wiiw Research Reports

No. 301
November 2003

Leon Podkaminer

A Note on the Evolution of Inequality in Poland, 1992-99

Analytical Notes on the Balassa-Samuelson Effect

Leon Podkaminer

A Note on the Evolution of Inequality in Poland, 1992-99

reprinted from
Cambridge Journal of Economics, Vol. 27, No. 5, 2003, pp. 755-768, by permission of Cambridge Political Economy Society

Analytical Notes on the Balassa-Samuelson Effect

reprinted from
Banca Nazionale del Lavoro Quarterly Review, No. 226, September 2003, pp. 207-221

Leon Podkaminer is wiiw research economist.

The present two articles, which have recently been published in international journals, are reprinted here to make them also available to wiiw subscribers.

Cambridge Journal of Economics 2003, 27, 755–768

COMMENTARY

This section is designed for the discussion and debate of current economic problems. Contributions which raise new issues or comments on issues already raised are welcome.

A note on the evolution of inequality in Poland, 1992–99

Leon Podkaminer*

Analyses of household budget surveys, national accounts data on functional income distribution, and data on the dispersion of wages, indicate that income inequality in Poland, after falling over the 1993–96 period, rose significantly from 1997 onwards. Farmers and the unemployed were the main losers. The overall position of wage-earners improved, although wage inequality increased sharply in the second half of the 1990s. Employers and the self-employed fared quite well. This coincided with fiscal policy changes which substantially slowed down progression in income taxes. Over the 1993–96 period growth was high and balanced. Subsequently, growth slowed down, giving rise to serious fiscal and external deficits.

Key words: Inequality, Poland.
JEL classifications: O15, P27, P36, J31

Introduction

Poland's recent economic history falls into two distinct periods: the first may be said to have run from 1992 to 1995; the second, which started in 1995–96, has yet to end. During the first period, imports were curbed via high tariffs and other means, and exports were selectively promoted through subsidies. The exchange rate was strictly managed (using a sliding-peg with very narrow bands), resulting in a slight real depreciation of the currency. Capital inflows were low—partly on account of the somewhat discouraging official policies. Real interest rates were quite moderate. The economy pulled itself up out of the deep recession of 1990–91—during which GDP had shrunk by 17%—and annual growth then reached 6%, while gross fixed investment grew at more than 15% per annum. No new foreign debt was incurred and only minor portions of domestic assets were sold to foreigners. Public sector deficits were low and declining. Inflation receded consistently from an initially high level.

Manuscript received 10 May 2002; final version received 20 February 2003.
Address for correspondence: The Vienna Institute for International Economics (WIIW), Oppolzergasse 6, 1010 Vienna, Austria; email: pod@wsr.ac.at

* The Vienna Institute for International Economics. I am indebted to Dr Adam Szulc who calculated the indicators contained in Tables 2–6, and to the two referees of this Journal for helpful suggestions. All other errors remain my sole responsibility.

The years 1995–97 were marked by a swift liberalisation of imports, through a rapid decrease in tariff rates and a radical liberalisation of capital movements. The sliding-peg regime was abandoned. To an increasing degree, determination of the exchange rate was left to the (still shallow) forex market (first through a gradual broadening of the bands, then upon the complete withdrawal of the National Bank from the forex market, and finally through the introduction of the free float). The major inflow of capital which started quite abruptly in 1995 resulted in a pronounced trend towards real appreciation which the National Bank could hardly manage—despite (or perhaps because of) very high interest rates that the Bank felt it had to set (while attempting to 'sterilise' the inflows). Foreign trade developments were disappointing throughout. After 1995, relatively high trade surpluses (on average 1% of GDP) turned into massive deficits (on average 3·7% of GDP). Investment growth has since slowed down consistently, matched by a decline in the GDP growth rates. In 2001, investment was down by 10%, and GDP growth was anaemic at 1%. In contrast to the first period, massive foreign debt has been accumulating (primarily in the form of foreign loans drawn by the corporate and banking sectors); much of the 'family silver' (comprising the largest and most profitable enterprises and financial institutions) has been sold off to buyers from abroad, often at a high discount. The unemployment rate, which dropped from 16% in 1993 to 10% in 1997, bounced back to 18%.

Public finances have been evolving rapidly. Current general government revenues, which accounted for more than 43% of GDP in 1996, fell to 39% in 2000. Current expenditures likewise dropped over the same period, from over 39% to 37%. The tax system has continued to evolve: the share of personal income tax revenue has dropped from 6·7% to 3·4%; the share of mandatory social security contributions has declined by 4 percentage points. The corporate income tax rate has been gradually reduced from 38% to 27%. The highest personal income tax rate has been lowered from 45% to 40%, while the lowest tax rate has been reduced from 20% to 19%(However, an attempt to introduce a flat tax at a rate of 21% failed in 1998.) On the expenditure side, spending on public health and education has rapidly contracted, coupled with an active promotion of private provision of health and education services. Since 1998, the process of downsizing social transfers (pensions, social benefits) has accelerated.

There is little doubt that the overall worsening of Poland's economic performance in the second period cannot be attributed to one single factor or one single change in economic policy, though changes in fiscal and public spending policies may have played a role. In so far as these changes affect income inequality, they may have had a definite impact on domestic demand—via differentials in the propensity to save at different income levels. Moreover, via differentials in the propensity to consume imported goods, the policy-induced changes in inequality may have had a definite impact on the growing imbalances in foreign trade. It is far from certain, however, whether in actual fact the two periods under consideration are so different in terms of income inequality.

Extensive research has been conducted into the dynamics of inequality in the transition countries in general (and thus also in Poland). The related research findings have been reviewed in the recent paper by Keane and Prasad (2002) (see also Keane and Prasad (2000)) as well as by several other authors, including Milanovic (1999), who contributed to a special issue of *The Economics of Transition* and in a volume edited by Layard (1999).

Milanovic's research on the evolution of inequality in Poland covers the years 1988–95; he observes a relatively consistent rise in inequality, especially after 1992. The research by Keane and Prasad, which covers the years 1985–97, suggests that inequality actually fell in the early years of transition (1990–92) and rose, albeit moderately, thereafter. Both

Milanovic and Keane–Prasad use Household Budget Survey (HBS) data, and use the same inequality indicator, the Gini coefficient. The discrepancies between the results reported may be due primarily to differences in the levels of aggregation of the HBS data actually used. Milanovic worked with data on quintiles of the income distributions, and Keane and Prasad with the original ('micro' HBS data).

This paper is focused on the evolution of income inequality over the period 1993–99. Three different types of analysis are conducted: (i) analysis of HBS ('micro data'); (ii) analysis of national accounts data on functional distribution of income; and (iii) analyses of data on the dispersion of wages across various sectors. For the analysis of the HBS data, inequality indicators other than the Gini coefficient are used. It emerges that, however measured, inequality fell in the first period (1993–96) but has been on the rise ever since.

1. Evidence from Household Budget Surveys

Generally, there is little doubt that inequality in incomes and consumption in the countries of Central and Eastern Europe, which is considered to have been relatively low prior to 1990, has increased substantially in the course of the transition to a market economy. However, measuring inequality is not unproblematic. Various popular indicators of inequality sometimes suggest different conclusions when applied to specific sets of data on the distribution of income and consumption. Moreover, data on the distribution of income and consumption are invariably fraught with problems. In practice, for many decades, research on inequality conducted in many countries (and by international organisations such as The World Bank or the OECD) has focused on studying data derived from Household Budget Surveys (HBS). Insofar as the conclusions on the evolution of inequality in Poland since 1993[1] rely on conventional analyses of HBS, they require the following two qualifications: First, the HBS data (and the conclusions derived from it) offer a distorted image of the actual structure of incomes and expenditures. Indeed, even with a large survey of, for example, 30,000 Polish households (approximately 100,000 persons),[2] the likelihood of properly representing extreme units with either very high or very low incomes is still rather low. Indeed, the homeless residents of homes for the poor, and 'pathological' individuals and families (as a rule extremely poor) are *excluded* from the HBS. 'True' social inequality is therefore not really reflected in the yardsticks applied in HBS to characterise inequality in the sample. Thus, the HBS-based measurements *underestimate* genuine inequality. Second, problems also occur with the manner in which households report income and expenditure. Some systematic 'errors' in reporting are quite common. For example, the average per capita expenditure on alcohol shown in HBS data is only about half of the actual level nationwide.

Before discussing the evolution of specific inequality indicators, it may be worth taking a look at the changing relative positions of 'average' representatives of various household groups distinguished in HBS.

Table 1 suggests that the position of farmers, part-time farmers, blue-collar employees and the self-employed improved greatly between 1993 and 1996 and then deteriorated (very markedly in the case of farmers, part-time farmers and blue-collar employees) in the period 1996–99. Pensioners experienced quite the opposite. The position of the unemployed has been steadily deteriorating, that of white-collar employees steadily improving.

[1] In 1993, the methodology underlying the Polish HBS was changed, thus complicating inequality comparisons with earlier years. The inequality comparisons with the pre-transition years are even more problematic because of fundamental methodological differences. An additional problem with pre-transition data stems from distorted prices, endemic shortages and rationing practices—all affecting their informational value (see Podkaminer, 1988).

[2] This amounts to 0·26% of total population.

Table 1. *Average per capita expenditure by type of household in 1993, 1996 and 1999 (average per capita expenditure = 1)*

	Farmers	Employees	white-collar workers	Part-time farmers	Self-employed	Retirees	Unemployed etc.
1993	0·89	0·99	0·84	1·27	0·83	1·28	1·12	0·63
1996	1·10	1·12	0·99	1·33	1·21	1·51	0·74	0·62
1999	0·71	1·04	0·83	1·39	0·74	1·28	1·10	0·60

Source: HBS 1993, 1996, 1999.

Table 2. *Equivalent[1] expenditures inequality indicators*

	Gini	Theil	90/10	75/25
1993	0·288	0·165	3·34	1·86
1996	0·286	0·159	3·32	1·85
1999	0·318	0·192	3·93	2·02

Remarks: All indicators are calculated using the commonly applied OECD (70/50) demographic equivalence scale. Columns 90/10 and 75/25 are the conventional percentile ratios (e.g., 90/10 indicates the ninth over the first decile).

