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Real Wage Adjustment in the Former Soviet Union

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Abstract

Since 1991, the economies of the former Soviet Union have experienced sizeable shocks that have pushed equilibrium real wages far from pre-transition levels. This paper sets out a framework in which to assess the degree of real wage adjustment needed to restore equilibrium, and discusses practical problems in applying wage targets and monitoring real wage developments. A key policy conclusion is that because the accuracy of real wage targets is inevitably suspect, observable indicators should be identified to evaluate the adequacy of actual movements in real wages and of the wage targets; rigid indexation rules should be avoided in nominal incomes policies.

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Contents

I. Introduction and Summary

Since 1991, most of the countries of the former Soviet Union (FSU) have embarked on comprehensive transformation and stabilization programs aimed at improving economic performance and standards of living. One of many issues which programs have had to address is a sizeable gap between equilibrium real wages and pre-1991 transition wages that already existed in 1991, and subsequently was widened by a number of sizeable shocks. Often, however, in the absence of hard budget constraints and good corporate governance, and particularly in view of the large size of wage adjustments needed, there has been concern that market forces are not sufficiently strong to effect smoothly the restoration of real wages to equilibrium. In this situation, there is no substitute for measures to strengthen market discipline, promote development of labor markets, and inculcate good corporate governance. However, until such efforts bear fruit, an incomes policy may be the only instrument, albeit imperfect, available to assert some control over wage-setting behavior, particularly during phases of price liberalization. In any event, the overall macroeconomic policy framework should be informed by some estimate of the degree of adjustment in real wages required to restore equilibrium.

The aim of this paper is to set out a framework in which to assess the adjustment in real wages needed to restore equilibrium--full employment and a sustainable balance between income and expenditure--and to discuss problems in applying wage targets and monitoring real wage developments. A brief discussion of the real wage cuts targeted in Fund-supported programs in the Baltic States is given in Section II to provide a factual setting for

this framework 1/; key aspects of the framework are described in sections III-VI; and ways to monitor wage developments are discussed in section VII. The paper focuses on a number of problems encountered in determining a reasonable course for real wages within the process of economic adjustment, and upon which an incomes policy, if desired, can be based.

- Data and information on the structure of the economy are unusually weak in these countries. Measures of the shocks experienced, real wages, and the responsiveness of employment to changes in relative factor prices are virtually non-existent. While approximate estimates of key variables can be constructed or assumed, they provide an uncertain foundation for calculating the equilibrium level of, and appropriate adjustment in, real wages.

- It is probable that initial real wages were excessive, as a result of lax financial policies and distortions stemming from government central planning. This initial disequilibrium should be incorporated into the targeted adjustment in wages.

- The sharp increase in energy prices requires an adjustment in real wages for two reasons: first, for net energy importers, the decline in the terms-of-trade requires a reduction in real factor incomes to keep domestic absorption in line with national income; and second, the increase in the price of an intermediate input has

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1/ The real wage objectives were not formal program targets, but rather a yardstick for setting nominal incomes policies and for measuring progress thereunder.

a negative impact on profitability, employment and supply, which can only be mitigated by a cut in real wages.

- In some economies, the large change in the economic environment may have led to a one-time change in productivity levels, for example because of capital obsolescence and structural reforms. This also would require an adjustment in real wages.

Three principal conclusions emerge from the analysis. First, enormous data limitations preclude the derivation of a real wage target to which any strong confidence can be attached. By implication, one should avoid locking in to a particular wage target through rigid indexation rules which ignore new information. Second, equally plausible but different characterizations of the economy, particularly of the production technology, provide different estimates of the required adjustment in real wages. Third, because the accuracy of real wage targets is suspect, it is important to identify a set of observable indicators that would provide evidence of the adequacy of actual movements in real wages and of the wage target.

