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HUNGARY

Selected Issues

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Approved by the European Department

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I. HUNGARY: FISCAL RISKS FROM PUBLIC TRANSPORT ENTERPRISES[1]

A. Introduction

1. **Public enterprises (PEs) may pose significant fiscal risks on account of their quasi-fiscal activities (QFAs) and contingent liabilities.** QFAs can lead to financial difficulties, unless they are adequately and transparently compensated by government budget transfers.[2] Contingent liabilities can arise, for example, when there is political interference or mismanagement leading to excessive borrowing and poor profitability. These liabilities can be explicit, as in the case of guarantees, or implicit, if there is an expectation or precedent that PEs in financial distress will be eventually bailed out by the government.

2. **Good practices in fiscal transparency call for the reporting on all activities of a fiscal nature and their associated risks.** When PEs undertake QFAs, these operations are not captured in the conventional measures of the government fiscal balance, distorting the nature and extent of fiscal activities. This can lead to poor fiscal policy design. It also creates the incentive to move fiscal activities to PEs to make the reported government fiscal balances appear better than they truly are. At a minimum, therefore, the operations of PEs should be systematically monitored and transparently reported to the public. This requires adequate frequency and detail to enable a proper evaluation of fiscal risks.[3]

3. **In 2005, the IMF's Fiscal Affairs Department proposed a framework to assess fiscal risks from PEs and define the appropriate coverage of fiscal indicators.** Quantifying QFAs and contingent liabilities can be methodologically challenging. Thus, identifying in first instance those enterprises that pose the most significant risks becomes important. The Fiscal Affairs Department (FAD) proposed an approach to the treatment of PEs in fiscal indicators and targets, focusing on the fiscal risks posed by the operations of PEs.[4] The ultimate goal of this work is to assist authorities and Fund staff in defining the

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[1] Prepared by Ana Corbacho (FAD).

[2] QFAs may be conducted by financial institutions (e.g., subsidized lending; credit ceilings; exchange rate guarantees), or by nonfinancial public enterprises (e.g., charging less than commercial prices; provision of social services; pricing for budget revenue purposes; paying above commercial prices to suppliers).

[3] For instance, the IMF Manual on Fiscal Transparency recommends that budget documents include statements on QFAs and fiscal risks, and that the consolidated position of the government and nongovernmental public sector agencies that undertake significant QFAs be reported. Similarly, the *2001 Government Finance Statistics Manual* (*GFSM 2001*) recommends the compilation of accrual-based statistics on the operations of PEs and the nonfinancial public sector.

[4] In 2004, FAD conducted several pilot studies to identify "commercially oriented" PEs, which could be considered candidates for exclusion from fiscal targets and indicators. Very few PEs were found to be

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appropriate coverage of indicators and targets for the analysis of fiscal policy. Appropriate coverage is essential to allow an adequate and transparent assessment of the fiscal stance, mitigate incentives to move fiscal activities off budget, and reduce risks that unrecorded liabilities surface unexpectedly.

4. **This paper assesses fiscal risks posed by two key public transport enterprises.** These are the Hungarian State Railways (MAV) and the Budapest Transport Company (BKV). As noted by the IMF Report on Observance of Standards and Codes, Fiscal Transparency Module (fiscal ROSC), these PEs undertake QFAs on behalf of the government, but annual transfers from the budget have been ad hoc and insufficient to cover recurring operating losses. MAV and BKV have, as a result, resorted to borrowing, typically with government guarantees. This has resulted in the accumulation of contingent liabilities for the government. Since PEs are not covered by fiscal indicators and targets that apply to the general government, incentives exist to under-finance QFAs and report a lower headline fiscal balance until the PEs run into financial distress and have to be bailed out. In the past, these bailouts have been treated as "one-off" operations, hampering fiscal transparency and contributing to overshooting of fiscal targets. Against this background, this paper applies FAD's framework to assess fiscal risks posed by MAV and BKV and draws policy lessons for enhancing the transparency, quality, and predictability of fiscal policy in Hungary.

5. **The rest of the paper is organized as follows**. Section B provides a brief overview of the public sector enterprise in Hungary. Section C applies FAD's approach to assess fiscal risks from MAV and BKV. The final section offers some concluding remarks.

B. Overview of the Public Enterprise Sector in Hungary

6. **Key assets remain under government ownership and operation.** Over 85 percent of the economy is in private hands.[5] According to the Privatization Act (Act XXXIX of 1995), assets may remain in long-term state ownership if they belong to a national public utility provider or are considered to be of strategic importance for the national economy or defense. Capital intensive (MAV, BKV, electricity production) and labor intensive (Post) enterprises remain as state property. The Privatization Act also established the Hungarian Privatization and State Holding Company (ÁPV Rt) to oversee the privatization program.[6]

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commercially oriented; but, more importantly, the pilot studies also suggested various changes in the approach to the fiscal coverage of PEs. See IMF (2005) for further details.

[5] See Báger and Kovács (2004) for a survey of privatization in Hungary.

[6] The government recently submitted to Parliament a new Act on State Asset Management, which will set up a new state asset management company. This company will assume the responsibilities currently assigned to the

(continued…)

7. **There is no centralized oversight and management of PEs**. The organization of ownership rights follows a decentralized model.[7] This is regulated by the Privatization Act, which assigns rights and oversight responsibilities between ÁPV Rt and line ministries.[8] PEs under the supervision of ÁPV Rt aim to maintain an arms-length relationship with the government.[9] Dividends and transfers between these PEs and the budget are set in business plans. Arrangements regulating transfers between PEs under line ministries and the budget are not transparent. Dividend and transfer policies have been ad hoc, and QFAs have not been fully compensated for by the government. QFAs are particularly significant in the cases of MAV and BKV, but are also present in the water, post, electricity, and gas sectors.[10]

8. **Consolidated information on the PE sector is not available**. The Hungarian budget covers the state budget sector, including central budget institutions, the health and pension funds, and other funds (e.g., Labor Market Fund; Cultural Fund). For the purpose of reporting on ESA95 basis, and setting targets for the Convergence Program, the state budget sector is consolidated with local government operations and certain central government units outside of the state budget sector.[11] The government does not report on the consolidated position of the PE sector, either in budget documents or within-year reports. Budget documents also lack information on QFAs. And the discussion on fiscal risks is limited to loan guarantees of the central government. To assess the fiscal impulse, the Central Bank of Hungary compiles an augmented measure of the fiscal deficit (the "augmented SNA deficit") that consolidates the general government sector with key QFAs, including those from public transport enterprises.

ÁPV Rt., the Treasury Property Directorate, and the National Land Fund, and will be directed by a national asset management council.

[7] See OECD (2005a) and OECD (2005b) for a survey on ownership function models for PEs.

[8] ÁPV Rt. exercises ownership rights over several important public enterprises, including the long-distance bus company VOLANBUSZ and certain power enterprises. The Ministry of Economy and Transport exercises ownership rights over MAV, the National Road Construction Company, and the State Motorway Company. The Municipality of Budapest is the sole shareholder of BKV. See Appendix 1 for a full list of enterprises under long-term state property as dictated by the Privatization Act.

[9] As part of its asset management duties, ÁPV Rt. defines and approves the enterprises' strategies and business plans, continuously tracks enterprises' financial management and liquidity, has enterprises' annual reports compiled, and decides on dividend payments.

[10] See fiscal ROSC for further details.

[11] These include, for example, ÁPV Rt; the National Road Construction Company; and the State Motorway Company. The budget documents include an appendix that explains the relationship between fiscal targets of the state budget sector and general government consistent with ESA95.

9. **The operations of MAV and BKV are monitored closely by the government, but within-year data are not reported to the public**. The Ministry of Economy and Transport (MET) exercises full ownership rights over MAV, while the Municipality of Budapest (MB) is the sole shareholder of BKV. Recognizing that these enterprises are in a difficult financial situation, their operations are monitored closely by the government. MAV reports to the MET on a monthly basis; and the amounts of capital injections and state guarantees are coordinated and approved by the MET and the Ministry of Finance. BKV also reports to the MB on a monthly basis. Its borrowing plans are approved by the MB, and by the state as well in the case of state-guaranteed loans. These within-year reports are not publicly available, although audited annual reports are.

C. Assessment of Fiscal Risks

10. **This section reviews fiscal risks posed by MAV and BKV.** Given precedents of financial difficulties and contingent liabilities, this section assesses fiscal risks from MAV and BKV against the criteria proposed by FAD. These criteria relate to: (i) managerial independence; (ii) relations with the government; (iii) financial conditions; (iv) governance structure; and (v) other risk factors (Box 1).

Assessment of fiscal risks posed by MAV

11. **MAV does not comply with several of the FAD criteria on fiscal risks.** As described in detail below, MAV does not meet many of the criteria in the areas of managerial independence, relations with the government, financial conditions, and other risk factors (Table 1). Regarding governance, MAV complies with the criteria on external audits, but reporting could be improved.

Criterion 1: Managerial Independence—Pricing and Employment Policies

12. **MAV does not enjoy managerial independence in employment and pricing policies.** Employment and wage policies are determined in annual business plans, which have to be approved by the MET in compliance with the Labor Code. Passenger tariffs are set by the government, and these are not fully-aligned with cost-recovery levels. Prices for freight facilities have been set more freely since 1994 and better reflect market conditions. As noted by KPMG (2006), MAV has operated at a loss mainly due to services being priced at below operating costs and pricing policies being outside the control of the enterprise.

Box 1. Criteria for Assessing Fiscal Risks of Public Enterprises

I. Managerial independence

Pricing policy: whether prices are in line with international benchmarks for traded goods and services; cover costs (for nontraded goods); and in regulated sectors, whether the tariff setting regime is compatible with the long-term sustainability of the PE.

Employment policy: whether this is independent of civil service laws, and the government intervenes in wage setting and hiring.

II. Relations with the government

Subsidies and transfers: whether the government provides direct or indirect subsidies and/or explicit or implicit loan guarantees which go beyond those given to private enterprises; and whether the PE make any special transfers to the government

Quasi-fiscal activities: whether PEs perform uncompensated functions or absorb costs which are not directly related to their business objective and/or substitute for government spending.

Regulatory and tax regime: whether PEs are subject to the same regulations and taxes as private firms.

III. Financial conditions and sustainability

Market access: whether PEs can borrow without a government loan guarantee.

Less-than-full leveraging: whether PEs' liability-to-asset ratio is comparable to industry averages.

Profitability: whether PEs perform compared to relevant industry.

Record of past investments: whether past investments had an appropriate average rate of return.

IV. Governance structure

Periodic outside audits: whether these are carried out by a reputable private accounting firm applying international standards and are published.

Publication of comprehensive annual reports: whether annual reports are published, and what type of information they include.

Shareholders' rights: whether minority shareholders' rights are protected.

V. Other risk factors

Vulnerability: whether PEs have sizeable contingent liabilities relative to their operating balance.

Importance: whether PEs are large in some significant dimension (for example, debt service, employment, customer base).

Table 1. Hungarian State Railways: Summary of Compliance with IMF's FAD Criteria on Fiscal Risks

	Managerial Independence						Government Relations		
	Pricing Policy		Employment Oolicy						
Public Enterprise	Prices Reflect Costs	Subsidies	Civil Servants	Market Wages	Over-staffing	Only Commercial Objectives	No Loan Guarantees	Quasifiscal Activities?	Standard Tax and Regulatory Rules
Hungarian State Railways	No	Yes	No	Determined by the enterprise and trade unions	Yes; but decreasing	No	Loan guarantees exist	Yes; services provided at below commercial prices and for social purposes	Yes (except for tax rebate, and exemption on local business tax)

	Financial Conditions			Governance Structure				Other Factors		
		Creditworthiness							Size	
Public Enterprise	Profitability 1/	Debt Level 2/	Debt Cost 3/	Stock Listed	Outside Audits	Annual Reports	Minority Rights Protected	Contingent liabilities	Number of Employees	Annual Sales
Hungarian State Railways	Negative	100.8% (2006)	6.0%	Not listed	Yes	Yes	100% state owned	Hedging, guarantees	46,814 (2004)	131,119 million forint (2006)

Sources: Hungarian authorities; and IMF staff estimates.

1/ The enterprise has had negative profitability over the last years. In 2006, MAV's net worth was also negative, requiring capitalization.

2/ Debt level is defined as the ratio of total liabilities to total assets in most recent year in percent.

3/ Debt cost is defined as the ratio of accrued 4-year financial costs to average total debt, including short and long-term debt, in percent.

