No. 73

JAN ZÁPAL

Judging the Sustainability of Czech Public Finances

2005

Judging the Sustainability of Czech Public Finances
JAN ZÁPAL[1] [2]

Abstract

The position of Czech public finances has been pronounced unsustainable by economists, whereas Czech politicians claim the opposite. Concise analysis is complicated by the purposeful use of data by both these camps, by the different methodologies used to collect the data, and, above all, by the fact that there is no precise benchmark for measuring sustainability.

This paper endeavors to work through such complications. It attempts to shed light on the sustainability of Czech public finances, presenting Czech public finances in an international context using comparable, same-methodology-based data, as well as taking different approaches and angles from which the public sector can be viewed. The analysis suggests that economists' concerns about the future development of Czech public finances are indeed legitimate.

Keywords: budget process, deficit bias, factor analysis, fiscal illusion, open-ended expenditures, public finances, sustainability index.

JEL codes: C10, D70, E62, H11, H61, H62

Budgets cannot be left adrift in the sea of democratic politics. They must be constructed within constraints that impose external form and coherence on the particular decisions about size and distribution which an annual budget reflects.

James M. Buchanan, Richard E. Wagner

Democracy in Deficit: The Political Legacy of Lord Keynes

1. Introduction

The recent accession of the Czech Republic to the European Union (EU), along with the country's prospective euro adoption, after which the Czech Republic will be obliged to comply with the requirements of the EU's stability and growth pact (SGP), raises concerns among economists and politicians alike about the long-term sustainability of Czech public finances.

An assessment of the situation is complicated by at least four factors. First, since politicians are much less concerned with public finance, they tend to derogate the arguments of economists. Even more, since politicians are accountable for sustainability, or lack thereof, they tend to use facts selectively, and independent analysis is difficult.

Second, quite the opposite applies for economists who, ever concerned with public finances, and often with the keen assistance of sensation-searching journalists, sometimes fashion the direst statistical data.

Third, analysis is complicated by use of different statistical methodologies. While European System of National and Regional Accounts (ESA 95) methodology is used in the European context, the Czech Statistical Office (CSO) and the Czech Ministry of Finance use the International Monetary Fund's methodology for Government Financial Statistics (GFS). Furthermore, in 2003, the CSO published an exceptional revision of yearly national accounts, which further complicates judgments based on ratios of relevant variables to gross domestic product (GDP). Therefore, besides the usual rattle and hum surrounding the politicians contra economists debate, one has to also establish whether the data employed are based on Czech or European methodology.[3]

---

[3] In order to avoid confusion, this study uses only data based on ESA95 methodology, taken predominantly from Statistical Annex of *European Economy* - Autumn 2004, published by the European Commission, unless otherwise indicated.

Fourth, even if one had relevant, comparable data at hand, it is hard to judge the long-term sustainability of public finances without knowledge of the composition of public expenditures, without knowing if the deficit is the result of short-term measures or long-term trends, or even of what amount of public debt is sustainable, for there is no such benchmark.[4]

In order to make an initial assessment of Czech public finances, one needs only a handful of relevant economic aggregates, which are included in Table 1.

Table 1. Czech General Government Main Aggregates

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Budget deficit	-2.3	-2.2	-3.2	-13.4	-3.1	-2.4	-5.0	-3.6	-3.7	-5.9	-6.8	-12.6	-4.8	-4.7	-4,3
Consolidated gross debt	:	:	:	:	:	12.7	15.0	16.0	18.2	25.3	28.8	37.8	37.8	39.4	40,6
Total expenditure	48.3	67.0	47.5	54.4	42.8	42.4	43.8	42.9	42.1	45.0	46.9	54.5	46.7	46.3	45,8
Total revenue	46.0	45.0	44.3	41.0	39.7	40.0	38.8	39.2	38.5	39.1	40.2	41.9	41.9	41.6	41,5
Budget deficit (based on GFS methodology)	:		:	-0.3	-1.1	-1.4	-0.5	-2.9	-2.3	-0.5	-5.1	-3.9	-3.2		:
Consolidated gross debt (based on GFS methodology)	:		:	12.4	12.2	12.2	13.5	15.5	17.5	18.4	21.7	24.0	25.9		:

Note: In percent of GDP at market prices, based on ESA 95 (except for the bottom two rows). The 2004 values are preliminary, the 2005–06 values are predicted.

While GFS-based data are generally more favorable in accounting Czech public finances, a rising tendency of deficit financing is apparent from the two rows expressing budget deficits. As a result, Czech public debt more than tripled (according to ESA95 methodology) in the period between 1997 and 2004, a period for which reliable data are available. Despite that it does not reach levels experienced by, for example, Belgium (exceeding 100 percent of GDP throughout the 1990s), its dynamic might raise some concerns.

In order to think about deficits (i.e., if they are the result of one-off measures connected with, for example, transition expenses, or if they are result of trend development), it is instructive to look at the medium-term averages expressed in Table 2.

---

[4] See Balassone and Franco (2000) for a survey of concepts and definitions used for assessing fiscal sustainability, and for a discussion of their respective advantages and shortcomings.

Table 2. Six-year Averages, 1995–2000 and 2001–2006 (in percent of GDP)		
Total expenditures	44.7	47.5
Total revenues	39.5	41.0
Note: Based on ESA95 methodology.		

The conclusion one would arrive at based on this table is that growing deficits are not likely to be the result of one-off expenses, rather, they seem to be the result of growing disparity between increasing expenditures of Czech government and rather stable revenues.

On first appearance, Czech public finances seem to have a tendency toward deficit spending. Lawmakers have lately realized this and proposed a set of measures to redress this course.[5]

Will the intended measures be able to solve the problem of mounting deficits? Is the sustainability of Czech public deficits really threatened? Is the development Czech specific, or is it a problem of transitional countries in general? How to measure the sustainability of public finances? What determines the behavior of deficits and debt levels in the European context?

This work hopes to shed some light on those questions. It tries to evaluate Czech public finances in an international context based on comparable (i.e., same methodology) data, if available. As the accession process toward European Monetary Union (EMU) in original EU members during the 1990s may offer a mirror to the contemporary position of new EU members, I examine the fiscal behavior of the prior group during that period.

The paper is structured as follows. In second part, I construct a so-called sustainability index of public finances for the Czech Republic as well as for old and new EU member countries. In the third part, I try to answer the question whether the change of the budget process envisioned in a government reform package will be able to redress Czech public finances and solve the widening deficit problem. The fourth part will try to answer the question whether past Czech fiscal development is given by country-specific or European-wide factors and will attempt to draw conclusions for the future. The fifth part will look at the composition of the Czech government's budget and draw conclusions based on an international comparison, while the sixth part concludes the paper.

---

[5] Measures of reform package, which is popularly known as "Reform of public finances", are described in government's decision no.624/2003 from 23rd June 2003 "About Fiscal Outlook for years 2003 through 2006, Concept of the Public Budget Reforms".

