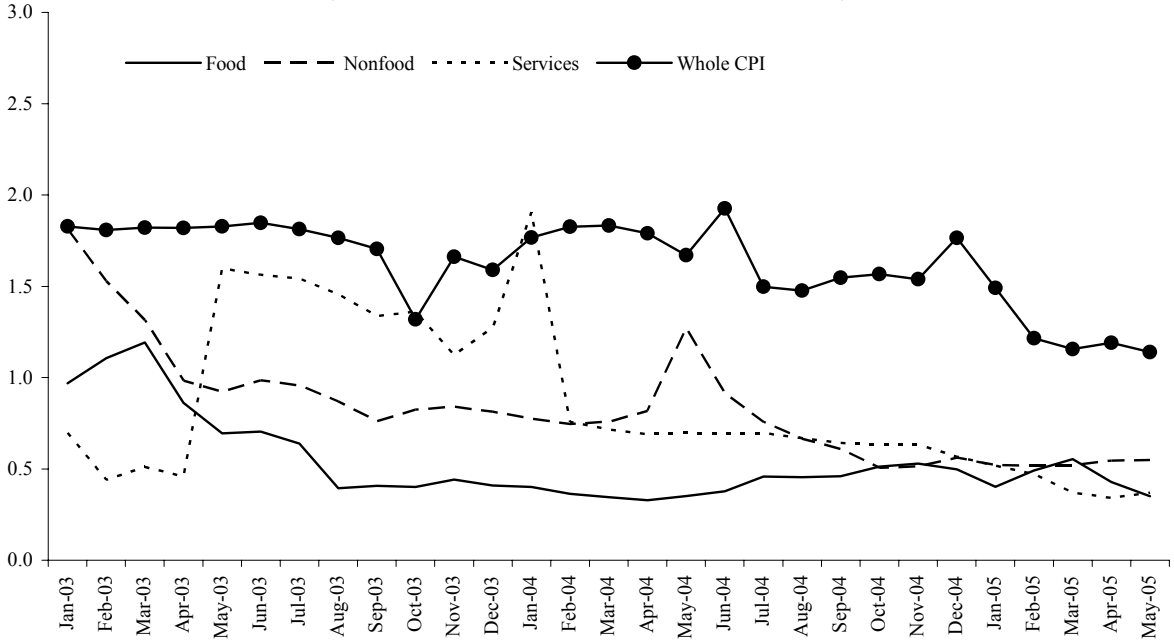


Figure 2b. Ukraine: Inflation Persistence in CPI Components, 2003-05
(Estimates of the half life of a unit shock, in months)



Source: IFS and staff estimates.

- *Relative price adjustments.* Relative price adjustments may take sometime while structural reforms are being implemented and both supply and demand adjust during transition. Moreover, relative prices can also adjust to reflect the capital content of individual items in the CPI basket. Zavoico (1995) and Saavalainen (1995) argue that the prices of certain capital-intensive services, such as transportation, utilities and housing, adjust more gradually than the prices of less capital-intensive services or goods that are exposed to international competition (tradables). According to this cost-recovery hypothesis, prices of capital-intensive items are not initially adjusted upward, even if demand rises, because the stock of capital, which has been inherited without associated costs, is left to depreciate. Then, however, maintenance costs and future investment costs would start to be priced in, completing an adjustment process that could last several years.[43]

Relative prices in Ukraine are reviewed in more details next.

D. Relative Prices

123. **As mentioned above, relative price adjustments can drive inflation irrespective of whether these are accompanied by money supply growth.** More specifically, the shape of the distribution of the inflation rates of the components in the CPI index can provide useful insights about the relation between inflation and relative price adjustments. For example, while relative price variability does not necessarily imply higher inflation since upward movements in some items may be offset by downward movements in others, positive asymmetry in the distribution (i.e. positive skewness) would indicate a certain degree of downward stickiness in the price of certain components. In such a case, a rise in the price of some of the components would translate into higher CPI inflation.

124. **The second and third moments of the weighted and unweighted inflation distributions describe the shape of the distribution of inflation rates across basket components over time.** The data set consists of monthly unweighted inflation rates for 100 categories of goods and services, which comprise the CPI basket in Ukraine, and of the weights of individual components in the CPI basket over the period January 2001–June 2005.

125. **Some stylized facts, which are in line with findings for market and transition economies, emerge from the analysis:**

- Both weighted and unweighted inflation distributions are non-normal—the Jarque-Bera statistics indicates consistently over time a zero probability that disaggregated inflation rates be normally distributed—and, most of the time, positively skewed. This would confirm some degree of downward price stickiness and the possibility that large increases in inflation for some items could drive average inflation up.

[43] This hypothesis would also suggest that price levels would be lower than those resulting from comparison of PPP-adjusted GDP, but would not indicate undervaluation.

- The disaggregated distributions tend to move over time suggesting that relative prices are still subject to adjustment even at this stage of transition. The variance and the skewness of monthly disaggregated inflation rates display very low persistence as shown by the small coefficient of their lagged values.
- A variance decomposition, based on a modified measure of the second moment of the disaggregated inflation distributions,[44] indicate that the variance within tradables amounts for most (about 70 percent) of relative price total variance, which is not surprising given the very large share of tradables (about 80 percent) in the CPI basket.
- Following Coorey et al. (1996), the second and third moments of the disaggregated inflation distributions and their modified "Theil" versions were regressed on inflation and the change in inflation. While both measures of variance do not appear correlated with inflation or its rate of change, both measures of skewness result positively correlated with inflation, though not with its rate of change.[45]

Table 2. Ukraine: Relative Price Variability—Regression Results

	Variance		Skewness	
	Unweighted definition	Theil definition	Unweighted definition	Theil definition
Constant	4.11	0.89	-0.36	-1.06
p-value	0.00	0.00	0.53	0.04
CPI	-1.41	0.29	1.85	2.24
p-value	0.18	0.21	0.00	0.00
CPI Change	0.00	0.00	0.00	0.00
p-value	0.27	0.87	0.48	0.37
No. of observations	52	52	52	51

E. A Multivariate Analysis

126. **The univariate analysis for Ukraine is extended to incorporate a set of regressors on the basis of the discussion above.** The sample period in this section extends further back to 1996. However, since prior to 2001, the level of disaggregation in the CPI basket reduces to three categories (food, non food, and services) the measures of relative price variability are calculated on the basis of this broader classification. The coefficients of inflation persistence are estimated over the period January 2000–May 2005 using the same rolling procedure in Section B. These coefficients are then regressed on the coefficients of persistence of a set of explanatory variables, which are selected on the basis of the discussion in the previous section. That is, the persistence in the monthly change in broad money, nominal public sector wages (in domestic currency terms), and pension payments (in domestic currency terms), as

[44] The modified measures of the second and third moments of the distribution are derived in Theil (1967). See the Appendix for a derivation of these measures.

[45] For this analysis, as well as for the multivariate analysis below, the various measures of relative price variability are calculated in terms of log differences, rather than in percentages.

well as in the real exchange rate, the distance of the monthly change in industrial production from its trend and the Theil measures of relative price variability. These persistence coefficients are calculated using the same rolling procedure used to calculate the coefficients of inflation persistence. A dummy is included to control for the switch to a de facto peg against the U.S. dollar in early 2002.[46] Also, the regression is estimated on the sub period January 2002–May 2005. All variables, except the measures of relative price variability, are defined in percentage terms. Measures of variance and skewness are defined in log differences. The regressions are estimated by ordinary least squares with corrections (Newey and West) for the bias in the standard errors resulting from heteroschedasticity. Autoregressive terms are also included to deal with serial correlation. The Breusch-Godfrey test of serial correlation revealed no evidence of correlation among the residuals in the final specification, while the Jarque-Bera statistic suggest that residuals are normally distributed.

127. **Tables 3 (first two columns) reports the results.**[47] Some previous research (Piontkivsky et al., 2001, Lissovolik, 2003, and Bilan and Siliverstovs, 2005) did not find a strong relation between inflation and money; in line with those results, money growth persistence does not appear to explain inflation persistence significantly irrespective of the sample period. The same applies to public sector wages and pensions. But both measures of relative price variability appear to be strongly significant, although only the measure of skewness remains so over the sub period. It is also worth noting that persistence in the measure that proxies the gap between actual and trend industrial production also turns out to be statistically significant and positive for the whole period. This would indicate the existence of supply-side constraints and be consistent with the cost-recovery hypothesis discussed above.

F. Panel Analysis

128. **The robustness of the results for Ukraine is here addressed in a cross-country panel framework.** The panel includes Czech Republic, Estonia, Hungary, Latvia, Poland, Romania, Russia, Slovak Republic in addition to Ukraine. The data span the period January 1996–June 2005, and include seasonally-adjusted monthly disaggregated CPI indexes, broad money, wages, industrial production, and CPI-based real exchange rates. The disaggregated CPI indexes for central and eastern European countries are from Eurostat; twelve items (goods and services) are included for most countries. For Russia and Ukraine, four (food, alcohol, nonfood, services) and three (food, nonfood, services) separate main items are considered, respectively.

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[46] It takes 1 starting in 2002 and zero otherwise.

[47] Regressions on the CPI components were also performed over the whole period, but the residuals were not normally distributed, which made the tests of statistical significance uninterpretable. Over the sub period, inflation persistence in the services components appears to be explained by persistence in both money and wage growth in addition to relative price variability and industrial production (distance from trend).

129. **The same rolling procedure as in the previous section is used to calculate coefficients of persistence** of inflation, growth in money, wages, and industrial production (distance from trend), as well as of the second and third moments of disaggregated price distributions for the period January 2000–June 2005. Inflation persistence is then regressed over persistence in these other variables. A seemingly unrelated weighted least squares estimation with fixed effects and autoregressive terms is used. A dummy to account for the type of exchange rate regime is included.[48]

130. **Figure 3** plots inflation persistence against the second and third moments of the disaggregated price distributions, respectively, across the panel and **hints at a positive relationship**. **Table 3 (last column) shows that relative prices variability** (particularly the second moment of the disaggregated price distribution) **is statistically significant**. For the panel, the impact of persistence both in money and wage growth cannot be rejected at 5 percent and 10 percent significance level, respectively, but the sign on the coefficient for broad money turns out unintuitively negative.

Table 3. Inflation Persistence—Regression Results

	Ukraine		Panel
	(1) Sample period: 2000:02-2005:05	(2) Sample period: 2002:01-2005:05	(3) Sample period: 2000:02-2005:06
Broad money	-0.02	-0.01	-0.04
p-value	0.36	0.73	0.05
Public wages 1/	0.06	-0.08	0.05
p-value	0.43	0.42	0.09
Pensions 2/	-0.03	0.02	...
p-value	0.58	0.83	...
Real exchange rate (CPI based)	-0.05	0.00	0.03
p-value	0.40	0.99	0.42
Industrial production (distance from trend)	0.36	0.11	0.05
p-value	0.00	0.21	0.16
Relative price variability (Theil variance)	0.18	0.01	0.07
p-value	0.04	0.89	0.02
Relative price variability (Theil skewness)	0.15	0.23	0.07
p-value	0.03	0.02	0.06
Dummy	-0.02	...	0.00
p-value	0.59	...	0.66
Adjusted R-squared	0.94	0.95	0.93
No. of observations	61	41	576

1/In the panel regression, wages indicate total wages rather than public sector wages.
2/Monthly data on pensions were not readily available for most of the panel countries.

[48] This dummy is based on the Annual Reports on Exchange Arrangements and Exchange Restrictions. Exchange rate regimes are classified ranging from currency board arrangements (1) to independent floats (7). The dummy taken a value of 1–7 depending on the regime over the sample period.

Figure 3a. Inflation Persistence and Variance

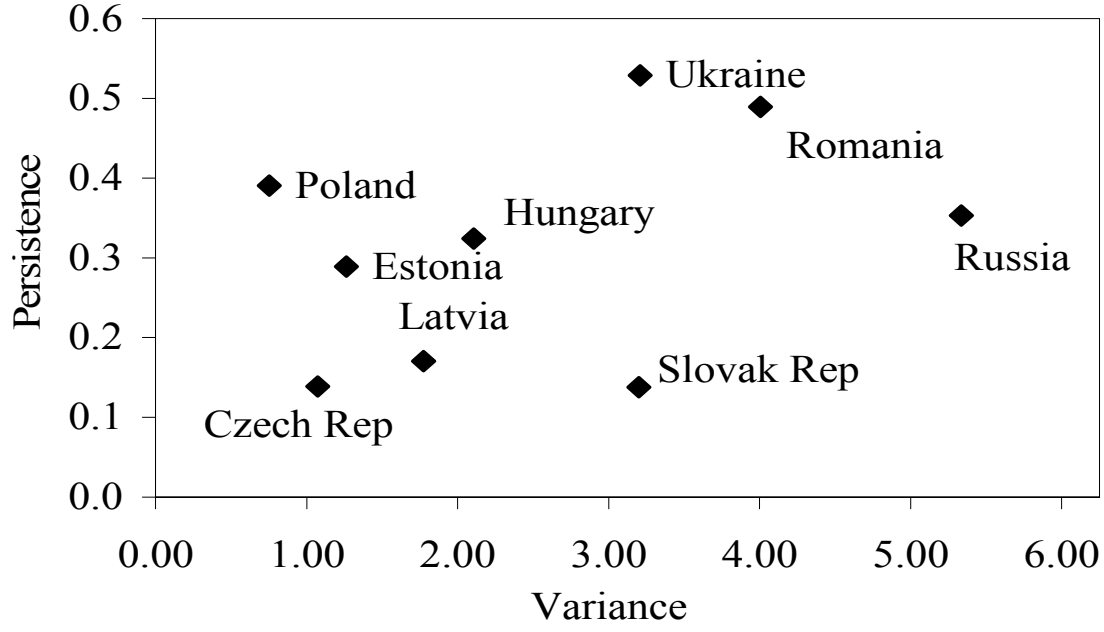
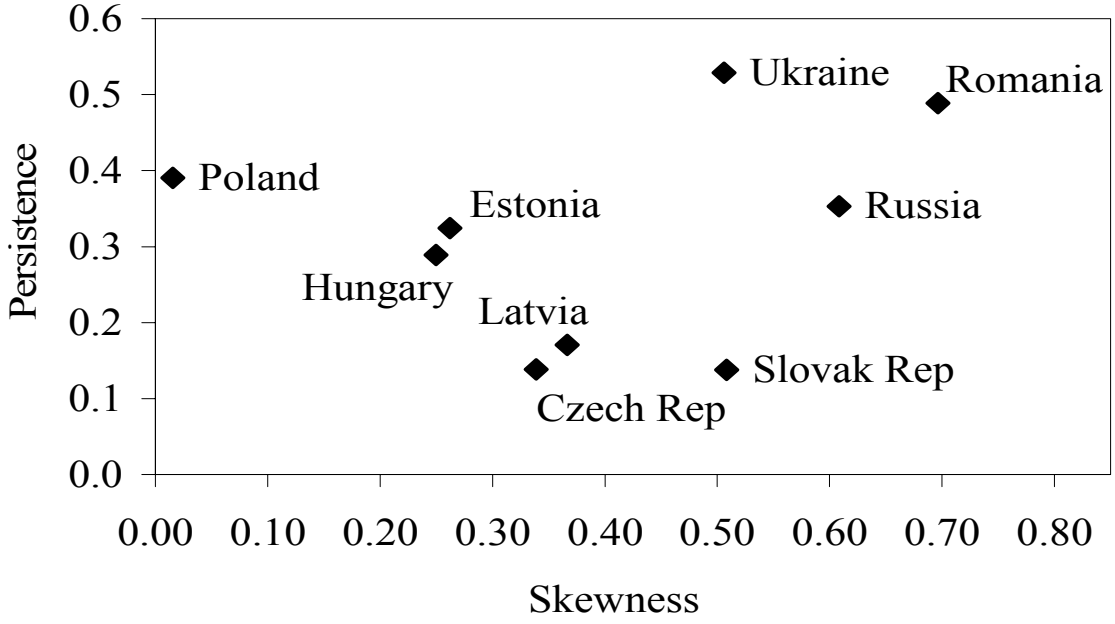


Figure 3b. Inflation Persistence and Skewness



Source: IFS and staff estimates.