II. Real Wage Objectives in the Baltic States' Programs

In Estonia, an incomes policy covering the general government and state enterprise sector was introduced at the start of its Fund-supported adjustment program in August 1992. The incomes policy envisaged holding average real consumption wages (nominal wages deflated by the consumer price index (CPI)) at their July 1992 level, implying a 45 percent drop for 1992 as a whole; living standards fell by less because in-kind transfers and subsidies were not cut by as much. On the basis of program forecasts, this

decline would have exceeded the loss in real income and output arising from the terms-of-trade deterioration in 1992, and a one-time downward shift in productivity. The decline in productivity was attributed to the sharp change in relative prices as prices were liberalized. 1/ The terms-of-trade deterioration was projected to be 44 percent implying a loss of real income of some 22 percent. Productivity was expected to fall by 20 percent, of which half was considered to be permanent. In total, these two shocks represented a 32 percent loss in real income. In the event, real wages declined by some 39 percent on average in 1992, while the terms-of-trade deterioration was similar to the original projection and the shift in productivity was estimated to be smaller. The estimated loss in real income was largely unchanged at 35 percent.

In the original design of the 1992 adjustment program for Latvia, difficulties in the valuation of trade data precluded a meaningful calculation of the loss of income arising from the projected terms-of-trade deterioration of 39 percent; the estimated share of exports and imports in GDP, 125 percent and 145 percent, respectively, made little sense in terms of what was known about the structure of the economy. Thus, the targeted decline in real consumption wages for state enterprises and budgetary organizations was not directly linked to the terms-of-trade, but instead was set to be of the same order as the projected fall in real GDP (25 percent) in 1992. In fact, real consumption wages fell by almost 20 percent on average in 1992, compared to a decline in real GDP of 33 percent. On the

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1/ While the terms-of-trade shock was an integral part of the change in relative prices, particularly with respect to energy, the loss of income and output are conceptually distinct.

basis of revised trade data, the loss of income arising from the decline in the terms-of-trade in 1992 is estimated at 25-35 percent.

In Lithuania, the 1992 Fund-supported program aimed at a reduction in real consumption wages of at least 30 percent in the second half of 1992 (equivalent to a similar cut for the year as a whole). The program projected a fall in the terms-of-trade of 44 percent in 1992; weighted by the average share of trade in GDP this implied an income loss of slightly over 35 percent. Real GDP was expected to decline by 25 percent. The most recent estimates indicate that real GDP dropped by 35 percent; the terms-of-trade declined by 21 percent; and real wages fell by 17 percent.

III. Measurement of the Terms-of-Trade, Real Wages, GDP and Productivity

The economies of the FSU present unusually severe data problems which prohibit an accurate calculation of the required correction in real wages, and make it difficult to set an operational wage target. These problems affect the measurement of three essential ingredients for determining and monitoring the path of wages: the loss of income arising from the deterioration in the terms-of-trade (henceforth referred to as the terms-of-trade income loss); nominal wages and prices; and movements in GDP and productivity.

For some of the Baltic States, the terms-of-trade income loss calculated by estimating separately the change in export receipts and import costs is implausibly large--even exceeding the value of GDP. In part, this reflects the very large increases in export and import unit values between 1991 and 1992 owing to the sharp increase in energy prices and valuation

distortions in the 1991 trade data. 1/ Also, terms of trade estimates are weak because, except for energy trade where price and volume data exist, they are based on prices in world markets and trading partner countries. The very large increases in energy import prices in 1992 also magnify the usual index number programs for measuring terms-of-trade changes. One approach, albeit imperfect, to improving estimates of the income loss, is to assume, as was done for Estonia, that trade is broadly balanced; this allows the income loss to be measured as the terms-of-trade change multiplied by the average share of trade in GDP in the base year (1991). 2/ However, the valuation problems endemic to the 1991 trade data will still flaw estimates of income losses based on 1991 data. In view of this problem and the fact that trade shares in GDP have fluctuated considerably over time 3/, it may make more sense to use share data averaged over several years as a base for calculating income losses.

An accurate measure of real wages is important not only as a base for targeted wage cuts, but also for monitoring their future movement consistently. A meaningful measure must include both cash, which may only be a small share of total income, and noncash remuneration. Also, the appropriate coverage of wages will differ between measures of product and

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1/ The multiplicity of valuation procedures used prohibit the derivation of sensible price and quantity data from aggregate data.