2. Sustainability Index of Public Finances

As von Hagen and Harden (1994) note, assessing sustainability is relatively easy, at least in theory. Imagine each period's t government budget constraint in the form

$$G_t - T_t + i_t B_{t-1} = \Delta B_t + \Delta M_t \qquad (1)$$

where G_t and T_t are government expenditures and revenues in the relevant time period, B_t and M_t are the stocks of government debt and base money at the end of the period t, and i_t is the current interest rate on the public debt. After deflating this expression by nominal GDP (1) becomes

$$d_t + \rho_t b_{t-1} = \Delta b_t \qquad (2)$$

where d_t is the primary government deficit expressed as the ration of GDP, b_t is the debt to GDP ratio, and $\rho_t = i_t - \pi_t - \Delta \ln y_t$ is the real interest rate corrected for real GDP growth.

Expressing this equation for n future periods yields

$$E_t \sigma_{t,n} b_{t+n} = b_t + E_t \sum_{j=1}^{n} \sigma_{t,j} d_{t+j} \qquad (3)$$

where

$$\sigma_{t,k} = \prod_{j=1}^{k} \frac{1}{1+\rho_j} \qquad (4).$$

Here $\sigma_{t,k}$ is a k-periods-ahead discount factor, which can be used to calculate the present value of assets and liabilities in period $t+k$ for period t, and $E_t x_{t+k}$ denotes expectation of x in period $t+k$ given the information available at period t.

Thus, equation (3) expresses the expected present value of government debt in period $t+n$ relative to GDP in that period as a sum of the current-debt-to-GDP ratio and sum of all discounted-deficits-to-GDP ratios between period t and $t+n$. The theoretical requirement for the sustainable position of public finances (or, in other words, in order for an intertemporal budget constraint to be satisfied) is that the left-hand side of equation (3) must be equal to or lower than zero as n grows in size.

However, the practical application of this formula is rather limited. Sustainability requires that government debt cannot grow faster than the growth-adjusted real interest rate on average, but it does not preclude periods of much higher growth of debt, as long as they are counterbalanced by periods of low debt accumulation.

To translate expression (3) into a practically usable form, one may consider intertemporal government budget constraints for limited periods of time and add the condition

that the present value of the debt-to-GDP ratio at the end of this period should not exceed the current one. This implies that public policy during that period can be maintained without adjusting government spending or revenue collection.

To assess the sustainability of Czech public finances, I calculate a measure of sustainability as the difference between the current debt ratio and the discounted debt ratio for a fixed period of time, n^*, using actual data instead of an expected debt ratio and using the *ex post* real interest rate. The measure of sustainability then becomes

$$S_t(n^*) = b_t - \mathrm{E}_t \sigma_{t,t+n^*} b_{t+n^*} \tag{5}$$

where $\sigma_{t,t+n^*}$ is the *ex post* discount factor calculated from actual interest rates, inflation rates, and real GDP growth rates.[6] The second part of the right-hand side in equation (5) expresses the present value of public debt to GDP ratio n^* periods ahead and therefore public policy can be said unsustainable whenever $S_t(n^*) < 0$.

Note that equation (5) includes a trade-off between choosing a longer time horizon (n^* large), which captures the long-term orientation of the concept, and choosing a shorter one (n^* small), which allows one to measure sustainability changes over time. Therefore, for the period for which relevant and internationally comparable data are available (1996–2004 and, based on estimated values, 2005–06), $n^* = 6$ is used. The development of the sustainability index over time for the Czech Republic and Slovakia, as well as for selected EU15 countries, is given in Figure 1.

---

[6] This expression can be further rearranged, using (3), as

$$S_t(n^*) = b_t - \left[b_t + \mathrm{E}_t \sum_{j=1}^{n} \sigma_{t,j} d_{t+j} \right] = -\mathrm{E}_t \sum_{j=1}^{n} \sigma_{t,j} d_{t+j}$$, which offers an alternative

interpretation of the sustainability index as the present value of increment of government debt over a chosen period.

Figure 1. Six-year Sustainability Index
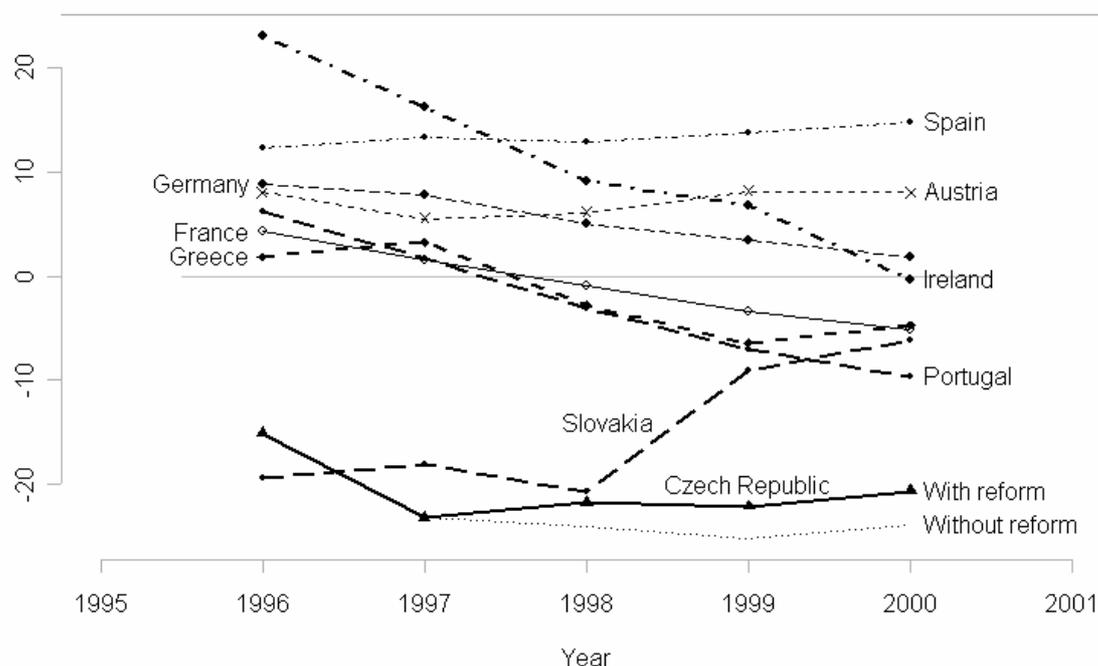
The development of Czech public finances toward unsustainability, especially when compared with neighboring, EU15 member states, is thus evident. Czech public debt develops in a manner even worse than do those of recent SGP transgressors: France, Portugal, and Germany.

To be fair, the measures envisioned in the governmental fiscal-reform commitment can, given full implementation, improve the development of the sustainability index. Assuming full implementation, the reform would indeed heel the development of the debt-to-GDP ratio. Sad to say, even assuming full implementation – which is a lot to assume – what the reform package does not offer is a significant improvement of the sustainability index toward above-zero values.

Table 3 compares the position of Czech public finances in an international context against a six-year sustainability index for the EU25 (excluding Luxembourg due to lack of comparable data).