Criterion 2: Relations with the Government—Transfers, Subsidies, and QFAs

13. **MAV undertakes significant QFAs on behalf of the government, but these are not fully compensated by the budget.** Subsidies or free tickets are provided for several population groups, including students, children, senior citizens, families, civil servants, pensioners, and others. About 25 percent of passengers do not pay for transport services. The government makes annual transfers to MAV under two concepts: consumer price supplements and public service obligations. These transfers have been insufficient to cover the cost of QFAs. The share of passenger operating costs covered by budget transfers has fallen since 2003, from 57 percent to about 47 percent in 2005 (Table 2). MAV also receives budget support for investment and other goals (Table 3).

Table 2. Hungarian State Railways: Passenger Operations, 2000-05
(In billions of forint; unless otherwise indicated)

	2000	2001	2002	2003	2004	2005
Revenues from passenger transport	101.9	114.4	122.0	122.5	121.8	116.1
Budget transfers	63.0	69.5	76.5	80.0	80.1	74.6
Consumer price supplement	16.9	19.3	20.7	22.2	23.6	24.2
Public service obligation	46.1	50.2	55.8	57.8	56.5	50.4
Inflow to cashier from paid fares	38.9	44.9	45.5	42.5	41.7	41.5
Costs from passenger transport	119.9	137.8	151.1	141.1	156.5	159.8
Share of costs covered by:						
Budget transfers (in percent)	52.5	50.4	50.6	56.7	51.2	46.7
Inflow to cashier (in percent)	32.4	32.6	30.1	30.1	26.6	26.0

Sources: KPMG (2006); and IMF staff estimates.

Table 3. Budget Support to Hungarian State Railways, 2000-06
(In billions of forint, unless otherwise indicated)

	2000	2001	2002	2003	2004	2005	2006 1/
Public service obligation transfer	46.0	50.2	55.8	57.8	56.5	50.4	74.4
Consumer price transfer	17.0	19.3	20.7	22.2	23.6	24.2	24.3
Investment subsidy	26.0	21.6	27.5	17.2	12.6	18.4	36.5
Fuel tax rebate	6.9	6.7	6.5	6.5	6.1	5.7	5.7
Severance compensation	0.0	0.0	0.0	0.0	1.0	2.8	0.8
Budapest Transport Company Alliance Compensation	0.0	0.0	0.0	0.0	0.0	0.2	1.0
Other subsidies	0.2	0.0	0.0	0.0	0.0	0.0	0.5
Debt takeover	35.7	0.0	121.1	0.0	0.0	0.0	0.0
State guarantees	28.7	38.4	24.3	38.7	59.0	131.3	55.0
Total	160.7	136.2	255.9	142.4	158.8	233.1	198.3
In percent of GDP	1.2	0.9	1.5	0.8	0.8	1.0	0.8

Sources: Hungarian authorities; and IMF staff estimates.
1/ 2006 data excludes freight operations.

14. **The tax treatment of MAV is broadly in line with that of private enterprises.** Since MAV does not use public roads, it receives a rebate from the government on paid excise taxes on fuel. The same treatment applies to water and air transportation enterprises. As MAV has been running losses, it has not paid dividends or corporate income taxes to the central government. MAV has also not paid the local business tax collected by municipalities.[12] However, loss-making private enterprises, which do not provide public services, do not receive the latter favorable treatment.

Criterion 3: Financial Conditions and Sustainability

15. **MAV is in poor financial health.** The liability-to-asset ratio has increased from 25 percent in 2000 to over 100 percent in 2006 (Table 4). The company's equity and reserve position has declined significantly over the past 5 years, reaching below capital adequacy levels in 2004 (KPMG, 2005). Liquidity indicators also show marked deterioration. Net operational losses before government transfers were close to 1 percent of GDP in 2006 (and about 0.5 percent of GDP after transfers). Investment levels have been compressed to under 0.5 percent of GDP in recent years.[13]

16. **The government provides loan guarantees to MAV and has taken over MAV's liabilities in several occasions in the past.** The state took over MAV's liabilities in 2000 and 2002. Despite these bailouts, liabilities have remained on the rise, reaching over 100 percent of assets in 2006. The cost of debt has been around 6 percent. This is close to

[12] Act C of 1990 on Local Taxes exempts public service enterprises from the local business tax when these enterprises do not incur corporate tax liabilities.

[13] See Appendix 2 for full details on the income statement and balance sheet of MAV.

government costs, arguably reflecting the state's backing of MAV's liabilities. State guarantees have averaged 0.3 percent of GDP in the past 6 years.

17. **The recent separation of freight and passenger branches has increased transparency.** A new and legally-independent firm for freight transport was established in January, 2006. As noted earlier, prices for freight transport have been better aligned with market conditions, and freight operations are expected to post profits following the split in operations from passenger transport. This separation will increase transparency and will make it easier to define public transport services that are to be compensated by the state. However, unless passenger fares or budget transfers are increased, losses from passenger operations will continue and will cease to be cross-subsidized from freight operations. Following the separation of freight and passenger operations, MAV will also undergo a rationalization program (e.g., closure of underutilized branch lines).[14]

Table 4. Hungarian State Railways: Summary of Financial Indicators, 2000-06

	2000	2001	2002	2003	2004	2005	2006 1/
				(In percent)			
Liabilities/Assets	25.5	73.7	73.7	76.2	82.9	91.4	100.8
Liquidity 2/	59.5	57.3	34.2	44.2	42.7	37.2	45.7
				(In percent of GDP)			
Net operational losses							
Before government transfers	-0.6	-0.6	-0.4	-0.6	-0.6	-0.7	-0.8
After government transfers	-0.2	-0.2	0.1	-0.2	-0.2	-0.4	-0.4
Investment	0.5	0.3	0.4	0.4	0.3	0.3	0.3
Liabilities	1.2	3.3	3.0	3.0	3.1	3.3	3.6
Short-term	0.7	0.7	1.0	0.9	0.8	1.0	0.8
Long-term	0.5	2.5	2.0	2.1	2.3	2.3	2.8
of which: guaranteed	0.2	0.3	0.1	0.2	0.3	0.6	0.2
Debt take over	0.3	...	0.7	...	...	...	...
Share capital increase	...	...	...	...	...	...	0.1

Sources: Hungarian authorities; and IMF staff estimates.
1/ 2006 data excludes freight operations.
2/ Current assets divided by current liabilities.

Criterion 4: Governance Structure: External Audits and Shareholders' Rights

18. **MAV's accounts are audited externally on the basis of International Accounting Standards, and these reports are available to the public.** Currently, the auditor is the

[14] The OECD (2007) notes that the returns on this program for 2007 and 2008 are uncertain, and that even with EU funds financing, the level of government support for this project is estimated to be large. These costs have to be incorporated in the Convergence Program.

KPMG Hungária Kft. (KPMG Hungária Limited Liability Co). Annual reports are not posted on-line and there is no within year reporting on MAV's financial position. MAV is not listed in the stock exchange and has no minority shareholders.

Criterion 5: Other Risk Factors

19. **MAV dominates railway transport in Hungary**. MAV faces little competition in passenger rail transport, serving over 150 million passengers a year. Győr-Sopron-Ebenfurt Co., a joint Hungarian-Austrian enterprises, also offers rail transport but at much smaller scale. Five small private railway enterprises offer freight services. In terms of employment, the number of employees has gone down in recent years, but at about 45.000, MAV continues to be a large employer in need of further restructuring.

Assessment of fiscal risks posed by BKV

20. **BKV also fails to meet many of the FAD criteria on fiscal risks**, including in the areas of managerial independence, relations with the government, financial conditions, and other risk factors (Table 5). External audits are performed and publicly available, and BKV's annual reports are also posted on-line.

Criterion 1: Managerial Independence—Pricing and Employment Policies

21. **BKV does not enjoy managerial independence in pricing and employment policies.** Prices are set administratively by the MB and lag behind cost-recovery levels. Given the current tariff structure, operating revenues before government transfers cover less than 50 percent of operating expenditures.[15] Employment and wage policies are set out in annual business plans, which have to be approved by the Budapest Municipal Owners' and Municipal Operations' Committees and comply with the Labor Code.

Criterion 2: Relations with the Government—Transfers, Subsidies, and QFAs

22. **Budget transfers are not sufficient to make up for the cost of QFAs**. Student, pensioners, and other groups receive discounted or free tickets. BKV receives subsidies to compensate for these QFAs under two concepts: price subsidies (linked to consumers) and normative subsides (linked to public service obligations). Both the central government budget and the MB provide financial assistance to the company (Table 6). Budget transfers are determined annually and cover about 40 percent of operating costs. In 2004, BKV and the MB signed an 8 year long public service contract the defines quality standards, volume of services to be provided, compensation schemes, etc.

[15] Tariffs would need to increase by 134% to fully finance operations without any budgetary compensation.

23. **BKV is broadly subject to the same tax regulations as private firms.** However, as noted below, BKV's poor liquidity position prompted the enterprise to apply for deferred tax payments to the tax authority (APEH) in 2004.[16] As BKV has been running losses, it has not paid dividends or corporate income taxes. Similarly to MAV, BKV has also not paid the local business tax.

Table 5. Budapest Transport Company: Summary of Compliance with IMF's FAD Criteria on Fiscal Risks

	Managerial Independence						Government Relations		
	Pricing Policy		Employment Policy						
Public Enterprise	Prices Reflect Costs	Subsidies	Civil Servants	Market Wages	Over-staffing	Only Commercial Objectives	No Loan Guarantees	Quasifiscal Activities?	Standard Tax and Regulatory Rules
Budapest Transport Company	No	Yes	No	Yes	Yes	No	Loan guarantees exist	Yes; services provided at below commercial prices and for social purposes	Yes (except for exemption on local business tax)

	Financial Conditions			Governance Structure				Other Factors		
		Creditworthiness							Size	
Public Enterprise	Profitability 1/	Debt Level 2/	Debt Cost 3/	Stock Listed	Outside Audits	Annual Reports	Minority Rights Protected	Contingent Liabilities	Number of Employees	Annual Sales
Budapest Transport Company	-12% (2006)	28.4% (2006)	6.2%	Not listed	Yes	Yes	100% state owned	Legal cases related to damage claims	12,745 (2004)	63,322 million forint (2006)

Sources: Hungarian authorities; and IMF staff estimates.

1/ Profitability is defined as the ratio of net profits to net worth in most recent years in percent.

2/ Debt level is defined as the ratio of total liabilities to total assets in most recent year in percent.

3/ Debt cost is defined as the ratio of accrued 4-year financial costs to average total debt, including short and long-term debt, in percent.

Table 6. Budget Support to Budapest Transport Company, 2000-06
(In billions of fortins, unless otherwise indicated)

	2000	2001	2002	2003	2004	2005	2006
Public service obligation transfer	14.2	14.2	16.2	3.0	8.9	11.9	32.1
Central budget	0.0	0.0	0.0	0.0	5.9	11.9	32.1
Municipal budget	14.2	14.2	16.2	3.0	3.0	0.0	0.0
Consumer price transfer	14.5	15.8	16.8	18.8	18.7	19.0	17.9
Debt takeover	0.0	0.0	37.4	0.0	0.0	0.0	0.0
Share capital increase	0.0	0.0	0.0	5.0	3.0	11.9	10.6
State guarantees	0.0	0.0	0.0	0.0	0.0	15.0	0.0
Total	28.7	30.0	70.4	26.8	30.6	57.8	60.6
in percent of GDP	0.2	0.2	0.4	0.1	0.1	0.3	0.3

Sources: Hungarian authorities; and IMF staff estimates.

[16] A similar situation arose in 2000.

Criterion 3: Financial Conditions and Sustainability

24. **The government took over BKV's liabilities in 2002 and provided loan guarantees in 2005.** The central government provided special assistance to BKV in 2002, taking over debt obligations worth HUF 36 billion (about 0.2 percent of GDP). About 60 percent of these liabilities corresponded to short-term credits. Reflecting poor liquidity and difficult access to market financing in 2004 (see below), state loan guarantees in the amount of HUF 15 billion were provided for the first time in 2005.

25. **BKV's financial conditions are weak**. Following the government's bail out in 2002, the ratio of total liabilities to assets continued to increase from 8 percent to close to 30 percent in 2006. Liquidity indicators have also worsened (Table 7), rendering the financial position critical in 2004, in part due to shortfalls in expected price subsidies. At that point, BKV was granted deferred payments of tax liabilities to APEH and was authorized to issue new debt. The issuance was undersubscribed as banks regarded BKV's creditworthiness as less favorable compared to previous years. Net operating losses after transfers have remained at around 0.1 percent of GDP in recent years. Weak financial conditions have constrained investment at 0.2 percent of GDP, and equity levels have been on the decline.