2/ That is, half the sum of the share of exports and imports in GDP.

3/ Energy trade shares have been very volatile, in part reflecting disruptions in supply.

consumption wages. 1/ Capturing both these elements of compensation in a
wage index is critical when the reform process involves shifting parts of
labor remuneration from the noncash to the cash sphere. In these
circumstances, cash wages will measure inaccurately the underlying
adjustment of more comprehensively defined wages, and actual living
standards.

The terms-of-trade shock experienced by the FSU requires an adjustment
in both real consumption wages and real product wages. In either case, the
measurement of the price deflator poses problems. Typically, CPIs are
constructed with a fixed set of base year weights which, for two reasons,
will overestimate the rate of inflation, and the decline in real consumption
wages: first, base-period weighted CPIs do not capture shifts in the
consumption basket towards goods with relatively low increases in prices;
second, officially controlled prices in the base period may understate the
utility of goods in excess demand. As a result, the increase in the price
of these goods following price liberalization will overstate a utility based
measure of inflation by more the larger changes in relative prices and the
more prices are controlled prior to liberalization. 2/ The first upward
bias can be overcome by constructing a new price index incorporating current
period weights, which would provide a lower bound estimate of inflation--

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1/ A product wage measure should include in-kind transfers, social
insurance contributions and housing subsidies paid by the employer, and take
account of periods of forced unpaid leave. A measure of consumption wages
should include, amongst other things, housing and other employment-related
specific subsidies received by the employee.
2/ The latter phenomenon has as a logical counterpart the overstatement
of the decline in output. See K. Osband (1992) for a theoretical discussion
of this index number problem.

this was done in Estonia, Latvia and Lithuania. 1/ The second upward bias
is present even when current period weights are used, but can be minimized
by using secondary or black market prices for the pre-decontrol period.
Price controls, however, may also lead to the underestimation of inflation:
price increases which elicit an expansion in the supply of goods for which
there was previously excess demand will have too low a weight in the CPI.

In order to measure real product wages (nominal wages deflated by the
price of gross output) a gross output price index is needed. At the level
of the firm, this index is relatively well-defined, namely the ex-factory
price; alternatively, but second best, is a wholesale or producer price
index. Any aggregate index will suffer from the usual problems associated
with the choice of current or base year weights. If real wages are measured
using the GDP deflator, it is important to note that this measure will
behave differently from a gross output real wage index (see section V.2).

In the transition economies, past national accounts data were compiled
in terms of net material product using official prices. Estimates of GDP
have become available recently, but suffer from data limitations, which also
feed into measures of labor productivity. The accuracy of estimates depends
heavily, amongst other things, on the deflation procedure used; price and
quantity data for the major macroeconomic aggregates are typically not
available, and have to be constructed on the basis of nominal values and
partial price data, with reasonable assumptions filling the gaps. Typically
for the FSU, real GDP is estimated from nominal values using a single

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1/ A crude splicing of old and new price indices will not provide a
consistent picture of price developments before and after the new base year.
Instead, the new price index must be extended backwards into history.

deflation method--that is the value of gross output less the value of intermediate inputs (domestic output less imports), divided by the gross output price. In this case, the measure of real GDP is equivalent to that of real income. However, this is not a true measure of real net output because it is not independent of changes in input prices, and will tend to overestimate the decline in real GDP following a terms-of-trade decline.

IV. Initial Conditions: Equilibrium or Disequilibrium?

There is strong evidence, such as the prolonged stagnation of output, that the FSU began the transition to a market economy from a position of disequilibrium. Consequently, the targeted adjustment in real wages must factor in any misalignment in their pre-reform level. While measurement of equilibrium real wages is well-nigh impossible for the economies in transition, it is helpful to evaluate, even in qualitative terms, the divergence of pre-reform wages from their efficient level. What factors might enter this evaluation? First, the existence of pre-reform shortages, queues and price controls, together with the sharp increase in prices following their decontrol suggests that real labor compensation was too high. Often, however, at least some of the needed adjustment in real wages is accomplished through price rises, following liberalization, that outstrip wage increases. Second, if firms' profitability depend on the receipt of state employment subsidies, this too would indicate excessive real product wages. Against these two considerations, however, is the fact that in Estonia and Lithuania the share of labor income in GDP is estimated at about 50 percent: this is low compared with European economies and would seem to

suggest that labor's share in GDP should rise in the move to a market economy. But, this suggestion must be viewed against the possibility of substantial measurement problems.