Table 3. Six-year Sustainability Index, 2000, $S_{2000}(n^* = 6)$											
Czech Republic	Portugal	Cyprus	Poland	Malta	Hungary	Slovakia	Latvia	France	Slovenia	Greece	Estonia
-20.7	-9.6	-8.6	-7.9	-7.2	-7.0	-6.1	-6.0	-5.2	-4.9	-4.7	-0.4
Ireland	Lithuania	Germany	Finland	UK	Sweden	Netherlands	Austria	Spain	Italy	Denmark	Belgium
-0.4	-0.3	1.9	2.6	3.3	5.9	6.9	8.1	14.9	15.6	18.8	26.2

As can be seen, Czech public finances fare poorly in comparison, and this should not be downplayed by the fact that Czech public debt is not as high as the debts of some of these countries. Calculating ordinary and Spearman's correlation indices of presented sustainability index with the estimated debt-to-GDP ratio in 2006 (chosen because it is the "end" year used in the calculation of the sustainability index for 2000) does not reveal any relation between the debt-to-GDP ratio and sustainability index.

Table 4. Correlation between **2000 Sustainability Index and 2006 Debt-to-GDP ratio**	
Standard correlation index	0.23
Spearman's rank correlation index	-0.06

Note: The correlation for twenty-four EU members from Table 3. Critical value for rejection of hypothesis of independence is 0.41.

Therefore, judgment based on the sustainability index affirms the concerns of many economists regarding the future development of deficits and public debt in the Czech Republic, with mandated reform set to solve only half (if that) of the problem.

Czech fiscal reform according to my view based on two key elements. The first consists of reducing public expenditures (cuts in social spending or cuts in public wages, among others). This is in full accord with the conclusions presented, for example, in McDermott and Wescott (1996), that is, that successful fiscal consolidation should be based predominantly on expenditure cuts rather than on greater taxes. The same conclusion follows from the empirical appraisal of fiscal consolidations by the European Commission (2003). Fiscal consolidation is considered more likely to be successful if it is based on expenditure cuts rather than on tax increases, and the more credible it is the higher the probability that it will have so-called non-Keynesian effects.[7] Higher credibility can be achieved, for example, by notable cuts in public wage expenditures, which signals a government's commitment to less public spending, even if it is connected with unpopular measures.

---

[7] Standard Keynesian economic theory (i.e., the IS-LM model) holds economic downturn to be connected with decreased governmental spending. Non-Keynesian effects of fiscal consolidations refer to events when fiscal consolidation leads to increased economic activity.

A second key element consists in revising the budget creation process rules, aiming toward better addressing problems often found in political-economy literature to be connected with decisions of public-funds allocation.[8] The evaluation of this change from the sustainability perspective is dealt with in the next section.

3. Quality of the Budget Process in the Czech Republic

The sustainability or unsustainability of national public finances is ultimately determined by the composition and size of annual budgets as well as by decisions on the way in which public funds are raised, whether through revenues or deficit financing, which are also part of the annual budget. Every budget reflects three important considerations. First, the overall size; in other words, the degree to which government is to be involved in the economic activity of the nation relative to the private sector; second, who will be the beneficiaries of public spending, and what programs shall be financed from public resources, and; third, how will the public resources be raised, who will bear the burden of financing the public budget, and when.

Given that public-funds beneficiaries are typically distinct from those who bear the burden of financing government activities, budget creation can be seen as a process of conflict resolution. Corroborated by two basic facts of the human condition – scarcity and limited altruism – such a conflict of interests is inevitable.

Effective use of public resources (i.e., efficient responses to the above budget considerations) is dictated by at least three conditions. The first efficiency condition requires that the social benefits of public expenditure should be equal to the social costs of raising the resources. The second condition requires that the current social costs and benefits of government spending should be properly weighted against associated future costs and benefits. And the third condition requires that current government spending, taxation, and borrowing is consistent with its intertemporal budget constraint; in other words, that it be sustainable.

The political-economy literature often cites three factors which lead to the inefficient use of public resources:[9] *fiscal illusion*, which refers to the tendency of government to be

---

[8] For a brief but enlightening discussion of the problems connected with decisions regarding the allocation of public funds (i.e., problems often found in the budget-creation process), see von Hagen and Harden (1995).

[9] It must be added that those problems refer only to the supply side of the public-goods market, i.e., to the politicians' side. I do not tackle here the question of inefficiency on the demand side, i.e., I do not consider such questions as why citizens vote for irresponsible politicians repeatedly. Therefore, the terms "fiscal illusion" and

inappropriately involved in national economic activity – it can arise when those who decide which programs will be publicly provided do not fully weigh the social costs of the programs; *deficit bias*, which is caused by a disregarding of the interests of future taxpayers vis-à-vis present-day decisions, which can lead to the excessive deficit financing of public activities, and; *misuse of public funds*, which stems from the principal-agent nature of the political process, and refers to the use of public resources by politicians-agents for private benefits given insufficient control by voters-principals.

Therefore, the nature of budget creation influences the effective use of public funds, a necessary condition for the sustainability of public resources. In general, there are two solutions to the problems outlined. One being the establishment of limits that government would impose on expenditures, annual deficits, debt levels, or tax burdens, and the second being a proper institutional structure of the budget-creation process that would ensure that resulting budgets efficiently address the above-said considerations as efficiently as possible.

To judge the quality of the budget process, it is helpful to divide the process into four stages: (i) draft proposal, (ii) legislative approval, (ii) implementation, and (iv) *ex post* evaluation.

Appropriate institutional structure of the budget process can limit the problems outlined above and help ensure that the resulting budget will be as efficient as possible. At the cabinet level, fiscal illusion can be limited by an assignment of special rights to the finance minister, by a requirement to agree on overall budget parameters at the initial stage of budget creation, by a requirement that budget drafts submitted to parliament itemize all governmental loans to non-government entities and government guaranties, or by requiring spending ministers to propose offsetting measures whenever they require more public funds from the budget.

Desired institutional structure at the parliamentary stage includes initial voting on the overall budget parameters along with a requirement that all subsequent amendments be offsetting (i.e., amendments that result in higher governmental expenditure must either specify which expenditures should be cut instead or how extra funds are to be raised).

Concerning budget execution, the approved budget must be taken as inviolable by the spending ministries. In this respect, proper overseeing and control over public funds, usually by the finance ministry, limits imposed on spending ministries, limited transfer of

---

"deficit bias" are used in the sense of von Hagen and Harden (1992), not in the sense of Buchanan (1968), who uses the terms in reference to fiscal illusion and bias toward deficit on behalf of citizens, i.e., he refers to the demand side of the public-goods market.

expenditures between budget chapters, limited carryover of unused funds into subsequent years or stringent rules for amending the budget during its execution might be helpful.

Ex post budget evaluation should include strict and *ex ante*–specified penalties for non-compliance as well as *ex ante*–specified rules as to whether entities that overspend are to be held accountable for the amounts by which they exceed their budgets.