Table 3. *Equivalent income inequality indicators*

	Gini	Theil	90/10	75/25
1993	0·290	0·176	3·34	1·83
1996	0·301	0·189	3·42	1·83
1999[a]	*0·316*	*0·216*	*3·79*	*1·90*

Note: [a]Estimated.

The first, and relatively unproblematic, set of *proper* inequality measures relates to *expenditure* inequality in the years 1993, 1996 and 1999 (see Table 2). As can be seen, expenditure inequality, however measured, *decreased*, albeit only slightly, in the first period, and *increased* in the second.

It is not really possible to track the development of *income* inequality indicators on account of the HBS definition of income having been changed in 1997: certain capital gains were excluded from household income. However, for 1997 there are two parallel sets of HBS findings (with and without capital gains taken into account). Assuming, somewhat daringly, that the ratios of income inequality indicators derived from the two alternative sets of HBS data in 1997 also apply to 1999, a table can be produced showing the income

[1] The term 'equivalent' refers here to the use of 'equivalence scales' or weights to calculate expenditure or income per household member. The OECD equivalence scales are 100% for a single adult, 70% for each next adult household member and 50% for each child. Other equivalence scales (empirically more relevant for Poland) were used to calculate the inequality indices for Tables 2 to 6. The resulting alternative inequality indices are not significantly different from the reported ones.

Table 4. *Decomposition of Theil expenditures inequality index into indices for professional groups*

	1993	1996	1999
Employees	0·156	0·169	0·196
Part-time farmers	0·125	0·114	0·147
Farmers	0·173	0·163	0·158
Retirees	0·154	0·115	0·146
Self-employed	0·218	0·223	0·292
Unemployed etc	0·175	0·149	0·215
Within-group	0·1594	0·1516	0·1824
Between-group	0·0058	0·0077	0·0097
Overall inequality	0·1652	0·1593	0·1921

inequality indicators for the latter year. Table 3 suggests that *income* inequality rose rather slowly in the first period. It then accelerated in the second period.

There is a rough correspondence between the respective inequality measures for expenditure and income. This correspondence was quite strong in 1993 and 1996, less so in 1999. The fact that the income inequality indices for 1999 are estimates (as distinct from actual values) may play a role here. Furthermore, the fact that in 1999 the gaps between expenditure inequality and income inequality indices were somewhat larger than in 1996 and 1993 may reflect changes in the net saving propensity of households at different levels of income. A consumer credit boom in 1999 may have contributed to inequality being disproportionately larger in terms of expenditures than in incomes. (Consumer loans are extended primarily to households that are reasonably well-off.)

Overall, Tables 2 and 3 indicate that the periods 1993–96 and 1996–99 are qualitatively distinct. In the first period, expenditure inequality decreased, while income inequality rose only moderately. In the second period, inequality rose strongly on both counts.

Unlike the Gini coefficient and the 90/10 and 75/25 percentile ratios, the Theil index can be conveniently (and exactly) decomposed. Decomposition of the Theil expenditure inequality indices for 1993, 1996 and 1999 sheds some light on the evolution of *within-group* and *between-group* inequalities—with various criteria for distinguishing between household groups.

Table 4 indicates that in the first period *within-group* inequality was generally decreasing (rather markedly so for part-time farmers, farmers, pensioners and the unemployed). A quite significant increase in *between-group* inequality was still to be observed, primarily on account of the improvement in the position of employees. In the second period, both components of overall inequality increased sharply. Inequality also rose appreciably for all social groups—except farmers (*within-group* inequality for farmers fell further still).

Decomposing by type of residence (Table 5), we see that in the second period both components of inequality rose sharply, with a major increase in inequality among urban households. Finally, whereas the education level did not have a very strong impact on shifts in inequality in the first period, it had a major impact in the second period (Table 6).

It is worth observing that differences in the level of education have a greater impact on inequality than differences in residence or occupation. The *between-group* inequality indices are highest when households are distinguished in terms of education levels. However, the *between-group* inequality indices based on the level of education seem to have increased less rapidly than the other two *between-group* indices. This may suggest that differences in residence and occupation may take on greater significance in future.

Table 5. *Decomposition of Theil expenditures inequality index into indices for groups distinguished by residence*

	1993	1996	1999
Cities and towns[a]	0·147	0·161	0·202
Small towns	0·155	0·142	0·156
Rural areas	0·180	0·143	0·166
Within-group	0·1592	0·1499	0·1775
Between-group	0·0059	0·0094	0·0146
Overall inequality	0·1652	0·1593	0·1921

Note: [a]With 50,000 or more inhabitants.

Table 6. *Decomposition of Theil expenditures inequality index into indices for groups distinguished by education level*

	1993	1996	1999
University	0·162	0·172	0·188
Secondary	0·137	0·142	0·175
Elementary or below	0·170	0·119	0·136
Within-group	0·1497	0·1416	0·1691
Between-group	0·0155	0·017	0·0231
Overall inequality	0·1652	0·1593	0·1921

2. Poverty

The World Development Report 1999/2000 of the World Bank (p. 237) reported 23·8% of Poland's population to be below the national poverty line in 1993 (with 15·1% living on less than US$2 [at PPP] a day and 6·8% on less than US$1). According to estimates available from the Institute of Labour and Social Studies (ILSS) in Poland, poverty was on the decline in the period 1993–95. Since 1995, however, poverty has been on the rise, especially in 1999 and 2000 (see Table 7).

The 'subsistence level', as defined by the ILSS, may well be considered too generous—or even somewhat arbitrary (see Szulc, 1994). Moreover, the current (monetary) expenditure or income levels may be inaccurate indicators of poverty because they do not reflect non-monetary resources and flows (such as unpaid services provided by owner-occupied residential facilities). None the less, the reversal of inequality trends around 1996 (see Tables 2–5) is consistent with Table 7. Generally, rising inequality implies rising poverty—especially when overall GDP growth is less than spectacular. One might add that unemployment appears to be the major determinant of poverty. According to the ILSS, in 2000 some 20% of the households with one or more unemployed lived on incomes below the official poverty line (and 'only' 5% of the households with no unemployed member). The trends in unemployment rates are broadly consistent with the trends shown in Table 7. (The rate of unemployment in 1993 was 16·4%, falling to 10·3% in 1997—and then bouncing back to 18% by 2002.)

Table 7. *Poverty*

	% of persons in households with expenditure less than 50% of the average	% of persons below ILSS poverty line ('subsistence level')	ILSS poverty line in PPP $ per day (per person in households with two adults)	% of households in poverty (self-evaluation)
1993	12	—	2·60	40
1994	13·5	6·4	3·00	33
1995	12·8	—	3·68	30·8
1996	14	4·3	3·20	30·5
1997	15·3	5·4	3·94	30·8
1998	15·8	5·6	4·18	30·8
1999	15·5	6·9	4·40	34·8
2000	17·1	8·1	4·70	34·4

Source: CSO, ILSS, own calculations.

3. Some factors behind inequality trends: going beyond HBS data

3.1 Functional distribution of income

National-account statistics enable an examination of the changing patterns of *functional* distribution of income. The summary data for 1992, 1995 and 1999 contained in Table 8, however, call for some explanatory comments.

(1) Within the household sector four 'classes' of population are distinguished: (a) farmers, (b) employers and self-employed, (c) employees, and (d) recipients of unearned income. Class (d) includes pensioners, unemployed persons receiving unemployment benefits, etc. Class (b) excludes self-employed farmers. Class (b) is also a heterogeneous 'class', with small-scale vendors lumped together with other occupations, such as lawyers and owners of businesses employing hundreds of workers.[1] Prior to 1995, classes (c) and (d) were also lumped together.

(2) The actual gross primary income of both employers and the self-employed are, in all probability, much higher. Employers and the self-employed can avail themselves of the opportunity to subsume the costs of numerous consumer goods and services (purchase, maintenance and operation of personal cars; travel, telecommunication services; certain domestic durables, etc.) under the operational costs of their businesses. (In so doing, they reduce their personal income tax liability as well as the amount of the corporate tax due. Moreover, purchases of items classified as 'production inputs' are not subject to VAT.) Hence, the actual gross operating surpluses and/or net property incomes of class (b) are much higher than Table 8 indicates.

(3) Net property-related income (which includes rental income, dividends, distributed profits, interest income etc.) has been negative for farmers—on account of the high level of indebtedness (and interest costs) incumbent on that class.

[1] A rapid rise in unemployment since 1997 has weakened the position of employees and trade unions. Encouraged by the legislative changes relaxing the provisions of the labour code, employers have been 'outsourcing' services using their own employees: former regular employees are asked to register as self-employed and perform the same duties as before on the basis of commercial contracts. This new labour market flexibility serves employers well (as they can cut the cost of social security contributions—of course at the expense of employees). At the same, time it magnifies, somewhat arbitrarily, the official figures reported for the self-employed.

Table 8. *Income of the household sector, by class and type of income, 1992, 1995, 1999 (current PLN billion)*

	Total	Farmers	Employers and self-employed	Employees	Pensioners and unemployed
Gross operating surplus					
1992	25·5	5·4	20·1		
1995	81·4	14	67·4		
1999	144·1	14·2	129·9		
Wages					
1992	39			39	
1995	94·4			94·4	
1999	195·3			195·3	
Property income net					
1992	6·3	−0·1	1	5·4	
1995	21·4	−0·4	13·6	5·4	2·8
1999	38·0	−0·9	26·9	7·7	1·6
Gross primary income					
1992	70·8	5·3	21·1	44·4	
1995	197·2	13·6	81	99·8	2·8
1999	377·4	13·3	158·7	203·0	1·6
Taxes on income and wealth minus transfers					
1992	−12·7	0·7	2·5	−15·9	
1995	−23·7	1·5	10·8	10·6	−46·6
1999	−60·1	2	11·4	23	−96·6
Gross disposable income					
1992	83·5	4·6	18·6	60·3	
1995	220·9	12·1	70·2	89·2	49·4
1999	437·5	11·3	148·1	180·0	98·2
Share of net taxes in gross primary income					
1992		0·132	0·118		
1995		0·110	0·133	0·106	
1999		0·150	0·071	0·113	
Shares in total gross disposable income					
1992	1·0	0·055	0·223	0·722	
1995	1·0	0·055	0·318	0·404	0·224
1999	1·0	0·026	0·339	0·411	0·224
Indices of real disposable income					
1995 (1992 = 1)	1·1	1·226	1·1	1·09	
1999 (1995 = 1)	1·198	0·575	1·272	1·215	1·214
Indices of real disposable income per capita (total) and per income-earning member of the class					
1995 (1992 = 1)	1·096	*1·169*	*1·482*		
1999 (1995 = 1)	1·204	*0·549*	*1·131*	*1·192*	
Gross disposable income per income-earning member of the class (income per farmer = 1)					
1992		*1·0*	*7·0*		
1995		*1·0*	*16·5*	*2·9*	
1999		*1·0*	*34·5*	*6·6*	

Notes: For 1992 'Employees' and 'Pensioners & unemployed' are lumped together.—numbers in italics (the last two items) are author's own estimates.