Table 7. Budapest Transport Company: Summary of Financial Indicators, 2000-06

	2000	2001	2002	2003	2004	2005	2006
				(In percent)			
Liabilities/Assets	14.8	14.7	8.1	12.7	24.3	29.0	28.4
Liquidity 1/	60.9	51.1	103.2	42.3	28.4	36.2	16.7
				(In percent of GDP)			
Net operational losses							
Before government transfers	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3
After government transfers	-0.1	0.0	0.1	-0.1	-0.1	-0.1	0.0
Investment	0.1	0.2	0.2	0.1	0.1	0.2	0.3
Liabilities	0.2	0.2	0.1	0.2	0.3	0.4	0.4
Short-term	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Long-term	0.1	0.1	0.0	0.1	0.2	0.2	0.2
Debt takeover	...	...	0.2	...	...	...	...

Sources: Hungarian authorities; and IMF staff estimates.
1/ Current assets divided by current liabilities.

Criterion 4: Governance Structure: External Audits and Shareholders' Rights

26. **BKV's accounts are audited externally on the basis of International Accounting Standards, and annual reports are published on-line.** Currently, the auditor is Deloitte & Touch, and audited reports are publicly available. BKV also publishes annual reports on its website, with useful and clearly presented financial information. As in the case of MAV, there is no public within-year reporting. BKV is not listed in the stock exchange, has no minority shareholders, and is not rated by any credit rating agency.

Criterion 5: Other Risk Factors

27. **BKV is the largest local public transport enterprise in Hungary**. BKV provides transport services to 1.4 billion passengers a year and does not face meaningful competition. It employs close to 13.000 people and its orders are significant in the local input markets.

D. Concluding Remarks

28. **MAV and BKV pose important fiscal risks**. Both enterprises fail to meet key FAD criteria. In particular, financial arrangements with the budget are not transparent, and QFAs are not fully compensated by the government. The enterprises financial conditions have been weak, and despite bailouts in recent years, liabilities have continued to rise. Some part of these liabilities are backed by government guarantees and, absent improvement in financial conditions, could impact the government accounts in the near future. Externally audited reports are publicly available, but the assessment and disclosure of fiscal risks from PEs in budget documents is lacking. This hampers fiscal transparency and increases uncertainty regarding the true extent of fiscal activities.

29. **While these PEs pose risks to the government budget, government policies also entail risks for these PEs.** Pricing policies are set by the government and tariffs have lagged behind cost-recovery levels. The enterprises' dependence on budget transfers pose risks to their operations. Incentives to under-finance QFAs and bail out the enterprises every few years will remain, until transparent financial arrangements between the budget and these enterprises are set out, and consistent pricing policies are determined.

30. **The government is taking steps to improve transparency and governance.** Over the past few years, the government has been discussing a public service contract with MAV. In the most recent Convergence Program, the government has reaffirmed its commitment to increase the transparency of financial arrangements. The goal is to clearly define the principles governing operating subsidies in public service contracts that would be concluded with the relevant enterprises. Under these contracts, subsidies would reflect the entire cost of efficient delivery of the service that the government requires the enterprise to undertake. Timely and proper completion of these contracts is essential to provide stability and transparency to funding arrangements. The government has also increased budget support to MAV in 2007 and provided a capital injection.

31. **The assessment in this paper suggests that additional efforts could enhance the quality, transparency, and predictability of fiscal policy.** While the general government balance on ESA95 basis is the key fiscal policy indicator and target, the extent of QFAs in these public transport enterprises, the history of bailouts, and incentives to under finance QFAs, support the view that the existing coverage does not reflect the true extent of fiscal

activities.[17] Best practices in fiscal transparency suggests that the government should include an analysis of these PE operations in budget documents, present a statement on QFAs, and report on the consolidated position of these PEs with the general government on a frequent basis. The budget should also provide a medium-term perspective of financial support to these PEs. Consideration could also be given to applying the criteria on fiscal risks to other sectors to identify other loss-making or vulnerable enterprises that may need closer monitoring.

[17] As recommended in the fiscal ROSC, a first priority should be to align the coverage of the budget with the ESA95 definition of government. This requires extending the coverage of the state budget to certain central government units (including the National Road Construction Company, the APV Rt., the State Motorway Company, the State Debt Management Company, the State Treasury Company, public media enterprises, and certain nonprofit institutions and enterprises).

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Appendix 1

Business associations operating with company shares in long-term state ownership, percentage of state ownership, and agencies exercising the state's membership (shareholder's) rights according to the Privatization Act

Name of company	Minimum long-term state holding
Body exercising owner's rights: Állami Privatizációs és Vagyonkezelő Rt.	
Nemzeti Tankönyvkiadó Rt.	25% + 1 vote
MOL Magyar Olaj- és Gázipari Rt.	1 preference share with prior voting rights
Tokaj Kereskedőház Rt.	99%
Magyar Villamosművek Rt.	99%
Budapest Airport Rt.	25% + 1 vote
CD Hungary Ingatlanforgalmazó és Szolgáltató Rt.	1 preference share with prior voting rights
Balatonfelvidéki Erdő és Fafeldolgozó Rt.	100%
Délalföldi Erdészeti Rt.	100%
Észak-Magyarországi Erdőgazdasági Rt.	100%
Gemenci Erdő- és Vadgazdaság Rt.	100%
"Gyulaj" Erdészeti és Vadászati Rt.	100%
Ipoly Erdő Rt.	100%
Kisalföldi Erdőgazdaság Rt.	100%
Kiskunsági Erdészeti és Faipari Rt.	100%
Mátra-Nyugatbükki Erdő és Fafeldolgozó Rt.	100%
Mecseki Erdészeti Rt.	100%
Nagykunsági Erdészeti és Faipari Rt.	100%
Nyírségi Erdészeti Rt.	100%
Pilisi Parkerdőgazdaság Rt.	100%
Somogyi Erdészeti és Faipari Rt.	100%
Szombathelyi Erdészeti Rt.	100%
Tanulmányi Erdőgazdaság Rt.	100%
VADEX Mezőföldi Erdő- és Vadgazdálkodási Rt.	100%
Vértesi Erdészeti és Faipari Rt.	100%
Zalai Erdészeti és Faipari Rt.	100%
TISZAVÍZ Kft.	100%
Hungaropharma Rt.	1 preference share with prior voting rights
PICK Szeged Rt.	1 preference share with prior voting rights
Zsolnay Porcelángyár Rt.	1 preference share with prior voting rights
HERZ Szalámigyár Rt.	1 preference share with prior voting rights
KAGE Rt.	1 preference share with prior voting rights
Herendi Porcelánmanufaktúra Rt.	25% + 1 vote
Szerencsejáték Rt.	100%
Eximbank Rt.	25% + 1 vote
Name of company	Minimum long-term state holding
MEHIB Rt.	25% + 1 vote
Országos Takarékpénztár és Kereskedelmi Bank Rt.	1 preference share with prior voting rights
Magyar Posta Rt.	100%
Hitelgarancia Rt.	50% + 1 vote
Minister exercising owner's rights: Minister of Economic Affairs and Transportation	

Magyar Államvasutak Rt.	100%
MAVIR Magyar Villamosenergia-ipari Rendszerirányító Rt.	1 preference share with prior voting rights
Állami Autópálya Kezelő Rt.	100%
Győr-Sopron-Ebenfurti Vasút Rt.	50% + 1 vote
Közlekedéstudományi Intézet Rt. (KTI Rt.)	50% + 1 vote
Villamosenergia-ipari Kutató Intézet Rt.	50% + 1 vote
ExVÁ Robbanásbiztos Villamos Berendezéseket Vizsgáló Kht.	100%
Magyar Fejlesztési Bank Rt.	100%
Kisvállalkozás-fejlesztő Pénzügyi Rt.	50%+1 vote
Északdunántúli Gázszolgáltató Rt.	1 preference share with prior voting rights
Középdunántúli Gázszolgáltató Rt.	1 preference share with prior voting rights
Délalföldi Gázszolgáltató Rt.	1 preference share with prior voting rights
Tiszántúli Gázszolgáltató Rt.	1 preference share with prior voting rights
Déldunántúli Gázszolgáltató Rt.	1 preference share with prior voting rights
Paksi Atomerőmű Rt.	1 preference share with prior voting rights
Dunamenti Erőmű Rt.	1 preference share with prior voting rights
Vértesi Erőmű Rt.	1 preference share with prior voting rights
Bakonyi Erőmű Rt.	1 preference share with prior voting rights
PANNONPOWER Energiatermelő, Kereskedelmi és Szolgáltató Rt.	1 preference share with prior voting rights
Mátrai Erőmű Rt.	1 preference share with prior voting rights
Tiszai Erőmű Rt.	1 preference share with prior voting rights
Name of company	Minimum long-term state holding
Budapesti Erőmű Rt.	1 preference share with prior voting rights
Északdunántúli Áramszolgáltató Rt.	1 preference share with prior voting rights
Dunántúli Áramszolgáltató Rt.	1 preference share with prior voting rights
Délmagyarországi Áramszolgáltató Rt.	1 preference share with prior voting rights
Tiszántúli Áramszolgáltató Rt.	1 preference share with prior voting rights
Északmagyarországi Áramszolgáltató Rt.	1 preference share with prior voting rights
Budapesti Elektromos Művek Rt.	1 preference share with prior voting rights
Országos Villamostávvezeték Rt.	1 preference share with prior voting rights
Magyar Befektetési és Kereskedelemfejlesztési Kht.	50%+1 vote

Minister exercising owner's rights: Minister of Agriculture and Regional Development

Állattenyésztési Teljesítményvizsgáló Kft.	75%
Érdi Gyümölcs- és Dísznövénytermesztési Kutató-Fejlesztő Kht.	100%
Ceglédi Gyümölcstermesztési Kutató-Fejlesztő Kht.	100%
Fertődi Gyümölcstermesztési Kutató-Fejlesztő Kht.	100%
Újfehértói Gyümölcstermesztési Kutató-Fejlesztő Kht.	100%
Konzervipari Kutató és Fejlesztő és Minőségvizsgáló Kft.	100%
Magyar Tejgazdasági Kísérleti Intézet Kft.	100%
Országos Húsipari Kutatóintézet Kft.	100%
Zöldségtermesztési Kutató Intézet Rt.	100%
Agroster Besugárzó Rt.	25% + 1 vote
Concordia Közraktár Rt.	100%
ATEV Fehérjefeldolgozó Rt.	25% + 1 vote

Geodéziai és Térképészeti Rt.	25% + 1 vote
Országos Mesterséges Termékenyítő Rt.	25% + 1 vote

Minister exercising owner's rights: Minister of Environmental Protection and Water Management

Hortobágyi Génmegőrző Kht.	100%
Hortobágyi Halgazdasági Rt.	100%
Dunamenti Regionális Vízmű Rt.	50% + 1 vote
Dunántúli Regionális Vízmű Rt.	50% + 1 vote
Észak-dunántúli Regionális Vízmű Rt.	50% + 1 vote
Name of company	Minimum long-term state holding
Észak-magyarországi Regionális Vízmű Rt.	50% + 1 vote
Tiszamenti Regionális Vízmű Rt.	50% + 1 vote
Vízgazdálkodási Tudományos Kutató Kht. (VITUKI)	50% + 1 vote

Body exercising owner's right: National Foundation for Employment

Agora Ipari Kft.	100%
Erfo Ipari Kft.	100%
Fővárosi Kézműipari Rt.	100%
Főkefe Ipari Kft.	100%
Savaria Nett-Pack Kft.	100%
Szegedi Fonalfeldolgozó Rt.	100%

Minister exercising owner's rights: Minister of Health

Gyógynövénykutató Intézet Rt.	25% + 1 vote

Minister exercising owner's rights: Minister of Cultural Heritage

Nemzeti Színház Rt.	100%

Minister exercising owner's rights: Minister of Defense

HM ARCOM Kommunikációtechnikai Rt.	50% + 1 vote
HM ARZENÁL Elektromechanikai Rt.	50% + 1 vote
HM CURRUS Gödöllői Harcjárműtechnika Rt.	50% + 1 vote
HM Elektronikai Igazgatóság Rt.	100%
HM Budapesti Erdőgazdasági Rt.	100%
HM Kaszói Erdőgazdasági Rt.	100%
HM VERGA Veszprémi Erdőgazdasági Rt.	100%
Dunai Repülőgépgyár Rt.	1 preference share with prior voting rights

Minister exercising owner's rights: Minister directing the Prime Minister's Office