A provision that should improve the budget process in general (especially the first two stages) is recourse to an overall numerical limit that a government specifies *ex ante* to be applicable over the medium term. Governmental expenditures, deficits, taxation, or public debt, either in a level or a rate-of-growth form, or in a nominal or real expression, could be subject to such a numerical constraint. The more binding this constraint is, the more conducive it can be to the sustainability of public finances.

The governmental reform of public finances in the Czech Republic includes measures that envision the change of the institutional arrangement of the budget process and aim at bringing future budgets closer to the mentioned efficiency requirements. It touches upon several areas. First, it envisions the introduction of medium-term expenditure limits. Every budget law in the future should thus include limits on governmental expenditure in three subsequent years, limits to be followed during cabinet negotiations of the budget in those years, and to be mirrored in subsequent budget drafts submitted to parliament. A second change anticipates greater transparency of budget drafts through more emphasis on government loans to non-governmental entities and through dealing with governmental guarantees. The third change aims at greater transparency and *ex post* control of the budget through a requirement to publish yearly financial reports on all public-funds receivers. Lastly, new rules regarding the practice of carrying forward of unused funds to subsequent years are to be specified.

Are the changes proposed conducive to the sustainability of Czech public finances? In order to answer this question, I construct two indexes of quality of budget process originally used by von Hagen and Harden (1992) based on a professional evaluation of budget process. It is important to specify that this evaluation is based on current practices, not simply on relevant legal norms.[10] High values of either of the index indicates that the budget process should in fact ensure the long-term sustainability of public finances, or should at least be helpful.

---

[10] I used the very same methodology (i.e., the same questions about budget process) as von Hagen and Harden (1992) and the same method for evaluating the answers (for which I must again thank Karel Bakeš from Czech Ministry of Finance) to those questions.

A high *structural index* signals the strong position of the finance minister relative to spending ministries during cabinet budget negotiations, parliamentary process with limited amending possibility and initial voting on overall budget size, limited flexibility of budget implementation, and strict *ex post* control of and the transparency of budget.

A high *constraint index* signals the presence of a medium-term numerical rule on some budget parameter, along with its binding nature, and the strong commitment to it by all agents present in budget process. The values of the two parameters before and after the Czech public-finances reform,[11] along with values for selected European countries taken from the original study of von Hagen and Harden (1992), are included in Table 5.

Table 5. Budget Process Indexes							
	Czech Republic		Belgium	France	Germany	Greece	Denmark
	Before reform	After reform					
Structural index	35.9	34.6	72.5	51.6	25.9	51.6	48.1
Constraint index	21.9	31.6	45.5	46.6	27.9	46.6	35.7
	Ireland	Italy	Portugal	Spain	UK	Spain	Luxembourg
Structural index	27.0	19.7	32.2	30.8	58.4	30.8	35.2
Constraint index	32.0	20.0	19.6	26.8	44.4	26.8	22.2

Note: Values of indexes for the EU12 countries taken from von Hagen and Harden (1992). The EU12 structural index average is 39.9, and the EU12 constraint index average is 31.6.

As expected, changes induced by public-finance reform increased the constraint index through the introduction of medium-term expenditure limits, but other measures present an overall decrease in the structural index.

The von Hagen and Harden study concludes that, based on empirical investigation, a higher value of the structural index leads to a lower debt and deficit level, which is not case with the constraint index.

The experience of the Czech Republic with the preparation of its budget for 2004 bears out this conclusion. Original expenditure limits set by Government's decision (2003a) were eventually adjusted upward by CZK 33 billion by Government's decision (2003b), and yet governmental expenditures in state budget for 2004 exceeded the original expenditure limits by more than CZK 15 billion (i.e., by 1.7 percent of the budget).

Thus, considering whether procedural reform of budget process will help ensure the future sustainability of public finances, and aware that structural index plays an important role

---

[11] All the measures touching the institutional arrangement of the budget process that are part of the Czech reform of public finances has been embodied into the amendment of law, effective since 2005, specifying budget process in the Czech Republic.

in this respect, one has to conclude that the governmental changes will likely not deliver the intended results.

Comparisons of the Czech budget process with those of other European countries' offer little optimism. More specifically, the values of both indexes, irrespective of whether before or after reform, are below the average of the twelve European countries presented in Table 5. One may object to comparing contemporary Czech and decade-old data. But noting that, as regards euro adoption, the EU12 countries in 1992 were in a similar position as the Czech Republic is today makes this comparison more relevant than would be comparison with contemporary data.

The recent experience of most EU countries with compliance with the SGP, when most were forced to adopt some form of national level expenditure ceiling (European Commission 2003), suggests that the budget process at 1992 was not sufficient to meet European fiscal rules.

When one accepts the interpretation that the value of the structural index of the budget process in Czech Republic is insufficient to ensure long-term public-finance sustainability or compliance with European SGP rules, what are the main deficiencies and how can the budget process be improved? The structural index can be decomposed into the four items listed in Table 6 along with their evaluation for Czech Republic.

Table 6. Decomposition of Structural Index for Czech Republic		
Item	Percentage of maximum points attained by Czech Republic	
	Before reform	After reform
Structure of negotiations within government	31.3	31.3
Structure of parliamentary process	50.0	50.0
Informativeness of the budget draft	75.0	75.0
Flexibility of budget execution	24.7	19.2

The decomposition suggests that the budget process can be improved mainly at the cabinet level. The low value of item 1 mirrors the fact that the finance minister of the Czech Republic does not have any special authority over the spending ministries as regards the preparation of the budget. This also reflects the relatively low control of the finance ministry over the execution of the budget and leads to the low value of item 4, both of which were further weakened with legislation permitting the carrying forward of unspent budget funds to subsequent years.

Therefore, possible recommendations how to improve the quality of the budget process essentially duplicates the recommendations of Alesina and Perotti (1996), which state

that increasing the authority of the finance ministry along with adopting so-called closed rules of budget creation (procedural rules which give the authority to set the budget agenda in cabinet stage to the finance minister and which limit the scope for amendments) might help ensure that resulting budgets will be as efficient as possible and will respect sustainability principles for public finances. Alesina and Perotti also recommend measures intended to improve the transparency of budget drafting, which, as is evident from Table 6, does not need to be improved significantly.

4. Development of Czech Public Finances in the European Context

This section considers whether the past development of Czech public finances was affected by country-specific or by European-wide factors and draws relevant conclusions for future development, particularly as regards the behavior of deficits and public debt when subject to SGP rules after euro adoption.

To investigate whether the behavior of budget deficits in Europe is given by country specific or European wide factors, a factor analysis is used.[12] To illustrate this statistical procedure, consider the following model

$$y_{i,t} = \beta_{1,i}x_{1,t} + \beta_{2,i}x_{2,t} + u_{i,t} \tag{6}$$

$$y_{j,t} = \beta_{1,j}x_{1,t} + \beta_{2,j}x_{2,t} + u_{j,t} \tag{7}$$

$$\text{cov}(u_{i,t}; u_{j,t}) = 0$$

where $y_{i,t}$ is country i's budget deficit in year t; $x_{1,t}$ and $x_{2,t}$ are unobservable, underlying shock common to all investigated countries; the coefficients β are country-specific reaction coefficients to those two shocks; and $u_{i,t}$ is country i's specific disturbance term.