G. Conclusions

131. Inflation persistence in Ukraine remains higher than in most central/eastern European countries. This preliminary analysis shows that inflation persistence appears to be affected by relative price adjustments even at this point in the transition process. This conclusion seems valid not only in the case of Ukraine, but also across a panel of central/eastern European countries and Russia. While their magnitude is crucial to gauge their actual impact on inflation, relative price adjustments may have potentially non-negligible implications in terms of the scope for financial policies to control inflation without unduly hinder economic activity.

132. Starting from the observation that inflation displays different degrees of persistence across countries, an important issue would be to incorporate into the analysis the policy response to economic developments, including the choice of the exchange rate regime, and how these responses have contributed to inflation. Similarly, appreciation/depreciation expectations could also be tested to see whether they impact inflation developments.[49] Under certain circumstances, depreciation expectations can also be interpreted as inflation expectations and their impact on inflation persistence tested.

[49] Bilan and Siliverstovs (2005) uses the spread between the average ask exchange rate in the cash foreign exchange market and the official exchange rate as a proxy for depreciation expectations and find evidence that these have a significant impact on inflation.

MODIFIED MEASURES OF VARIANCE AND SKEWNESS

The Theil variance (Theil 1997) and the corresponding Theil skewness are usually used in the literature since they overcomes some of the drawbacks of both unweighted and weighted measures of variance and skewness. Although it does not correspond to the second moment of the weighted or unweighted distribution, the Theil variance assumes, unlike the weighted measure, a value of zero when all individual inflation rates are the same, i.e. there is no relative price change. Moreover, unlike the unweighted measure, it uses the expenditure weights to reflect the relative importance to the consumer of the various components in the basket.

The Theil variance is defined as:

$$TVAR = \sum_{i=1}^{n} w_i (\pi_i - \bar{\pi})^2 \qquad where$$

$$\bar{\pi} = \sum_{i=1}^{n} w_i \pi_i$$

The aggregation property of the Theil variance allows for the total variance to be decomposed into the variance within tradables and nontradables, respectively, and between tradables and nontradables according to the following formula:

$$TVAR = VTNT + \beta VT + (1- \beta)VNT$$

where $\beta = \sum_{i=1}^{g} w_i$ and i=1....g are tradables, VTNT is the variance between tradables and nontradables, VT is the variance within the tradables, and VNT the variance within nontradables.

The Theil skewness is defined as:

$$TSK = \frac{\sum_{i=1}^{n} w_i (\pi_i - \bar{\pi})^3}{\left[\sum w_i (\pi_i - \bar{\pi})^2 \right]^{3/2}}$$

where $\bar{\pi} = \sum_{i=1}^{n} w_i \pi_i$

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IV. Developments in Ukraine's Financial Sector—FSAP Follow-Up Report[50]

A. Introduction and Summary

133. **The banking sector dominates the financial landscape in Ukraine but the non-bank financial sector is picking up.** With credit having grown sharply since 2000, total bank assets stood at 46 percent of GDP at end-June 2005, comparable with levels in transition countries with more advanced financial systems. The banking system remains fragmented and includes a large number of so-called pocket banks, but the structure is on the brink of change, with significant interest shown by foreign banks to enter the market. The non-bank financial sector is still very small, but the insurance industry in particular has expanded rapidly over the past two years.

134. **The banking sector continues to be plagued by key structural weaknesses.** While the banking system weathered last year's political crisis well, this episode also uncovered several weaknesses, including a legislative framework that makes it difficult to prevent early deposit withdrawals and risks arising from unhedged foreign currency borrowing. At the moment, the largest vulnerability of the banking sector stems from the downside macroeconomic risks and their potential impact on the repayment ability of borrowers, particularly given the rapidly expanding credit portfolio, notably in the real estate sector. These vulnerabilities are exacerbated in some banks by concerns about capitalization and profitability, risk management, related-party lending, widening maturity mismatches, and the still-high—albeit declining—non-performing loans (NPLs) ratio. Management of direct and indirect foreign exchange exposures will also be key as the exchange rate regime becomes more flexible.

135. **While there has been tangible progress in improving the supervisory and structural framework of the banking sector, much remains to be done.** The NBU has raised provisioning ratios for unhedged foreign currency loans, reduced limits for foreign currency open positions, tightened the definition of capital and NPLs, and reduced the limit for related-party lending. Further, a credit bureau was founded, which should eventually facilitate risk assessments. The authorities intend to further address concerns about bank capitalization as well as related-party lending. For the latter, adopting the long-delayed amendments to the Banking Act, which would require identification of bank owners, is key. As last year's liquidity near-crisis demonstrated, revisions to the Civil Code, the NBU Act, and the Banking Act that would entitle the NBU to establish a moratorium on early withdrawals of deposits would be important to safeguard against similar shocks in the future. More generally, to strengthen banking supervision further, the NBU should move from the present procedural-driven approach to more risk-based supervision.

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[50] Prepared by Li Lian Ong (MFD), Andrea Schaechter (EUR), and Dimitry Sologub (Kyiv office).

136. **The insurance sector, the largest segment of the non-bank financial sector, is expanding.** At 5½ percent of GDP, the sector's assets are still small but have quadrupled in size over the past two years. Since insurance companies are closely tied to banks, and some insurance activities are related to tax avoidance, greater transparency is key for the effective supervision of this sector and its linkages to other financial sector segments.

137. **The rest of this chapter is structured as follows.** Starting from the findings of the 2002 FSAP report, Section B takes stock of the main recent developments in the banking sector and assesses the sector's main vulnerabilities. Section B also summarizes key revisions to the regulatory and supervisory system and lists further reform recommendations. Section C provides an overview of the development of the non-bank financial sector.[51] Appendix I assesses the rapid increases in housing prices in Ukraine; Appendix II analyzes the risks from a recent government initiative in mortgage lending; Appendix III estimates the exposure of the corporate sector to external shocks; Appendix IV explores the determinants for banks' interest rate margins; and Appendix V summarizes the status of implementation of FSAP recommendations.

B. The Banking Sector

Structure of the Banking Sector

138. **Ukraine's banking system is fragmented.** While the number of banks is large, banking sector assets are largely concentrated in the ten largest banks, which own more than half of the total assets in the sector. In all, the top 30 largest banks, account for three-quarters of the sector's assets (Table 1).[52] The majority of Ukraine's 162 banks, the so-called pocket banks, are small—more than 125 hold assets of less than US$150 million—and are closely associated with the treasury functions of their corporate owners. The larger banks are also mostly part of existing corporate structures, which, in most cases, also include insurance companies. Foreign bank participation is much lower than in other transition economies, with 22 banks accounting for 11 percent of bank capital and about 20 percent of total banking assets.

[51] Developments in capital markets are not discussed. See for an account, the Selected Issues paper from 2004.

[52] Up to this point, the consolidation process has been slow. In 2004, only one bank was reorganized through a merger with another bank, and another was allowed to reorganize in 2005.

Table 1. Ukraine: Financial Soundness Indicators for the Banking Sector, 2000–05
(In percent, unless otherwise indicated)

	Dec-00	Dec-01	Dec-02	Dec-03	Dec-04	Mar-05	Jun-05
Ownership							
Number of banks	153	152	157	158	160	161	162
Private	151	150	155	156	158	159	160
Domestic	120	122	135	137	139	138	138
Foreign	22	21	20	19	19	21	22
o/w: 100% foreign-owned	7	6	7	7	7	9	9
State-owned	2	2	2	2	2	2	2
Concentration							
Share of assets of largest 10 banks	55.3	52.5	54.1	53.7	53.1	53.0	...
Share of assets of largest 25 banks	71.4	66.8	71.0	71.7	72.0	72.5	...
Number of bank with assets less than $150 million	145	141	140	132	124	124	...
Capital Adequacy							
Regulatory capital to risk-weighted assets	15.5	20.7	18.0	15.2	16.8	17.1	15.2
Capital to total assets	16.2	15.6	14.7	12.3	13.1	12.4	11.9
Asset Quality							
Credit growth (year-over-year)	61.3	40.5	47.3	60.8	31.2	31.5	33.9
Credit to GDP ratio	12.4	14.5	19.4	26.6	27.1	28.3	30.7
Change of loan to GDP ratio (in precentage points)	2.4	2.1	4.8	7.3	-2.4	1.2	2.4
Loans in foreign currency to total loans	41.4	41.3	39.5	39.3	39.2	39.1	38.4
NPLs to total loans 1/ 3/	29.6	24.6	21.9	28.3	30.0	25.3	23.1
NPLs (excl. part of timely serviced substandard loans) 2/				8.5	8.9	7.4	6.6
NPLs net of provisions to capital 3/	68.0	62.9	66.6	144.6	147.2	124.0	127.7
Specific provisions to NPLs 3/ 4/	38.4	39.2	37.0	22.3	21.1	23.8	23.5
Specific provisions to total loans	11.3	9.6	8.1	6.3	6.3	6.0	5.4
Earnings and Profitability							
Return on assets (after tax; end-of-period)	-0.1	1.2	1.2	1.0	1.1	1.5	1.2
Return on equity (after tax; end-of-period)	-0.5	7.5	8.0	7.6	8.4	11.2	9.2
Net interest margin to total assets	6.3	6.9	6.0	5.8	4.9	4.8	4.6
Interest rate spreads (in percentage points; end-of-period)							
Between loans and deposits in domestic currency	28.5	18.9	14.9	9.9	9.6	7.7	7.8
Between loans and deposits in foreign currency	10.2	5.4	5.3	4.0	4.2	4.9	4.7
Between loans in domestic and foreign currency	21.3	18.0	10.5	6.9	6.2	5.0	4.4
Between deposits in domestic and foreign currency	3.4	4.6	0.9	1.1	0.8	2.2	1.4
Liquidity							
Liquid assets to total assets	20.8	15.3	13.5	15.3	16.7	18.4	15.1
Customer deposits to total (non-interbank) loans	59.1	87.6	87.6	87.1	89.2	95.3	91.2
of which: foreign currency deposits to total deposits	44.4	32.9	32.2	33.5	36.5	34.0	33.8
Sensitivity to market risk							
Net open positions in foreign currency to capital	32.9	23.6	21.5	17.7	14.7	12.3	9.5
Foreign currency loans minus foreign currency deposits to capital	49.6	47.2	49.2	55.1	33.8	34.8	42.9
Foreign currency loans to total loans to enterprises		41.6	39.2	36.0	36.1	35.7	34.3
Number of banks not complying with banking regulations							
Not meeting capital adequacy requirements for Tier I capital	7	3	1	1	2	0	0
Not meeting prudential regulations	27	21	16	9	14	8	9
Not meeting reserve requirements	3	6	2	0	11	2	3

Sources: National Bank of Ukraine; and Fund staff estimates.

1/ Increase in nonperforming loans (NPLs) in 2003 partly due to new classification rules.
2/ The NBU estimates that as of end-March 2004, 6.2 percent of loans classified as substandard were being timely serviced.
3/ NPLs are those classified as substandard, doubtful, and loss.
4/ About half of the drop in the provision to NPL ratio from end-2002 to end-2003 is due to new loan classification rules.

139. **The structure of the banking system is likely to change, with foreign interest on the rise and some bank consolidation anticipated.** Foreign banks perceive the Ukraine banking market as being under-serviced, with potentially large expansion opportunities (see, for example, Moody's Investor Service, 2005). In a landmark move, Raiffeisen Bank of Austria (the eighth largest bank in Ukraine by assets) announced in August 2005 that it intends to acquire 93.5 percent of shares in Aval Bank (the second-largest bank), thereby aiming at creating Ukraine's largest bank with an estimated share of 12 percent of total banking assets. Further consolidation of the large number of small banks is also anticipated

for the future through mergers—either with each other or with larger counterparts—to strengthen their capital base in the face of rising foreign competition. However, some sector participants see a viable role for small banks as providing niche and other valuable services to the private sector, especially in the rural areas.

Risk Assessment

Credit Risk

140. **The rapid credit expansion has raised concerns about asset quality.**[53] Credit growth averaged 42 percent per year between 2000 and 2004; this increased the credit-to-GDP ratio from 12 percent of GDP at end-2000 to 31 percent of GDP at end-June 2005 (Table 1). In terms of asset concentration, the share of loans as a percent of total assets in the banking sector increased to almost 65 percent at August 2005, compared with 43 percent at the beginning of 2000. The expansion of credit has been funded largely through additional deposits from households and enterprises, and increasingly, through foreign borrowing (Table 2). Despite the credit boom, the level of non-performing loans (NPLs) has started to come down only very recently, and is still high at 23 percent (Table 3).[54] Based on a survey from March 2004, the NBU estimated, however, that 94 percent of the loans classified as "substandard" are being serviced timely. Excluding them from the NPLs would yield an estimated rate of 6.6 percent of loans that are overdue.[55]

141. **The rapid broadening of banks' investment base to the household sector has emerged as a new risk.** While the expansion of loans to other sectors may represent a normal transition adjustment and welcome diversification strategy, banks may risk overstretching themselves. Some banks are already refocusing their loan portfolios away from the corporate sector toward individuals—the share of loans to households has increased

[53] See Duenwald and others (2005) and Schaechter (2004) for a discussion on credit booms in transition economies.

[54] Asset quality is, however, a backward-looking indicator that may not provide pertinent early warning signals on the emergence of potential problems in the banking sector.

[55] NPLs include loans in the "substandard", "doubtful" and "loss" categories. Previous discussions with the NBU about the terminology, "non-performing" suggest that while a large share of "substandard loans" are actually "performing", that is, being serviced in a timely manner, they are riskier than "watch" loans and thus should be provisioned at a higher rate. Among European countries, Ukraine appears to have a very stringent definition of NPLs, which may explain, to a large degree, the higher NPL ratios relative to other countries. For example, Poland—which is considered to have one of the most stringent definitions of NPLs—excludes loans classified as "substandard" and "doubtful" that are still performing from the calculation of NPLs.

from 5 percent as at end-2001 to 19 percent as at end-August 2005—as this market segment is perceived to have the biggest growth potential. Although few banks offer housing mortgage loans at this stage, some of the bigger banks are making preparations to launch mortgage lending programs later this year. Currently, real estate loans are largely related to construction lending.