Regionális Fejlesztési Holding Rt.	100%
Magyar Hivatalos Közlönykiadó Kft.	100%
KOPINT DATORG Szervezési és Adatfeldolgozási Rt.	50% + 1 vote

Minister exercising owner's rights: Minister of Finance

Államadósság Kezelő Központ Rt.	100%

Minister exercising owner's rights: Minister of Justice

Országos Fordító és Fordításhitelesítő Iroda Rt.	50% + 1 vote
Name of company	Minimum long-term state holding

Minister exercising owner's rights: Minister of Information Technology and Communications

Magyar Távközlési Rt.	1 preference share with prior voting rights

Minister exercising owner's rights: Minister of Regional Development and Land Use Planning

VÁTI Magyar Regionális Fejlesztési és Urbanisztikai Közhasznú Társaság	100%
Építésügyi Minőségellenőrző Innovációs Kht.	50% + 1 vote

Body exercising owner's rights: National Bureau for Sports

Sportlétesítmények Vállalat Rt.	75%

Appendix 2. Hungarian State Railways: Income Statement and Balance Sheet, 2000-06
(In millions of forints)

	2000	2001	2002	2003	2004	2005	2006 1/
	Income Statement						
Sales at purchasers prices	142,717	148,118	150,097	161,752	174,770	183,222	162,520
of which consumer price transfer	16,989	19,302	20,705	22,161	23,597	24,226	24,306
- Indirect taxes on sales	9,832	10,795	9,605	11,824	21,534	23,249	31,321
= Revenues from sales	132,885	137,323	140,492	149,928	153,236	159,973	131,199
- Total employee compensation	89,658	98,611	108,396	117,102	130,426	130,976	124,616
of which social security contributions	24,428	25,909	27,177	28,480	30,939	30,638	28,840
- Purchases of goods & services	38,442	41,095	42,590	42,921	42,261	43,366	48,029
- Services provided by outsiders	50,016	54,683	56,017	56,327	58,157	69,447	56,290
- Depreciation & Amortization	17,346	20,377	29,311	31,292	33,313	34,927	34,405
- Misc. Fees/Taxes	25,377	19,242	17,197	39,531	23,188	30,305	66,873
- Interest payments	5,724	15,167	6,656	5,903	11,061	13,090	21,015
+ Interest earned	5,086	3,840	5,055	3,302	7,177	2,883	6,934
+ Foreign grants	0	0	0	0	0		
+ Transfers from government (public service obligation)	46,048	50,208	55,845	57,815	56,534	50,384	74,407
+ Other income	20,476	28,813	71,888	48,978	32,006	28,228	54,846
= Profit before tax	-22,068	-28,991	13,113	-33,053	-49,453	-80,643	-83,842
- Corporate income tax	143	191	29	13	8	0	0
- Dividends paid	0	0	0	0	0	0	0
To Government	0	0	0	0	0	0	0
To Others	0	0	0	0	0	0	0
= Retained earnings for the period	-22,211	-29,182	13,084	-33,066	-49,461	-80,643	-83,842
New investment	62,192	51,898	66,560	74,706	57,859	57,802	68,933
	Balance Sheet						
Current Assets	59,201	62,109	59,463	73,929	68,150	81,812	87,168
+ Long-term investments	15,365	16,100	18,788	18,237	16,344	14,497	40,025
+ Fixed & Other Assets at cost	692,305	738,738	802,388	872,891	925,639	976,414	997,215
- Accumulated depreciation & Amort.	125,868	143,717	183,710	214,580	244,249	275,868	273,498
= Total assets	641,003	673,230	696,929	750,477	765,884	796,855	850,910
+ Current liabilities	99,445	108,358	173,838	167,347	159,527	219,817	190,653
+ Long term liabilities	64,246	388,119	339,566	404,629	475,314	508,831	667,381
+ Equity and reserves	477,312	176,753	183,525	178,501	131,043	68,207	-7,124
= Total liabilities & Equity	641,003	673,230	696,929	750,477	765,884	796,855	850,910
Financing							
Net external	48,875	63,153	7,417	35,213	37,880	54,250	78,873
New loan obligations	...	...	49,289	66,976	62,490	55,035	162,996
Repayment of old loans	...	...	13,061	7,898	7,388	7,115	32,780

Source: Hungarian authorities based on data provided by Hungarian State Railways.
1/ 2006 data excludes freight operations.

Appendix 3. Budapest Transport Company: Income Statement and Balance Sheet, 2000-06
(In million of forints)

		2000	2001	2002	2003	2004	2005	2006
	Income Statement							
	Sales at purchases prices							
	Fare revenue at purchases prices	28,342	30,527	31,389	35,214	40,933	44,729	50,371
	Social reimbursement for concessionary fares (consumer price transfer)	16,281	17,672	18,814	21,094	21,490	21,902	21,283
	Revenue of other activities	2,693	13,417	2,873	4,201	2,547	5,413	2,667
-	Indirect taxes on sales	5,073	7,781	5,852	6,785	8,554	9,610	10,999
=	Revenues from sales	42,243	53,835	47,224	53,724	56,416	62,434	63,322
-	Total employee compensation	29,238	30,790	33,643	36,774	42,035	46,158	51,202
	of which social security contributions	8,007	8,081	8,472	9,099	10,261	11,243	12,225
-	Purchases of goods and services	23,360	27,754	31,467	35,289	37,470	38,497	40,265
-	Services provided by outsiders	531	818	1,419	1,469	1,491	1,894	2,243
-	Depreciation and Amortization	10,825	11,192	10,930	11,363	11,594	12,275	13,296
-	Misc fees/taxes	40	19	18	15	38	39	29
-	Interest payment	1,848	1,918	2,034	700	3,862	4,064	5,054
	foreign	428	401	395	71	0	0	0
	domestic	1,420	1,517	1,639	629	3,862	4,064	5,054
+	Interest earned	24	137	51	105	5	5	57
+	Foreign grants	0	0	0	0	0	0	0
+	Transfers from governments (public service obligation)	14,200	14,692	47,006	5,011	11,508	13,552	39,451
	of which subsidies from the Municipality of Budapest	13,905	13,905	16,202	3,000	3,000	0	0
+	Other income	5,080	1,200	2,190	1,508	2,723	7,309	3,949
	Other expenditure	4,360	6,959	2,855	2,472	3,801	5,682	9,410
	Activated own performance	1,796	2,472	2,451	2,705	3,231	2,843	3,024
=	Profit before tax	-6,859	-7,114	16,556	-25,029	-26,408	-22,466	-11,696
-	Corporate income tax	0	0	0	0	0	0	
-	Dividends paid	0	0	0	0	0	0	
	To government	0	0	0	0	0	0	
	To others	0	0	0	0	0	0	
=	Retained earnings for the period	-6,859	-7,114	16,556	-25,029	-26,408	-22,466	-11,696
	New investments	14,880	26,667	26,347	21,082	21,688	39,140	74,148
	Balance Sheet							
+	Current assets	6,980	6,402	19,009	7,408	7,843	10,673	8,025
+	Long term Investments	2,731	2,480	2,319	1,633	1,699	1,153	1,160
+	Fixed and other assets at cost	225,970	244,822	268,299	298,766	320,179	365,003	439,814
-	Accumulated depreciation and amortization	46,027	53,059	62,848	73,262	83,709	94,578	105,421
	Accrued and deferred assets	84	68	295	294	98	118	111
=	Total assets	189,738	200,713	227,074	234,839	246,110	282,369	343,689
+	Current liabilities	11,460	12,520	18,420	17,493	27,664	29,523	47,921
+	Long term liabilities	16,549	16,947	0	12,262	32,256	52,305	49,787
+	Equity and reserves	146,930	140,213	156,351	136,589	112,865	102,598	101,568
	Accrued and deferred liabilities	14,799	31,033	52,303	68,495	73,325	97,943	144,413
=	Total Liabilities and Equity	189,738	200,713	227,074	234,839	246,110	282,369	343,689
	Financing							
	Net external	28,009	29,467	18,420	29,755	59,920	81,828	97,783
	New loan obligations	4,202	4,568	25,804	16,542	27,672	22,784	9,932
	Repayment of old loans	570	2,965	4,953	6,529	30	3,876	3,770

Source: Hungarian authorities.

II. Could Hungary's Growth Deceleration Persist? Inferring Productivity Trends from Consumption Volatility[18]

A. Introduction

32. Recent research differentiates business cycles in emerging and developed markets.[19] The key question raised in this research is the nature of shocks, which, in turn, leads either to cyclical or trend reactions. Shocks, though not directly observable, cause fluctuations in consumption, income, investment and trade balance. Importantly, the size and permanence of the fluctuations differ in different types of economies. In emerging economies, the shocks to income itself tend to be persistent, leading to volatility in income growth that is twice that in developed markets. Consumption is even more volatile than output, which leads also to sizeable changes in imports and hence to a deterioration of the trade balance during booms.

33. The higher volatility of consumption in emerging markets has been interpreted as implying that consumers view income shocks to be of a relatively "permanent" nature. As such, while consumers maintain (or smooth) consumption in the face of a shock, they also adjust their consumption levels to the new information revealed by the shock. Similarly, investment and net exports shift in response to anticipated future output.

34. In this paper, the finding is that Hungary has features of developed and emerging markets. First, Hungarian consumers behave in much the same manner as consumers elsewhere. They respond to transitory income changes but are also forward-looking and change their consumption behavior when the future outlook changes. This behavior is consistent with the permanent income hypothesis, where "permanent" is a horizon that may be 3-4 years long (see Carroll 2001). Second, Hungary's income or output volatility is low, and is comparable to that of advanced countries. Third, however, its consumption volatility is relatively high and is particularly high in relation to its income volatility. In combination then with the finding that Hungarian consumers are forward-looking, the implication is that the high consumption volatility is a response to shocks that have a relatively permanent character. It is in this sense that Hungary is most like an emerging market: shocks tend to have long-lasting effects on income and output growth. Finally, the trade balance is countercyclical and net export volatility is relatively high, in line with that of other emerging markets.

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[18] Prepared by Srobona Mitra, who wishes to thank Abdul Abiad, Gita Gopinath, Daniel Leigh, Ashoka Mody, and Martin Uribe for helpful discussions, and seminar participants at the Magyar Nemzeti Bank during the Article IV mission for useful comments.

[19] Aguiar and Gopinath (2007), and Garcia-Cicco, Pancrazi and Uribe (2006).

35. This paper is motivated in part by the slowdown in Hungary's GDP growth relative to regional peers since 2005, a slowdown that turned more emphatic in 2006. While the 2006 deceleration is related to an ongoing fiscal adjustment, the objective of this paper is to understand the extent to which the recent slowdown in Hungarian growth is likely to persist reflecting a more permanent negative shock to productivity growth.

36. There has, at the same time, been a sharp deceleration in Hungary's consumption growth. As noted, consumption growth can be particularly informative in gauging the perceptions of consumers about the future. The literature on permanent income hypothesis and precautionary savings represents two converging strands explaining consumption behavior. Empirical evidence on determinants of consumption growth shows that income uncertainty plays a role besides current income growth (Carroll, 1992). In other words, in response to a negative shock to output growth, consumers adjust their consumption growth downwards not only in response to the current lower growth in income but also to negative perceptions about the future, in the belief that the current conditions are going to persist.

37. Because the relatively short time series makes it difficult to precisely estimate the permanent and transitory components of productivity, Aguiar and Gopinath (2007) have proposed using the consumption volatility (and other moments such as the correlation between net exports and output) to infer the relative importance of permanent shocks. We repeat their exercise for a large number of countries, including a number of new members of the European Union. Given the high ratio of consumption to income volatility, the implication is that the permanent component of productivity shocks is relatively high in Hungary (between two-thirds and 100 percent of the shock tends to be permanent), which is significantly higher than in the Czech Republic or Poland. Consumption volatility, in turn, is associated with net-exports volatility among the countries—such association could imply that the source of permanent shocks could be related to terms-of-trade shocks arising from shocks to external competitiveness. Unless such structural shocks are corrected by policy initiatives, the low Hungarian output growth could persist in the near term.

38. The rest of this paper is organized as follows. An overview of Hungary's recent growth experience is followed by an analysis of the determinants of its consumption growth. After a brief summary of the recent analytical procedures for identifying productivity processes from moments of macro aggregates such as consumption and net exports, some stylized facts about business cycle moments are shown for Hungary and other countries. Finally, the paper provides a quantitative measure of the persistence of productivity shocks.