If the behavior of deficits is given by country-specific shocks only, $x_{1,t} = x_{2,t} = 0$ and behavior of deficits in the different countries is uncorrelated. If the behavior of deficits is given by unobservable common shock, $u_{i,t} = u_{j,t} = 0$ and differences are given by country-specific β_i's and β_j's.

Factor analysis allows one to estimate the two underlying, unobservable common factors that determine the behavior of deficits, x, country-specific responses to those factors, β, correlation of deficits, y, with the unobservable common factors as well as the overall percentage of the variability of deficits caused by the underlying common factors.

---

[12] For an introduction to factor analysis, see Härdle and Simar (2003).

Figure 2 plots the correlation of deficits of the EU15 with the two most important common factors. Correlation with the first factor is on the horizontal axis, and the correlation with the second factor is on the vertical axis. Available data are from 1990 through 2004, and have been divided in the in year 1999, which represents the first year after the decision was made on which countries were eligible to enter the EMU. Because the correlation ranges from -1 to +1, the position of a country on the unity circle suggests that the behavior of the deficit in a given country is fully explained by the two unobservable factors common to all European countries.[13]

Figure 2. Results of Factor Analysis, EU15
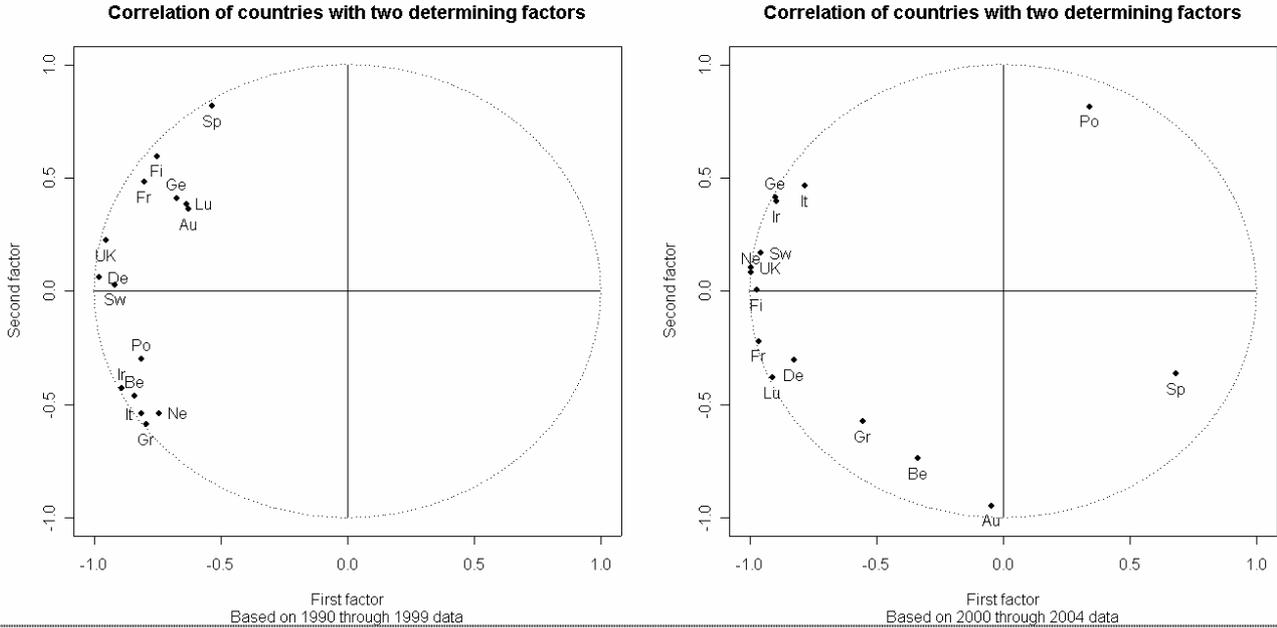
Note: Country abbreviations are as follows: Au - Austria, Be - Belgium, De - Denmark, Ge - Germany, Gr - Greece, Fi - Finland, Fr - France, It - Italy, Ir - Ireland, Lu - Luxembourg, Ne - Netherlands, Po - Portugal, Sp - Spain, Sw - Sweden, UK - United Kingdom.

One conclusion that immediately follows from Figure 2 is that deficit behavior in European countries prior to euro adoption was predominantly determined by one underlying factor. Attractive interpretation is that this factor was perspective of not being eligible to adopt the common European currency. After fulfilling the requirement for eligibility, the EU members seem to spread out again, not perceiving the sanctions of the SGP as truly binding. Note the three groups of countries on the left picture. The first group consists of the United Kingdom, Denmark, and Sweden: the countries that did not need comply with the fiscal rules required for euro adoption. The second group of countries consists (among others) of Belgium, Italy, and Greece: highly indebted countries which were required to cut their debts

---

[13] In other words, if the behaviour of deficits through the given period in all countries was given by purely

and budget deficits toward euro eligibility. Finally, the third group of countries consists (among others) of France, Austria, and Germany: those countries which had to cut their budgets deficits only prior to euro adoption.

Because the present position of new the EU member states today can be seen as a mirror position of the old EU members more than a decade ago with respect to the euro adoption, consider Figure 3, which illustrates the correlation of deficits in new the EU member states for the 2000–2006 period with two underlying factors.[14]

Figure 3. Results of Factor Analysis, EU10

Correlation of countries with two determining factors

First factor
Based on 2000 through 2006 data
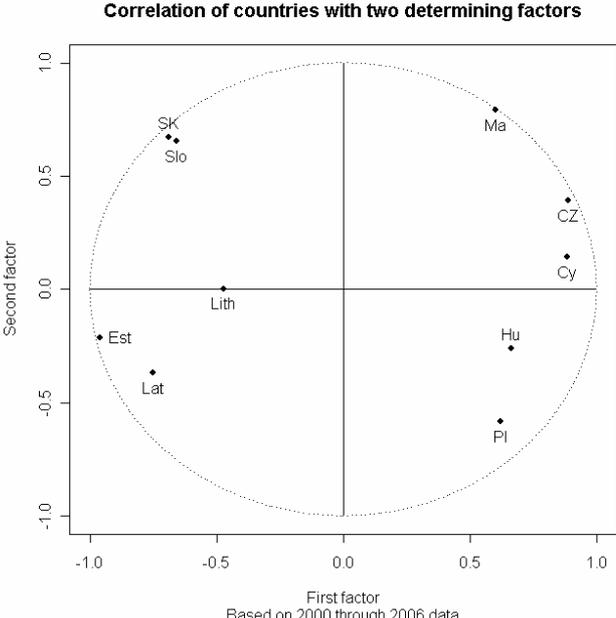
Note: Country abbreviations are as follows: Cy - Cyprus, CZ - Czech Republic, Est - Estonia, Hu - Hungary, Ma - Malta, Lat - Latvia, Lith - Lithuania, Pl - Poland, SK - Slovakia, Slo - Slovenia.