Table 2. Ukraine: Funding of Credit Boom, 2000–05

	2000	2001	2002	2003	2004	Mar-05	Jun-05
Banks' balance sheet:			(In percent of GDP)				
I. Deposits	11.4	12.8	16.9	23.4	24.1	26.9	27.9
II. Net foreign assets	1.5	0.3	0.1	-0.7	-0.4	-1.0	-1.4
III. Net credit to government	-0.3	-0.1	0.4	0.6	0.3	0.2	0.5
IV. Net claims on NBU	1.8	1.3	1.4	1.8	2.2	4.6	3.6
V. Other items, net	-3.9	-3.2	-4.3	-5.2	-5.1	-5.2	-5.3
Credit to the economy (I.-II.-III.-IV.-V.)	12.3	14.4	19.3	27.0	27.1	28.2	30.6
	(Ratio to GDP, change over previous year, in percentage points)						
Deposits	1.8	1.4	4.1	6.5	0.7	2.8	1.0
Credit	2.4	2.1	4.8	7.7	0.1	1.1	2.4
				(In percent)			
Credits to deposits	110.0	113.5	113.6	115.2	112.5	105.0	109.7

Sources: National Bank of Ukraine; and Fund staff estimates.

142. **The on-going boom in real estate prices represents another potential vulnerability for asset quality.** Residential prices in Kyiv have risen by more than 350 percent since the beginning of 2001 (see Appendix I). Price increases can be traced largely to supply constraints against rising demand for property, while the stock of housing has deteriorated over time. While most housing is purchased as primary residences, speculative demand is rising. The recently proposed government initiative on mortgage lending, which has yet to be adopted by parliament, could add to the risk of an overheating housing market (see Appendix II).

143. **A continued sharp slowdown of the economy would constitute the main risk for banks' asset quality.** With corporate loans still accounting for the bulk of banks' loan portfolios (83 percent of total bank lending in domestic currency and 70 percent in foreign currency), a major setback for the economy, for example, triggered by external shocks[56] or a deepening slump in investment, could test the quality of the credit portfolio.

[56] Metal products account for about 40 percent of Ukraine's total exports, with steel exports making up most of the total. See Chapter II for a discussion of potential external risks related to declines in metal export prices or volumes as well as sharp increases in energy prices.

Table 3. Ukraine: Non-Performing Loans, 2000–05
(In percent)

	Dec-00	Dec-01	Dec-02	Aug-03 1/	Dec-03	Dec-04	Mar-05 2/	Jun-05
Share of loans by classification								
(1) Standard	41.6	39.0	37.6	65.8	66.6	67.0	43.0	40.1
(2) Watch	28.9	36.4	40.5	7.9	5.1	2.9	31.7	36.8
(3) Substandard	12.8	14.7	14.7	18.4	21.1	22.5	19.1	17.6
(4) Doubtful	4.6	3.6	3.1	4.7	4.6	5.5	4.2	3.7
(5) Loss	12.1	6.2	4.1	3.1	2.7	2.1	2.0	1.8
Categories (3 to 5)	29.6	24.6	21.9	26.3	28.3	30.0	25.3	23.1
Categories (4 to 5)	16.8	9.9	7.2	7.9	7.2	7.6	6.2	5.5
Categories (3 to 5) adjusted for timely serviced substandard loans	...	...	...	9.0	8.5	8.9	7.4	6.6

Sources: National Bank of Ukraine; and Fund staff estimates.

1/ Introduction of tighter loan classification rules.

2/ The recent jump in "watch" loans resulted from a change in loan classifications. Loans to class B borrowers that are serviced in a timely manner were moved from the "standard" to the "watch" category on March 1, 2005.

Foreign Exchange Risk

144. **As the exchange rate regime becomes more flexible, banks could be directly exposed to greater exchange rate volatility in the absence of adequate hedging instruments.** However, by end-June 2005, the banking sector had a relatively small long foreign-exchange position. In fact, at 9.5 percent of capital, it was well within the regulatory limits.

145. **Banks' indirect exchange rate risk arises from the large share of foreign currency loans in their portfolios.** Presently, 34 percent of corporate and 58 percent of household loans are denominated in foreign currency and generally not hedged (Table 4).[57] A factor analysis based on a very limited number of corporations suggests that the profitability of the corporate sector can be affected by movements in the nominal effective exchange rate (NEER) (see Appendix III). While there appears to be an *initial* boost in corporate share prices from an appreciation in the NEER, the negative effects of an appreciation on the export sector feed through several months later. On a company-by-company basis, the results

[57] Foreign currency loans remain high at 38 percent of total bank lending, albeit having remained stable around this rate since 2003. The biggest share of total foreign currency loans (31 percent) has been to the wholesale and retail trade and repair service sectors, followed by loans to the manufacturing sector (28 percent).

suggest that an appreciation in the NEER is generally negative for electric and thermal energy companies, but the opposite seems true for the local oil and gas industry.

146. **Restrictions on foreign currency transactions have hampered the development of the foreign exchange market, but the NBU has taken key liberalization steps.** Until September 2005, restrictions governing foreign exchange transactions have discouraged the development of basic hedging instruments.[58] For instance, banks were able to either buy *or* sell foreign currencies on any given day, not both, under NBU regulations. Further, banks were prohibited from conducting forward transactions for their own account or their customers. These restrictions were lifted in September 2005 as part of the NBU's gradual approach to more exchange rate flexibility. At the same time, the 1.5 percent pension funds tax on purchases of non-cash foreign currency continues to hinder market development. However, the 2006 draft budget envisages to halve the tax rate to 0.75 percent.

Interest Rate Risk

147. **While maturities of both assets and liabilities have increased, the maturity mismatch appears to have widened.** Data on duration or maturity gaps between assets and liabilities are scarce, but the shares of both long-term deposits and loans have clearly increased on banks' balance sheet. In particular, long-term credits have increased to more than half of total credits, from 18 percent in 2000, while long-term deposits have risen to 36 percent of total deposits, compared to a mere 6 percent in 2000 (Table 4). As loans are now being extended for up to 20 years, including for mortgage lending, while long-term maturities of deposits range typically just up to two years, which seems also the long-term maturity for most funding from abroad, banks are likely to face widening maturity mismatches.

148. **But banks and policy makers cautioned against overinterpreting maturity mismatches on banks' balance sheets.** Long-term deposits currently cover 65 percent of long-term loans, a ratio that has remained largely unchanged since 2003. Although it can be assumed that the original maturities of deposits are generally shorter than those of loans, early repayments of long-term loans are a common phenomenon (as there is no penalty for early repayment), and this helps to reduce banks' interest rate risk. In the case of mortgage loans, which currently constitute only a small share of long-term loans, individuals tend to view them—given their very high rates of interest—as bridging loans, until they are able to organize other sources of funding, often from family members. That said, the rapid expansion of long-term loans, including mortgages, is likely to raise interest rate risks if funding sources do not keep pace in extending their maturities.

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[58] In some emerging market countries, the corporate sector's exposure to exchange rate risk has been found to decrease over time with the development of hedging instruments and the increasing proficiency of companies in managing their exchange rate risks (see Chan-Lau, 2004; Garcia-Saltos and Ong, 2005).

Table 4. Ukraine: Foreign Currency Loans and Maturity Structure, 2000–05

	2000	2001	2002	2003	2004	Mar-05	Jun-05
				(In percent)			
Foreign currency credits to total credits	32.1	35.6	35.6	37.8	38.6	38.5	38.0
Foreign currency credits to households to total credits to hous	13.1	28.4	39.0	55.0	54.1	56.4	57.8
Foreign currency deposits to total deposits	39.0	32.9	32.2	32.2	36.4	34.0	33.8
Foreign currency credits to foreign currency deposits	90.4	122.7	124.0	135.5	119.1	119.2	123.2
Long-term deposits to long-term loans	32.6	57.7	77.2	64.6	65.7	69.0	64.5
Short-term deposits to short-term loans	109.6	99.6	94.6	111.7	171.8	138.9	136.9
Long-term fx deposits to long-term fx loans	30.3	43.7	61.8	50.6	60.9	61.5	56.0
Long-term credits to total credits	18.0	21.7	28.2	45.0	54.2	54.4	56.1
o/w Long-term foreign currency credits to total credits	9.4	11.8	14.5	23.2	26.7	27.4	28.4
Long-term deposits to total deposits	6.1	13.8	24.3	32.2	38.0	37.2	37.6
o/w long-term foreign currency deposits tot total deposits	3.0	5.7	10.0	13.0	17.4	16.7	16.5
				(In millions of hryvnias)			
Diff. between long-term foreign currency deposits and loans	-1,288	-1,883	-2,321	-7,773	-9,260	-10,098	-13,588
Banks' other long-term foreign currency funding	422	572	860	2,302	4,428	5,234	6,356
Banks' net foreign assets	2,663	2,494	656	-1,924	-1,526	-3,602	-5,343

Sources: National Bank of Ukraine; and Fund staff estimates.

Liquidity Risk

149. **Liquidity levels recovered quickly following last year's political crisis.** At 15 percent in June 2005, the ratio of liquid assets to total assets is at a relatively high level (Table 1). With the central bank conducting sterilization operations, the banking sector has become a net creditor to the NBU. Overnight money market rates have hovered at a low of 2–3½ percent since the resolution of the political crisis and have only picked up somewhat in August and September. Interest rates for customer deposits in hryvnia have come down significantly in nominal terms (Figure 2), and are sharply negative in real terms. The shift into foreign currency deposits during the crisis has not yet been fully reversed, but the share of hryvnia deposits (at 33 percent) is approaching the pre-crisis level.

150. **The foreign currency funding gap (the difference between foreign currency loans and deposits) is increasingly financed by borrowing from abroad.** Foreign currency loans exceed foreign currency deposits by 23 percent, with banks taking advantage of low offshore lending rates to obtain their funding abroad (Table 2).

151. **Looking ahead, political and reputation risks could be key factors affecting liquidity in the banking system.** The financial near-crisis in November/December 2004, when in the run-up to the presidential elections depositors withdrew 8 percent of their deposits and shifted into foreign-currency holdings, highlighted the vulnerability of the system to political uncertainties (Box 1). Confidence in the banking system was, however, quickly restored. Nevertheless, some banks have remained concerned about their reputation and exposure to liquidity risks, in part reflecting press reports on alleged money laundering

and tax evasion. The passage of legislation that would allow the NBU to put a moratorium on the early withdrawal of deposits—an emergency measure that was introduced without legal basis in December 2004—would be an important safeguard against liquidity risks, particularly if political uncertainties increase again.

Capacity to Absorb Risks

152. **While reported bank capital adequacy ratios (CARs) are relatively high, they may not be adequate given banks' risk exposures and concerns about the quality of capital.** The CAR for the banking sector has remained fairly stable at 15 percent since 2003 (Table 1).[59] However, weak management and disclosure practices—specifically, the lack of full transparency in bank ownership and connected-lending practices—raise questions about the adequacy of capital in the system. Vulnerabilities are exacerbated by the fact that banks lack adequate risk assessment capabilities at a time when they have multiplied their loan portfolio over the past years. Moreover, the NBU is concerned about the quality of capital, in particular because of the inclusion of asset revaluations in regulatory capital (Table 5). While the NBU has already tightened the definition of capital by excluding accrued income and tying the inclusion of fixed asset revaluation gains to audits with specific auditing requirements, it gives high priority to improve the quality of capital further (see below). In particular, the NBU envisages to limit the amount of asset revaluations gains, which currently represent about 10 percent of total bank capital, that can be included into capital given the susceptibility of this component to creative accounting measures.

Table 5. Composition of Bank Capital, 2000-05
(In percent of total)

	2000	2001	2002	2003	2004	Jun-05
Statutory fund	56.9	56.9	58.2	63.0	63.0	62.3
General bank reserves	6.4	6.4	7.3	10.6	10.0	11.2
Previous years earnings	23.6	23.6	18.5	8.3	6.8	9.7
Fixed assets valuation results	10.5	10.5	6.8	9.5	11.1	10.2
Current activity bank result	-0.5	-0.5	6.7	6.4	6.8	4.4
Other	2.9	2.9	2.4	2.2	2.3	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

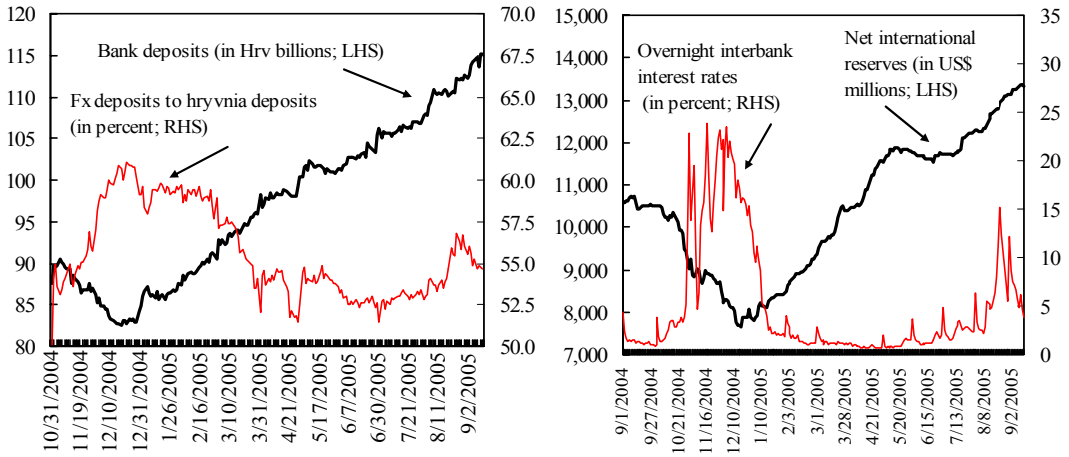
Sources: National Bank of Ukraine; and Fund staff estimates.

[59] The increases of the CAR in the December 2004 and the first quarter of 2005 reflect banks' constraints to expand their asset side during and in the aftermath of the political crisis owing to lack of funding and formal restrictions imposed by the NBU.

Box 1. Last Year's Liquidity Near-Crisis

During the political turmoil of the 2004 presidential elections, the exchange rate came under strong pressure and Ukraine's banking sector faced large outflows of deposits. After a record build-up of foreign exchange reserves by the NBU during the first nine months of 2004, the currency started to come under pressure during the run-up to the presidential elections, starting from mid-September (see chart). Following the second round of elections on November 21, widely perceived irregularities in the voting process led to a political impasse as demonstrators took to the streets to protest the results. The pressure on the currency intensified and bank customers started to withdraw their deposits. The outflows and shifts into foreign currency deposits were accelerated by ill-advised public comments about vulnerabilities of the banking system. By December 16, the banking sector had lost 8 percent of total deposits and 12 percent of hryvnia deposits compared to end-October. The NBU had sold US$3 billion in foreign reserves starting from the peak in early September.

Ukraine: Liquidity Indicators (2004-05)



Source: National Bank of Ukraine.

The NBU swiftly took measures to pre-empt a liquidity crunch. The first set of measures included restrictions on foreign exchange transactions, a reduction in NBU refinancing rates, and a loosening of reserve requirements. As these did not prove sufficient, the NBU issued a regulation on November 30, that set limits on the withdrawal of current deposits, prohibited the early withdrawal of time and savings deposits (though there was no legal basis for these requirements), broadened banks' access to NBU loans by widening the definition of eligible collateral, and placed limits on banks' asset transactions and foreign exchange sales.