B. Hungary's Recent Growth Performance and the Role of Consumption

GDP growth and consumption dynamics

39. It is useful to consider three growth phases in Hungary since 2000. From 2000-2003, Hungary grew relatively strongly (above the average of Czech Republic, Poland, and Slovak Republic or the CE3). Growth slowed down in 2003 and 2004 but remained at about the level of regional peers. Since 2005Q2, Hungary's growth rate has increasingly fallen behind, even as the other new member states and the Euro Area accelerated (Figure 1).

40. In each of these three growth phases, the role of private consumption has been important and informative (Figure 2). In the first phase, consumption growth followed in the wake of surging real wage growth and buoyant consumer confidence about low future unemployment (Figure 3). In the second phase, falling growth in real wages pulled down consumption growth, even though investment growth strengthened and expectations about unemployment improved between 2003Q3 and 2005Q1.

41. The third phase saw a decreasing contribution of consumption growth to overall growth. Household consumption growth fell from 3.8 percent in 2005 to 1.2 percent in 2006, a much larger shift than the change in real GDP growth from 4.2 percent to 3.9 percent over the same period. By end-2006, annualized consumption had stopped growing. This decrease was associated with falling growth in real wages and a markedly deteriorating consumer confidence about future employment prospects. With falling investment and a depreciating exchange rate in mid-2006, the trade surplus increased.

Role of consumption

42. The literature explaining consumption behavior is made up of two strands. The first is the permanent income hypothesis, which implies that current spending is determined by "permanent income", or the "expected level of income in the very near term" (Friedman, 1957, 1963, Carroll, 2001). Distant future labor income is uncertain and it is difficult to borrow against such income due to capital market imperfections. Permanent income hypothesis implied that the marginal propensity to consume out of transitory shocks is about a third, and not close to 1 as was assumed in Keynesian models. The second strand is the precautionary savings motive that says that impatient consumers will save to build up a "buffer stock" of wealth to tide future income uncertainty (Carroll, 1992). If actual cash on hand is below the 'target' wealth, precautionary savings motive will outweigh impatience and the consumer will try to build wealth back toward the target.

43. If there is uncertainty in future labor income of impatient consumers, the behaviors of consumers under permanent income hypothesis and precautionary savings motive are indistinguishable. In fact, Friedman had "acknowledged the importance of precautionary motives induced by uncertainty of labor income" (Carroll, 2001). Precautionary savings and

liquidity constraints are, in turn, connected: constrained consumers have the same behavior as unconstrained consumers with a precautionary motive—in the first, consumers are refused credit and in the second, consumers have a self-imposed reluctance to borrow. If consumers are in either of these two scenarios then consumption growth can be strongly tied to current income growth.

44. Econometric evidence supports the role of uncertainty in determining consumption growth. For example, Campbell and Mankiw (1989) find future income uncertainty playing a role in current consumption growth with the latter connected to current income growth. The test on the role played by uncertainty is based on a regression of consumption growth on income growth and unemployment expectations. Carroll (1992) attributes the persistently low consumption growth in the United States during the 1990-91 recession to a higher probability of unemployment in the future.

45. Econometric analysis shows that consumption growth in Hungary is affected by future uncertainty as well as by current income growth. A regression similar to Campbell and Mankiw's shows that consumption growth reacts to real wage growth and to unemployment expectations (Table 1).[20] Consumption growth is regressed (and estimated by Ordinary Least Squares) on two lags, real wage growth and expectations about future unemployment. A decrease in the real wage growth by 1 percentage point would decrease consumption growth by 0.27 percentage point on impact, and (to the extent consumption growth is smoothed) by 0.55 percentage point over time. Deterioration of expectations about employment prospects would also have an adverse effect on current consumption. A 10 percentage point increase in unemployment expectations would decrease consumption growth by 0.8 of a percentage point on impact and by 1.6 percentage points over time.

46. The analysis shows that Hungarian consumers are forward-looking and adjust their consumption to perceptions about the future. In particular, if there is a sense that the current conditions would persist at least for another year, consumers hold back on consumption growth. To the extent labor income uncertainty has increased, consumption growth has decreased to build up a higher target wealth as a buffer stock or an insurance against such uncertainty, if we believe in a world with precautionary savings. Consumption growth slowed less than real wages, but more than real GDP growth did. The overall effect is an average of that of various types of consumers in the economy—some are rule-of-thumb ones consuming their income every period and some are able to borrow (from banks) to smooth

[20] The variable 'unemployment expectations', compiled by Eurostat, is based on a consumer survey that measures consumers' expectations of unemployment in the next 12 months. The variable indicates the difference in percentage points between the percent of survey responders who expect the unemployment rate to increase and those who expect it to decrease. The scale is different from Carroll (1992), which reproduces Campbell and Mankiw's regression using unemployment expectations in the United States—the *fraction* of households who believe unemployment will increase minus the *fraction* who believes it will decrease.

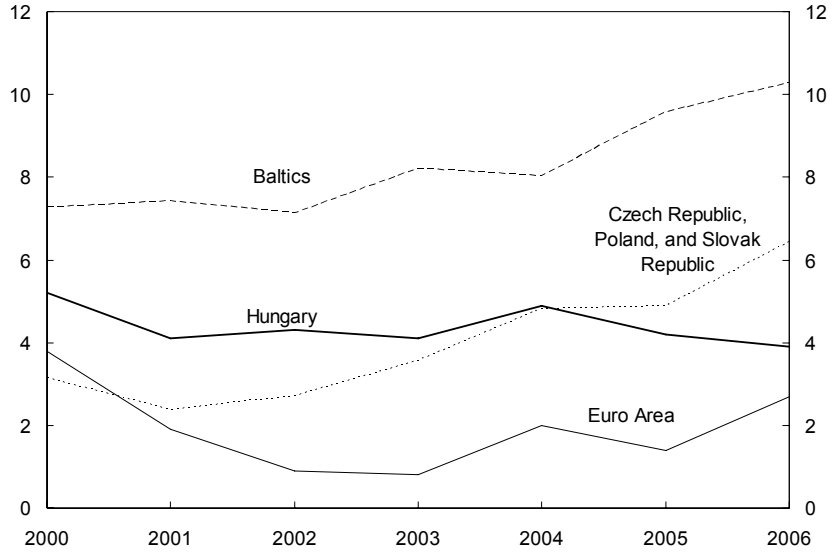
consumption. The continuing strength of growth in household credit is evidence of such smoothing; however, credit growth did not accelerate in 2006 as in the previous years.

47. The current slowdown in consumption growth could, therefore, reflect an underlying slowdown in permanent income growth. Consumption behavior driven by permanent income hypothesis in a world with uncertainty or by precautionary savings behavior seems to point to one observable characteristic—a perception of the current negative shock persisting into the future—that is making consumers wary.

48. The extent of persistence of negative shocks can be identified from correlations and volatilities of key macroeconomic aggregates. Aguiar and Gopinath (2007) employ a methodology that uses a real business cycle (RBC) model and matches its implications on correlations and volatilities of key variables with their empirical counterparts to extract the underlying productivity parameters. Estimates of the underlying productivity process would throw light on the persistence of negative shocks in Hungary.

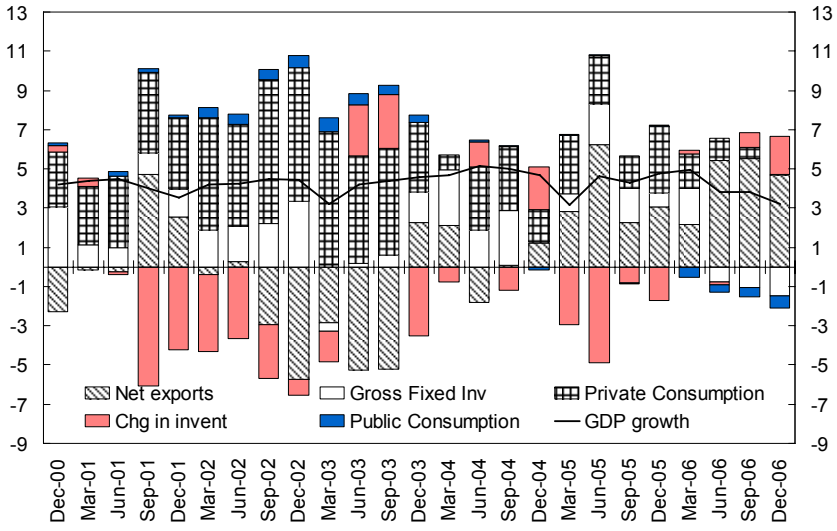
49. The remaining sections describe the methodology, compare volatilities and correlations in Hungarian macroeconomic data with those in other countries, and quantify the extent to which output is driven by a volatile productivity trend.

Figure 1. GDP Growth, 2000-06
(year-on-year percent change) 1/



1/ CE3 refers to Czech Republic, Poland and Slovak Republic; Baltic refers to Estonia, Latvia and Lithuania.

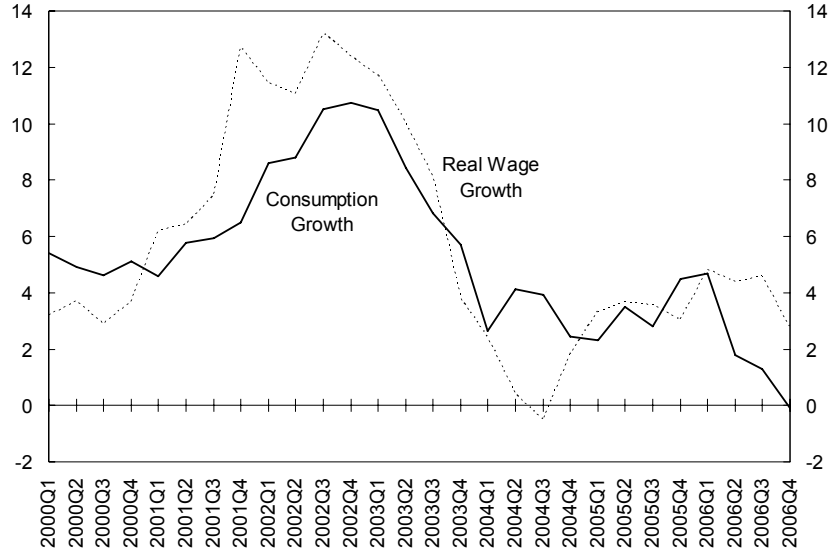
Figure 2. Hungary: Contributions to GDP Growth, 2000-06
(Year-on-year, in percent) 1/



Source: Hungarian Central Statistical Office.

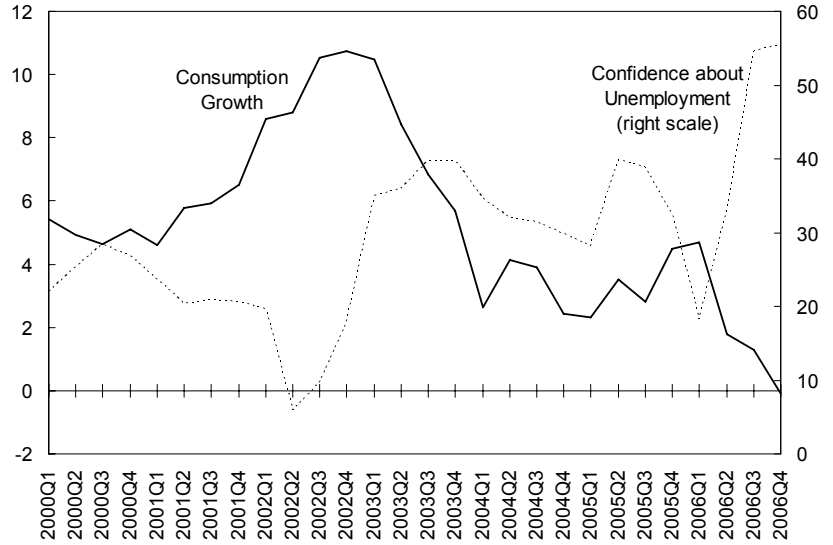
1/ The revised methodology for the calculation of GDP, in which the aggregation is done based on weights of the previous year, rather than on the weights of the base year, implies that the sum of the components does not exactly match GDP (see Box 1-1 of the Quarterly Report on Inflation (Update), Magyar Nemzeti Bank, February 2007)

Figure 3. Consumption and Real Wages 1/



1/ Annual percent change in gross real wage and actual final consumption expenditure by households.

Figure 4. Consumption and Unemployment Expectations 1/



1/ Consumers' expectations about unemployment in the next 12 months indicates the difference, in percentage points, between the percent of survey responders who expect unemployment rate to increase and those who expect it to decrease in the next 12 months.