Two conclusions follow: First, the behavior deficits in the new EU member states is chiefly determined by country-specific developments, quite the opposite to that of the original EU member states. Second, despite that the present position of the new EU members vis-à-vis euro adoption is similar to that of the original EU members a decade ago, the new member states seem unaware of this. Their deficit behavior is not united by one underlying factor, as was the case of the original EU members.

What does this imply for the sustainability of Czech public finances? If one accepts that the sustainability of public finances in general is given by the responsible behavior of politicians, the picture above can be seen to illustrate the fact that politicians in the new

---

country-specific factors, all the countries would be located in the middle of the unity circle.

[14] Data for years 2005 and 2006 were taken from convergence programs submitted by each country in order to extend the data sample and are hence estimates.

member states have not yet realized that they should behave more responsibly toward EMU. In other words, they consider the European fiscal rules to be a matter of the future, not, unfortunately, of the present.

The overall picture worsens if one applies factor analysis on both groups of countries simultaneously. Figure 4 addresses the question of whether the one-size-fits-all nature of European fiscal rules is, in fact, appropriate.

Figure 4. Results of Factor Analysis, EU25

Correlation of countries with two determining factors
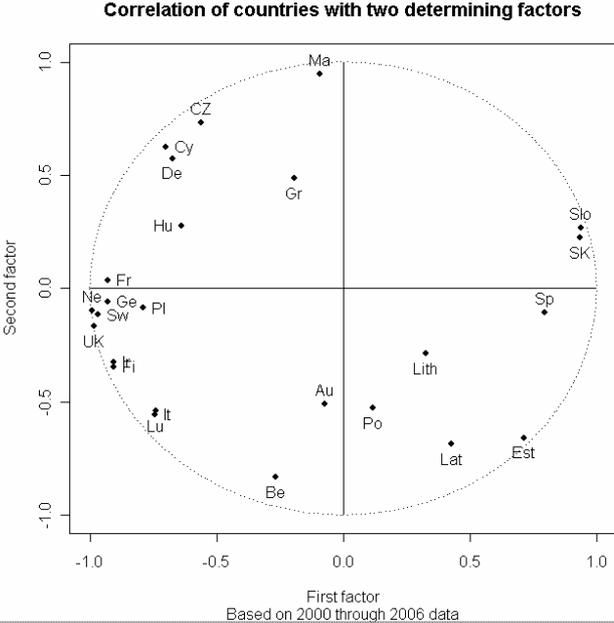
Note: Country abbreviations are the same as for Figures 2 and 3, and data source for 2004 and 2005 are the same as for Figure 3.

Note that deficit behavior of EU members is far from united; therefore, a common European monetary policy might not be appropriate. Policy will likely be determined or influenced mainly by EU countries that are located in the middle-left part of Figure 4. The immediate implication for Czech public finances is that it might not be appropriate since the behavior of budget deficits in the Czech Republic seems to be determined or influenced more by the second than the first unobservable common factor. Nevertheless, the Czech position is still a bit more perspective than the position of countries such as Slovakia or Slovenia, with their deficits behaving oppositely to the deficits of the main group of countries.

Factor analysis can be taken further here. Having estimated the two underlying common factors, one can plug those into the regression model in order to estimate how sensitive the response of a budget deficit in a given country is when it is hit by one of those

factors.[15] In other words, we can estimate the country-specific β_i's and β_j's from equations (6) and (7).

If a country is hit simultaneously by the two underlying factors in the same direction, the deficit rises by the sum of the estimated regression coefficients. If, on the other hand, a country is hit by the two underlying factors in the opposite direction, then the deficit rises by the difference between the estimated regression estimates. Overall, the response of public finances to the underlying common factors can be important, especially once a country is expected to comply with SGP rules. For new EU member states, budget deficits are vital toward fulfilling Maastricht criteria for euro adoption. Table 7 includes the sums and differences of the two regression estimates for new EU member states, expressed as the percentage of the highest value.

Table 7. Response of Budget Deficit Affected by Underlying Common Factors

Factor direction	Cyprus	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Slovenia	Slovakia
Same	21	20	15	34	4	3	19	44	17	100
Opposite	38	100	35	15	14	5	77	10	3	19
Sum	59	120	50	49	18	8	96	54	20	119

Note: The sum/difference of each country's regression estimates as a percentage of the highest sum/difference, based on data for 2000–2006, regression estimates respond to the factor analysis underlying the picture for new EU member states presented above.

Because the factor analysis does not consider whether the two common factors are more likely to be in the same or opposite direction, probably the most revealing facet of Table 7 is the last row, which illustrates that Czech budget deficits are much more volatile (along with deficits in Slovakia) than the deficits of other countries in the sample.

To summarize, I tried to show that the behavior of deficits in the new EU member states is more country specific than the behavior of deficits in the original EU member states ahead of EMU. This can be interpreted as that the governments of the new EU member states still do not perceive common European fiscal rules as constituting an effective threat.

From the perspective of future development, two things stand to threaten Czech public finances. The high volatility of deficits in the Czech Republic should be at least alarming, especially considering that the behavior of Czech deficits is determined by different factors

---

[15] I add for interested readers that R^2 of such a regression model (with intercept) is equal to the distance of a given country on above pictures from the origin and the estimates of regression coefficients are equal to the first two eigen vectors of the correlation matrix of the original data.

that determine the behavior of deficits in the main group of European countries that will probably influence most common monetary policy of the European Central Bank (ECB).

5. Composition of the Budget

The composition of the budget can reveal something about the sustainability of public finances. More specifically, if the larger share of public expenditures consist of items that are not under the direct control of policy-makers, the budget document subsequently becomes a mere list of expenditures and of possible ways how to raise the funds needed to finance them. Its fulfillment than becomes a function of the quality of the predictions of the general economic conditions on which it is based.

From this perspective, state expenditures can be divided into those under the direct control of policy-makers and those which are more or less outside their control, to which the economic literature usually refers to *open-ended* expenditures. Open-endedness refers to the fact that the exact amount of public funds needed to finance an expenditure is unknown at the time the commitment is made.

Three types of government expenditures are usually mentioned in this context: (i) social transfers and social-welfare benefits, expenditures that are usually dependent on the economic cycle and are hard to predict during volatile periods; (ii) government interest payments on public debt, since those payments are given by monetary conditions, and by the composition of government debt and its maturity structure, which cannot be directly influenced by the government; and (iii) the public wage bill, since governments often find it hard to defy pressures for its increases.

While the open-endedness of the first two types is usually given by the fact that they are prescribed by law and by the necessity to meet interest payments, open-endedness of the public wage bill is given by fact that policy-makers usually choose to treat this type of expenditure in such a way. Therefore, open-endedness is more political than economic category.

From the perspective of public-finance sustainability, a high share of open-ended expenditures should be positively correlated with high public debt and/or higher deficits, since the development of both is given more by autonomous trends than by the decisions of politicians. This autonomous trend usually shows through snowballing effects working through the three channels. First, generous social transfers and social-welfare programs imply a high share of beneficiaries, which in turn implies stronger public pressure for greater

generosity. Second, a high level of public debt implies high interest payments, which compounds deficits. Third, a high public wage bill usually stems from the fact that there are excessive public workers, which often extends to their stronger collective pressure for wage increases.