V. Adjustment to Terms-of-Trade Shocks

The large terms-of-trade decline in most FSU economies requires a sizable downward adjustment in real wages. In assessing the requisite size of this adjustment, two types of considerations must be taken into account: first, the adjustment in real factor incomes needed to ensure that domestic absorption remains in line with national income 1/; and second, the reduction in real product wages needed to mitigate the effect of the sharp increase in the price of an intermediate input on profitability, employment, and supply. The objective of this section is to review these considerations in a relatively simple, small open-economy model which captures many of the characteristics of the economies of the FSU. The economy produces a single final good, which is consumed domestically and exported, and imports an intermediate energy input. The prices of both are given. Aggregate production takes place at constant returns to scale and utilizes three inputs: capital, labor, and the imported energy input. The supply of labor and the initial stock of capital are fixed.

A number of conclusions emerge from this discussion. First, the terms-of-trade shock necessitates a correction in both real consumption wages and real product wages which need not be identical. This difference should be

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1/ This need for adjustment also applies to the rearrangement of previously existing inter-republic budgetary transfers.

kept in mind when evaluating the success of nominal incomes policies which, because price data beyond the CPI are scant, are cast in terms of real consumption wage objectives. Second, the required correction in real product wages following an input price shock will be different in the short and the long run. This calls for caution in setting wage targets that provide little scope for subsequent reappraisal or adjustment. Third, different characterizations of, or assumptions about, the technology of production will influence judgements about the real product wage adjustment needed to mitigate the effect of an increase in the price of energy.

1. Adjustments in domestic absorption and factor incomes

In order for domestic demand to remain broadly in line with national income, the rise in the import (energy) bill should be offset by an equivalent decline in domestic expenditure. In practice, the pace of the offset will depend on external borrowing possibilities, which can be assumed to be limited for the economies under review. Accordingly, real factor incomes measured in terms of domestic expenditure must fall by the percentage increase in the price of imports times their share in GDP. 1/

If markets are not left to effect the cut in income, how should policy distribute the burden of adjustment between factors? An incomes policy that targets real factor rewards to fall by equivalent amounts preserves the existing distribution of factor incomes, and therefore has the political merit of being socially equitable. However, a policy that keeps relative factor shares constant need not be consistent with the adjustment in real

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1/ Note that with the price of exports given, the price of imports is equivalent to the terms-of-trade.

product wages needed to maintain full employment (see next section). Also, if the government sector reduces its domestic expenditure by less than the amount that incomes to labor and owners of capital are targeted to fall, then real factor rewards would need to decline by an even larger amount to restore equilibrium. In this regard, cuts in real wages may affect the financial balance of social security funds whose wage-based contributions may fall in real terms by more than benefit levels because the latter are low and cannot be easily reduced.

These conclusions are drawn for a setting in which a single, final domestic good is consumed. What are the implications of relaxing this restriction, namely allowing for imports to be consumed? Consider the case in which the share of imports in the consumption of wage earners is smaller than the share of total imports in GDP. In these circumstances, an increase in the price of energy will lead to a smaller rise in the CPI than in the domestic expenditure deflator. Thus, if the real consumption wage is cut by the amount that total real factor incomes measured in terms of the domestic expenditure deflator must fall, then the decline in purchasing (consuming) power for wage earners will be greater than that required for the economy as a whole. By implication, the loss of real income must be greater than for other sectors of the economy. In general, the effective adjustment in each sector will depend on the share of imports in expenditure of each sector.