The crisis was eventually contained and most flows quickly reversed. When the possibility of a re-run of the second round of elections on December 26 emerged, liquidity pressures began to fade, and ultimately subsided after the elections. Deposits returned to the banking system, and by February, the pre-crisis level of deposits was reached. The shift into foreign currency deposits, however, has not yet fully been reversed, despite the hryvnia appreciation during 2005.

Nevertheless, the liquidity crisis has exposed some vulnerabilities of the banking system. These include: a legal framework that made it difficult in preventing early deposit withdrawals; weaknesses in banks' liquidity management practices; indirect foreign exchange risks from unhedged foreign currency borrowing; and shortcomings in the preparedness of the NBU to deal with a full-blown banking crisis.

153. **Banks' capital base is also vulnerable to a decline in profitability.** The already-low profitability, partly a result of banks' high overhead costs, could further suffer from a continued economic slowdown, making it difficult for banks to replenish capital from their own resources (Table 5).

154. **In terms of a safety net, Ukraine's deposit insurance system provides limited coverage guarantees on household deposits.** The deposit insurance scheme, which was set up in 1999, and which received a generally positive assessment in the 2002 FSAP, is implemented through the Fund for Guarantee of Deposits of Natural Persons (FGDNP).[60] Household deposits are covered up to Hrv 5,200 (US$ 1,030) per depositor, which is equivalent to about 60 percent of per capita income (compared to about 300 percent coverage on average worldwide). The reserves of the deposit insurance fund totaled Hrv 573 million at end-June 2005 (0.1 percent of GDP), compared to total household deposits (excluding the Savings Bank) of around Hrv 50 billion (12 percent of GDP). Nevertheless, it is estimated that about 90 percent of retail depositors would be fully covered by the insurance system.[61]

155. **A very preliminary and basic stress test is performed on the aggregate banking sector** (Table 6). In line with the empirical evidence in Appendix III, it is assumed that an appreciation in the currency would eventually have a negative impact on corporate sector returns, and hence their funding requirements. This would translate into a decrease in interest income and the need for higher loan-loss provisions as asset quality deteriorates. Further, it is assumed that interest expenses would rise in an environment of tighter monetary policy. However, the inter-relationships between these variables are difficult to determine, as there are insufficient historical data to date.

156. **The results suggests that profitability could be sensitive to changes in the exchange rate and interest income, but the capital adequacy ratio is quite resilient.** In the first scenario, a 5 percent decrease in interest income—which, for example, could result from increased competition—results in a decline in returns on asset and equity by about two-thirds, highlighting the large share of loans in total assets. In the second scenario, losses are incurred when interest income falls by 10 percent and interest expense rises by 5 percent in an environment of unhedged exchange rate appreciation. The capital-adequacy indicator

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[60] Membership in the deposit insurance fund is mandatory for banks, with the exception of the state-owned Savings Bank. Banks contribute 0.5 percent of total deposits annually to the fund. Lifting the state guarantee for deposits held with the Savings Bank is expected to be part of the strategy to restructure the bank.

[61] As a comparison, Russia's deposit insurance scheme extends coverage to the first 100,000 rubles ($3,500) for any deposit account opened by physical persons at local banks after November 1, 2004. Currently, this would reportedly cover about 85 percent of all retail deposits (see OECD, 2004).

appears to be quite resilient, however, suggesting a broader diversification in the capital base, albeit subject to the reliability of the asset-revaluation component.

Table 6. Ukraine Banking Sector: Stress Test Scenarios for Exchange Rate Shocks—Selected Indicators, as at end-June 2005

	Actual as at end-June 2005	Scenario 1	Scenario 2	Scenario 3
Variable				
USD/HRV	5.05	*4.85*	*4.50*	*5.50*
Interest income	--	*Decrease 5 percent*	*Decrease 10 percent*	*Increase 15 percent*
Interest expense	--	*Increase 5 percent*	*Increase 5 percent*	*Decrease 10 percent*
Loan loss provisions	--	*Increase 2 percent*	*Increase 5 percent*	*Decrease 5 percent*
			(In percent)	
Capital adequacy				
Capital to assets	11.9	*11.6*	*11.6*	*12.4*
Earnings and profitability				
Net profit/loss after tax (percent of assets)	1.0	*0.3*	*-0.5*	*3.0*
Net profit/loss after tax (percent of equity)	9.1	*2.4*	*-4.4*	*27.1*
Net profit/loss after tax (percent of total revenue)	13.2	*3.8*	*-7.5*	*31.3*
Sensitivity to market risk				
Foreign currency loans minus foreign currency deposits to capital	42.2	*41.9*	*39.8*	*43.7*

Sources: National Bank of Ukraine; and Fund staff calculations.

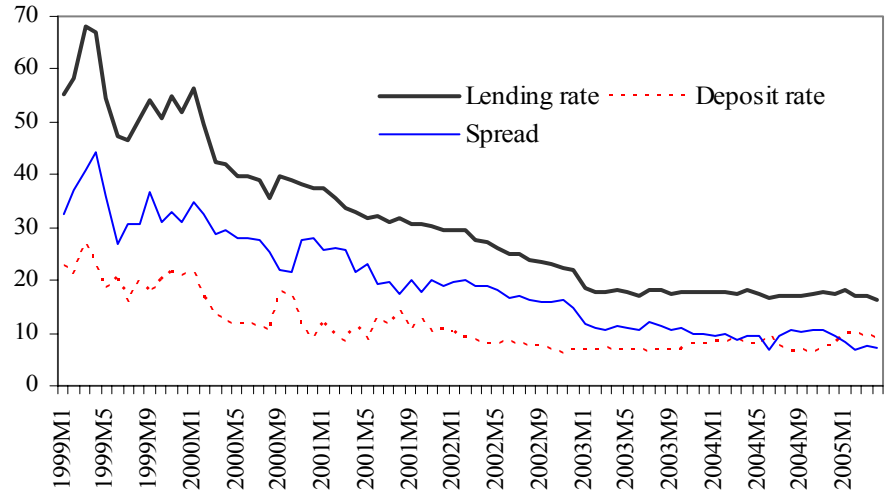
Efficiency of Intermediation

157. **The profitability of the banking sector remains low**, with return on assets posting 1.1 percent in 2004 (and 1.5 percent as at June 2005). While profits are likely to be understated due to tax avoidance techniques used by some banks, banks' increasing predilection for investing in a wide range of assets have also increased their overhead costs, contributing to their low profitability. According to some analysts, the low returns on assets could indicate operational inefficiencies on the part of Ukrainian banks, although some banks have suggested that the incurrence of these high costs are well-justified as part of their expansion strategy.

158. **Interest rate spreads, which are commonly used as proxies to measure banks' intermediation efficiency, have declined significantly but are still quite large relative to international levels** (Figure 1). The average net interest margins (NIMs) of Ukrainian banks are at 4.9 percentage points compared to 2–3 percentage points in developed countries at the end-2004, suggesting potential inefficiencies in the Ukrainian banking system.[62]

[62] The term "spread" is defined as the difference between banks' lending and deposit rates, while "margin" represents the difference between banks' earned interest on loans and interest (continued)

Figure 1. Ukraine: Deposit and Lending Rates, January 1999–July 2005
(In percent)



Source: National Bank of Ukraine.

159. **Empirical analysis based on panel data suggests that overhead costs, loan-loss provisions, and capital adequacy drive NIMs in Ukraine** (see Appendix IV). In particular, overhead costs appear to play a dominant role in determining bank interest margins—a 10 percent increase in overhead cost translates to a 6 percent increase in NIMs.[63] Loan-loss provisions are also positively related to bank margins—which is not surprising since they are an indicator of credit risk—pointing to the riskiness of existing lending practices.

160. **Capital adequacy and interest margins are found to be negatively correlated.** This result may be explained by one or both of two factors. First, there is the so-called "win-or-lose-it-all" strategy, whereby management in poorly capitalized banks might engage in riskier operations by lending to high-risk projects at high interest rates, which translates to bigger margins. The second explanation could be more relevant for transition and developing economies: In poorly regulated financial systems, the book value of equity may inadequately

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paid on deposits divided by banks' total assets. The use of margins is more appropriate for cross-sectional comparisons, as they have been standardized for asset size.

[63] This result is consistent with the findings of Claeys and Vander Vennet (2003). They show that the magnitude of impact of overheads on interest margins is much larger in transition economies (especially the less advanced ones) than in developed countries. In countries with less developed financial sectors, banks tend to pass their overhead costs to clients by increasing their margins; in contrast, banks in more advanced countries are unlikely to be able to do so.

reflect the true extent of bank capitalization, thus rendering the relationship between capital adequacy and margins difficult to interpret.[64]

161. **There is little evidence of other operating factors having significant influence on margins.** Overall, income from fees and commissions ("other operating income") seems to have little effect on margins. There is also little evidence to support the use of monopolistic power by the largest banks to increase their margins. In line with other research, the results show that foreign-owned banks tend to have lower margins, implying greater efficiency of operations.[65]

Banking regulation and supervision

162. **The NBU has made significant progress in strengthening its regulatory and supervisory framework, but more work needs to be done.** Empirical work suggests that regulatory and supervisory practices play an important role in promoting bank performance and stability (see Barth and others, 2004). The FSAP and technical assistance provided by the Fund and other international financial institutions have established a work program that would help to close the gap with international standards in banking supervision and regulation practices.[66] The NBU has already implemented a number of those recommendations and identified core areas for further improvement. The status of these efforts is summarized below (with Appendix V providing details).

163. **Raising the quality of bank capital is a key priority for the NBU, and it has undertaken the following initiatives:**

- The NBU reviewed and revised the structure of core and supplementary capital components of banks. Minimum core capital was increased from 4 to 5 percent, while non-distributed profits were reclassified from the core capital to the supplementary capital account.

- It envisages to strengthen the inclusion of asset revaluations under regulatory capital after it had already tightened the auditing requirements in 2004. The NBU is proposing to include only up to 20 percent of any revaluation gain as part of banks' regulatory capital (it is currently 100 percent, subject to specific disclosure requirements). However, it would reserve the right to exclude any revaluation that appears unsatisfactory, since inclusions cannot be reversed.

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[64] See Brock and Rojas-Suarez (2000).

[65] See for example Claessens and others (2001).

[66] Compliance with the Fund's FSAP recommendations is one of the agreed actions under the present Ukraine-EU Action Plan.

- The NBU has announced a uniform minimum statutory capital requirement of €5 million for newly-formed banks, in line with international standards.

- The NBU advocates a reversal of changes to tax deductibility of loan loss-provisions introduced in the 2005 Budget Law. The Law reduced the amount of loan-loss provisions that banks could deduct from profits (before taxation) from 20 percent of expenditure to 10 percent, thereby reducing incentives to create loan-loss provisions.

164. **The NBU has encouraged better management of banks' foreign currency risks with the following measures:**

- The NBU has strengthened the foreign-currency loan-loss provisioning requirements for banks. Larger provisions are required in cases where banks make foreign-currency loans to non-hedged borrowers which do not have corresponding foreign currency sources of income.

- Limits on long open foreign currency positions were reduced. In August 2005, the NBU cut the limit for overall long positions to 20 percent of capital (from 30 percent) and for total positions to 30 percent (from 35 percent). At the same time, it raised the limit on short positions from 5 percent to 10 percent of capital.

- The NBU lifted the ban on forward operations, as well as the restrictions for banks to operate only as buyers or sellers on a single day in the foreign currency market, which should facilitate banks' management of their foreign exchange risks.

165. **The NBU has also encouraged banks to improve their credit risk management practices, although progress in this area has been mixed:**

- The authorities appear committed to addressing ongoing concerns about related-party lending and implications for credit risks and capital adequacy. In 2004, the NBU adopted a resolution that requires related-party lending at favorable terms to be fully matched by set-aside capital. In September 2005, the NBU reduced the limit on total related-party lending from 40 percent to 30 percent of capital. However, the required passage of the long-delayed amendments to the Banking Act, which requires identification of bank owners, still awaits parliamentary approval.

- The first private credit bureau was founded in an effort to improving disclosure in the credit market. The initiative was jointly undertaken by 30 commercial banks, which currently control more than 65 percent of the retail lending market, and two insurance companies. Initially, the credit bureau will collect and exchange information on the loan repayment performance of individuals and small businesses; this would later be extended to cover the credit history of legal entities. The operation of this bureau would only commence after the parliament has approved the necessary legislation. That said, the disclosure of information by borrowers to the centralized credit bureau

remains voluntary, although banks are expected to charge higher rates of interest for those who choose not to participate.

166. **To provide an important safeguard against panic-driven deposit withdrawals, revisions to the Civil Code, the NBU Act, and the Banking Act are needed—drafts are ready to be submitted to parliament.** Under current legislation, banks cannot enter into contracts that prohibit the early withdrawal of deposits, and the NBU is not entitled to legally impose a moratorium on early deposit withdrawals in a crisis situation.[67] Adopting these legal changes has been included as one of the conditions of the Development Policy Loan with the World Bank, but passage by parliament is unlikely before the March 2005 parliamentary elections.

167. **Changes to the legislation to allow foreign bank to open branches in Ukraine has been submitted to parliament.** The proposed change to further open up the banking system to foreign competition is in line with Ukraine's pursuit of WTO membership.

168. **Against this background, the key reform measures that would further promote the stability and sound development of Ukraine's financial system include:**

Short-term measures that could be implemented quickly:

- Further step-by-step liberalization in the foreign exchange market (including eliminating the 1.5 percent tax on foreign exchange transactions).

- As a transitory safeguard until structural weaknesses in the banking system have been more fully addressed, increase the minimum capital adequacy ratio from 10 percent to 12 percent.

- Conduct a risk assessment of the SMC, and implement a set of loan origination standards and methods to ensure the quality of mortgage loans under the new initiative.

- Introduce a separate account on mortgage lending in banks' balance sheets to improve monitoring of potential risks from mortgage activity.

Medium-term measures that require amendments to laws and regulations, and other more extensive preparations:

- Pass amendments to the legislation on early withdrawal of deposits.

- Prepare a contingency plan for crisis management.

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[67] The NBU resolution issued in December 2004 to limit deposit withdrawals which could have been challenged in court.

- Pass the law, "On Mortgage Securities" to ensure a credible process for the registration of property titles and enforcement.

- Pass the amendment to the Banking Law requiring greater transparency on related-party lending and on the relationship between banks and insurance companies.

- Develop a database on same-group bank activities and related-party lending.

- Move toward more risk-based supervision methods to improve efficiency. Current bank supervision methods employed by the authorities are perceived to be highly procedural and costly.

C. The Non-Bank Financial Sector[68]

169. **The non-bank financial sector is still relatively small, but inter-linkages with the banking sector need to be monitored.** The total sector assets of non-bank financial institutions stood at about 11 percent of GDP at the end of 2004, having expanded rapidly over the past two years. The main threat posed by this sector is that of reputation risk—the possibility that failure to an institution in this segment of the market could affect public confidence in financial institutions in general.

170. **The insurance sector represents the largest segment of non-bank financial institutions, but it may owe much of its rapid growth to tax avoidance.** The total assets of insurance companies totaled $3.6 billion (5½ percent of GDP) as at end-2004. The total premiums collected in 2004 was almost ten times the amount earned in 2000 (Table 7). Insurance companies are said to be largely used as vehicles for tax minimization schemes by banks. The sharp contrast between the rate of tax on insurance premiums (3 percent) and bank profits (25 percent) has invited tax avoidance activities, with banks paying unrealistically high premiums to group-owned insurance companies. The funds are subsequently recycled back to the banks as capital or deposits.