Table 1. Determinants of Consumption Growth, 1999Q2 to 2006Q4
(Dependent Variable: Consumption Growth, in annual percent change) 1/

	Constant	Consumption growth $_{t-1}$	Consumption growth $_{t-2}$	Real wage growth $_{t-1}$	Unemployment expectations$_t$	R^2
Estimates	3.47**	0.36+	0.13	0.27**	-0.08**	0.89
(Standard errors)	(0.70)	(0.15)	(0.15)	(0.05)	(0.02)	

1/ Ordinary Least Squares estimates, 1999Q2—2006Q4, with Newey-West standard errors, ** (+) implies significance at 1 percent (10 percent).

C. Identification of Productivity Shocks in the Recent Literature

50. Given the short time series in emerging markets, a trend-cycle decomposition of productivity shocks is likely to be imprecisely estimated. Recent research suggests an alternative approach to understanding business cycles in these countries. Using a theoretical RBC model in which output is driven by both transitory and permanent technology shocks, Aguiar and Gopinath (2007, AG henceforth) derive business cycle features of both emerging and developed small open economies. These features are in terms of moments within business cycle frequencies: relative volatilities of consumption and income, the volatility of trade balance, and the correlation of the trade balance with income, among others. The theoretical moments are driven by the relative volatilities of the permanent and the transitory components of the productivity process, and these relative volatilities are different between emerging and developed countries.

51. In emerging markets, the permanent component of productivity is much more volatile than the transitory component, rendering the trend to be more volatile than that in developed markets. Shocks to trend growth are therefore the primary source of fluctuations in these countries. Accordingly, optimizing agents respond to income shocks depending upon whether they believe the shock to persist. If the economy is hit with a negative income shock, and agents believe that there is an even larger (negative) effect on future output, then consumption responds more than income, increasing savings and reducing the trade deficit. However, if the shock is believed to be transitory, then savings will decrease and the trade deficit will reduce by a smaller amount. In the data, if there is a large response of consumption to income accompanied by a large change in net exports, then the standard business cycle model will identify the underlying shock as a change in trend.

52. The relative volatilities of transitory and permanent shocks are related to the theoretical moments of macroeconomic aggregates in the business cycle models. There are two types of shocks to productivity—shocks to its level and shocks to its growth.[21] To see the relationship between the relative importance of these two shocks and macroeconomic

[21] Productivity is modeled as comprising of a stationary process with volatility of shocks given by σ_z, and a stochastic trend with volatility of its growth rate given by σ_g.

moments, the sensitivity of theoretical moments to assumptions about the relative volatility of these two types of shocks is replicated from AG (Figure 9). An increase in the relative variance of the trend shocks is positively related to the volatility of consumption, investment and net exports relative to output at business cycle frequencies. Furthermore, correlations of filtered consumption, investment, and net exports with filtered income show that the one with net exports is most sensitive to the relative importance of shock to productivity growth.

D. Some Stylized Facts About Business Cycle Moments in Emerging Markets

53. This section looks at a set of stylized facts about the behavior of macroeconomic aggregates from emerging and developed country clusters. In particular, it locates Hungarian business cycle moments and compares them to those in other emerging and developed markets. The analysis follows the methodology in AG to extract moments from seasonally adjusted data on real consumption, income, investment, and net exports. Keeping the developed country samples from AG, we take a larger set of emerging markets than in AG. National accounts data for Hungary spans 1995Q1 to 2006Q4.[22]

Stylized facts

(1) *Emerging markets tend to have higher volatility of cyclical output and output growth than developed markets (Table 2 and Figure 5)*. The lower volatility of output comes either from lower incidence of shocks or better management of monetary and fiscal policies in developed countries. The clusters for developed and European emerging markets are close to each other, with a few exceptions. Some developed countries are highly susceptible to commodity price shocks—Norway and New Zealand are such cases—that render a relatively higher output volatility. In emerging Europe, domestic policies may not be as well managed or constrained because of currency boards or a high level of euroization.

(2) *Emerging markets have higher volatility of consumption relative to that of output (Table 2 and Figure 5).* The presumption is that when a shock to output is thought to be more permanent (leading to changes in future output), consumers respond to it by adjusting consumption much more than changes in current output, according to permanent income hypothesis. The developed countries are mostly below or just at the 45-degrees line.

(3) *The volatility of consumption is very tightly linked with that of net exports (Figure 6).* Consumption fluctuates almost one-to-one with net exports. This could be due to the nature of shocks affecting exports: shocks to commodity prices affecting the terms of trade or shocks to competitiveness are more of a structural or permanent nature. Some countries, such

[22] See Appendix I for data sources and sample sizes for all the countries.

as a few in Latin America, have much higher consumption volatility than that of net exports, possibly due to other structural domestic shocks.

(4) *The trade balance deteriorates with an income shock and the extent of deterioration is higher for emerging markets (Figure 7).* This observation is closely associated with the interpretation of permanent shocks through consumption (see (2)). As consumers respond to a permanent shock by adjusting consumption more than one-for-one with current output, the trade balance deteriorates with decrease in private savings. Thus trade balance is more countercyclical in emerging markets.

(5) *Relative consumption volatility is higher in countries with low financial depth (Figure 8).* Developed countries, with higher credit/GDP ratios have lower consumption volatility compared to emerging countries. This observation could support the view that the presence of liquidity constraints in emerging economies make consumers cut back on consumption when there is a negative income shock, irrespective of whether the consumers view it as permanent or transitory. However, many emerging markets have higher consumption volatility than their level of financial depth may suggest about liquidity constraints.

How does Hungary compare?

54. Given the stylized facts outlined above, Hungary seems to be enjoying both developed and emerging market features (Table 2 and Figures 5-8). The volatilities and correlations in key macroeconomic aggregates qualitatively match those in recent work done on central and eastern European countries (Benczúr and Ratfai, 2007):

- *Hungary enjoys the lowest output volatility among emerging markets.* This observation is in contrast to the findings in AG that "emerging market economies have a business cycle twice as volatile as their developed counterparts." The cyclical volatility of output is only 0.79, much smaller than the emerging markets average of 2.40. This low volatility is also mirrored in a low volatility of overall output growth—in this case Czech Republic and Hungary share more stable output growth than other emerging European markets (Figure 5).

- *Hungary has the highest consumption volatility relative to income volatility among European emerging markets.* While part of this 'excessive' relative volatility is explained by the low output volatility, a large part of it is still due to high consumption volatility. For instance, Hungary has almost twice the consumption volatility as Czech Republic. The latter is nearer the developed markets cluster, whereas Hungary is the highest among the range of countries with similar output volatilities (Figure 5).

- *The trade balance in Hungary is countercyclical, which is a distinguishing feature of emerging markets.* In contrast, the trade balance in developed markets is almost procyclical. The correlation of the trade balance with output at business cycle frequencies is -0.23 in Hungary. This is similar to Poland, but quite opposite to Czech Republic (procyclical) and much lower than Slovakia (Figure 7).

- *Volatility of net exports is within the emerging markets average in Hungary.* High trade balance volatility is tightly correlated with consumption volatility, with Hungary almost on the 45-degrees line (Figure 6).

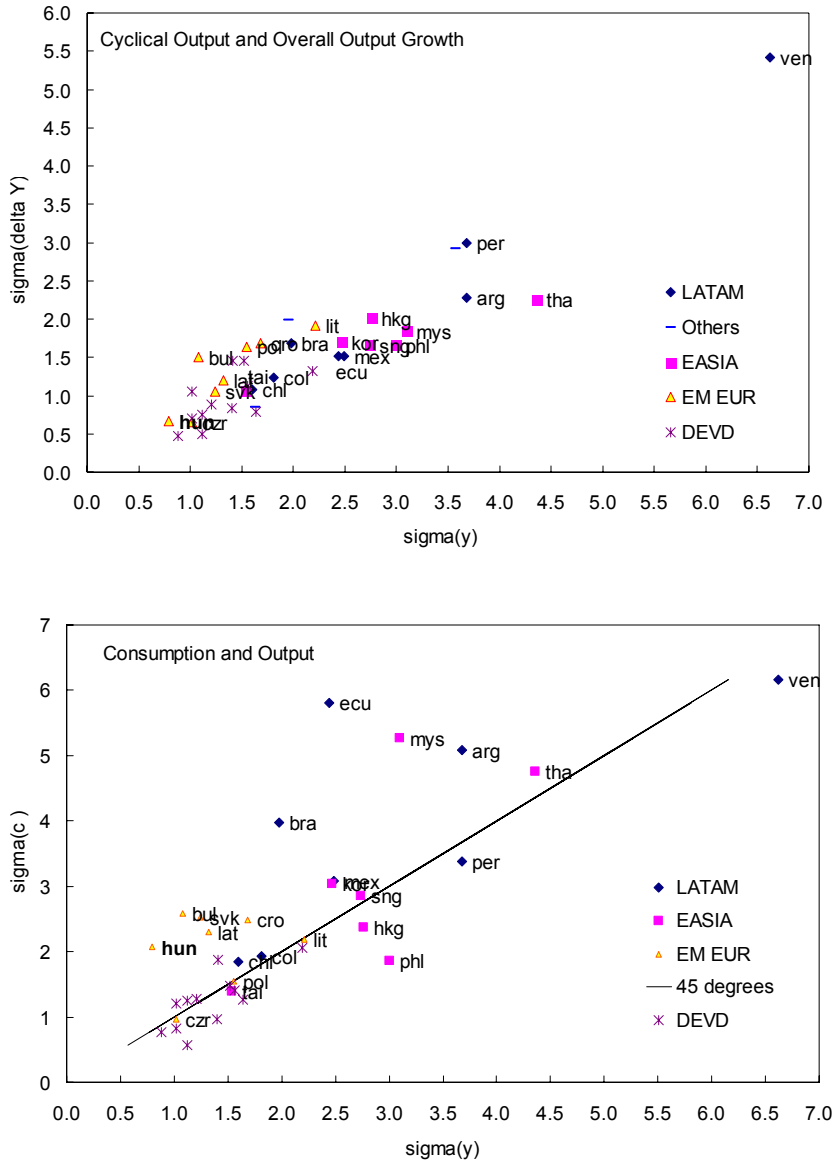
- *Consumption volatility in Hungary is much higher than what the level of financial depth would suggest (Figure 8).*