2. Intermediate input (energy) price shock

An adjustment in real wages has also been needed in most of the FSU to offset the adverse effects on profitability, output and employment stemming from an increase in the price of an intermediate input, namely energy. For

this purpose, the adjustment should be calculated in terms of real product wages. When it is assumed that there is only one good produced and consumed, the real product and real consumption wage are identical. In practice, this will generally not be the case. In general, the required adjustment in real product wages will depend on the increase in the product price of the energy input (the price of energy deflated by the price of gross output) and the technology of production--the relative size of factor shares in gross output and the substitution possibilities between different factors of production. This information is not available in the transition economies but by assuming a production technology, some insight can be gained into the range of possible wage adjustments needed in the short and long run. 1/ The broad results from applying two production assumptions are briefly reviewed here; the correction of any initial disequilibrium in wages and factor shares would involve an additional adjustment.

The most easily tractable framework analytically is a Cobb-Douglas function. In the short run, with the capital stock fixed, full employment maintained and the price of output given, an increase in the price of energy leads to drop in gross output equal to the percentage increase in the product price of energy times the share of energy in GDP. By assumption, factor cost shares are constant and thus both the real product wage and real

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1/ An Annex containing a formal derivation of the effect of an intermediate input price shock on real wages, profitability, investment, gross output, and value-added under four different three-factor aggregate production functions: an unrestricted general production function; a Cobb-Douglas production function; production with raw material separability; and production with labor separability is available from the author. M. Bruno and J. Sachs (1985) provide a general exposition of the adjustment issue and explicit solutions for a two-level CES production function.

rate of profit must fall by the same percentage amount as output. 1/ In the model of the economy outlined above, real product and consumption wages are identical because the gross output price is the CPI and energy is total imports. With Cobb-Douglas production, the required adjustment in real wages needed to secure full employment is the same as required to keep absorption in line with income--in general, this will not be true.

A key consideration in ascertaining the needed adjustment of wages in the short run is the existence of separability between inputs. When labor and capital (value-added) are separable from energy 2/, for example in Cobb-Douglas production and a CES production function nested in value-added and energy, the wage adjustment is the percentage increase in the product price of energy times the share of energy in GDP. However, this particular assumption of separability, which imposes strong restrictions on the required adjustment in real factor prices, may not be the most realistic. In fact, empirical work indicates that when energy is classified as a distinct intermediate input, rather than as part of a broader grouping, production is likely to be characterized by labor separability; that is, where capital and energy inputs combine to form a composite separable from

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1/ Often, real product wages are measured in terms of a GDP deflator. In the Cobb-Douglas case, it is important to note that nominal wages deflated by a value-added deflator remain unchanged--see Annex. In practice, however, GDP deflators rarely correspond to a true value-added deflator.

2/ When energy is assumed to be weakly separable from labor and capita, the marginal rate of substitution between labor and capital is independent of (i.e., separable from) energy. Consequently the wage-rental ratio is also independent of the real product price energy.

labor (and other raw material inputs). 1/ Under the assumption of labor
separability, real product wages also need to fall to maintain full
employment 2/, but probably less than in the Cobb-Douglas case. 3/

In the long run, the capital stock adjusts so that its rate of return
equals the long-run cost of capital, which in a small country will be
determined by foreign conditions. With the product price of energy
permanently higher and the real cost of capital given, the real product wage
must fall in the long run in order to sustain full employment. This fall is
the same whatever the production technology and equals the percentage
increase in the product price of energy times the ratio of the share of
energy and labor costs in gross output (or GDP). What does differ,
depending on the technology of production, is the relationship between the
long-run adjustment and the short-run adjustment described above. Under
Cobb-Douglas technology, the long-run drop in real product wages is more
than that in the short run, 4/ by an amount which will be greater the
larger the cost share of capital. Capital will be decumulated relative to