Source: CSO Yearbooks.

Taking the data of Table 8 at face value, one observes the following:

(1) In the first period (1992–95), the share of taxes in gross primary income declined for farmers and increased for employers and the self-employed. In the second period (1995–99), the tax burden eased markedly for employees, and even more so for employers and the self-employed. (In 1999, the gross primary incomes of both classes were taxed at effectively the same rate.) Taxes levied on farmers' income, however, rose very sharply.

(2) The farmers' share in total gross disposable income did not change in the first period, and was then halved in the second. The share of employers and the self-employed in gross disposable income rose sharply in the first period and rather moderately in the second. The employees' share in gross disposable income rose in the second period, while that of pensioners and the unemployed declined in the second period.

(3) In the first period, farmers' *real*[1] gross disposable incomes greatly improved whereas, in the second period, they fell quite dramatically. Moderate improvements in the real value of gross disposable incomes of the remaining 'classes' in the first period were followed by further, much more pronounced improvements in the second period.

(4) The disparities between gross disposable income *per income-earning members* of individual classes have changed. In the second period, the gap between employees and employers and the self-employed narrowed somewhat. In both periods, farmers lost out enormously to employers and the self-employed (as well as to employees).

The most important conclusion to be drawn from Table 8 is that during the first period farmers managed to maintain—and even improve—their living standards. In the second period, however, they suffered heavy losses. Not only did their *relative* standing *vis-à-vis* other social classes deteriorate, but their real incomes also collapsed in absolute terms. Bearing in mind that farmers account for one-quarter of the professionally active population, it can be concluded that in the second period income inequality has risen dramatically overall (and not merely in the sample of individuals covered by HBS).

Why have farmers fared so badly? Arithmetically, the rising burden of taxation and interest charges did not play a major role. Even if farmers' incomes had not been taxed at all in the second period and interest charges had been waived, their real incomes would still have been some 33% lower (1999 over 1995). A direct reason for the farmers' misfortune must be seen in a kind of 'price squeeze' operating against them in the second period (see Table 9).

Foreign trade in agricultural products (excluding trade in products manufactured by the food processing industry) may have had some impact on prices and farmers' incomes. In 1992, foreign trade in agricultural products registered a comparatively large *surplus*,

Table 9. *Price indices for agriculture*

	Sold farm output	Consumer items purchased by farmers	Inputs for farm production purchased	All items purchased by farmers	'Price scissors'
1995 (1992 = 1)	2·31	2·20	2·12	2·14	1·08
1999 (1995 = 1)	1·29	1·63	1·62	1·62	0·77

Source: CSO.

[1] Real gross disposable incomes are calculated using class-specific cost-of-living indices.

equivalent to 4·6% of agricultural output sold. By 1995, however, it was running a *deficit* of 1·5%, followed by a 2·7% deficit in 1999. In both periods, farm produce imports were cheaper than domestic produce. In the first period, the import price index was about 2·2, in the second period 1·22. There was a major change in the profitability of farm produce exports. The export price index was 2·05 for the first period, and 1·01 for the second. Clearly, exchange rate developments (*viz.*, real appreciation, particularly strong after 1995) must have had a major—and negative—impact on output (rising trade deficit), prices and incomes. These developments were undoubtedly reinforced by the liberalisation of imports and reduction in export subsidies. Overall, liberalisation may well have compounded the farmers' losses (something that perhaps would have been inevitable given global market developments, the low elasticity of domestic demand for food and the atomistic structure of farming).

3.2 Inequality in wages across the NACE sections

Table 10 contains data on average wages—relative to the national averages—in various sectors over the 1992–99 period.[1] The data suggest the following tentative conclusions:

(a) Some services sectors pay consistently low wages. Others pay consistently high wages. In both instances, there is no shift in the relative wage patterns.
(b) Two groups lose out: construction workers and health service employees. Health service employees may be losing out primarily because of the ongoing reform ('down-sizing') of the public health system, while construction sector workers are certainly the indirect victims of high interest rates which have been depressing the demand for credit and housing throughout.
(c) Manufacturing employees enjoyed some measure of gain in both periods—miners gained in the first period, yet lost out resoundingly in the second.

The last two columns of Table 10 report Gini coefficients for wages in individual NACE sections in 1995 and 1997[2] (and the Gini coefficients for wages in the entire economy in 1992, 1995 and 1999). As can be seen, inequality rose sharply in 1995–97 in terms of wages earned in the economy overall, as well as in almost all sectors. Only in the *Hotels & restaurants* sector did the Gini coefficient decline sharply (and slightly in the *Health & social work* sector). This may be linked with the fact that the average wage is very low in both of these sectors. Otherwise, the ongoing privatisation process may have been an important economic factor in inducing a rise in wage inequality. In 1992, average wages in the private sector were some 3% lower than those paid in the public sector. In 1995, that differential increased to 10%; in 1999 to 13·3%. At the same time, wage inequality in the private sector is higher and rising more rapidly than in the public sector. In 1992, the Gini coefficient for wages in the private sector was 0·286, in the public sector 0·237. In 1995, the respective coefficients were 0·32 and 0·27; in 1997 0·344 and 0·271.

The lower part of Table 10 reports data on some other non-wage incomes. Here the message is crystal clear: in recent years social policy has undergone radical change. In relation to average wages, average pension and unemployment benefits are becoming quite low. The very generous unemployment benefits and pension systems of the early 1990s had a purpose. They were intended to 'sweeten' the transition to capitalism and soften workers' opposition to privatisation (which usually implied massive labour cuts forcing workers to

[1] The wages in question are paid to persons employed on a regular 'contractual' basis (incomes earned by casual and 'outsourced' workers, working owners, farmers etc. are not counted here).
[2] These coefficients are taken from Borkowska (1999).

Table 10. *Wages by sectors, and social benefits as share of average gross wage*

	Wages												Gini coefficients		
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	1992	1995	1997
Agriculture and forestry	.	.	0·83	0·83	0·82	0·90	0·92	0·91	0·93	0·92	0·91			0·235	0·309
Mining and quarrying	.	.	1·64	1·75	1·99	1·93	1·92	1·84	1·83	1·74	1·68			0·253	0·291
Manufacturing	.	.	0·92	0·93	0·94	0·95	0·95	0·95	0·94	0·96	0·94			0·276	0·293
Electricity, gas, water supply	.	.	1·30	1·42	1·50	1·46	1·44	1·39	1·37	1·35	1·34			0·248	0·257
Construction	.	.	1·02	0·94	0·88	0·87	0·87	0·90	0·92	0·92	0·93			0·277	0·296
Wholesale, retail trade, repair motor veh.	.	.	0·89	0·83	0·83	0·83	0·82	0·84	0·84	0·87	0·87			0·320	0·337
Hotels and restaurants	.	.	0·73	0·67	0·70	0·71	0·69	0·72	0·73	0·73	0·73			0·338	0·310
Transport, storage, telecommunications	.	.	1·05	1·06	1·06	1·05	1·05	1·06	1·09	1·11	1·12			0·196	0·224
Financial intermediation	.	.	1·50	1·50	1·46	1·45	1·50	1·54	1·60	1·58	1·73			0·307	0·320
Real estate, renting & business activities	.	.	1·12	1·09	1·08	1·07	1·09	1·10	1·09	1·09	1·09			0·305	0·332
Public admin., defence, compuls. soc. sec.	.	.	1·27	1·26	1·21	1·24	1·29	1·28	1·30	1·28	1·26			0·325	0·328
Education	.	.	0·89	0·90	0·87	0·89	0·90	0·92	0·91	0·90	0·95			0·197	0·209
Health and social work	.	.	0·88	0·85	0·82	0·83	0·82	0·82	0·81	0·79	0·77			0·196	0·195
Oth. community, social & personal services	.	.	0·90	0·93	0·94	0·93	0·91	0·92	0·92	1·00	1·00			0·293	0·292
Total													**0·247**	**0·285**	**0·329**
Social benefits															
Monthly pension, average[a]															
Employees, old-age	0·65	0·76	0·73	0·72	0·74	0·74	0·71	0·70	0·68	0·55	0·52				
Individual farmers	0·46	0·45	0·38	0·39	0·43	0·43	0·42	0·42	0·41	0·33	0·31				
Unemployment benefits															
Recipients, 1000 persons, Dec.	892	1703	1312	1396	1422	1548	1225	557	420	554	592	*620*			
Benefits per person per month, Dec.[a]			0·41	0·32	0·33	0·31	0·31	0·33	0·26	0·21	0·19				
Share of unemployed receiving benefits	0·79	0·79	0·52	0·48	0·50	0·59	0·49	0·31	0·23	0·24	0·20	*0·20*			

Note: [a] s share of average gross wage.

face unemployment or take early retirement). As privatisation progresses, that 'generosity' is losing its usefulness. What is remarkable is the drastic drop in the share of recipients of unemployment benefits since 1996. Shifts in social policy and their impact on inequality can also be analysed in the context of indices derived from HBS data. The so-called *Gini income elasticities* for various income sources (wages, social transfers, etc.) were calculated for 1993, 1996 and 1999. It turns out that in 1993 a 1% increase in the social transfer incomes of households (pensions and welfare benefits) would have *reduced* the overall Gini coefficient observed by about 0·003. For 1996 and 1999, the impact would have been 0·006 and 0·007, respectively. The Gini coefficient's enhanced sensitivity to social transfers means that changes in social policy (actual transfers) have indeed contributed to rising inequality.