171. **In the medium- to longer-term, the sound development of these institutions may be key to the stability of the financial system, given their strong links to the banking sector.** Some estimates suggest that insurance companies hold about 25 percent of their total investments (or half of their securities portfolio) in the stocks and bonds of banks, usually within the same group of companies. There is also a concentration of insurance company reserves placed in bank deposits. Rough estimates suggest that actual insurance activity accounts for only 15–30 percent of the sector.

172. **Supervisory responses are aimed at addressing the weaknesses in this sector.** The State Commission for Regulation of Financial Services Markets, which supervises insurance companies as well as all other non-bank financial institutions (except for the capital markets

[68] For a comprehensive analysis of the non-bank financial sector, see World Bank (2005).

and its participants), raised capital requirements for insurance companies in late 2003 and has tightened regulations on reinsurance activities. In the past, overseas reinsurance abroad were largely done in the Baltic states through non-registered companies, often under the suspicion of tax evasion and money laundering activities. However, tighter oversight of the industry by the Commission has ensured that not a single contract of reinsurance is currently with a non-supervised counterparty.[69] The elimination of sharp differences in tax rates between banks and insurance companies, and the extension of ownership disclosure requirements to these institutions would go a long way towards increasing the transparency of the sector.

Table 7. Ukraine: Structure of the Non-Bank Financial Sector, 2000–05

	Dec-00	Dec-01	Dec-02	Dec-03	Dec-04	Mar-05
Insurance						
Number of insurance companies	283	328	338	357	387	392
Total assets	1,564	3,007	5,329	10,457	20,013	18,098
Premium revenue (in mill. of Hrv)	2,136	3,031	4,442	9,135	19,431	3,373
Investment funds and mutual funds of investment companies						
companies	250	142	129	109	186	...
Total assets (in mill. of Hrv)	...	352	329	...	302	...
Pension funds						
Number of pension funds	12	...	...	47	6	14
Total assets (in mill. of Hrv)	23	...	...	...	11	13
Credit unions						
Number of registered credit unions	...	...	...	...	662	668
Total assets (in mill. of Hrv)	37	...	...	...	1,067	1,110
Leasing companies						
Number of leasing companies	...	...	...	...	38	48
Number of financial companies (leasing agencies)	...	...	...	...	12	14
Leasing operations (in mill. of Hrv)	1,750	1,500	1,348	504	...	...
Lease-purchase agreements (in mill. of Hrv)	...	...	...	...	14	18
Financial leasing agreements (in mill. of Hrv)	...	...	...	...	57	59

Sources: State Commission for Regulation of Financial Services Markets in Ukraine; State Commission on Securities and Stock Exchange; and Ukrainian Leasing Association.

173. **Credit unions have proliferated.** While the number of credit unions is large (about 700), their assets make up less than ½ percent of GDP. Ukraine has strong prudential requirements for credit unions, but enforcement has been difficult as the regulator lacks the power to sanction transgressors or close down unviable ones.[70] Some 200 credit unions are

[69] The Commission prohibits reinsurance to counterparts based in the Baltic states.

[70] Credit unions were already entrenched before the State Commission for Regulation of Financial Services Markets was formed; supervision was initiated in 2003, when 1,400 credit unions were already registered. The Commission has since performed a complete re-registry of all existing *viable* credit unions and categorized them according to their investment structure and risk management capability, to determine the required level of supervision. It has also implemented a system of tight reporting standards, with on-site audits required.

estimated to be insolvent (including some which are perceived to be financial pyramids) but it is unlikely that they will be closed down any time soon.

174. **The merger of non-bank supervisors, the State Securities and Stock Market Commission with the State Commission for Regulation of Financial Services Markets remains a government objective.** However, finalization of this issue is expected to take a long time, as many legislative changes will have to be effected. It may even require changes to the Constitution. At this stage, there has been very little demonstration of a systematic and transparent approach to the process, and the individual regulators and beneficiaries have yet to be consulted.

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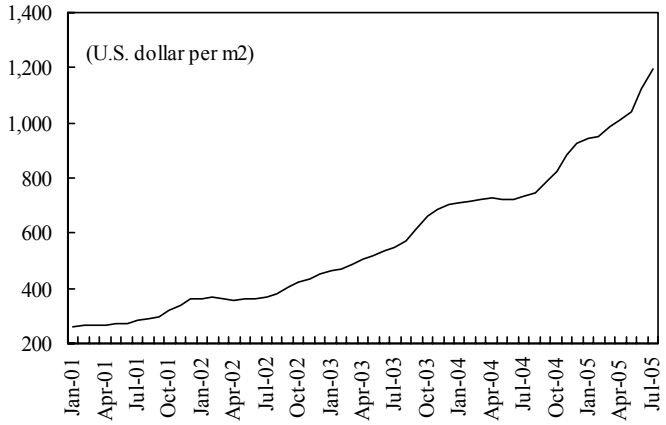
THE HOUSING SECTOR: BOOM OR BUBBLE?

Residential real estate prices in Ukraine have grown strongly over the past four years. Since 2001, the price of housing in Kyiv has risen fourfold; prices have already increased by almost 4 percent in 2005 alone. Similar trends have been observed in the other large industrial or resort cities.

The boom in housing prices is largely attributable to rising housing demand. In addition to sharp rises in household incomes, demand has been driven by the search for a safe investment medium, given uncertainties about macroeconomic outlook, the lack of a liquid securities market, and more recently, the near-financial crisis. The development of mortgage lending facilities and the increase in mortgage loan maturities combined with gradual declining in mortgage interest rates has also fostered demand.

Kyiv Housing Prices, 2001-05



Source: Megakvartal.

The lack of an elastic housing supply has also contributed to the disequilibrium. Housing construction in Kyiv grew only by about 2–3 percent per year. Sharp rises in construction costs are another factor that has driven housing prices from the supply side. Producer prices rose by 11 percent in 2003 and 24 percent in 2004.

The real estate sector still lacks an adequate regulatory and legal framework, and the registration of property titles and its enforcement is weak. As a result, relations between construction companies, homebuyers and banks are often complicated and non-transparent.

Despite the existing problems, however, analysts and market participants expect that housing prices will continue to rise in the future, with demand anticipated to outstrip supply for quite some time.

RECENT INITIATIVES IN MORTGAGE LENDING

High interest costs, short funding maturities, and the lack of a regulatory and legislative framework have hampered the development of mortgage lending in Ukraine. Only 10–15 percent of all real estate purchases are estimated to be financed through mortgage loans, equivalent to about Hrv3.6 billion (4 percent of GDP) as at end-April 2005. An estimated 75 percent of mortgage loans are denominated in foreign currency at relatively high interest rates of up to 14 percent, once closing and other costs are imputed.

The State Mortgage Company (SMC) was set up in November 2004 as a refinancing vehicle. The SMC, which has a statutory capital of Hrv20 million ($4 million) provided by the government, was created with advice from the World Bank to stimulate mortgage lending. Essentially, the role of the SMC is to purchase mortgage loans from banks, bundle them into tranches of obligations, from which it would issue its own mortgage securities. The SMC would then utilize the funds from the securities issuances to provide longer-term refinancing for banks, and also provide them at a cheaper rate, thus making them more accessible to the public.

The government recently announced a scheme of guarantees to support housing finance through the SMC but the draft bill has not yet been passed in parliament. The draft bill would allow up to Hrv10 billion hryvnia ($2 billion) of government guarantees for the SMC with the objective to attract a wide institutional investor base. The SMC would then be able to provide banks with cheaper financing. Lowering mortgage rates to only 2–6 percent has been stated as an objective; levels that would clearly be unsustainable at current economic conditions.

There are several concerns over this initiative for the banking sector, in addition to the potential implications for fiscal policy. At this stage, no proper risk assessment has been conducted for the SMC. Additionally, there is no system of checks and balances in place to monitor banks' lending behavior. Specifically, a set of loan origination standards and methods to assess the quality of loans would be crucial to protect the asset quality of the banks. There are also several short-comings from a regulatory and legislative perspective. The law "On Mortgages" which came into effect in 2004, still contains some weaknesses, while the draft legislation, "On Mortgage Securities" has not yet been passed, and registration of property titles and enforcement is weak. In the absence of development on the supply-side of the housing market, the proposed scheme could fuel housing prices. Another concern includes the recently extended role of the SMC to finance unfinished construction rather than mortgages only.

CORPORATE SECTOR EXPOSURE TO EXTERNAL SHOCKS

Significant movements in global oil and steel prices could have considerable effects on the profitability—and thus viability—of Ukraine's corporate sector, given the importance of oil imports for the economy and the dominance of steel products in the export sector.[71] The corporate sector could also be exposed to exchange rate risk in the event of a move from the current pegged exchange rate regime to a more flexible exchange rate.

The exposure of the corporate sector in Ukraine to external shocks can be gauged using factor analysis.[72] We apply this model using Ordinary Least Squares with correction for serial correlation in the error term. Essentially, this test entails estimating a regression of the individual company stock returns on respective changes in oil and steel prices, as well as in changes to the nominal effective exchange rate (NEER). The econometric model is specified as follows:

$$(1) \qquad R_i = a + b_1 R_m + b_2 R_o + b_3 R_s + b_4 R_e + \varepsilon_i ,$$

where R_i is the stock return for the stock market in period t, R_m is the change in the stock market index, R_o is the change in the U.S. dollar price of oil, R_s is the change in the U.S. dollar price of steel, R_e is the rate of change in the nominal effective exchange rate, and ε_i is an independent and identically distributed error term. [73] The individual *b* coefficients measure the sensitivity of the company stock price to the respective independent variables. A higher number for each coefficient, either positive or negative, represents a higher exposure to changes in the respective dependent variables.

Overall stock market prices are represented by the PFTS index, which comprises the stock prices of 10 "blue chip" companies across several industries (Table 8). Global oil prices are represented by Brent oil prices, while global steel prices are represented by the hot-rolled coil steel prices. All monthly stock and commodity price data are obtained from

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[71] However, Ukraine, while a net energy importer, is well hedged against rising oil prices, as transit fees for oil, along with higher Russian demand for Ukraine's exports, act as significant offsets.

[72] See Jorion (1990).

[73] The NEER is used as an independent variable in the model, instead of the nominal spot exchange rate, since Ukraine has largely maintained a *de facto* peg to the U.S. dollar. Commodity prices are left in their U.S. dollar denominations for two reasons: (i) the nominal spot exchange rate has been *de facto* pegged to the U.S. dollar since early-2000; and (ii) it allows the effects of any exchange rate movement to be captured separately through the NEER variable.

Bloomberg, while the NEER data are obtained from the International Financial Statistics of the International Monetary Fund.[74] The sample period is from November 1998 to April 2005.

Table 8. Ukraine: Companies in the PFTS Index, as at end-June 2005

Company	Ticker	PFTS Weight (Percent)	Product
1. Centrenego	CEEN UZ	2.293	Supplies thermal energy to industrial and residential markets.
2. Dniproenergo	DNEN UZ	2.425	Supplies thermal energy.
3. Donbasenergo	DOEN UZ	0.395	Supplies electric and thermal energy to industrial and residential markets.
4. Kyivenergo	KIEN UZ	2.126	Produces and distributes electric and thermal energy.
5. Nyzhnodniprovsky Truboprokatny Zavod	NITR UZ	10.798	Produces steel pipes for oil and gas extraction, processing and transport sectors.
6. Stirol Concern	STIR UZ	12.903	Manufactures diverse chemical products.
7. UKRNAFTA	UNAF UZ	30.902	Explores for, extracts and processes crude oil and natural gas. Also known as the Ukrainian National Oil Company.
8. UkrTelecom	UTEL UZ	6.131	Offers a wide range of telecommunications products and services.
9. Zakhidenergo	ZAEN UZ	3.439	Generates and supplies thermal energy to industrial and residential markets.
10. Zaporizkiy Metallurgical Plant Zaporizhstal	ZPST UZ	28.588	Manages full production cycle of various ferrous metal products and ferrous alloys. Also operates in the food industry.

Source: Bloomberg.

We initially test for the main factors contributing to overall stock market risk, by regressing the overall stock market return on its own lagged returns and the contemporaneous and lagged returns fro oil and steel prices and the NEER. Our results indicate that the stock market returns are negatively affected by oil price rises up to 6 months after they occur; they are positively affected by increases in steel prices up to 3 months later; they initially receive a boost from an appreciation in the NEER, but significant negative effects start to feed through 6 months later.

The stock price performance of the individual companies is most influenced by movements in the overall stock market (Table 9). Not surprisingly, increases in world oil prices have adverse effect on the prices of energy companies, albeit marginally so once the market risk factor is accounted for. Meanwhile, any appreciation in the NEER is generally more negative for energy companies, but appears to have the opposite effect for the oil and gas and steel/metals industries.

[74] The use of a monthly frequency is determined by the availability of data for the NEER. The relative illiquidity of the stock market suggests that little information would be lost by not using either a daily or weekly frequency.

Table 9. Ukraine: Corporate Sector Exposure to External Shocks, November 1998 – April 2005
(Standard errors in parentheses)

	Stock Market		Stocks									
			Centrenergo (Energy)		Dniproenergo (Energy)		Donbasenergo (Energy)		Kyivenergo (Energy)		Nyzhnodniprovsky (Steel)	
Constant	0.014	(0.016)	-0.003	(0.032)	-0.008	(0.032)	-0.002	(0.036)	-0.001	(0.022)	0.075	(0.134)
Stock market	--	--	1.182	**(0.465)**	1.806	**(0.425)**	1.017	**(0.432)**	0.937	**(0.225)**	0.896	(0.741)
Oil	0.129	(0.087)	-0.150	(0.304)	-0.772	**(0.363)**	0.011	(0.430)	-0.270	(0.283)	-1.457	(1.038)
Steel	0.235	**(0.134)**	0.297	(0.331)	-0.449	(0.566)	-0.655	(0.663)	-0.091	(0.301)	-2.598	(2.215)
Exchange rate	0.369	(0.269)	-0.698	(1.503)	-1.564	(1.379)	-1.519	**(0.877)**	0.143	(0.593)	0.428	(2.566)
Adjusted R-squared	0.018		0.066		0.201		0.063		0.190		0.089	
F-statistic	1.530		2.348		4.541		1.201		4.221		1.764	
D-W statistic	1.600		2.591		2.574		2.937		2.189		2.006	

	Stocks									
	Stirol Concern (Chemical)		UKRNAFTA (Oil and Gas)		UkrTelecom (Telecommunications)		Zakhidenergo (Energy)		Zaporizkiy (Metals)	
Constant	0.021	(0.015)	0.027	(0.015)	-0.056	(0.037)	-0.002	(0.027)	0.008	(0.100)
Stock market	0.791	**(0.168)**	0.849	**(0.146)**	1.303	**(0.339)**	1.224	**(0.290)**	-0.582	(0.891)
Oil	0.363	(0.229)	-0.118	(0.110)	-0.083	(0.283)	0.119	(0.206)	-0.916	(0.659)
Steel	0.043	(0.279)	0.012	(0.215)	0.219	(0.354)	-0.781	(0.627)	3.236	(2.373)
Exchange rate	-0.274	(1.428)	1.635	**(0.275)**	0.305	(3.534)	-0.735	(1.747)	6.784	(6.540)
Adjusted R-squared	0.208		0.348		0.447		0.156		0.127	
F-statistic	4.726		9.622		4.654		3.333		2.116	
D-W statistic	2.480		2.788		1.718		2.666		1.938	

Sources: Bloomberg; and IMF staff calculations.