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1/ See E. Berndt and D. Wood (1979). Empirical work for the industrial
countries does suggest, however, that raw material separability from value-
added applies for most industrial raw materials or when the intermediate
input is defined as total imports for the aggregate economy.
2/ This assumes the absolute size of the cross Allen elasticity of
substitution (AES) between capital and energy is smaller than the own
elasticity of capital. The AES is the proportionate change in the quantity
of an input with respect to a change in one factor price holding all other
factor prices and output constant (see R. Allen (1938)).
3/ This holds true for plausible values of factor shares and substitution
elasticities, although, a priori, the relative magnitude of the required
decline in real wages under these two production technologies is uncertain.
4/ For example, in the case of Lithuania where the shares of labor and
energy in GDP are about 50 percent and 4 percent, respectively, the required
cut in real product wages in the long run would be double that in the short
run. However, in view of the uncertain accuracy of the labor and energy
shares, these results should be viewed with caution.

trend to restore the rate of return--the decline will be determined by the size of the energy price shock and the relative size of factor shares. When there is separability of labor in production, real wages also fall more in the long run than in the short run, but the additional long-run decline will be greater than for Cobb-Douglas production. Capital decumulation (relative to trend) is also likely to occur 1/ and will be influenced by substitution possibilities between factors as well as the relative size of factor shares.

3.   Net energy exporters

Some FSU economies, such as Russia and Kazakhstan, are net exporters of energy products and have registered an income and wealth gain from the recent FSU-wide increase in energy prices. This gain adds a positive shift in demand to the supply-side effects of the change in the relative price of an intermediate input. How does this additional influence affect the preceding analysis? In the single sector model outlined above 2/, the adjustment in real product wages is the same as in the absence of energy exports. At the same time, because of the terms-of-trade income gain, the economy can afford a higher level of absorption and of real consumption wages, which would be matched by a deterioration in the non-energy trade balance. However, the cut in real product wages needed to preserve full employment requires a fall in nominal wages because the final goods' price is fixed. In these circumstances, real consumption wages can rise only

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1/ Strictly, this holds true when the absolute size of the cross AES between capital and energy is smaller than the own elasticity of labor.
2/ The energy producing or extraction sector typically employ a minor fraction of the resources of the economy and, therefore, can be treated as an exogenous source of domestic income or wealth.

through a transfer of the income gain via the government sector, for example, by taxation of the energy sector and a reduction in taxes on wages (i.e. a rise in the post-tax nominal wage) or an increase in government expenditures. 1/

The financial gain arising from an increase in energy prices can be thought of either in terms of actual cash flow generated by a given extraction profile, or in terms of a permanent income stream equivalent to the increase in value of recoverable energy reserves. Policy prescriptions based on the latter option will be feasible only if borrowing opportunities are available to bridge any gaps between expenditures and actual revenues. Indeed, if energy production or extraction is declining, and borrowing opportunities are negligible, then the income effect of an increase in energy on the economy will be small.

VI. Productivity Shocks

The sharp contraction in output in the FSU has been reflected in a sizeable decline in productivity. Part of this decline may stem from a permanent shift in the level of productivity, for which an adjustment in real wages is required to ensure full employment. Whether this targeted adjustment should also take account of transitional (and reversible)

1/ A two-sector traded-nontraded goods model allows one to explore the Dutch disease effects of the terms-of-trade gain combined with its negative supply-side impact. The increase in demand for nontraded goods stemming from the income (wealth) gain, will lead to a rise in the relative price of nontraded to traded goods, a contraction in the traded goods sector, and a deterioration in the non-energy current account. If the increase in the demand for nontraded goods is sufficiently large, and the nontraded goods sector is relatively labor intensive, then the real product wage may rise in both sectors following an increase in energy prices. See M. Bruno (1982).

downturns in productivity is a matter of judgment. Including the transitional component could risk hindering industrial restructuring by sustaining profitability in inefficient industries through excessive wage compression; but, it would also improve profitability in new industries, generating greater incentives for new investment (and jobs) in them. The scope for discounting the transitional loss in productivity and output will also depend on the possibilities for external financing.