3.3 Inequality in terms of wages across branches of manufacturing

Overall, the dispersion in average wages across branches of manufacturing (measured by the weighted coefficient of variation) registered no change between 1992 and 1995. By 1999, however, dispersion had increased (see Table 11) as had overall inequality (measured with the Gini coefficient) in wages in the entire manufacturing sector in the second period. Relatively speaking, average wages in 'light industries' (*Food processing, Textiles, Leather & Wood Products*) fell in both periods. Wages in *Chemicals, Paper & Printing* and *Coke & Petroleum Refining* improved their high standing. Employees in two branches, *Electrical & Optical Equipment* and *Transport Equipment*, have been moving up the wage ladder quite consistently.

Table 11. *Average wages across branches of manufacturing*

	Nominal wage				
	1992	1995	1999	Index 1995/92	Index 1999/95
Manufacturing total	1	1	1	2·51	1·98
Food products; beverages and tobacco	1·039	0·944	0·934	2·28	1·96
Textiles and textile products	0·818	0·730	0·667	2·24	1·81
Leather and leather products	0·778	0·730	0·680	2·35	1·85
Wood and wood products	0·888	0·851	0·767	2·40	1·79
Pulp, paper & paper products; publishing & printing	1·207	1·251	1·302	2·60	2·06
Coke, refined petroleum products & nuclear fuel	1·734	2·056	1·915	2·97	1·85
Chemicals, chemical products and man-made fibres	1·125	1·330	1·431	2·97	2·13
Rubber and plastic products	1·050	1·107	1·029	2·64	1·84
Other non-metallic mineral products	0·957	1·005	1·024	2·63	2·02
Basic metals and fabricated metal products	1·105	1·135	1·093	2·58	1·91
Machinery and equipment n.e.c.	0·992	1·009	1·050	2·55	2·06
Electrical and optical equipment	1·009	1·102	1·198	2·74	2·15
Transport equipment	1·039	1·088	1·193	2·63	2·17
Manufacturing n.e.c.	0·917	0·842	0·799	2·30	1·88
Coefficient of variation (weighted)	0·191	0·191	0·22		
Gini coefficient		0·276	0·293		

Certainly, beyond the wage differentials of different branches, a number of factors can be seen to play a role, among them the impact of technology change on the demand for skilled vs unskilled labour, the levels of unionisation and the concentration of production. The highly uneven spatial agglomeration of industrial potential (with the most dynamic branches located in a few highly industrialised areas with relatively low levels of unemployment) may be of some importance too, especially in view of the rather low rate of labour mobility (partly attributable to the unavailability of affordable housing). Light industry, on the other hand, tends to be dispersed throughout the country; they are often located in areas with extremely high rates of unemployment.

It is useful to search for some statistically sound determinants of wage movements across branches. Generally, the correlation coefficients between indices of average wages and most other economically relevant variables are too minor to deserve attention. There is certainly no association between wage rate indices and employment changes. Hence, one does not observe 'workers pricing themselves out of their jobs', or 'saving their jobs by moderating wage claims'. Wage rate indices are not associated with producer price indices (hence no 'wage-price-spirals' seem to operate), just as changes in wages are not correlated with changes in (real) sales. A strong demand for products is not translated into higher wage levels. Some, albeit rather weak, association is to be found between wage rate indices and labour productivity indices. In the first period, the correlation between the labour productivity growth rate (real gross value-added per employee) and the average wage growth rate was 0·31. In the second period, the correlation rose to 0·59. This seems to support the theory that there is a *tendency* to adjust wage growth to productivity growth. Apparently, this tendency has become more pronounced in the second period.

4. Concluding remarks

Any judgement on trends related to inequality must be qualified not only on account of the imperfections of the indicators used to measure inequality, but also because of the limitations inherent in the statistics available. None the less, in the light of the discussion of this paper, the verdict is that inequality, which did not increase perceptibly (or in some instances even fell) over the period 1993–96, went on to rise significantly thereafter. Shifts in inequality have been closely associated with the shifts in farmers' fortunes. Over the period 1996–99, farmers were the main losers, losing out to other social groups in both relative and absolute terms—and very heavily. The unemployed have also suffered heavy relative losses. In general, the position of wage-earners has improved. Wages in most service sectors have not changed much in relation to the overall average wage. Wages paid to miners, construction workers and health-service employees have been on the decline. In manufacturing, wage increases have shown a tendency to be more closely correlated with advances in labour productivity. None the less, wage inequality increased markedly in the second half of the 1990s. Employers and the self-employed fared quite well in both periods—but certainly better in the second half of the 1990s. This can be attributed at least in part to the changes in fiscal policy, which has substantially lowered the rate of progression in personal income taxes.

Downsizing the system of social transfers (pensions, welfare benefits) has contributed to rising inequality. Cuts in public spending, coupled with cuts in taxes on high personal incomes (and cuts in corporate income taxes), have had an unmeasured (and difficult to measure) impact on the living standards of the medium- and low-income social groups.

Both the quality and quantity of public services (education, health and personal security) have sharply deteriorated since 1997.

The question often asked is whether a decrease in inequality disrupts overall growth or whether an increase in inequality reinforces overall growth. Admittedly, these questions are difficult to answer. The Polish experience indicates that the drop in inequality coincided with high growth and the rise in inequality coincided with growth slow-down. The overall rate of growth was much higher in the first period, owing in part to an improvement in external performance. During this time, there was a foreign trade surplus while, in the second period, there was a major deficit. Moreover, growth in the first period did not preclude growth later on. Growth in the second period has proved unsustainable—it first provoked a near-crisis in the current account (in 1999), followed by an economic slowdown and, currently (2001–2002), stagnation coupled with a crisis in public finances.

It would certainly be a gross oversimplification to attribute Poland's success over the first period *solely* to a drop in inequality and the country's current misfortunes *solely* to a subsequent rise in inequality. Yet, to the extent that rising inequality has quite an obvious impact on domestic demand (via differentials in the propensity to save at various income levels) and on the external equilibria (via differentials in the propensity to consume imported commodities), it played an essential role in steering the Polish economy away from a balanced high-growth path. Moreover, in so far as it was consciously engineered,[1] the blame for the rise in inequality must be placed fairly and squarely on changes in fiscal policy, public spending and social transfers.

Bibliography

Borkowska, S. 1999. *Wynagrodzenie godziwe*, Warszawa, ILSS

Keane, M. P. and Prasad, E. S. 2000. 'Inequality, transfers and growth: new evidence from the economic transition in Poland', IMF Working Paper WP/00/17

Keane, M. P. and Prasad, E. S. 2002. Inequality, transfers and growth: new evidence from the economic transition in Poland, *Review of Economics and Statistics*, vol. 84, no. 2

Layard, R. (ed.) 1999. *Tackling Inequality*, London, Macmillan

Milanovic, B. 1999. Explaining the increase in inequality during transition, *The Economics of Transition*, vol.7, no. 2

Podkaminer, L. 1988. Inequality effects of disequilibria in Poland's consumer markets 1965–1986: evidence from the households' budgets, *Research Reports of the Vienna Institute for Comparative Economic Studies*, no. 146

Szulc, A. 1994. Poverty in Poland during the transition period: 1990–1992 evidence, *Statistics in Transition*, vol. 5, 669–82

[1] In actual fact, the rise in income inequality was consciously engineered. Changes in the tax system and the 'downsizing' of public service sectors are *officially* motivated by arguments taken from 'supply-side economics' and naïve monetarism. 'Savings from low incomes are low—and Poland needs high savings' the argument goes, 'because high savings mean high investment'. Hence, 'if a larger share of overall income falls into hands of the affluent, then this is all the better for the country as a whole'.

Analytical notes on the Balassa-Samuelson effect *

LEON PODKAMINER

1. The Balassa-Samuelson effect: intuition and standard formalisation

The intuition underlying the Balassa-Samuelson effect (BSE) is as follows: consider a country producing two goods: tradables and non-tradables. Suppose the wage rate in either sector equals the marginal labour product. Assume that labour is mobile and homogenous; also assume that both sectors pay the same wage rate. Now imagine an increase in the (physical) labour productivity in the tradable sector – for instance, on account of technological change. Then there is a rise in the wage rate in the sector. Due to the 'law of one wage' that is assumed, the wage rate in the non-tradable sector rises as well. This raises costs and hence prices in the latter sector. In effect, a rise in the relative (non-tradable/tradable) price ratio follows.

The BSE can be formalised in many ways. Most of the recent papers referring to the BSE[1] follow, directly of indirectly, the formal-

☐ The Vienna Institute for International Economic Studies (WIIW), Vienna (Austria); e-mail: pod@wsr.ac.at.

* The author is greatly indebted to two anonymous referees for helpful comments and suggestions.

[1] The literature on the BSE is vast. The EconLit bibliographical data bank identifies 49 items (as at the end of April 2002) that mention the Balassa-Samuelson effect in their titles or abstracts. The AltaVista internet search machine lists 244 entries. This is only a fraction of output available from various research institutions, national banks and international organisations featuring the BSE quite prominently. Very recent examples of unlisted texts include a chapter in the 2001 UN *Economic Survey of Europe*. Explicit references to the BSE also appear very frequently in papers and memoranda etc. published in the languages spoken in the countries of Central and Eastern Europe. Of course, many papers rely essentially on the BSE without men-

isation presented in De Gregorio, Giovannini and Wolf (1994) and Froot and Rogoff (1995). That formalisation explicitly makes the following assumptions: *i*) the country in question is small and open to trade and capital flows; *ii*) its internal price for a tradable good is given (the law of one price for the tradable good prevails internationally); *iii*) perfect competition obtains in both sectors; *iv*) both sectors pay the same wage rate; *v*) marginal products of labour equal the wage rate; *vi*) production in either sector is a constant returns-to-scale Cobb-Douglas function of labour and capital; *vii*) the rate of return on capital ('the world interest rate') is the same in both sectors (and equal to its respective marginal productivity) and fixed (i.e. determined by global market conditions). Expressed in symbols, the physical levels of production of tradable and non-tradable goods, Y_t and Y_n, are functions of the 'physical' quantities of labour and capital employed. They are given by

$$Y_t = A L_t^{\alpha} K_t^{(1-\alpha)} \quad \text{and} \quad Y_n = B L_n^{\beta} K_n^{(1-\beta)} \tag{1}$$

where L_t, L_n, K_t and K_n are sectoral levels of labour and capital employment, and A, α, B, β the respective fixed technology parameters.