Table 2. Emerging and Developed Markets Moments 1/

	σ(Y)	σ(ΔY)	ρ(Y,Y')	ρ(ΔY,ΔY')	σ(C)/σ(Y)	σ(I)/σ(Y)	σ(NX/Y)	ρ(C,Y)	ρ(I,Y)	ρ(NX/Y,Y)
Emerging Markets										
Argentina	3.68	2.28	0.85	0.61	1.38	2.53	2.56	0.9	0.96	-0.7
Brazil	1.98	1.69	0.66	0.35	2.01	3.08	2.61	0.41	0.61	0.01
Chile	1.6	1.08	0.79	0.31	1.15	4.21	1.77	0.9	0.89	-0.74
Columbia	1.81	1.24	0.8	0.2	1.07	6.39	1.65	0.9	0.85	-0.78
Ecuador	2.44	1.52	0.82	0.15	2.38	5.56	5.63	0.73	0.89	-0.79
Mexico	2.49	1.52	0.82	0.26	1.24	4.05	2.19	0.92	0.91	-0.74
Peru	3.68	3	0.64	0.14	0.92	2.37	1.25	0.78	0.85	-0.24
Venezuela	6.62	5.42	0.69	-0.08	0.93	2.92	4.35	0.85	0.88	-0.47
Israel	1.95	1.99	0.5	-0.26	1.6	3.42	2.12	0.45	0.49	0.12
South Africa	1.63	0.85	0.88	0.53	1.61	3.87	2.47	0.71	0.75	-0.55
Turkey	3.57	2.92	0.67	0.05	1.09	2.71	3.23	0.89	0.83	-0.69
Hong Kong	2.76	2.01	0.75	0.07	0.86	2.02	2.27	0.7	0.53	-0.04
Korea	2.47	1.7	0.78	0.16	1.23	2.5	2.34	0.84	0.77	-0.62
Malaysia	3.1	1.84	0.85	0.56	1.7	4.82	5.3	0.76	0.86	-0.74
Phillipines	3	1.66	0.87	0.17	0.62	4.66	3.21	0.59	0.76	-0.41
Singapore	2.74	1.66	0.84	0.3	1.04	2.77	3.1	0.7	0.6	-0.28
Taiwan	1.54	1.06	0.82	0.41	0.9	3.67	1.68	0.59	0.69	0.005
Thailand	4.36	2.25	0.89	0.42	1.09	3.49	4.59	0.92	0.91	-0.83
Bulgaria	1.08	1.5	0.08	-0.42	2.39	6.83	2.55	0.15	0.18	0.19
Croatia	1.68	1.69	0.51	-0.32	1.48	3.49	2.91	0.7	0.68	-0.66
Czech R	1.02	0.65	0.92	0.82	0.94	2.76	1.5	0.23	0.44	0.17
Hungary	0.79	0.67	0.61	-0.17	2.62	3.65	2.22	0.46	0.31	-0.23
Latvia	1.32	1.2	0.64	0.07	1.74	8.81	2.54	0.38	0.12	0.23
Lithuania	2.21	1.92	0.65	-0.28	0.99	3.98	2.11	0.16	0.72	-0.1
Poland	1.55	1.64	0.44	-0.25	1	4.47	1.16	0.46	0.68	-0.24
Slovakia	1.24	1.06	0.66	-0.2	2.04	7.77	4.29	0.42	0.46	-0.44
	2.40	1.77	0.71	0.14	1.39	4.11	2.75	0.63	0.68	-0.37
Developed Markets										
Australia	1.4	0.84	0.84	0.35	0.69	3.66	1.08	0.48	0.8	-0.43
Austria	0.88	0.47	0.9	0.52	0.87	2.75	0.66	0.74	0.75	0.1
Belgium	1.02	0.7	0.79	0.18	0.81	3.72	0.91	0.67	0.62	-0.04
Canada	1.64	0.79	0.91	0.55	0.77	2.63	0.91	0.88	0.77	-0.2
Denmark	1.02	1.05	0.49	-0.15	1.19	3.9	0.88	0.36	0.51	-0.08
Finland	2.19	1.32	0.85	0.02	0.94	3.25	1.12	0.85	0.88	-0.45
Norway	1.41	1.46	0.48	-0.45	1.33	4.3	1.73	0.63	-0.01	0.12
Netherlands	1.21	0.88	0.76	0.02	1.06	2.94	0.71	0.72	0.71	-0.18
New Zealand	1.56	1.13	0.77	0.02	0.9	4.38	1.37	0.76	0.82	-0.26
Spain	1.12	0.75	0.82	-0.08	1.11	3.7	0.86	0.83	0.83	-0.6
Sweden	1.52	1.45	0.53	-0.35	0.97	3.66	0.94	0.35	0.68	0.01
Switzerland	1.12	0.5	0.92	0.81	0.51	2.56	0.96	0.58	0.69	-0.03
	1.34	0.95	0.76	0.12	0.93	3.45	1.01	0.65	0.67	-0.17

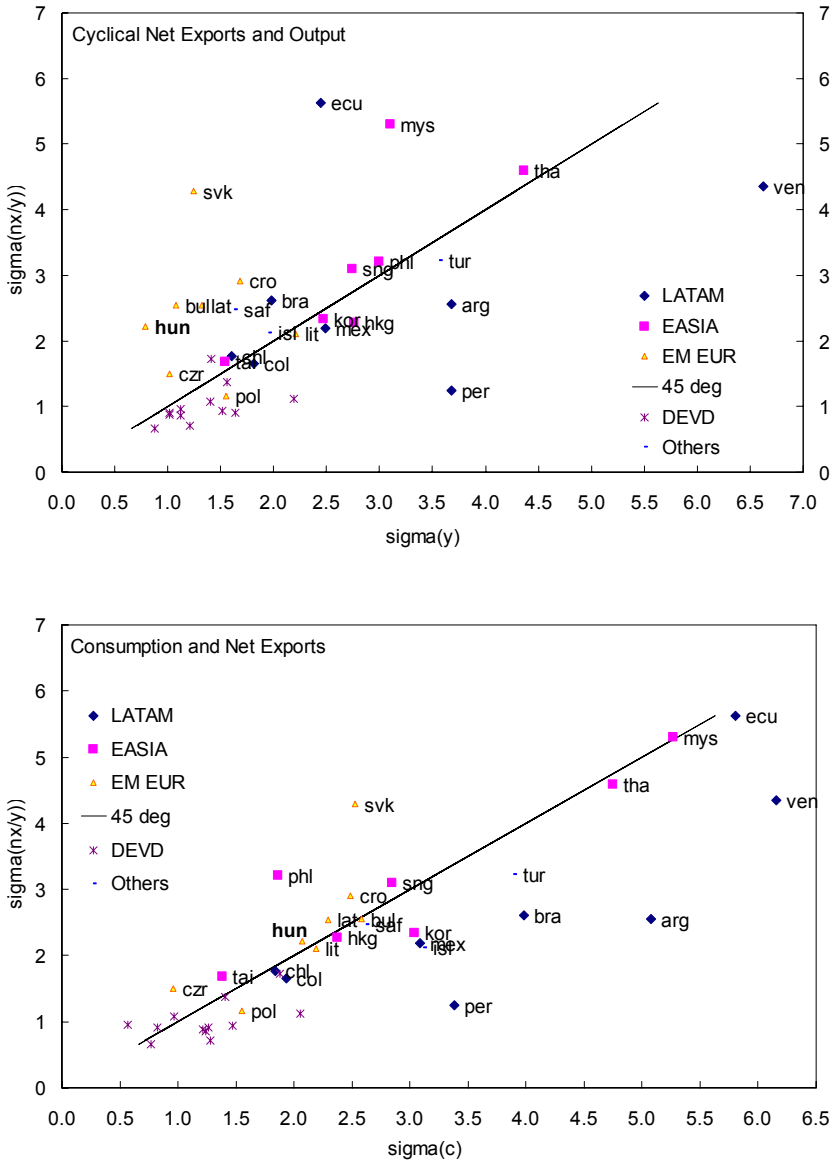
1/ The series for each country are deseasonalized using the x12 command in Eviews. The income (Y), consumption (C) and investment (I) series were logged and HP-filtered using a smoothing parameter of 1600. Net exports to income (NX/Y) were HP-filtered similarly. For growth rates, the unfiltered series were used. A 'σ' denotes standard deviation, and a 'ρ' denotes correlation coefficient. For the correlations, ρ(X,X') denotes the first autocorrelation coefficient, where X' denotes one-lag of X.

Figure 5. Relative Volatilities of Output, Output Growth, and Consumption 1/



1/ "Sigma" denotes the standard-deviation of macroeconomic aggregates: C (log consumption), Y (log GDP), NX/Y (Net Exports to GDP), all at business cycle frequencies or HP-filtered from quarterly data. "Cor" denotes correlation coefficient. See Appendix for country and region codes.

Figure 6. Relative Volatilities of Output, Consumption and Net Exports 1/



1/ "Sigma" denotes the standard-deviation of macroeconomic aggregates: C (log consumption), Y (log GDP), NX/Y (Net Exports to GDP), all at business cycle frequencies or HP-filtered from quarterly data. "Cor" denotes correlation coefficient. See Appendix for country and region codes.

Figure 7. Correlations of Output and Net Exports 1/

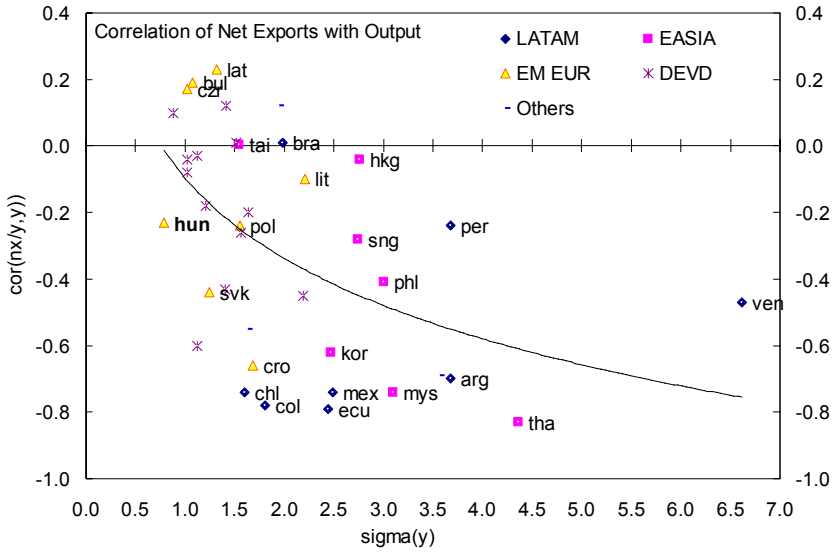
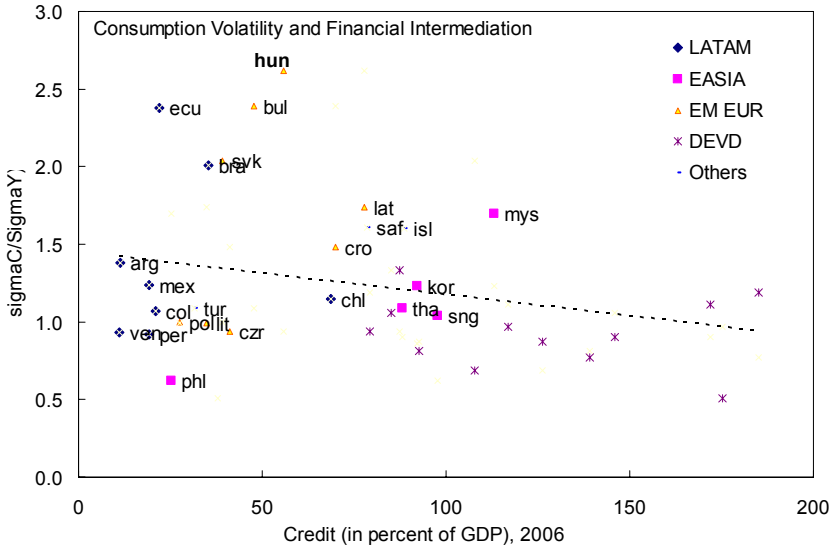


Figure 8. Financial Depth and Relative Consumption Volatility



1/ "Sigma" denotes the standard-deviation of macroeconomic aggregates: C (log consumption), Y (log GDP), NX/Y (Net Exports to GDP), all at business cycle frequencies HP-filtered from quarterly data. "Cor" denotes correlation coefficient.

Discussion

55. The set of stylized facts reveal some systematic differences between the emerging and the developed market groups. Yet, there are countries within each of the two groups that display features of the other group. In particular, Hungary stands out among emerging

markets in its low volatility of income (and income growth). At the same time, it has other moments that are much more in line with its emerging market counterparts.[23]

56. Most notable among these are the volatility of consumption relative to that of income and volatility of net exports. Highly volatile net exports could be symptomatic of terms of trade shocks—commodity exporters and countries that are very open to trade would be more prone to higher volatility of net exports. The East Asian group and some of the Latin American countries display a strong correlation between net exports volatility and income volatility. Perhaps these countries' dependence on natural resources and commodities with large fluctuations in price explain the higher volatility of their income. Norway, an oil exporter, has emerging market features in this respect. The central eastern European countries, on the other hand, rely more on manufactured exports or might not be as open to trade as their Asian or Latin American counterparts. Their trade balance volatility on average is, therefore, smaller (2.4) than the average for the Asian (3.2) or the Latin American (2.75) groups.

57. The calculated moments together with the discussion on Hungary's growth experience could help us make certain inferences about the nature of productivity shocks experienced by the country. The high relative volatility of consumption would have us believe that shocks to trend productivity are relatively more important in Hungary than shocks to the cyclical part of productivity. This means that a negative shock to output is more likely to depress productivity growth than just its level. Hungary's trade-balance volatility (and its close association with high consumption volatility) could reflect shocks to competitiveness (possibly due to structural rigidities in the domestic labor market or the nature of labor taxes), that are viewed to be more of a permanent nature by consumers.

58. The extent to which shocks affect the productivity growth versus its level is informative about the permanence of output shocks. A high stochastic component or permanence would imply that a shock, however small, would have a long lasting effect on output growth. In the next section, we provide rough estimates of the importance of this stochastic or random walk component for various countries.

E. Calculations of the Random Walk Component of the Productivity Process

59. The productivity process in a real business cycle (RBC) is driven by a trend, Γ_t, and a stationary component, z_t.[24] The shocks to the growth of productivity contribute to the stochastic trend of productivity. Specifically, the trend is the cumulative product of

[23] Czech Republic stands out among the emerging market group in having all its moments point towards a developed country.