A number of reasons why a one-time negative productivity shock might occur spring to mind. First, if the capital stock technology is putty-clay, then the large shift in relative output prices may have rendered part of the capital stock obsolete, thereby reducing the level of potential output and labor productivity. This may have occurred in the military-industrial complex of some FSU economies. The sharp rise in energy prices also may have contributed to capital obsolescence. However, the shift to a market-based economy and the implementation of structural reforms such as privatization could have a positive impact on productivity; for example, through imposing a greater degree of financial discipline on enterprise managers and encouraging more efficient managerial practices. However, these positive factors are likely to take longer to bear fruit. In sum, the magnitude (and timing) of these various shocks, which influences the required adjustment in real wages, may be not only considerable but also very uncertain. Other elements in the adjustment calculus are the nature of the productivity shock (e.g. labor or capital-augmenting) and the production technology. In view of the dearth of information, an assumption that

technical change is disembodied and neutral is not unreasonable and is simple to use. 1/

VII. Indicators of Adjustment

It is virtually impossible to calculate accurately the desired adjustment in real wages, and nominal wage targets based on such calculations are subject to considerable uncertainty. Also, there are problems in accurately measuring movements in real wages. For these reasons, it is essential to establish a set of observable variables to assess the adequacy of the actual path of wages and whether the wage target should be modified. Indeed, when market forces are influential, inappropriate nominal wage targets will trigger corrective processes that will move real wages towards equilibrium: excessive nominal wages may increase unemployment and dampen wage pressures and/or spur inflation.

The design of an adjustment program for the FSU economies inevitably contains a large measure of uncertainty. Consequently, the initial program projections, even under the assumption of no unanticipated exogenous shocks, do not provide a suitable yardstick to assess the adequacy of wage targets and success of incomes policies. Instead, actual developments in employment and output should be the litmus test of success. A number of other variables (see below) may also serve as indicators of the adequacy of real wage adjustment, but are neither exhaustive nor perfect; the influence of nonwage factors on these indicators must also be taken into account.

1/ For some production functions, e.g. Cobb-Douglas, Hicks-neutral, capital-augmenting, and labor-augmenting (Harrod-neutral) technical change amount to the same thing.

What would one expect, in the absence of new exogenous shocks, if the targeted cut in real product wages was inadequate? Output, profitability and employment would fall, and inventories would probably be drawn down. If institutional factors constrained labor shedding, the negative impact of excessive real wages on profitability and output would be even greater and the decline in employment less. In this situation, measures of labor turnover could provide an indication of the extent of either new hiring or firing, which would reflect labor hoarding. To improve labor mobility, further cuts in real product wages would need to be accompanied by structural measures. A sustained and larger rise in unemployment than projected could, also, reflect a more lengthy transitional component of unemployment (for a given level of real wages) than expected; the latter would need to be addressed through labor market reform.

What if real wages were "too low"? One would then expect to observe a revival in output (productivity), profitability and investment. Even without well-developed markets, corrective upward pressures on real wages would emerge as labor demand strengthened. However, low real wages could sustain production in inefficient industries, thereby delaying industrial restructuring. In this regard, industry-level data and inter-industry comparisons need to inform whether efficient restructuring is taking place.

The use of profitability as a yardstick of the appropriateness of real wages is bedeviled by measurement difficulties, particularly with regard to inventory valuation. A partial, although not conclusive, indicator of improved profitability would be the timely payment of taxes and elimination of arrears. Expressions of interest or actual commitments by foreign

investors is another, albeit lagging, indicator. High rates of credit expansion to public enterprises may reflect financial disequilibrium stemming from excessive real wages. Measures of international competitiveness, such as a comparison of nominal wages in dollar terms with those in formerly centrally planned economies of Eastern Europe, may prove informative; data on unit labor costs, if available, would be preferable. While large divergences in wage levels across countries may reflect different productivity levels or other country-specific factors, they may point to an inadequate degree of real wage adjustment. Finally, inadequate adjustment of real consumption wages would tend to be reflected in levels of domestic absorption out of line with national income, inflationary pressures, and overly large current account deficits.

The occurrence of new exogenous shocks complicates the picture. The restoration of output and employment following a downward shift in the aggregate demand curve requires a reduction in wages and prices, but not in real wages, at the new equilibrium; however, wage-price dynamics of the adjustment process will entail temporary movements in real wages. By contrast, a permanent upward shift in the aggregate supply curve will require a permanent cut in real wages to restore output and full employment.

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