Table 8 depicts the share of open-ended expenditure as a percentage either of GDP or of government expenditure. Because the methodology used by the European Commission differs from the methodology used by the OEC), the table depicts data computed from both sources.

Table 8. Open-ended Expenditures

	Estonia	Ireland	Czech Republic	Slovakia	Latvia	Lithuania	Luxembourg	Spain	United Kingdom	Netherlands	Germany
Percent of GDP, European Commission data, 2004	20	20	21	21	21	22	25	25	26	26	30
Percent of general government expenditure, European Commission data, 2004	52	59	47	58	59	63	56	65	63	57	68
Percent of GDP, OECD data, 2001	:	20	28	:	:	:	27	28	24	33	38
Percent of general government expenditure, OECD data, 2000	:	60	60	44	:	:	:	72	59	73	83

	Hungary	Poland	Austria	Portugal	Finland	Belgium	Italy	France	Greece	Sweden	Denmark
Percent of GDP, European Commission data, 2004	31	31	31	33	33	33	34	35	36	37	38
Percent of general government expenditure, European Commission data, 2004	69	65	66	74	68	72	77	68	81	67	73
Percent of GDP, OECD data, 2001	11	:	38	33	34	40	36	40	34	39	40
Percent of general government expenditure, OECD data, 2000	:	:	73	72	70	80	77	76	73	69	73

Note: Open-ended expenditure is the sum of the public-employee wage bill, social transfers other than in kind, and interest payments on government debt. The countries in the table are ranked by the first row (European Commission data).

Based on the table, Czech public finances do not seem to be directly threatened by their high share of open-ended expenditures. Based on European Commission data, the Czech Republic has the third-lowest share of open-ended expenditure, expressed as a percentage of GDP, in the data sample. But three comments need to be made.

First, countries in the data sample are mostly from the original EU members, countries with much higher per capita GDP; in other words, countries that, in general, can afford to have generous welfare systems or to generously reward public employees.

Second, the Czech Republic is the only of the new EU member states that has not reformed its pay-as-you-go pension system, despite many recommendations otherwise, including from the European Commission (2004a). Therefore, as Bezděk, Dybczak, and Krejdl (2003) note, the impact of future demographic changes on Czech public finances is expected to be considerable, and every postponement of a decision concerning Czech pension reform worsens the situation. (This threat is grave since the expected worsening of Czech public finances stemming from population ageing is likely to be incremental, which implies that future policy makers might be reluctant to introduce difficult reforms).

Third, a high level of public expenditure is often needed in transition countries since they need to invest more than developed countries into infrastructure and related projects. This need is likely to prevail in the near future and will put Czech public finances under great pressure.

Thus, based on the share of open-ended expenditure expressed as a share of GDP in the composition of the general government budget, the position of Czech public finances is not the worst, but it is not encouraging.

6. Conclusion

As noted at the outset, measuring the sustainability of public finances is not an easy task. A basic problem, besides the use of different methodologies, is that there is neither a generally accepted definition of sustainability nor a benchmark for comparative purposes.

Therefore, I tried to put down some arguments about Czech public finances based on comparable data where available and in the widest international context possible.

Previous analysis revealed four facts. First, based on the sustainability index, Czech public finances deteriorated recently at a faster pace than the public finances of other EU member states, and, further, measures envisioned in Czech fiscal reform, even when fully implemented, are not likely to considerably improve this situation.

Second, although the quality of the budget process in the Czech Republic is not exceptionally poor, it is not likely to ensure the fulfillment of European fiscal rules, and recently proposed institutional changes, while well intentioned, will not alter this course.

Third, the behavior of deficits in the European context seems to be generally determined by two underlying common factors. The behavior of deficits in the old EU member states is, from this perspective, more uniform than those in the new EU member states. This suggests that policy-makers in the latter group of countries do not treat European fiscal rules as binding. Furthermore, the monetary policy of the ECB, if determined by the needs of the majority of its members, might not be appropriate for the Czech Republic. Besides this, deficits in the Czech Republic seem to respond more sensitively to the estimated underlying common factors than do deficits in other new EU member states.

Fourth, looking at the sustainability of Czech public finances as regards the composition of the general government budget gives a somewhat more positive picture, which, however, worsens when considering that the Czech Republic is the only country among the new EU members that has not yet reformed its pension system and which is thus more exposed to future demographic changes.

Based on those four facts, I suspect that rising or unreasonably high deficits will be the main problem of future Czech governments and could well complicate the country's adoption of the common European currency. Given that one of the most cited critiques of the SGP is its lack of enforcement, a situation could arise in which first fiscally misbehaving new EU member will punished exceptionally harshly by the European Commission as a means to send a clear signal that European fiscal rules are to be heeded. In other words, the first transgressing new EU member state is likely to make an example of. I hope it is not to be the case of Czech Republic.

7. References

- Alesina, A. and Perotti, R., (1996) "*Fiscal Discipline and the Budget Process*", The American Economic Review, vol.86, no.2, 1996, 401-407.
- Bezděk, V., Dybczak, K. and Krejdl, A., (2003) "*Czech Fiscal Policy: Introductory Analysis*", Czech National Bank working paper, no.7, 2003.
- Balassone, F. and Franco, D., (2000) "*Assessing Fiscal Sustainability: A Review of Methods with a View to EMU*", Proceedings of 'Fiscal Sustainability' conference, Banca d'Italia, 2000, 21-60.
- Buchanan, J.M., (1968) "*The Demand and Supply of Public Goods*", Rand McNally, Chicago, 1968.
- McDermott, C.J. and Wescott, R.F., (1996) "*An Empirical Analysis of Fiscal Adjustments*", IMF working paper, no.59, 1996.
- Härdle, W. and Simar, L., (2003) "*Applied Multivariate Statistical Analysis*", Springer-Verlag Press, Berlin, 2003.
- von Hagen, J. and Harden, I.J., (1992) "*Budgeting Procedures and Fiscal Performance in the European Countries*", Economic Papers, no.96, European Commission, 1992.
- von Hagen, J. and Harden, I.J., (1994) "*National Budget Processes and Fiscal Performance*", European Economy reports and studies, no.3, 1994, 311-419.
- von Hagen, J. and Harden, I.J., (1995) "*Budget Processes and Commitment to Fiscal Discipline*", European Economic Review, vol.39, no.3/4, 1995, 771-779.

- European Commission, (2003) "*Public Finances in EMU 2003*", European Economy reports and studies*, no.3, 2003.
- European Commission (2004a) "*Commission Recommendation on the 2004 update of the Broad Guidelines of the Economic Policies of the Member States and the Community (for the 2003-2005 period)*", Brussels, 2004.

Government's decisions:

- Government's decision no.624/2003 from 23rd of June, 2003, (2003a) "*About Fiscal Outlook for years 2003 through 2006, Concept of the Public Budget Reforms*".
- Government's decision no.984/2003 from 1st of October, 2003, (2003b) "*About Medium-term Outlook of State Budget of Czech Republic for years 2005 and 2006*".