From the profit maximisation assumption one derives equations linking the money-termed items: wage and capital-rental rates, w and r, with prices p_t and p_n:

$$p_t A \alpha L_t^{(\alpha-1)} K_t^{(1-\alpha)} = w \qquad p_n B \beta L_n^{(\beta-1)} K_n^{(1-\beta)} = w \tag{2}$$

$$p_t A (1-\alpha) L_t^{\alpha} K_t^{-\alpha} = r \qquad p_n B (1-\beta) L_n^{\beta} K_n^{-\beta} = r \tag{3}$$

There is an equivalent (and more convenient[2]) way of representing the links, inherent in equations 2 and 3, between (the logarithms of) w, r, p_t and p_n:

$$\log(p_t) = -\log(A) + \alpha\log(w) + (1-\alpha)\log(r) - \alpha\log(\alpha) + \\ -(1-\alpha)\log(1-\alpha) \tag{4}$$

---

tioning it in their abstracts or key words (see, for example, Richards and Tersman 1996).

[2] Equations 4 and 5 are the so-called unit cost-functions corresponding to the Cobb-Douglas production functions.

$$\log(p_n) = -\log(B) + \beta\log(w) + (1-\beta)\log(r) - \beta\log(\beta) + -(1-\beta)\log(1-\beta) \quad (5)$$

Setting $p_t = 1$, $p_n = p$, and differentiating equations 4 and 5 with respect to time (τ), one obtains

$$0 = -(dA(\tau)/d\tau)/A(\tau) + \alpha\,(dw(\tau)/d\tau)/w(\tau) \quad \text{and} \quad (6)$$

$$(dp(\tau)/d\tau)/p(\tau)) = -(dB(\tau)/d\tau)/B(\tau) + \beta\,(dw(\tau)/d\tau)/w(\tau)) \quad (7)$$

Replacing equation 7 in equation 8 and suppressing τ and $d\tau$ one gets

$$dp/p = (\beta/\alpha)(dA/A) - (dB/B) \quad (8)$$

Equation 8 is interpreted as *the* BSE:[3] *dA/A* is identified with the rate of growth of productivity in the tradable sector; *dB/B* with the rate of growth of productivity in the non-tradable sector. The relative price of the non-tradable good increases with rising *dA/A* (and decreases with rising *dB/B*). If the sectors' labour elasticities are the same ($\alpha = \beta$), the relative price of the non-tradable good rises when $dA/A > dB/B$ (and in particular when $dA/A > 0$ and $dB/B = 0$). If $\alpha < \beta$ (the tradable sector is more capital-intensive), the relative price of the non-tradable good will rise – even at the same rates of productivity growth ($dA/A = dB/B$).

A minor problem arises with equation 8. Arithmetically, equation 8 is approximately correct only for very small increments in *A*, B. The exact equivalent of equation 8 for any finite increments *ΔA* and *ΔB* (with $\Delta A = A(\tau) - A(\tau - 1)$ and $\Delta B = B(\tau) - B(\tau - 1)$) properly derived from equations 4-5, is

$$\Delta p/p = [(1+\Delta A/A)^{(\beta/\alpha)}/(1+\Delta B/B)] - 1 \quad (9)$$

Of course, equation 9 preserves the gist of the BSE argument: the relative price of the non-tradable good remains a rising function of rising productivity in the tradable sector and a diminishing function of rising productivity in the non-tradable sector. *A fortiori*, the relative price of a non-tradable good is a rising function of the differential between labour productivity growth rates (tradable vs. non-tradable

[3] See De Gregorio, Giovannini and Wolf (1994, p. 1228); Froot and Rogoff (1995, p. 1675).

goods). More specifically, $\Delta p/p$ given by 9 equals the growth rate of the relative *average*[4] physical labour productivities:

$$\Delta(v_t/v_n)/(v_t/v_n) = [(1 + \Delta A/A)^{(\beta/\alpha)}/(1 + \Delta B/B)] - 1 \qquad (10)$$

where

$$v_t = A\,[(1-\alpha)A]^{(1-\alpha)/\alpha} \quad \text{and}$$
$$v_n = B\,A^{(1-\beta)/\alpha}\,((1-\beta)\alpha/\beta)^{(1-\beta)}(1-\alpha)^{(1-\alpha)(1-\beta)/\alpha} \qquad (11)$$

The second, and more consequential, problem pertinent to interpreting equation 8 – as well as equation 9 – arises with respect to the treatment of the production-elasticity parameters α and β. Hitherto, these have been assumed to be constant over time. Thus, equations 8 and 9 apply only when technical progress is neutral. When technical progress is non-neutral, α and β will vary over time, possibly together with A and B. In this case neither equation 8 nor equation 9 can capture the associated change in the relative price of the non-tradable good.

The proper analytical formula for determining $\Delta p/p$ as a function of all varying parameters, which can be derived from equation 6, appears rather difficult to handle in analytical terms; however, some properties of $\Delta p/p$ as a function of all parameters can be established numerically. It is of particular interest to see whether a positive association is to be observed between the (properly) calculated $\Delta p/p$ and the growth rate of the relative (tradable vs. non-tradable) *average* labour productivity. It can be shown that no such positive association generally holds. Let us start with specific initial values for the parameters: $A = 1.8$; $B = 2$; $\alpha = 0.3$; $\beta = 0.5$, and the corresponding values for the wage rate and the relative price of non-tradable goods. (The latter two items are determined from equations 4 and 5, with $r = p_t = 1$.) Next, allow some variations in the initial values and (properly) calculate, correspondingly, the new wage rate and the new relative price of the non-tradable goods. Finally, compare the resulting relative price

[4] Although predicated on the marginal products of labour, the BSE ultimately hinges on the link between *average* physical labour productivities and prices. The relative marginal productivity is not allowed to change in the BSE model because by assumption it always equals 1, irrespective of what happens to the technology parameters (see equation 2)

and relative average labour productivity with the initial values. Table 1 summarises these comparisons for five sets of varied parameters.

TABLE 1

RESPONSES TO CHANGES IN THE TECHNOLOGY PARAMETERS

	$A+\Delta A$	$B+\Delta B$	$\alpha+\Delta\alpha$	$\beta+\Delta\beta$	$\Delta p/p$	$\Delta(v_t/v_n)/(v_t/v_n)$	$\Delta MPL/MPL$
1	1.98	2	0.3	0.5	0.172	0.172	0.1
2	1.98	2	0.36	0.5	0.083	-0.098	0.054
3	1.7	2	0.2	0.5	-0.025	0.17	-0.009
4	1.8	2.2	0.25	0.7	-0.066	0.57	0.05
5	1.98	2.5	0.35	0.7	-0.178	-0.013	0.06

As can be seen, in scenario 1 $\Delta p/p = \Delta(v_t/v_n)/(v_t/v_n)$. However, here the production elasticities α and β are kept at their initial levels.[5] In the remaining scenarios $\Delta p/p$ does not equal $\Delta(v_t/v_n)/(v_t/v_n)$. Moreover, in scenarios 2-4 $\Delta p/p$ and $\Delta(v_t/v_n)/(v_t/v_n)$ have *different* signs: here the rise (fall) in the relative price of the non-tradable goods is associated with falling (rising) relative average labour productivity. This is counter to the BSE. Finally, it is worth noting that similarly there is no firm regularity linking the associated growth rate of marginal labour productivity (or the wage rate) to either $\Delta p/p$ or $\Delta(v_t/v_n)/(v_t/v_n)$. A rise in the marginal productivity of labour can be associated with: either a rise in both relative prices and relative average productivity (scenario 1); or a drop in relative average labour productivity and a rise in relative prices (scenario 2); or a rise in relative average labour productivity and a drop in relative prices (scenario 4); or a drop in both relative average labour productivity and relative prices (scenario 5).

Lessons can be drawn from the exercise just performed. In essence, the BSE, as generally understood, need not obtain even in an 'ideal' world. In that world the relative prices of non-tradable goods can change in a way inconsistent with the BSE. Non-neutral technical progress in one (or the other) sector can generate relative price movements that run counter to conventional intuition.

---

[5] Application of the simplified formula 8, which is legitimate in this scenario (because the elasticities remain unchanged in this instance), yields $\Delta p/p = 0.167$.

2. The consequences of non-constant returns to scale

It is rather doubtful whether under other production functions the original BSE would hold generally. It can be shown that it does not generally hold under CES, translog and other commonly considered functions with constant returns to scale. It does not hold when the production function of one sector differs in type from that of the other sector. Basically, as long as there are more than two independently changing technology parameters, it is always possible to have relative rise (or fall) in prices irrespective of the direction in which the relative average labour productivity changes.

For the Cobb-Douglas (and other commonly considered) production functions with non-constant returns to scale, the BSE cannot be derived at all – even if the technology changes are restricted to the efficiency parameters (A and B). Basically, in the absence of constant returns to scale, the marginal rules for determining input prices (and demand for those inputs) are incompatible with the elementary national-account identity that requires equality of *a)* total costs or factor rewards ($wL_i + rK_i$); and *b)* the value of the total product (p_iY_i). Here the ratio $(w^*L_i^* + r^*K_i^*)/p_i^*Y_i^*$ always differs from the unity for the variables/parameters w^*, L_i^*, r^* K_i^*, p_i^*, Y_i^* that satisfy the usual first-order profit maximisation conditions. Moreover, that ratio depends entirely on production elasticities; it is invariant to changes in either the level of the wage rate w or the efficiency parameters A and B.

The existence of a 'surplus' (or 'deficit') of total output over total factor incomes is a logical impossibility – unless one introduces, *ad hoc*, 'the government' or 'the rest of the world'. Alternatively, one may feel obliged to assume that either the marginal rules do not apply or quantity constraints (rationing) impact on the levels of output and/or inputs employed.