Note: The standard errors in bold font indicate significance at the 10 percent level or lower.

THE COMPOSITION OF BANK INTEREST RATE MARGINS

Econometric analysis is used to determine the main factors affecting bank interest rate margins in Ukraine. We employ a general-to-specific approach—one which has been widely used in the economic literature—to analyze the determinants of banks' net interest margins (NIMs).[75] Using this method, three groups of factors that may influence bank interest rate margins are explained. The first comprises bank-specific factors, namely, overhead costs, capital adequacy ratio, loan quality, fee and commissions revenue, among others. The second group comprises indicators relating to the banking sector environment, including the degree of concentration (share of assets of the *n* largest banks in total banking sector assets), size of the banking sector (ratio of banking sector assets to GDP), the degree of financial taxation. Finally, the third group includes macroeconomic variables such as inflation, the rate of GDP growth, interest rates and their variability.

The general form of the regression model may be presented as follows:

$$(1) \qquad NIM_{it} = a_1 + a_2 B_{it} + a_3 C_{it} + a_4 M_{it} + e_{it},$$

where NIM_{it} is the difference between interest revenue and interest expenditure, divided by average total earning assets, for bank i in period t (i=1,…,N; t=1,…,T); the variable B_{it} is the vector of bank-specific factors; the variable C_{it} represents indicators of the banking sector environment; and M_{it} is the set of macroeconomic variables. Annual data on Ukrainian banks is obtained from BankScope. The data comprises a panel of 43 Ukrainian banks for the 1999–2004 period, representing around 65–70 percent of total banking sector assets. Consequently, all regressors are also normalized to average total assets. The data on indicators of the banking sector environment is obtained from the NBU.

Both overhead costs and loan loss provisions appear to be important components to explain the level of interest rate margins. The fixed-effects (FE) estimation method is applied to the baseline model (1). Initially, the regression is run using levels data in order to determine the nature and significance of the relationship between variables. The result in Table 10 indicate that overhead costs and credit quality, as proxied by the level of loan loss provisions, are positively related to bank margins while the capital adequacy ratio has a negative relation. The consistency of the results, irrespective of the inclusion of other variables in the model, supports their robustness. Two other included variables, other operating income and market share (which proxies for bank size) appear to be insignificant.

[75] See Demirguc-Kunt and Huizinga (1999), and Claeys and Vander Vennet (2003).

Table 10. Ukraine: The Composition of Bank Interest Rate Margins, 1999–2005
(Standard errors in parentheses)

	Levels		Logarithmic	
	Coefficient		Coefficient	
Constant	0.330	(1.838)	1.030	**(0.338)**
Overhead costs to average total assets	0.977	**(0.114)**	0.61	**(0.117)**
Loan loss provisions to average total assets	0.395	**(0.148)**	0.055	(0.038)
Equity to average total assets	-0.108	**(0.058)**	-0.060	(0.107)
Other operating income to average total assets	0.109	(0.102)	-0.021	(0.096)
Share of bank assets in total banking sector assets	0.489	(0.569)	0.195	(0.147)
Adjusted R-squared	0.485		0.280	
F-statistic	21.860		7.610	

Sources: BankScope; National Bank of Ukraine; and IMF staff calculations.
Note: The standard errors in bold font indicate significance at the 10 percent level or lower.

When we include a dummy variable for foreign ownership, the coefficient for this variable is always negative.[76] This suggests that foreign banks tend to have lower margins than their domestic counterparts. This result is also confirmed by a simple observation of the statistics—the average NIM of foreign-owned banks in 1999–2003 is 5.3 percentage points, while domestic banks in our sample have an average NIM of 8.9 percentage points. This difference, however, has narrowed in recent years—in 2003, the average NIM of foreign-owned banks of 5.3 percentage points was only slightly lower than that of domestic banks of 5.9 percentage points. This may be attributable to the improved efficiency of local banks over time.

In order to determine the elasticity of the NIM with respect to the independent variables, we rerun the regression using data in logarithmic form. The results suggest that overhead costs have a significant effect on margins—a 10 percent increase in overhead costs leads to a 6 percent increase in NIMs (Table 10). In contrast, loan loss provisions and capital adequacy seem to have little effect on margins—a 10 percent change in either variable leads to a 0.6 percent change in the NIM. The effect of the "other operating income" variable is even smaller. The coefficient for bank size is positive but insignificant (similar to the levels regression results), suggesting the lack of significant monopolistic behavior.

[76] We also included a dummy variable for foreign ownership using other methods, namely pooled ordinary least squares (OLS) and random effect (RE) estimators. This is because dummies are dropped from the FE model due to its nature—under the FE method, the regression is performed on deviations from bank-specific means, which eliminates any time-invariant variables (see Verbeek, 2004).

RECOMMENDATIONS UNDER THE FINANCIAL STABILITY ASSESSMENT PROGRAM AND ACTIONS TAKEN BY THE AUTHORITIES

FSAP Recommendations	Actions Taken
Banking Sector	
Increase the minimum risk-weighted CAR to at least 10 percent, and eventually to 12 percent.	Done. Increase to 10 percent took effect from March 1, 2004.
Require banks to increase provisioning for foreign currency-denominated credits to borrowers without a reliable source of foreign currency earnings.	The provisioning ratios on foreign-currency loans to borrowers without foreign currency income have been increased (NBU Board Resolution #411, September 7, 2004). The ratios were increased as follows: 2 percent for "standards" loans (from 1 percent); 7 percent for "watch" loans (from 5 percent; 25 percent for "substandard" loans (from 20 percent); 60 percent for "doubtful" loans (from 20 percent). The changes took effect on July 1, 2005.
Strengthen supervisory controls on insider and connected lending.	The NBU has strengthened related-party lending by requiring that lending to such parties on favorable terms be fully matched by capital set aside and be granted only on the basis of a decision by the supervisory board and/or management board (NBU Board Resolution #192, April, 29 2003). This measure became effective on 12 June 2004. The draft amendments to the Banking Law, which will eliminate lending to related parties at favorable terms, has been submitted to parliament. The NBU has adopted a resolution that prohibits any borrower from participating in loan analysis and decisions (NBU Board Resolution #186, 20 May 2002). Banks are required to report all transactions with related parties to the NBU and publicly disclose such lending in their annual reports (NBU Board Resolution #518, December 3, 2003). Amendments to the Banking Act, which require identification of bank owners have been submitted to parliament.
Implement consolidated supervision.	A new procedure was introduced in January 2003 to calculate prudential normatives based on consolidated reports; banks are required to compile and submit the appropriate consolidated financial reports; the composition of consolidated association members must be identified. The NBU plans to require banks to operate information management systems that enable bank management to view the major risk concentration levels in a timely manner.
Maintain requirement that banks take prompt corrective action to rectify any prudential deficiency and strictly avoid forbearance.	The NBU has introduced, and is constantly improving, an early warning system which reveals problems in their early stages.

FSAP Recommendations	Actions Taken
Pursue the rehabilitation and restructuring of the State Savings Bank.	A Memorandum of Understanding has been signed between the government, the NBU, and the World Bank.
Review and revise the provisioning rates based on empirical evidence of loss rates.	The provisioning ratios on foreign currency loans to borrowers without foreign currency income have been increased (see above). Loan classification rules were tightened in 2003 resulting in many "watch" loans moving to "substandard". Another change occurred in 2005 (Resolution #411) which shifted many loans from "standard" to "watch".
Tighten regulations on bank equity investment.	The NBU has drafted a resolution on criteria and procedures of granting permission for each investment made by banks in the capital of other institutions (previously adopted by NBU Board Resolution #368, August 2001). This will take effect after parliament adopts amendments to the Banking Law.
Require banks to prepare accounts fully in compliance with IAS.	Audits must be in line with IAS (NBU Board Resolution #389, September 9, 2003).
Integrate the deposits at the state-owned Savings Bank into the deposit insurance system.	Not done.
Modernize the mortgage law, land and building titling, and the law on secured transactions.	The Mortgage Law was adopted on June 5, 2003. The law "On Securitization of Creditors' Claims and Registration of Encumbrances" was adopted on November 18, 2003. The law "On State Registration of Property Rights to Real Estate and Their Restrictions" was adopted on July 1, 2004.
Anti-Money Laundering	
Make operational the Financial Monetary Department (the financial intelligence unit).	FATF removed Ukraine from its list of non-cooperative jurisdictions in February 2004. A Financial Intelligence Unit was created in February 2003 (NBU Board Resolution #40, February 7, 2003) but has since been integrated into the Banking Supervision Department.
Update and extend anti-money laundering regulations.	The State Department for Financial Monitoring (SDFM) is in charge of implementing the law "On Preventing and Counteracting Laundering of Money Received by Criminal Actions", which came into effect June 12, 2003. The AML Law includes reference to the prevention of money laundering, the duty to identify clients and the store of documents. The NBU adopted a resolution on "Provisions on Financial Monitoring Held by Banks" (NBU Board Resolution #189, July 14, 2003) which was amended to simplify low-risk client identification procedures (NBU Board Resolution #446, October 14, 2003). The NBU can impose fines on banks that perform poor financial monitoring procedures and take some steps against money laundering. Nevertheless, fines of 1,000 hryvnia appear to be very low.

FSAP Recommendations	Actions Taken
Monetary Policy	
Phase out the NBU's longer-term refinancing facility, or at least strictly limit refinancing; require the provision of high-quality collateral of matching maturity.	The facility was terminated effective March 2004, but in September 2005 the NBU announced new tentative plans for its reintroduction.
Clarify to the public the prioritization of the central bank's domestic and external monetary policy targets.	Not done.
Determine central bank profit transfers to the government based on realized profits.	Not done.
Appropriately limit the conditions under which central bank management could be replaced.	Not done.
Non-Bank Financial Sector	
Make operational the new regulatory agency for non-bank financial institutions.	In December 2002, a non-bank supervisory agency was created. A Memorandum of Understanding between the financial services regulators (NBU, State Commission for Securities and the Stock Market and the State Commission for Regulating Financial Markets) was signed in November 2003. Reporting requirements for non-bank financial institutions (required to submit quarterly and annual reports) was adopted in April 2003.
Update and extend regulation for non-bank financial institutions, notably for leasing companies, pension funds and credit unions.	The law "On Mandatory State Pension Insurance" and the law "On Non-State Pension Insurance" came into effect in January 2004. Minimum capital requirements for insurers were increased (risk insurers to 500,000 euros in 2003, 1 million euros in 2004; life insurers 750,000 euros in 2003, 1.5 million euros in 2004) in November 2003. Tighter restrictions were imposed on reinsurance abroad in January 2004; reinsurance with countries that lack appropriate supervision was prohibited. The NBU instructed banks to enhance their monitoring of transfer of funds by Ukrainian insurers to non-resident insurers and reinsurers, in December 2004.
Securities Markets	
Increase size and concentration of domestic government debt issues.	Since 2005, the frequency of auctions has been reduced to once a month. The government has started to reopen issues, which are concentrated in the maturities 18 months, 3 years and 5 years.
Simplify auction procedures for government securities.	Not done.
Consolidate securities exchanges, registrars and depositories.	Not done.
Increase disclosure requirements for securities.	Not done.

FSAP Recommendations	Actions Taken
Strengthen shareholder rights by increasing access to corporate information, moving towards international standards in corporate accounting and audit, facilitating shareholder control of management, reinforcing supervisory boards (including of banks).	Not done.

V. Rebalancing Ukraine's Public Pension Finances[77]

A. Introduction and Summary

175. **Sharp increases in pensions in 2004-05 have destabilized Ukraine's public pension finances.** Within a 12-month time span, minimum pensions were increased by 155 percent. As a result, staff projects that pension spending in 2005 will be ratcheted up by an estimated 5 percent of GDP, to about 15 percent of GDP, one of the world's highest spending ratios. To close the resulting financial gap of the Pension Fund of Ukraine (PFU), budgetary transfers are projected to rise to about 5 percent of GDP in 2005, from about only 1½ percent of GDP in 2004.

176. **Not restoring the public pension system's financial viability over the medium term could carry substantial costs:**

- First, the envisaged shift to a modern multi-pillar pension system, legislated in June 2003, would be derailed—the present oversized pay-as-you-go pillar (PAYG) would leave little room to finance the buildup of a funded second pillar. This would mean that Ukraine could not reap the benefits from a multi-pillar pension system, typically viewed as encompassing higher and more secure retirement incomes, increased national savings, higher labor market efficiency, and improved incentives to develop financial markets.

- Second, the large requirements for budgetary transfers would crowd out other medium-term fiscal spending priorities, such as infrastructure developments and investment in health and education.

- And third, by severely constraining the authorities' scope for reducing the already high tax burden on labor, an unreformed pension system could trigger a vicious circle of promoting the shift of labor from the official to shadow economy, labor emigration, and, as a consequence, further increases in pension system's already very high system dependency (pensioner per contributor) ratio.

177. **Restoring financial viability requires a package of measures.** The key objective has to be alleviating financing pressures, i.e. reduce budget transfer and contribution rates. Measures will therefore need to lower the high system dependency ratio and, as a complement, reduce the pension replacement rate. The system dependency ratio could be reduced by: (i) raising statutory retirement ages, particularly for women; (ii) pruning the privileged pension regime; (iii) reducing early retirement entitlements; (iv) lengthening the contribution period for eligibility to a full pension; and (v) increasing contributions from the

[77] Prepared by Andrea Schaechter.

self-employed and agricultural workers. The replacement rate could be reduced by mainly revising the indexation rule.

178. **The rest of the chapter is structured as follows.** Section B summarizes the financial situation of the pension fund at the beginning of 2004, i.e. after the 2003 pension reform and before the recent pension hikes too place. The key elements of the 2003 pension reform are summarized in an appendix. Section C lays out how the financial situation has changed as a result of the pension hikes, and Section D analyzes the medium-term pension fund outlook without policy measures. Section E considers various adjustment options to bring the pension system back on track.