[Government's decision are available at: www.vlada.cz/vlada/cinnostvlady_usneseni.htm]

Data sources:

- European Commission (2004b) "*Statistical Annex of European Economy; Autumn 2004*", Brussels, 2004.
- OECD (2003) "*National Accounts of OECD Countries; Detailed Tables; volume II 1990-2001*", Paris, 2003.
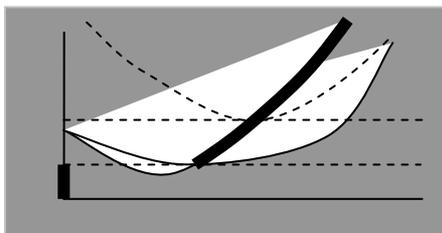
Previously published:

2002:

19. *Vladimír Benáček , Víšek Jan Ámos: Determining Factors of Competitiveness of Trade and Specialization of Czech Industrial Sector before the EU Accession*
20. *Milan Sojka, Postkeynesovská teorie peněz, peněžní a úvěrová politika a postavení centrální banky*
21. *Milan Sojka, Alternativní scénáře transformační strategie československé ekonomiky na počátku 90. let a jejich teoretická východiska*
22. *František Turnovec, Economic Research and Education in the Czech Republic 1989-2000*
23. *Jiří Hlaváček , Michal Hlaváček : Petrohradský paradox*
24. *František Turnovec : Evaluation of National, Political and Institutional Influence in Consultation, Cooperation and Co-decision Procedures of the EU Decision Making*
25. *Karel Půlpán: Rakouský poválečný vývoj*

2003:

26. *Ondřej Schneider : European Pension Systems and the EU Enlargement*
27. *Martin Gregor: Mancur Olson redivivus, „Vzestup a pád národů“ a současné společenské vědy”*
28. *Martin Gregor: Mancur Olson's Addendum to New Keynesianism: Wage Stickiness Explained*
29. *Patrik Nový : Olsonova teorie hospodářského cyklu ve světle empirie: návrh alternativního metodologického přístupu*
30. *Ondřej Schneider: Veřejné rozpočty v ČR v 90. letech 20. století – kořeny krize*
31. *Michal Ježek: Mikroanalýza reformy českého důchodového systému*
32. *Michal Hlaváček: Efektivnost pořízení a předávání informace mezi privátními subjekty s pozitivně-extenalitní vazbou*
33. *Tomáš Richter: Zástavní právo k podniku z pohledu teorie a praxe dluhového financování*
34. *Vladimír Benáček: Rise of an Authentic Private Sector in an Economy of Transition: De Novo Enterprises and their Impact on the Czech Economy*
35. *Tomáš Cahlík, Soňa Pokutová, Ctirad Slavík: Human Capital Mobility*
36. *Tomáš Cahlík, Jakub Sovina: Konvergence a soutěžní výhody ČR*
37. *Ondřej Schneider, Petr Hedbávný: Fiscal Policy: Too Political?*
38. *Jiří Havel: Akcionářská demokracie „Czech made“*
39. *Jiří Hlaváček, Michal Hlaváček: K mikroekonomickému klimatu v ČR na začátku 21.století: kartel prodejců pohonných hmot? (případová studie)*
40. *Karel Janda: Credit Guarantees in a Credit Market with Adverse Selection*
41. *Lubomír Mlčoch: Společné dobro pro ekonomiku: národní, evropské, globální*
42. *Karel Půlpán: Hospodářský vývoj Německa jako inspirace pro Česko*
43. *Milan Sojka: Czech Transformation Strategy and its Economic Consequences: A Case of an Institutional Failure*
44. *Luděk Urban: Lisabonská strategie, její hlavní směry a nástroje.*

2004:

45. *Jiří Hlaváček, Michal Hlaváček: Models of Economically Rational Donators*
46. *Karel Kouba, Ondřej Vychodil, Jitka Roberts: Privatizace bez kapitálu.*
47. *František Turnovec: Economic Research in the Czech Republic: Entering International Academic Marke.t*
48. *František Turnovec, Jacek W. Mercik, Mariusz Mazurkiewicz: Power Indices: Shapley-Shubik or Penrose-Banzhaf?*
49. *Vladimír Benáček: Current Account Developments in Central, Baltic and South-Eastern Europe in the Pre-enlargement Period in 2002-2003*
50. *Vladimír Benáček: External FInancing and FDI in Central, Baltic and South-Eastern Europe during 2002-2003*
51. *Tomáš Cahlík, Soňa Pokutová, Ctirad Slavík: Human Capital Mobility II*

52. *Karel Diviš, Petr Teplý: Informační efektivnost burzovních trhů ve střední Evropě*
53. *František Turnovec: Česká ekonomická věda na mezinárodním akademickém trhu: měření vědeckého kapitálu vysokoškolských a dalších výzkumných pracovišť*
54. *Karel Půlpán: Měnové plánování za reálného socialismu*
55. *Petr Hedbávný, Ondřej Schneider, Jan Zápal: Does the Enlarged European Union Need a Better Fiscal Pact?*
56. *Martin Gregor: Governing Fiscal Commons in the Enlarged European Union.*
57. *Michal Mejstřík: Privatizace, regulace a deregulace utilit v EU a ČR: očekávání a fakta*
58. *Ilona Bažantová: České centrální bankovnictví po vstup České republiky do Evropské unie (právně institucionální pohled)*
59. *Jiří Havel: Dilemata českého dozoru finančních trhů.*
60. *Irena Jindřichovská: Response of Regulatory Bodies to FInancial Crises: Role of Auditors and International Comparison*
61. *Karel Janda: Bankruptcy Procedures with* Ex Post *Moral Hazard*
62. *Ondřej Knot, Ondřej Vychodil: What Drives the Optimal Bankruptcy Law Design*
63. *Jiří Hlaváček, Michal Hlaváček: Models of Economically Rational Donators: Altruism Can Be Cruel*
64. *Aleš Bulíř, Kateřina Šmídková: Would Fast Sailing towards the Euro Be Smooth? What Fundamental Real Exchange Rates Tell Us about Acceding Economies?*
65. *Gabriela Hrubá: Rozložení daňového břemene mezi české domácnosti: přímé daně*
66. *Gabriela Hrubá: Rozložení daňového břemene mezi české domácnosti: nepřímé daně*
67. *Ondřej Schneider, Tomáš Jelínek: Distributive Impact of Czech Social Security and Tax Systems: Dynamics in Early 2000's.*
68. *Ondřej Schneider: Who Pays Taxes and Who Gets Benefits in the Czech Republic.*

   2005:
69. *František Turnovec: New Measure of Voting Power*
70. *František Turnovec:Arithmetic of Propoerty Rights: A Leontief-type Model of Ownership Structures*
71. *Michal Bauer:Theory of the Firm under Uncertainty: Financing, Attitude to Risk and Output Behavior*
72. *Martin Gregor: Tolerable Intolerance: An Evolutionary Model*