The alternative approaches are bound to create problems of their own. This can be illustrated in the following model. Let us assume that firms fail completely to take the rental-rate r into account. Then, their decision making would boil down to the determination of the employment level at which a firm's residual surplus ($pY - wL$) attains its maximum. (In this case, total output always equals the sum of factor incomes.) More specifically, assume that initial production functions are as follows:

$$Y_t = A^0 L_t^{\alpha} \quad \text{and} \quad Y_n = B^0 L_n^{\beta}$$

Assume that the initial wage rate and prices p_t and p_n are fixed. Profit maximisation implies equalisation of the wage rate and marginal labour products:[6]

$$p_t A^0 a L_t^{(\alpha-1)} = w \qquad p_n B^0 \beta L_n^{(\beta-1)} = w$$

The profit-maximising employment levels are

$$L_t = (w/(p_t A^0 \alpha)^{1/(\alpha-1)} \qquad L_n = (w/(p_n B^0 \beta))^{1/(\beta-1)}$$

Suppose one knows that there has been an increment in the efficiency parameter A^0, with the remaining parameters unchanged. What are the consequences for the wage rate (i.e. for the marginal productivity of labour in the tradable sector)? This question cannot be answered, even if one assumes that the price of tradables p_t remains unchanged. There are an infinite number of wage rates satisfying the equation

$$p_t (A^0 + \Delta A^0) \alpha L_t^{(\alpha-1)} = w$$

Each of them corresponds to a different level of employment. Unless one makes additional assumptions (e.g. as to the level of production and hence employment or as to the specific mechanism of wage responses to changes in the *technology parameters*), one cannot say anything about the new wage rate.

To demonstrate the indeterminate character of the model, let us assume there has been no change in any of the technology parameters or in the wage rate levels. With $p_t = 1$ this implies an unchanged level of employment in the tradable sector. Does this imply the constancy of the price of non-tradables p_n? The answer is no. With higher employment in the latter sector (and output), p_n will be higher, with lower employment (and output) it will be lower.[7] Formally, p_n/p_t =

---

[6] On the assumption that α and $\beta < 1$.

[7] This observation suggests that changes in demand patterns, and not the alleged productivity trends, may explain the well-documented tendency of relative price of services (non-tradables) to rise with income level. Since the income elasticity of demand for non-tradables tends to increase with real income levels (and the income elasticity of demand for tradables tends to decline), non-tradables tend to become relatively more expensive as growth continues, more or less irrespective of what happens to the sectoral productivity differentials (see Podkaminer 1999).

$(A^0/B^0)(L_n^{\alpha-1}/L_t^{\beta-1})$; this indicates that in this instance the relative price is a function of the employment structure.

Observe that formally the ratio of physical labour productivities is given here by the following expression:

$$v_t/v_n = (\beta/\alpha)(p_n/p_t)$$

so that arithmetically

$$\Delta(p_n/p_t)/(p_n/p_t) = \Delta(v_t/v_n)/(v_t/v_n)$$

However, it would be erroneous to interpret this as reflecting the BSE. The causation runs here from a change in relative prices to a change in relative productivities, not vice versa.[8]

BSE may hold in a specific model that assumes a linear production function with one production factor (labour) in each sector. Of course, in such a model the wage rates cannot equal marginal productivity. Assume that initially the wage rates are set at levels w_t and w_n. Assume that mark-ups on labour costs in each sector m_t and m_n are such that

$$p_t = a\,w_t(1+m_t) \quad \text{and} \quad p_n = b\,w_n(1+m_n) \tag{12}$$

where *a* and *b* are unit labour requirements. (Average physical labour productivities equal 1/a and 1/b respectively.)

Assuming that the wage rate ratio (w_t/w_n) and the mark-up ratio $(1+m_t)/(1+m_n)$ do not change as the technology parameters *a* and *b* evolve, one arrives at the following form of BSE:

$$\Delta p/p = [(1 + \Delta b/b)/(1 + \Delta a/a)] - 1 \tag{13}$$

Approximately then, $\Delta p/p = \Delta b/b - \Delta a/a$.

Of course, equation 13 holds only because of the assumptions as to the constancy of ratios of wages and mark-ups. If these assumptions are not satisfied, equation 13 need not hold.

---

[8] Physical labour productivities here are given by $v_t = w/(\alpha p_t)$, $v_n = w/(\beta p_n)$.

3. BSE with intermediate consumption

In the real world, the production of tradables requires inputs of non-tradables – and vice versa.[9] Generally, each sector's production function should therefore be defined on three arguments: labour, capital and intermediate inputs from the other sector. If once again production in either sector is a Cobb-Douglas constant returns-to-scale function, six independent parameters determine $\Delta p/p$ and $\Delta(v_t/v_n)/(v_t/v_n)$. As long as only the constants A and B vary, equations 9 and 10 always hold – and the BSE obtains. The BSE breaks down, however, if one (or more) of the four independent elasticities is allowed to change.

In the fixed-proportions model with intermediate consumption of the other sector's output, four independent technology parameters apply. The price equations here are:

$$p_t = (a\, w_t + c\, p_n)(1+ m_t) \quad \text{and} \quad p_n = (b\, w_n + d\, p_t)(1+ m_n) \qquad (14)$$

where c and d are unit requirements for the other sector's intermediate inputs.

An explicit solution to 14 exists (provided $(c\, d)(1+ m_t)(1+ m_n) < 1$) and implies the following formula for the relative price:

$$p_n/p_t = [(1+ m_n)/(1+ m_t)]\,(w_n/w_t)\,[b + a\, d\,(1+ m_t)\,(w_t/w_n)]/ [a + b\, c\,(1+ m_n)\,(w_n/w_t)] \qquad (15)$$

The assumption that changes in the technology parameters leave the ratio of mark-ups unchanged is no longer sufficient to derive any conclusions relating to p_n/p_t. (The right-hand side of equation 15 contains separate $(1 + m_t)$ and $(1 + m_n)$ terms which cannot be expressed as the ratio $(1 + m_t)/(1 + m_n)$.) One can only proceed further when one assumes that mark-ups do not respond to changes in the technology parameters (and that only wage rates possibly do). However, this does not help much. Depending on the initial values of the technology

---

[9] In particular, tradables require heavy doses of inputs from non-tradable sectors, such as retailing, storage and transportation. Conversely, many non-tradables cannot be produced without large inputs of tradables. Medical care, for that matter, is becoming ever more costly not because of exorbitant rises in nurses' wages or a slow rise in surgeons' productivity, but on account of the major inputs of tradable drugs and medical equipment, the prices of which are rising very swiftly.

parameters, equation 15 is complex enough to be capable of producing the $\Delta p/p$ of any sign – even if only *one* of those parameters changes.

4. Growth rates of relative real value-added per worker given intermediate inputs

When conducting empirical research into the link between relative productivities and relative prices, the former have to be defined. Two definitions may be considered: physical (gross) output per employee or real value-added per employee. When there are no intermediate inputs, the growth rates of labour productivity, defined either way, are the same. When there are intermediate inputs, however, this need not be the case. Growth rates of physical labour productivity have the advantage of not requiring the introduction of properly defined price deflators. Nonetheless, one usually opts for the growth rates of value-added per worker, deflated by the corresponding GVA deflators. In this context, the question may well arise whether the heretical conclusions of the preceding paragraph (in which physical labour productivities were considered) may perhaps be more determinate when the analysis is conducted in terms of value-added per worker. A specific example presented below indicates that generally there is no gain in the degree of determination.

Assume the Cobb-Douglas production functions:

$$Y_t = A\, L_t^{\alpha} K_t^{\alpha'} y_n^{(1-\alpha-\alpha')} \quad \text{and} \quad Y_n = B\, L_n^{\beta} K_n^{\beta'} y_t^{(1-\beta-\beta')} \tag{16}$$

where y_n and y_t are quantities of intermediate inputs (from the other sector) used in the production of tradables and non-tradables respectively.

The price equations corresponding to equation 16 are as follows:

$$\log(p_t) = -\log(A) + \alpha \log(w) + \alpha' \log(r) + (1-\alpha-\alpha')\log(p_n) + \\ -\alpha \log(\alpha) - \alpha' \log(\alpha') - (1-\alpha-\alpha')\log(1-\alpha-\alpha')$$

$$\log(p_n) = -\log(B) + \beta \log(w) + \beta' \log(r) + (1-\beta-\beta')\log(p_t) + \\ -\beta \log(\beta) - \beta' \log(\beta') - (1-\beta-\beta')\log(1-\beta-\beta')$$

With $p_t = r = 1$, one arrives at the (rather long, but otherwise uncomplicated) logarithms for the wage rate and p_n. On that basis equations can be formulated for $\Delta p/p$ and the growth rate of the ratio of physical labour productivities $\Delta(v_t/v_n)/(v_t/v_n)$, with v_t and v_n given by

$$\log(v_t) = \log A - (1 - \alpha)\log(\alpha /(\alpha' w)) + (1 - \alpha - \alpha')\log((1 - \alpha - \alpha')/\alpha')$$

$$\log(v_n) = \log B - (1 - \beta)\log(\beta /(\beta' w)) + (1 - \beta - \beta')\log((1 - \beta - \beta')/ \beta')$$

Nominal gross value-added for tradables is defined as $VAM_t = (p_t Y_t - p_n y_n)$ and for non-tradables as $VAM_n = (p_n Y_n - p_t y_t)$. After some protracted manipulations one arrives at the logarithms for nominal GVA per employee:

$$\log(VAM/L)_t = \log(1 - \alpha - \alpha') + \log(v_t)$$

$$\log(VAM/L)_n = \log(1 - \beta - \beta') + \log(v_n) + \log(p_n)$$

Eventually, one can produce a (somewhat complex) expression for the growth rate of the relative nominal GVA labour productivity, i.e.

$$\Delta[(VAM/L)_t /(VAM/L)_n] / [(VAM/L)_t /(VAM/L)_n] = F(\Delta A, \Delta B, \Delta\alpha, \Delta\alpha', \Delta\beta, \Delta\beta')$$

The next step entails determining the GVA deflators. The Laspeyres deflators are given by the following formulae:

$$P_{Lasp,t} = [1 - (1 - \alpha - \alpha')(p + \Delta p)/p]/ (\alpha + \alpha') \quad \text{and}$$
$$P_{Lasp,n} = [(p + \Delta p)p - (1 - \beta - \beta')]/(\beta + \beta')$$

and the Paasche deflators by

$$P_{Paa,t} = (\alpha + \Delta\alpha + \alpha' + \Delta\alpha')/[1 - (p/(p + \Delta p) (1 - \alpha - \Delta\alpha + - \alpha' - \Delta\alpha')], \text{ and}$$
$$P_{Paa,n} = (\beta + \Delta\beta + \beta' + \Delta\beta')/[(p/(p + \Delta p) - (1 - \beta - \Delta\beta - \beta' - \Delta\beta')]$$

Thus equipped with all the necessary formulae, one can now easily demonstrate that no determinate links are to be found between changes in relative price $\Delta p/p$, relative physical labour productivities $\Delta(v_t/v_n)/(v_t/v_n)$ and growth rates of relative real value-added per worker.