B. The Public Pension Fund at the Beginning of 2004

179. **The financial situation of a PAYG pension system can be summarized by a few key parameters.** PAYG arithmetic implies that in every period pension outlays cannot exceed pension contributions unless the financial shortfall is covered by budgetary transfers. This identity is expressed in equation (1), where total outlays (the pension replacement ratio (β) times average wages (W) times number of pensioners (M)) equal contributions (the contribution rate (α) times average wages times the number of contributors (N)) plus budgetary transfers (the share of budgetary transfers (τ) times the replacement rate times wages times number of pensioners). Equation (1) can be rearranged so that the contribution rate is a function of the pension replacement rate, the budgetary transfer rate, and the system dependency ratio (M/N) (equation (2)).

$$(1) \qquad \underbrace{\alpha WN}_{\text{Own revenues}} + \underbrace{\beta\tau WM}_{\text{Budgetary transfers}} = \underbrace{\beta WM}_{\text{Pension outlays}}$$

$$(2) \qquad \alpha = \beta(1-\tau)\frac{M}{N}$$

180. **Before 2004, the already low pension replacement rate was trending downward as developments in the other pension parameters increasingly constrained the scope for higher pension payments.** With the contribution and budgetary transfer rates as well as the system dependency ratio determined by policy decisions and exogenous factors (such as demographics and labor market trends), the replacement rate becomes the residual variable in equation (2). In Ukraine, due to a rising system dependency ratio, slightly declining actual contributions rate, and lower budgetary transfer rates, the replacement ratio dropped by 2003 to only 32 percent (Figure 1, Table 1). Such a low rate compares unfavorably with other transition and industrial countries (Figure 2) and, as Ukraine's average wage rates are very low in international comparisons, was not sufficient to keep pensioners out of poverty.[78]

[78] The World Bank found that headcount poverty among pensioners in 2001 was substantial at 30 percent (defined as 75 percent of equivalent adult expenditure in 1999 adjusted for

(continued)

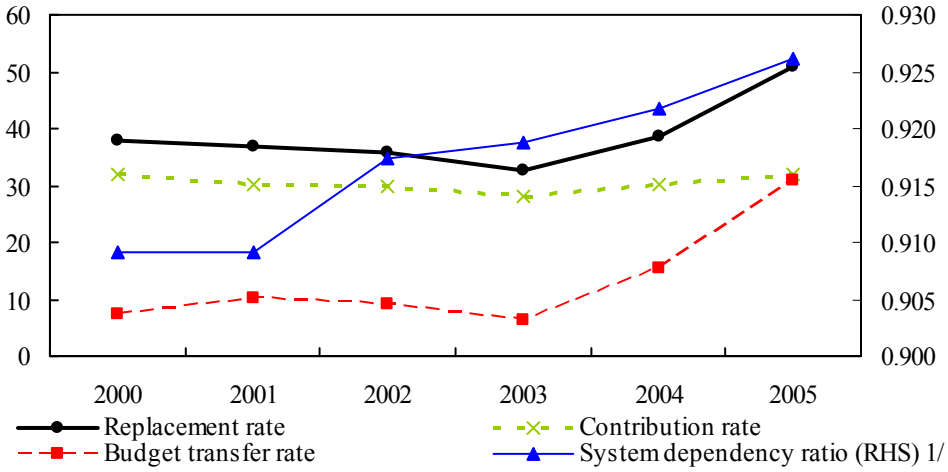
Table 1. Ukraine: Pension System Indicators, 1995-2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 Proj.
Total PFU outlays (in percent of GDP)	7.9	9.3	10.2	9.3	9.5	8.4	8.8	10.1	9.1	11.3	14.9
Contribution rate (in percent; year-end) 1/	33.6	33.0	33.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0
System dependency ratio 2/	0.76	0.81	0.87	0.87	0.87	0.91	0.91	0.92	0.92	0.92	0.93
Old-age dependency ratio 3/	2.47	2.44	2.42	2.43	2.44	2.44	2.48	2.49	...	...	...
Replacement rate (in percent) 4/	36.1	36.6	38.9	36.1	39.1	36.6	32.0	37.4	32.0	40.1	50.9
Average pension in percent of subsistence level	55.6	69.5	67.1	63.8	56.0	32.6	44.8	49.8	65.0	87.7	88.7
Minimum pension (in hryvnias, year-end)	48.0	48.0	48.0	53.5	53.4	59.9	80.0	47.3	92.5	284.7	332.0
Average pension (in hryvnias)	37.8	49.3	49.4	57.9	66.2	81.0	120.0	133.4	185.0	317.4	383.0

Sources: Anusic and Petrina (2003); PFU (2005); and staff estimates and projections.

1/ Total contribution rate by employer and employee. In October 1998, a differentiated contribution rate for employees rate was introduced (1 or 2 percent), and further widened from February 2000 (1-5 percent).
2/ Pensioners to contributors.
3/ Working age persons to pension age persons.
4/ Average old-age pension to average wage.

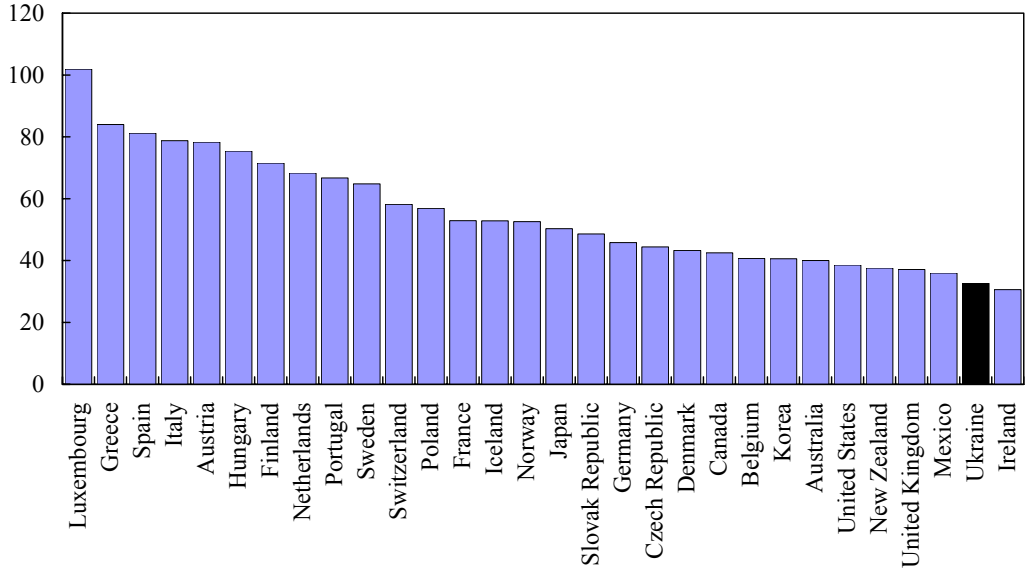
Figure 1. Ukraine: Public Pension Fund Parameters 1/
(In percent)



Source: Pension Fund of Ukraine; and staff estimates and projections.
1/ Number on pensioners to contributors.

inflation) but virtually identical to the poverty rate among non-pensioners (Anusic and Petrina, 2003).

Figure 2. Gross Replacement Rates in Selected Countries, 2003
(In percent)



Sources: OECD (2003); and staff estimates.

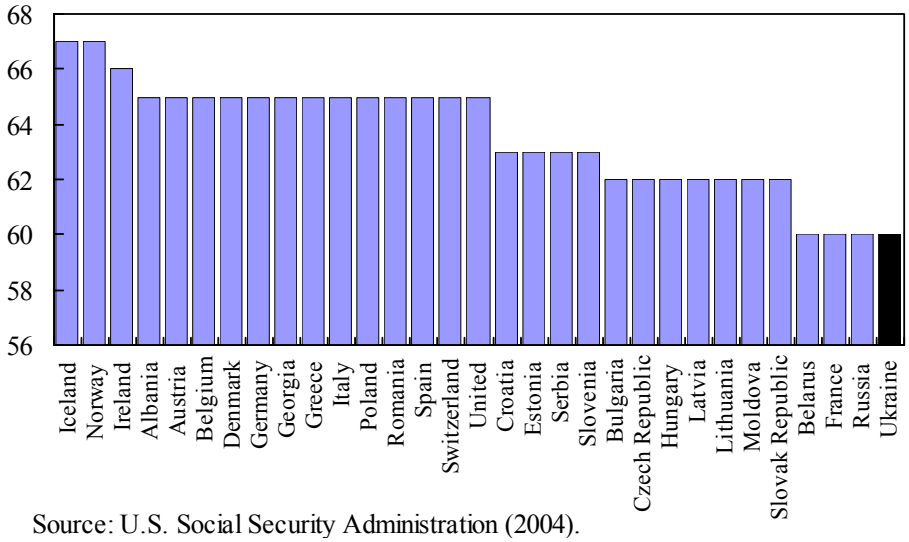
181. **A number of factors account for the low replacement rate.** Ukraine's system dependency ratio is exceptionally high, with nearly one contributor supporting one pensioner—significantly above ratios in most other countries. Low statutory retirement ages (Figure 3), at 60 years for men and 55 years for women with full old-age entitlement based on 25 and 20 years of service respectively, combined with unfavorable demographics[79] are one set of factors driving up the dependency ratio. Other features of the pension system also restrain revenues while hiking pension outlays. The system provides for various privileged benefits schemes. Individual replacement rates calculated on the best five years of wage earnings or last two years, provide incentives to minimize contributions in other years. Similarly, the agricultural sector and self-employed tend to underreport their income under the simplified tax regime, creating shortfalls in pension contributions.[80] More generally, as the contribution rate had to remain high (Figure 4) to avoid the replacement rate falling even

[79] Ukraine's population shrank by 4 million since 1991 (a combination of low birth rates, falling male life expectancy, and migration). The pension fund estimates the ratio of pension age population to working age population to rise from just below 0.4 to 0.8 by 2050 (Pension Fund of Ukraine, 2005).

[80] The self-employed pay 42 percent of their tax liabilities to the pension fund. Until 2005, the agricultural sector was under the same regime but is now officially required to contribute one fifth of the universal contribution rate which will be increased annually by 20 percent until the full contribution rate is reached.

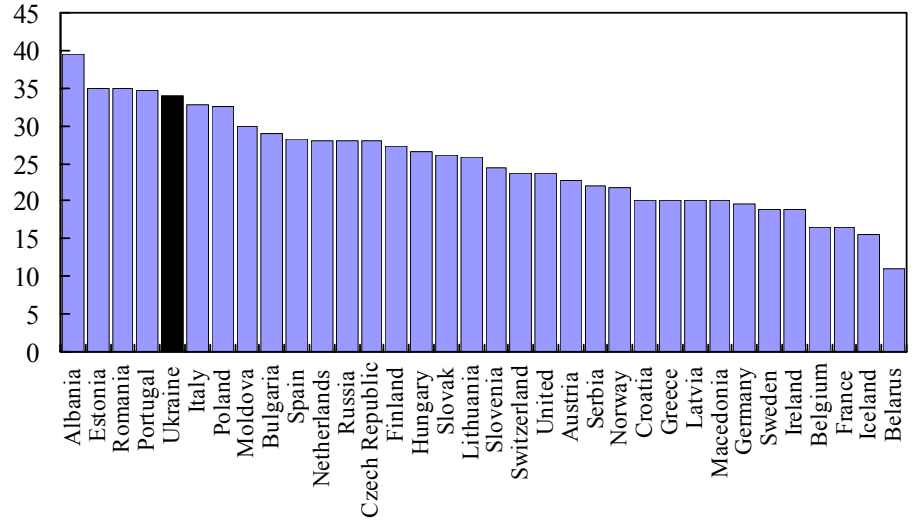
further, many activities in Ukraine stayed in the shadow economy, depriving the pension system of potential contributions.[81]

Figure 3. Statutory Retirement Age for Men in Selected Countries, 2004



Source: U.S. Social Security Administration (2004).

Figure 4. Pension Contribution Rates in Selected Countries, 2004
(In percent)



Source: U.S. Social Security Administration (2004).

[81] Without reforms, the Pension Reform Working Group (2003) estimated that the replacement rate would drop to 22 percent by 2040. Wiener (2002) reports a similar estimate of 25 percent by 2050.

182. **The pension reform, legislated in June 2003, aimed to retool Ukraine's pension system.** The adopted pension legislation envisaged to introduce a modern three-pillar pension system.[82] The first pillar would be constituted by a revised mandatory PAYG system; the second pillar would be a mandatory, fully-funded scheme, financed by contributions based on a share of the payroll tax; and the third pillar would be a voluntary, fully-funded privately managed pensions scheme.[83] The purpose was to shift to a financially more viable system that would (i) provide adequate pensions, including a minimum benefit, (ii) be transparent and establish a direct link between life-time contributions and benefits, and (iii) diversify the sources of financing by combining social security contributions with compulsory and voluntary accumulated savings (see Anusic and Petrina, 2003).[84]

C. The Public Pension Fund After the Minimum Pension Hikes

183. **The deviation of actual minimum pension payments from the legally mandated subsistence level was eliminated with the public pensions hike in 2004.** In September 2004, during the run-up to the presidential elections, the government raised minimum pensions from Hrv 130 to the subsistence minimum level of Hrv 284, bringing pension payments in line with the social mandate guaranteed by Article 46 of Ukraine's Constitution, which states that no pension should be below the subsistence minimum level. In 2005, the government raised the subsistence level further, and minimum pensions in tandem, to Hrv 332.

184. **The fiscal costs of the pension hikes have been unprecedented.** Staff estimates suggest that the annualized budget cost of the 2004 hike was about 3½ percent of GDP. Together with the 2005 increase, staff estimates that the combined hikes raised pension spending by about 5 percent of GDP to 15 percent of GDP in 2005, one of the highest ratios world-wide (Figure 5).

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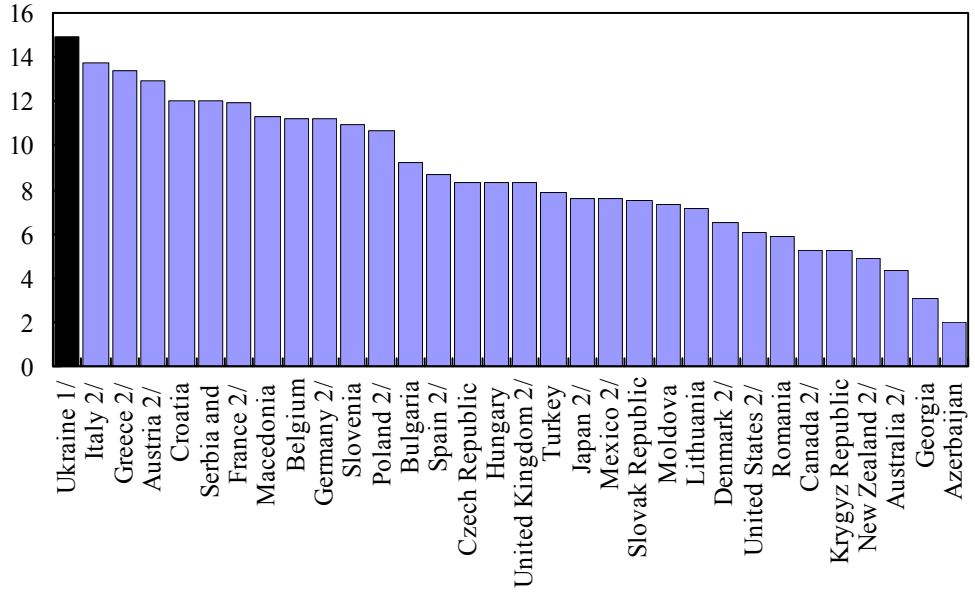
[82] In July 2003, parliament adopted the Mandatory State Pension Insurance Law and the Law on Non-Government Pension Provisioning.

[83] Revisions to the first and third pillars took effect January 1, 2004, while the second pillar is scheduled to be launched conditional on a serious of factors. See the appendix for a brief summary of the reform's key elements.