Let us assume the following initial values for the parameters: A= 1.8; B = 2, α = 0.3; α' = 0.25; β = 0.3; β' = 0.3. We consider three sets of altered parameters (see Table 2). Two parameters (A, α') are kept the same in all scenarios.

TABLE 2

RESPONSES TO TECHNOLOGY CHANGES IN THE MODEL WITH INTERMEDIATE INPUTS

	ΔB	Δβ	Δβ'	Δα	Δp/p	Δv/v	ΔGVA/ GVA - Lasp.	ΔGVA/ GVA - Paa.	Δw/w
1	0.2	0.03	-0.1	0	-0.046	0.048	0.107	0.095	0.027
2	0	0	0	-0.03	-0.02	0.088	-0.003	-0.005	-0.068
3	0	0.03	0.11	0	0.043	0.148	-0.009	-0.023	0.332

Δv/v is the growth rate of the ratio of physical labour productivities (tradables over non-tradables; ΔGVA/GVA - Lasp. is the growth rate of the ratio of real gross value-added per worker (adjusted using the Laspeyres GVA-deflators); ΔGVA/GVA - Paa. is the growth rate of the ratio of real value-added per worker (adjusted using the Paasche GVA-deflators), Δw/w is the growth rate of wage rate (= growth rate of marginal labour productivity).

As can be seen, Δp/p can move in the same direction as the ratio of real ΔGVA/GVA, no matter which deflator is applied.[10] This occurs in scenario 2. In the two remaining scenarios, the opposite outcome obtains. It is worth noting that the three scenarios differ in that each of them has one of the three items of interest (Δp/p, Δv/v, ΔGVA/GVA) moving in the opposite direction to the other two.

5. Additional qualifications and concluding remarks

On closer examination, it transpires that the intuition underlying the BSE is wrong: even in idealised models with highly restrictive features, the BSE need not obtain at all. A proper analysis of conventional models customarily believed to yield the BSE rigorously, in the form of an equation, indicates that changes in the relative prices of non-tradable goods may be totally unrelated to changes in relative productivity levels. Of course, in more realistic models (i.e. those that

[10] Remember that any standard price index can take on values that fall into the ranges given by the values of the Paasche and Laspeyres indices (see e.g. Diewert 1991, pp. 771-73).

do not postulate constant returns to scale or allow for intermediate inputs) there is even less room for determinate results supporting the BSE.

This paper has not entered into many other questionable, though common and tacitly accepted features of the basic model. We have even left aside the fundamental question of the legitimacy of working with the 'surrogate' aggregate production functions based on homogenous 'capital' as their arguments – as if Pasinetti, Joan Robinson *et al.* had never put them to rest. Serious problems arise even if one overlooks this. Perhaps one does not have to waste much space to discussing the empirical (or theoretical) relevance of assumptions on perfect mobility of labour (domestically) and perfect mobility of capital (both domestically and internationally) or those on the 'law of one domestic wage' and the 'law of one capital-rental rate' (obtaining both domestically and internationally). Equally irrelevant and misleading is the concept of one international price for 'tradables'. In actual fact, there is no such thing – if only because every country (with the exception perhaps of some oil-exporting countries) produces different baskets of inordinately heterogeneous commodities that can in principle be exported. Moreover, as documented in numerous statistical studies on so-called 'unit values' (or price indices in exports and imports), even at a very low level of aggregation commodities traded by individual countries tend to have vastly different prices.

Perhaps the most striking feature of the BSE-type models (and of the related econometric studies) is their almost total neglect of foreign trade. These models do not address the issue of trade: this is the consequence of their assuming the homogeneity of tradables. Indeed, if both the home and foreign country produce the same tradable good, what then is the purpose of engaging in exchange? Of course, if there is only one tradable good, then each participant in the 'exchange' would enjoy balanced 'trade'. (In order to have a trade imbalance, one would have to introduce a second tradable item after all: viz. some internationally accepted fiat money, something that has yet to be attempted.) Moreover, if there is no foreign trade, how did the internationally prevailing, single price for 'tradables' ever come into being?

It ought to be noted that the standard BSE model implicitly presumes fixed exchange rates that, of course, do not change in relation to events in the home country. Only on this assumption can one proceed with models in which the internationally prevailing price of tradables and the capital-rental rate are exogenous parameters to

which everything else adapts. This has not deterred people in various follow-up research activities from speculating how, after all, the BSE might relate to exchange rate movements. Much of that research postulates a link between exchange rates and purchasing power parities. Insofar as the gaps between the purchasing power parities and exchange rates are explained by the differences in relative prices of non-tradables, it is useful to study the developments in relative prices. However, the specific convention usually adopted assumes that: *i)* prices of tradables observe the law of one price; *ii)* changes in the prices of tradables in terms of non-tradables are identified with changes in *real* exchange rates. Both assumptions are debatable, if not wrong. Furthermore, of course, the basic maintained hypothesis on the link between productivity and price developments is – as argued above – generally untrue. This, incidentally, has been confirmed by a number of studies which failed to find any statistically robust evidence in favour of the BSE-based hypotheses. However, some studies claim to have found evidence to that effect. In any case, given that the core BSE is itself flawed, the need to put it to the empirical test appears a problematic issue.

In summary, the theory underlying the purported regularity linking trends in relative prices to trends in relative productivities is quite weak. It is all the more deplorable that vast amounts of effort have gone into econometric studies on the estimation of the responses of relative prices to relative productivities. Worse still, serious economic policy debate often refers to the estimates derived from those studies that border on the spurious. For example, the BSE plays a prominent role in considerations of the exchange rate and anti-inflation policies pursued by the countries of Central and Eastern Europe aspiring to EU membership (and in debates on the timing of the switch to euro).[11] In these considerations, the BSE serves several purposes. First, by drawing on the BSE, the much higher inflation rate in the applicant countries compared to the EU can be portrayed as an 'equilibrium adjustment' to relative productivity (tradables over non-tradables) which has risen more rapidly than in the EU. Secondly, the BSE is invoked to rationalise the trend towards real appreciation being sustained over quite long time-periods in most countries in Central and Eastern Europe. However, there is no rigorous argument linking higher inflation or the trend towards real appreciation to

[11] See e.g. Buiter and Grafe (2002).

the core BSE theory – be its assumptions satisfied in practice or not. In the ultimate analysis, the BSE is all about the dynamics of *relative* prices – and not about the evolution of price *levels*. Similarly, as already mentioned, there is no rigorous way of tying the evolution of real exchange rates to that of domestic relative prices. First and foremost, the study of inflation and the trend towards real appreciation requires a better understanding of both the monetary policies pursued in the transition countries and the impact of the freer movements of capital.

This preoccupation with possible Balassa-Samuelson effects obscures the real issues that the transition countries face, such as the propensity to run unsustainable trade deficits. Ironically, this propensity – which does not seem to have much to do with the shifts in *internal* relative prices – suggests that despite high growth rates in labour productivity in the tradable sectors, the transition countries are not improving their competitive position *vis-à-vis* the EU.

REFERENCES

BUITER, W.H. and C. GRAFE (2002), "Anchor, float or abandon ship: exchange rate regimes for accession countries", *Banca Nazionale del Lavoro Quarterly Review*, vol. 55, no. 221, pp. 111-42.

DE GREGORIO, J., A. GIOVANNINI and H.C. WOLF (1994), "International evidence on tradables and non-tradables inflation", *European Economic Review*, vol. 38, no. 6, pp. 1225-44.

DIEWERT, W.E. (1991), "The index numbers", in J. Eatwell, M. Milgate and P. Newman eds, *The New Palgrave*, vol. 2, Macmillan, London and Basingstoke, pp. 767-80.

FROOT, K.A. and K. ROGOFF (1995), "Perspectives on PPP and long-run exchange rates", in G.M. Grossman and K. Rogoff eds, *Handbook of International Economics*, vol. III, Elsevier, New York, pp. 1648-88.

PODKAMINER, L. (1999), "Non-tradable goods and deviations between purchasing power parities and exchange rates: evidence from the 1990 European Comparison Project", in H. Gabrisch and R. Pohl eds, *EU Enlargement and Macroeconomic Effects in Eastern Europe. Currencies, Prices, Investment and Competitiveness*, Macmillan, London and Basingstoke, pp. 62-93.

RICHARDS, A.J. and G. TERSMAN (1996), "Growth, non-tradables and price convergence in the Baltics", *Journal of Comparative Economics*, vol. 23, no. 2, pp. 121-45.

UNO (2001), "Economic transformation and real exchange rates in the 2000s: the Balassa-Samuelson connection", in *Economic Survey of Europe*, vol. 1, United Nations, Geneva and New York, pp. 227-39.

Short list of the most recent wiiw publications (as of November 2003)

For current updates and summaries see also wiiw's website at www.wiiw.ac.at

A Note on the Evolution of Inequality in Poland, 1992-99
(reprinted from *Cambridge Journal of Economics*, Vol. 27, No. 5, 2003, pp. 755-768, by permission of Cambridge Political Economy Society)

Analytical Notes on the Balassa-Samuelson Effect
(reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 226, 2003, pp. 207-221, by permission of Banca Nazionale del Lavoro)
by Leon Podkaminer
wiiw Research Reports, No. 301, November 2003
29 pages including 13 Tables, EUR 8.00

EU Enlargement: Growth, Competitiveness and Some Challenges Facing the Future Member States
by Peter Havlik
wiiw Current Analyses and Country Profiles, No. 20, November 2003
22 pages including 8 Tables and 6 Figures, EUR 30.00 (PDF: 28.00)

Countries in Transition 2003: wiiw Handbook of Statistics
covers twelve transition countries (Bulgaria, Croatia, Czech Republic, Hungary, Poland, Macedonia, Romania, Russia, Serbia and Montenegro, Slovakia, Slovenia, Ukraine), 1990 to August 2003
wiiw, Vienna, November 2003
556 pages including 416 Tables and Figures, EUR 90.00 (ISBN 3-85209-008-3)

The Vienna Institute Monthly Report 11/03
edited by Leon Podkaminer

- Bulgaria: growing economy, widening external deficit
- Romania: becoming attractive for investors
- Croatia: worsening external imbalances
- Macedonia: growth returns
- Serbia and Montenegro: investments and elections
- Ukraine: fast-growing economy, end-game for Kuchma
- Overview developments in 2001-2002 and forecast for 2003-2004
- Selected monthly data on the economic situation in ten transition countries, 2002 to 2003
- Guide to wiiw statistical services on Central and Eastern Europe, Russia and Ukraine

wiiw, November 2003
27 pages including 16 Tables
(exclusively for subscribers to the wiiw Service Package)

Structural Change, Convergence and Specialization in the EU Accession Countries
by Michael Landesmann
Industrial Development
by Peter Havlik and Waltraut Urban
Structural Patterns of East-West European Integration
by Michael Landesmann and Robert Stehrer
wiiw Structural Report 2003 on Central and Eastern Europe, Volume 1, October 2003
121 pages including 28 Tables and 39 Figures, EUR 90.00

Labour Market Trends
by Hermine Vidovic
Structural Development of Manufacturing FDI
by Gábor Hunya

Technological Activity
by Mark Knell
Regional GDP and Regional Unemployment
by Roman Römisch
wiiw Structural Report 2003 on Central and Eastern Europe, Volume 2, October 2003
113 pages including 48 Tables, 13 Figures and 4 Maps, EUR 90.00

Low-quality Trap or Quality Upgrading
by Uwe Dulleck, Neil Foster, Robert Stehrer and Julia Wörz
Structural Characteristics of Agriculture and the Food Industry
by Doris Hanzl-Weiss, Zdenek Lukas and Josef Pöschl
Structural Change: a Comparison of Three Manufacturing Sectors
by Doris Hanzl-Weiss
wiiw Structural Report 2003 on Central and Eastern Europe, Volume 3, October 2003,
113 pages including 52 Tables, 22 Figures and 1 Map, EUR 90.00

The Vienna Institute Monthly Report 10/03
edited by Leon Podkaminer

- Czech Republic: slow growth, a sign of strength?
- Hungary: getting out of the deficit trap?
- Poland: strong exports, continuing fiscal disarray
- Russian Federation: growth picking up strongly
- Slovakia: exports fuel high GDP growth
- Slovenia: GDP growth is slowing down
- Selected monthly data on the economic situation in ten transition countries, 2002 to 2003
- Guide to wiiw statistical services on Central and Eastern Europe, Russia and Ukraine

wiiw, October 2003
27 pages including 16 Tables
(exclusively for subscribers to the wiiw Service Package)

Regional Issues, Banking Reform and Related Credit Risk in Russia
by Vasily Astrov
wiiw Research Reports, No. 300, September 2003
71 pages including 15 Tables, EUR 60.00

The Vienna Institute Monthly Report 8-9/03
edited by Leon Podkaminer

- The dark side of the Balkans (the shadow economy in Southeastern Europe)
- Are CEECs trapped in low-quality export specialization?
- Do interest rate differentials determine the movements in the zloty-euro exchange rate?
- Selected monthly data on the economic situation in ten transition countries, 2002 to 2003
- Guide to wiiw statistical services on Central and Eastern Europe, Russia and Ukraine

wiiw, August/September 2003
33 pages including 21 Tables and 5 Figures
(exclusively for subscribers to the wiiw Service Package)

Consequences of EU Accession: Economic Effects on CEECs
by Michael Landesmann and Sándor Richter
wiiw Research Reports, No. 299, August 2003
39 pages including 3 Tables and 7 Figures, EUR 22.00 (PDF: EUR 20.00)

Booming Chinese Economy Overshadowed by SARS
by Waltraut Urban
wiiw China Report, No. 1/03, August 2003
10 pages including 1 Table, EUR 18.00

From Accession to Cohesion: Ireland, Greece, Portugal and Spain and Lessons for the Next Accession

by Kazimierz Laski and Roman Römisch

wiiw Research Reports, No. 298, July 2003
74 pages including 19 Tables and 40 Figures, EUR 22.00 (PDF: EUR 20.00)

Serbia and Montenegro: Transition with Organized Crime

by Vladimir Gligorov

wiiw Current Analyses and Country Profiles, No. 19, July 2003
44 pages including 4 Tables and 7 Figures, EUR 70 (PDF: EUR 65.00)

Transition Countries in 2003: Reforms and Restructuring Keep Global Economic Slowdown at Bay

by Peter Havlik et al.

wiiw Research Reports, No. 297 (Special issue on the transition economies), July 2003
94 pages including 29 Tables and 21 Figures, EUR 70.00 (PDF: EUR 65.00)

The Vienna Institute Monthly Report 7/03

edited by Leon Podkaminer

- Trade structure and convergence: a comparison of CEECs to different world regions
- The weak dollar and its repercussions on Central and Eastern Europe
- Conference Report: 'WTO Round: Basic Issues'
- Selected monthly data on the economic situation in ten transition countries, 2002 to 2003
- Guide to wiiw statistical services on Central and Eastern Europe, Russia and Ukraine

wiiw, July 2003
27 pages including 14 Tables
(exclusively for subscribers to the wiiw Service Package)

Internationale Konjunkturflaute stellt Wirtschaft der MOEL auf die Probe

by Josef Pöschl

wiiw Research Papers in German language, June 2003
(Reprint from: WIFO-Monatsberichte, Vol. 76, No. 5, May 2003)
21 pages including 11 Tables and 8 Figures, EUR 8.00 (PDF: free download from wiiw's website)

Prospects for further (South-) Eastern EU enlargement: from divergence to convergence?

by Vladimir Gligorov, Mario Holzner and Michael Landesmann

wiiw Research Reports, No. 296, June 2003
39 pages including 11 Tables and 16 Figures, EUR 22.00 (PDF: EUR 20.00)

Patterns of Trade Specialization and Economic Growth

by Julia Wörz

wiiw Research Reports, No. 295, May 2003
67 pages including 14 Tables and 10 Figures, EUR 22.00 (PDF: EUR 20.00)

The Vienna Institute Monthly Report 5/03

edited by Leon Podkaminer

- Transfers in the enlarged European Union after 2006
- Structural change in Poland's labour productivity
- Regional growth poles in the CEE countries
- Selected monthly data on the economic situation in ten transition countries, 2001 to 2003
- Guide to wiiw statistical services on Central and Eastern Europe, Russia and Ukraine

wiiw, May 2003
35 pages including 32 Tables and 3 Figures
(exclusively for subscribers to the wiiw Service Package)

wiiw Service Package

The Vienna Institute offers to firms and institutions interested in unbiased and up-to-date information on Central and East European markets a package of exclusive services and preferential access to its publications and research findings, on the basis of a subscription at an annual fee of EUR 2,000.

This subscription fee entitles to the following package of **Special Services**:

– A free invitation to the Vienna Institute's **Spring Seminar**, a whole-day event at the end of March, devoted to compelling topics in the economic transformation of the Central and East European region (for subscribers to the wiiw Service Package only).

– Copies of, or online access to, ***The Vienna Institute Monthly Report***, a periodical consisting of timely articles summarizing and interpreting the latest economic developments in Central and Eastern Europe and the former Soviet Union. The statistical annex to each *Monthly Report* contains tables of the latest monthly country data. This periodical is not for sale, it can only be obtained in the framework of the wiiw Service Package.

– Free copies of the Institute's ***Research Reports*** (including ***Reprints***), ***Analytical Forecasts*** and ***Current Analyses and Country Profiles***

– A free copy of the **wiiw Handbook of Statistics, *Countries in Transition*** (published in October/November each year and containing more than 200 tables and 100 figures on the economies of Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia, Russia and Ukraine)

– Free online access to the **wiiw Monthly Database**, containing more than 1000 leading indicators monitoring the latest key economic developments in ten Central and East European countries.

– **Consulting**. The Vienna Institute is pleased to advise subscribers on questions concerning the East European economies or East-West economic relations if the required background research has already been undertaken by the Institute. We regret we have to charge extra for *ad hoc* research.

– Free access to the Institute's specialized economics library and documentation facilities.

Subscribers who wish to purchase wiiw data sets **on diskette** or special publications not included in the wiiw Service Package are granted considerable **price reductions**.

For detailed information about the wiiw Service Package
please visit wiiw's website at www.wiiw.ac.at

To
The Vienna Institute
for International Economic Studies
Oppolzergasse 6
A-1010 Vienna

- ○ Please forward more detailed information about the Vienna Institute's Service Package
- ○ Please forward a complete list of the Vienna Institute's publications to the following address

Please enter me for

- ○ 1 yearly subscription of *Research Reports* (including *Reprints*)
  at a price of EUR 225.00 (within Austria), EUR 250.00 (Europe) and EUR 265.00 (overseas) respectively

Please forward

- ○ the following issue of *Research Reports* .....
- ○ the following issue of *Analytical Forecasts* .....
- ○ the following issue of *Current Analyses and Country Profiles* .....
- ○ the following issue of *Working Papers* .....
- ○ the following issue of *Research Papers in German language* .....
- ○ the following issue of *China Reports* .....
- ○ the following issue of *Industry Studies* .....
- ○ the following issue of *Structural Reports* .....
- ○ the following issue of *wiiw-wifo Data on Foreign Direct Investment* .....
- ○ the following issue of *COUNTRIES IN TRANSITION: wiiw Handbook of Statistics* .....

.....

Name

.....

Address

.....

Telephone Fax e-mail

....

Date Signature

Herausgeber, Verleger, Eigentümer und Hersteller:
Verein "Wiener Institut für Internationale Wirtschaftsvergleiche" (wiiw),
Wien 1, Oppolzergasse 6
Postanschrift: A-1010 Wien, Oppolzergasse 6, Tel: [431] 533 66 10, Telefax: [431] 533 66 10 50
Internet Homepage: www.wiiw.ac.at

P.b.b. Verlagspostamt 1010 Wien