[84] The advantages of a multi-pillar pension system are seen as reducing labor market distortions by establishing a close link between individual contributions and benefits, increasing a country's savings and investment path, and accelerating the development of financial markets and improve the efficiency of capital allocation (see, for example World Bank 1994 for a discussion of the rationale of a multi-pillar system, and Lindeman, Rutkowski, and Sluchynskyy 2000, OECD 2003, Schiff and others 2000, and Castello-Branco 1998 for a discussion of pension reforms in transition economies).

Figure 5. Public Pension Expenditure-to-GDP Ratio in Selected Countries, 2004
(In percent)



Sources: OECD (2004); and Fund staff estimates.
1/ Projections for 2005.
2/ Data are for 2001.

185. **The government took a key countermeasure to avoid an even bigger buildup of fiscal costs.** One of the originally adopted pension measures envisaged that for each additional year of service beyond a full service period (20/25 years for women/men), pensions would increase by 1 percent of average wages up to a maximum replacement rate of 75 percent. However, it was decided to apply the 1 percent increase only to the labor pension (up to 1 percent of the minimum subsistence level for each year in excess of the full service period), which reflects a pensioners contribution history and is now for most pensioners significantly lower than the minimum pension, thereby saving about 1½ percent of GDP.

186. **The pension hikes have significantly changed the pension system's parameters and further weakened the social insurance link between contributions and pensions .** While the replacement ratio has risen to nearly 50 percent, this is offset by a corresponding increase in budgetary transfers in 2005. At the same time, the minimum pension hikes have even further compressed benefits across pensioners, most of which now receive similar pensions irrespective of their contribution history. In fact, more than 80 percent of pensioner are estimated to receive a pension that in ranges from 75-100 percent of the subsistence level compared to only 15 percent in 2003 (Table 2).

Table 2. Ukraine: Distribution of Pensioners by Average Pension-to-Minimum Subsistence Level Ratio (In percent of total) 1/

	2001	2003	2004
25 percent or lower	6.3	3.9	0.2
More than 25 percent and upt to 50 percent	67.2	3.0	1.4
More than 50 percent and up to 75 percent	22.0	65.1	0.6
More than 75 percent and up to 100 percent	2.8	15.3	79.2
Above subsistence level	1.7	12.7	18.6

Source: Annual Reports of the Pension Fund of Ukraine.
1/ 2002 data not available.

D. What Would Happen Without Further Policy Changes?

187. **The fiscal imbalances generated by the pension hikes will be difficult to reverse in the short term.** Rough estimates by staff suggest that without changes to the other pension parameters, the contribution rate would have to be raised by about 15 percentage points in 2006 to allow shifting to full PAYG financing (Table 3). Contribution rates at such elevated levels for the first pillar would make it almost impossible to introduce a multi-pillar system and could have serious adverse labor market effects. Alternatively, the pension fund gap would have to be closed through budgetary transfers of about 4 percent of GDP over the medium term, which would crowd out other fiscal spending priorities.

Table 3. Ukraine: Pension Parameters, 2000-10
(In percent)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Contribution rate 1/	32.0	30.1	29.9	28.1	30.0	31.8	32.0	32.0	32.0	32.0	32.0
Budget transfer rate 2/	7.4	10.0	9.0	6.3	15.5	30.9	32.7	29.6	26.6	23.8	20.7
System dependency ratio 3/	0.91	0.91	0.92	0.92	0.92	0.93	0.93	0.93	0.93	0.93	0.93
Replacement rate 4/	38.0	36.8	35.8	32.7	38.6	50.9	50.3	48.4	46.4	44.6	42.9
Pension spending (in percent of GDP)	8.4	8.8	10.1	9.1	11.3	14.9	15.1	15.7	16.2	16.2	15.8
Fiscal transfer (in percent of GDP)	0.9	1.1	1.2	0.9	1.8	5.2	4.9	4.6	4.3	3.9	3.3
Alternative calculation: 5/											
Fiscal transfer (in percent of GDP)	...	...	...	...	...	...	0.0	0.0	0.0	0.0	0.0
Contribution rate	...	...	...	...	...	...	47.2	45.2	43.4	41.8	40.2

Source: Pension Fund of Ukraine; and staff estimates and projections.

1/ Until 2004, calculated contribution rate based on pension fund revenues, average wages, and number of contributors.
2005 projected rate and from 2006 assumption.
2/ Calculated as budget transfers divided by the product of the replacement ratio, average wages, and number of pensioners.
3/ Number of pensioners to contributors.
4/ Average pension to average wage.
5/ Assumes self-funding of the pension fund and calculates the contribution rate as the residual.

188. **The scope for establishing a multi-pillar structure in the short term has been reduced considerably.** As the pay-as-you-go pillar has been vastly extended through the pension hikes, the prospects to lower contribution rates and thereby finance the introduction of a fully funded mandatory second pillar are now dim. This setback is particularly costly for a country like Ukraine, where a multi-pillar system could be a key element in a strategy to address adverse future demographic developments and underdeveloped financial markets.

189. **Pension financing requirements would severely crowd out other budget spending priorities.** A number of medium-term structural reform priorities were spelled out in the Ukraine-EU Action Plan, and the President's Plan "Ten Steps to Meet the People," and the Development Policy Loans with the World Bank. Expenditures for those initiatives would have to be downscaled if fiscal maneuver is being limited through pension outlays. For example, to fight corruption and strengthen the court system, wage rises in the civil service were envisaged. Likewise, to increase Ukraine's human capital, improvements in the education and health sectors are needed. Extending and improving the public infrastructure would be costly, as would be a transition period to introduce targeted social benefits for non-pensioners.[85]

190. **And, the inability to reduce the high labor tax burden would impede the de-shadowing of the economy.** The present already high contribution rate, combined with other disincentives to contribute to the pension system, contributes to keeping a large share of activities in the shadow economy, which is still estimated at about 30 percent of GDP. The large labor tax burden also aggravates Ukraine's demographic situation by providing further incentives for migration. As a result, the already high dependency ratio could rise further, requiring either an even higher contribution rate (assuming unchanged other parameters) or larger budget transfers—both likely unsustainable scenarios.

E. Bringing the Pension Reform Back on Track: Elements of a Package[86]

191. **Putting the pension system back on its track to a multi-pillar system will require policy measures.** The preferred option to rebalance the finances of the pension fund and reduce the first pillar of the system would have been a more pronounced reversal or phasing in of the pension hikes. However, since this option was not acceptable for political reasons, other reform options will need to be considered, which would either lower the system dependency ratio or lower the replacement rate. Ultimately, these revisions need to enable the pension fund to also lower the contribution rate so as to break the vicious circle of tax evasion and labor market inefficiencies and finance the transition to a second pillar of the pension system. Since Ukraine has significant growth potential over the medium term,

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[85] For an account of medium-term fiscal-structural challenges and their costs (which are estimated at about 6 percent of GDP), see Flanagan (2005).

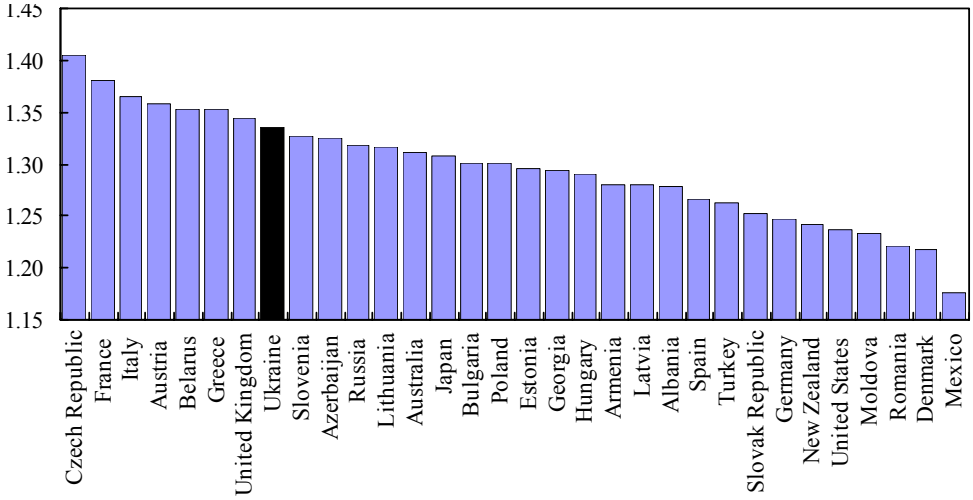
[86] See Anusic and Petrina (2005) for an discussion of reform options.

particularly if it addresses its lagging market-enhancing institutions,[87] and real wages are bound to rise in line with productivity growth, pensioners would face good prospects of receiving rising benefits once the fundamental weaknesses of the pension system have been corrected.

192. **Measures aimed at reducing the system dependency ratio could include:**

- *Increase the statutory retirement ages, particularly for women.* At 55 years, the retirement age for women in Ukraine is very low in international comparison, in particular in relation to female life expectancy (Figure 6). In the medium-term, also the retirement age for men may have to be reconsidered as the life expectancy is projected to recover from the sharply declined levels of recent years.[88] For example, the World Bank estimates that gradually raising the women retirement age to 60 years over ten years would result in annual savings of 1 percent of GDP from 2010 onward (and less than 1 percent of GDP until 2010) (see Anusic and Petrina, 2005).

Figure 6. Ratio of Female Life Expectancy to Retirement Age in Selected Countries, 2003



Source: U.S. Social Security Administration (2004).

- *Lengthen the contribution period for eligibility to a full pension.* Extending the period of eligibility for a full pension beyond the current 20/25 years for women/men would help to reduce expenditure and simultaneously raise contributions.

[87] See Chapter I.

[88] Working beyond the statutory retirement age increases eventual pension payouts. However, it seems these incentives are not very effective in raising effective retirement ages.

- *Reduce early retirement entitlement and privileged pensions.* The unfavorable pension parameters do not leave room to allow for generous early retirement entitlements (Table 4) or privileged pensions benefits. Pruning both areas would contribute to limiting pension outlays.

Table 4. Ukraine: Number of Pensioners Receiving Early Retirement Benefits 1/

	2000	2001	2002	2003	2004	2005
Number of early retirees (in thousands)	2,182	2,193	2,194	2,214	2,231	2,241
Number of pensioners (in thousands)	13,201	13,287	13,388	13,422	13,600	13,800
Share of early retirees (in percent of total pensioners)	16.5	16.5	16.4	16.5	16.4	16.2

Sources: Pension Fund of Ukraine; and staff estimates and projections.

1/ Projection for 2005.

- *Revise the contribution system for the self-employed and agricultural workers.* Currently, the incentive structure for self-employed and agricultural workers is to underreport their tax liabilities and consequently also their pension contributions. Linking their contributions directly to their pensionable income could address this distortion. The gradual increase in the contribution rates for agricultural workers, starting from 2005, already aims to address the issue and needs to be enforced.

- *Encourage the growth of the labor force.* In addition to the parametric adjustments of the characteristics of the pension system, and the systemic reform that aim at building a second pillar, the public pension system can be strengthened raising the size of the labor force through higher labor force participation and a return of emigrants to Ukraine.

Measures that would reduce the replacement rate include:

- *Revise indexation rule.* While the envisaged link of pensions to at least 20 percent of real wages increases would allow pensioners to participate in the expected large catch-up growth of real wages, such a redistribution is costly. At least in the short-term, the government may want to reconsider the indexation rule and link pension increases exclusively to CPI inflation. Based on 2005 data, the suspension of the 20 percent link could save about ½ percent of GDP.

- *Strengthen the link between benefits and contributions.* As a result of the recent pension hikes, the already weak link between pensions and contributions was lost as more than 80 percent of pensioners now receive the minimum pension. Revisions to the indexation rule could be used to reestablish a stronger differentiation of pension benefits by status of pensioner which the accrual rules of the pension reform aim to achieve.

KEY ELEMENTS OF THE PENSION REFORM

Pension legislation was adopted in June 2003 and the new system took effect from January 1, 2004. The system will consist of a mandatory defined-benefit, tax-financed pay-as-you go pillar; a mandatory defined-contribution, fully-funded second pillar; and voluntary fully-funded privately managed third pillar. While revisions to the first and third pillar have entered into force from 2004, the introduction of the second pillar is linked to the following conditions (i) two consecutive years of at least 2 percent real GDP growth per annum, (ii) a balanced budget of the PFU according to international accounting standards, (iii) functioning supervisory systems, and (iv) an increase of the actual minimum pension to the subsistence level.

Even without the recent hikes in pensions, the successful shift to a multi-pillar system was viewed to require a number of further adjustments. In particular, (i) the retirement age is low; (ii) the indexation to real wages is relatively generous and discretion in the indexation makes it intransparent; (iii) privileged pensions are costly; (iv) the trigger mechanism for the introduction of second pillar could delay its implementation and individual choices under second pillar are only envisaged eleven years thereafter; and (v) some institutional weaknesses of the third pillar remain.

The first pillar: Mandatory PAYG

- The range of pensions has been reduced to three types of pensions: old age, disability, and survivors.

- The retirement age is unchanged at 55 years for women and 60 years for men.

- The system has been more clearly related pensions to earnings. It offers a 1 percent accrual rate for those covered by the PAYG system only and 0.8 percent for those covered by the mixed system. Total accrual rates are capped at 75 percent for old-age pension and 85 percent for privileged pensions.

- Pension increases will become more rules-based compared to the discretionary increases under the old system. Indexation will be linked to CPI changes plus at least 20 percent of real wage growth to let pensioners participate in the labor productivity growth. Nevertheless, discretion remains as the wage indexation includes a range (0-20 percent) and it has not been defined whether it refers to net or gross wages.

- Benefits for high-wage earners were raised. The ceilings on income and pensionable wage were increased to seven times average earnings from less than twice average earnings.

- The pension reform allowed a recalculation of the benefits under the provision that the newly calculated pension benefits cannot fall below the currents ones. The process, conducted between January and August 2005, raised pension expenditure by about 1½ percent of GDP (Anusic and Petrina, 2005).

- The disability pension was reduced to those from general illness and benefits tied to the projected old-age benefit rather than average wages.

- The social pension, for those not eligible for an old age pension, was moved to the Social Assistance Fund.

The second pillar: Mandatory contributions scheme

- Participants will be those below the ages of 40 (men) and 35 (women). Men between 40 and 50 and women between 35 and 45 can choose to stay in the old PAYG or to enroll in the multi-pillar system.

- The maximum contribution rate is capped at 7 percent.

- The second pillar will be organized as a state accumulation fund which chooses asset management companies to manage the funds which will earn an aggregate rate of return. An option to individually choose the asset manager and obtain an individual rate of return will be provided to participants eleven years after the launch of the second pillar.

- Legislation provides strict requirements for asset managers and investment limits.[89]

- The mandatory pension funds will be supervised by the Non-bank Financial Supervisor which was established in late 2002.

The third pillar: A private pension scheme

- Participation in the third pillar of non-state pension fund is voluntary and unrestricted.

- Voluntary pension funds can be set up as open, corporate or occupational by a sponsor, interest group or fund management group.

- Legislation provides requirements for asset managers and investment limits.[90]

- The mandatory pension funds will be supervised by the Non-Bank Financial Supervisor which was established in late 2002.

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[89] The World Bank views the requirements as appropriate except for the high investment limit (50 percent) on bank deposits and banks' savings certificates.

[90] The World Bank views the relatively low minimum capital requirements and some of the investment limits, which allow large exposure to bank deposits and money market instruments but restrict investment in Ukrainian government securities, as problematic.

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