[24] The underlying production function is Cobb-Douglas using labor and capital as inputs.

productivity growth shocks. Productivity growth, g_t, has a long-term mean, μ_g, and variance of shocks, σ_g^2. The stationary component follows an AR(1) process with variance of shocks given by σ_z^2.

$$(1) \quad z_t = \rho_z z_{t-1} + \varepsilon_t^z, \quad |\rho_z| < 1, \quad \varepsilon_t^z \sim iidN(0, \sigma_z^2)$$
$$(2) \quad \Gamma_t = e^{g_t} \Gamma_{t-1}$$
$$(3) \quad g_t = (1-\rho_g)\mu_g + \rho_g g_{t-1} + \varepsilon_t^g, \quad |\rho_g| < 1, \quad \varepsilon_t^g \sim iidN(0, \sigma_g^2)$$

The log of the solow residual is a sum of the trend or a random walk and the transitory components. The importance of trend shocks in the productivity process is the variance of trend-growth relative to the overall variance of the productivity growth.

$$Random\ walk\ component = \frac{a(\sigma_g^2 / \sigma_z^2)}{b + c(\sigma_g^2 / \sigma_z^2)}$$

60. The parameters, *a, b*, and *c* are combinations of various parameters (other than σ_g^2 and σ_z^2) in the productivity processes ((1) – (3)) and the share of labor in the production function. Thus, keeping all other parameters constant, the random walk component is an increasing function of σ_g^2 / σ_z^2, or the relative importance of shocks to trend-growth.

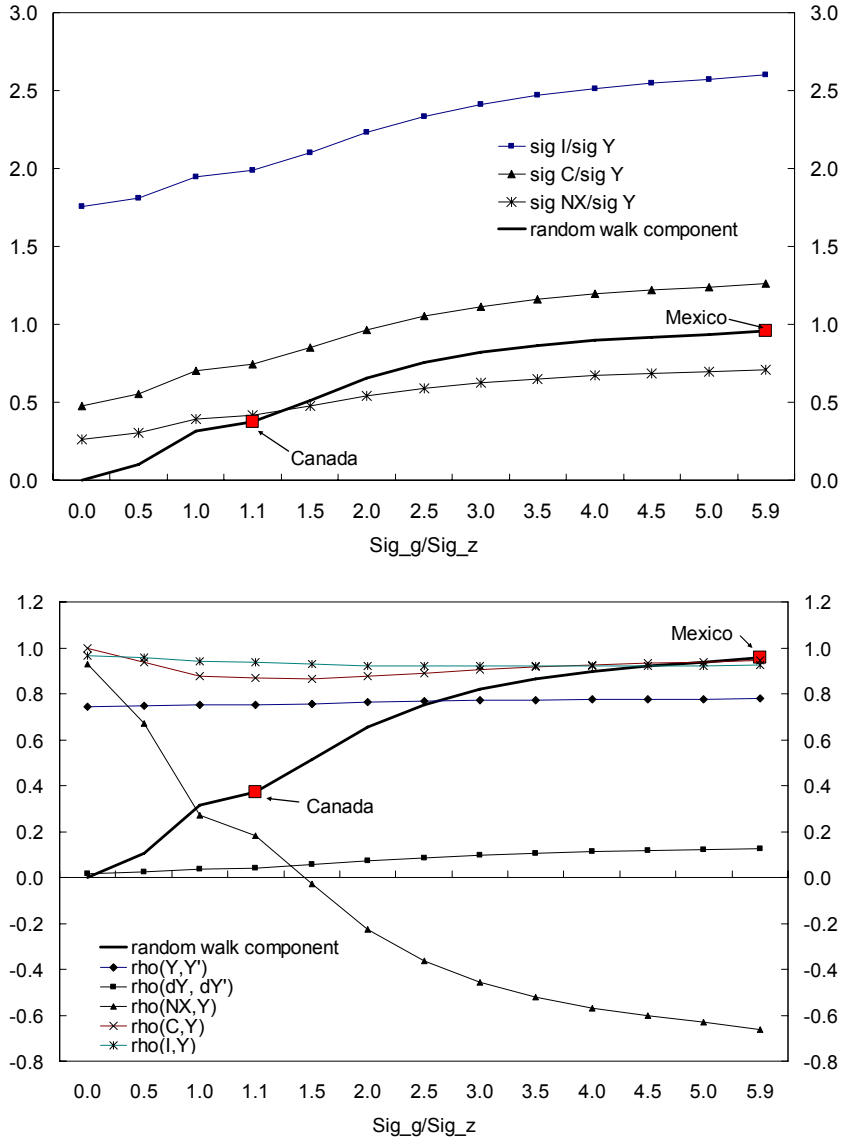
61. The full RBC model, when solved, has implications for moments of the income, investment, consumption and the net exports processes. These moments are in terms of parameters that constitute a, b, and c, σ_g^2 / σ_z^2, and other model parameters. To see how the theoretical moments relate to σ_g^2 / σ_z^2, and to the random walk component, one of the diagrams from AG is replicated here after adding the random walk component (Figure 9). It shows that both σ_g^2 / σ_z^2 and the random walk component are positively related to the moments involving volatility. Higher volatilities of investment, consumption and net exports are associated with higher random walk components. Among the moments involving correlations, the correlation of net exports and output have a strongly negative relationship with the random walk component. Thus highly volatile consumption could reflect a very high random walk component, as does a strongly counter-cyclical trade balance.

62. Given the short time series, the random walk component of the productivity process can be identified matching some of the data moments listed in the previous section with the theoretical moments derived from the RBC model. For example, we can pick σ_g^2 / σ_z^2 so that the theoretical moment, $\sigma(c) / \sigma(y)$, could be matched to its empirical counterpart for a

particular country (Table 3).[25] A range of the random walk components is derived for each country by varying σ_g^2 / σ_z^2 and two moments—the relative volatility of consumption and the correlation of the trade balance and output.

[25] AG's programs and data can be found at http://www.economics.harvard.edu/faculty/gopinath/papers/datapage.html.

Figure 9. Sensitivity of Moments and Relative Size of the Random Walk Component to the Relative Size of Shocks to Productivity
(Replication of Aguiar and Gopinath (2007, Figure 4) 1/



1/ The random walk component is estimated by varying the ratio of σ_g^2 / σ_z^2 (Sig_g/Sig_z), keeping all other parameters the same. The estimates for Mexico and Canada are taken from AG who compute them using sig C and sig Y.

Table 3. Random Walk Components Implied by Two Types of Moments 1/

Moment used	ρ(NX/Y,Y) Random walk	σ(C)/σ(Y) Random walk
Emerging Markets		
Argentina	0.98	1.00
Brazil	0.48	1.00
Chile	0.98	0.85
Columbia	1.00	0.77
Ecuador	1.00	1.02
Mexico	1.00	0.94
Peru	0.67	0.60
Venezuela	0.83	0.60
Israel	0.41	1.00
South Africa	0.88	1.00
Turkey	0.97	0.80
Hong Kong	0.52	0.53
Korea	0.93	0.94
Malaysia	0.98	1.00
Phillipines	0.78	0.20
Singapore	0.70	0.74
Taiwan	0.48	0.60
Thailand	1.00	0.80
Bulgaria	0.37	1.00
Croatia	0.96	1.00
Czech R	0.37	0.60
Hungary	0.66	1.00
Latvia	0.34	1.00
Lithuania	0.57	0.68
Poland	0.67	0.68
Slovakia	0.80	1.00
	0.74	0.82
Developed Markets		
Australia	0.80	0.30
Austria	0.41	0.53
Belgium	0.52	0.46
Canada	0.63	0.41
Denmark	0.55	0.89
Finland	0.81	0.60
Norway	0.41	1.00
Netherlands	0.62	0.77
New Zealand	0.68	0.57
Spain	0.93	0.81
Sweden	0.48	0.66
Switzerland	0.52	0.04
	0.61	0.59

1/ When the estimate for random walk component is greater than 1, we report it as 1. NX/Y refers to net-exports/GDP, C to consumption, Y to GDP, all at business cycle frequencies; ρ refers to correlation and σ to standard deviation.

Discussion

63. Hungary has a high random walk component, higher than two-thirds. The two moments yield a range for the random walk component. While the relatively higher consumption volatility deliver an extremely high random walk component, the relatively low countercyclicality of net exports imply a lower random walk component. Consumption volatility is an especially informative moment, in terms of distinguishing the set of emerging and developed markets (Table 2). Although the correlation of net exports to output is also a sensitive moment, its empirical counterpart does not distinguish emerging and developed markets as much as consumption volatility does. Hungary, therefore, is more likely to behave like other emerging economies rather than developed ones.

64. Very few countries among the emerging European group strike out as "obviously emerging." As in the example used in AG, Mexico stood out as a country with very obvious emerging market features with a tight range (of almost 1) of random walk components derived from various moments. Only Croatia (and to some extent Slovakia) stand out as such among the emerging European group. In contrast, Czech Republic could pass as a developed country.

F. Conclusions

65. Hungary has some emerging market features that point towards the nature of income shocks it faces. In particular, a very high volatility of consumption relative to income suggests that rational consumers perceive shocks to income as being more permanent. This implies that a negative income shock is more likely to prolong the period of low output growth. This is in contrast to Czech Republic and Poland. In comparison with other emerging markets, Hungary's income volatility is very low. Such low volatility of income combined with a relatively high volatility of consumption could suggest that although shocks to income are small and possibly infrequent, they have a long-lasting effect.

66. In particular, Hungary's trade-balance volatility (and its close association with high consumption volatility) could reflect shocks to competitiveness (possibly due to structural rigidities in the domestic labor market or the nature of labor taxes), which are viewed to be more permanent by consumers. Even though these shocks may be small—rendering a low volatility of overall output—they are long-lasting and create uncertainties that depress consumption growth and leads to high consumption volatility. Unless structural policies are implemented to correct such shocks, the effect of these shocks could persist in the near term.

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Appendix 1. Country Codes, Data Sample, and Sources

Countries	Country code	Region code 1/	Sample	Source 2/
Emerging Markets				
Argentina	arg	LATAM	1995Q1-2002Q4	AG
Brazil	bra	LATAM	1991Q1-2002Q1	AG
Chile	chl	LATAM	1996Q1-2006Q3	DX
Columbia	col	LATAM	1995Q1-2006Q4	DX
Ecuador	ecu	LATAM	1991Q1-2002Q2	AG
Mexico	mex	LATAM	1980Q1-2003Q1	AG
Peru	per	LATAM	1990Q1-2003Q1	AG
Venezuela	ven	LATAM	1998Q1-2006Q4	Haver
Israel	isl	Others	1980Q1-2003Q1	AG
South Africa	saf	Others	1980Q1-2003Q1	AG
Turkey	tur	Others	1987Q1-2003Q2	AG
Hong Kong	hkg	EASIA	1995Q1-2006Q4	DX
Korea	kor	EASIA	1979Q4-2003Q2	AG
Malaysia	mys	EASIA	1991Q1-2003Q1	AG
Phillipines	phl	EASIA	1981Q1-2003Q1	AG
Singapore	sng	EASIA	1995Q1-2006Q4	DX
Taiwan	tai	EASIA	1995Q1-2006Q5	DX
Thailand	tha	EASIA	1993Q1-2003Q1	AG
Bulgaria	bul	EM EUR	1998Q1-2006Q4	Haver
Croatia	cro	EM EUR	1997Q1-2006Q4	DX
Czech R	czr	EM EUR	1996Q1-2006Q4	DX
Hungary	hun	EM EUR	1995Q1-2006Q4	DX
Latvia	lat	EM EUR	1995Q1-2006Q3	Haver
Lithuania	lit	EM EUR	1995Q1-2006Q4	Haver
Poland	pol	EM EUR	1995Q1-2006Q4	PSO
Slovakia	svk	EM EUR	1993Q1-2003Q2	AG
Developed Markets				
Australia	aul	DEVD	1979Q1-2003Q2	AG
Austria	aus	DEVD	1988Q1-2003Q2	AG
Belgium	bel	DEVD	1980Q1-2003Q2	AG
Canada	can	DEVD	1981Q1-2003Q2	AG
Denmark	dnk	DEVD	1988Q1-2003Q1	AG
Finland	fin	DEVD	1979Q4-2003Q2	AG
Netherlands	ntl	DEVD	1979Q4-2003Q3	AG
New Zealand	nzl	DEVD	1987Q2-2003Q2	AG
Norway	nor	DEVD	1979Q4-2003Q3	AG
Spain	spa	DEVD	1980Q1-2003Q2	AG
Sweden	swe	DEVD	1980Q1-2003Q1	AG
Switzerland	swi	DEVD	1980Q1-2003Q2	AG

1/ LATAM stands for Latin America; EASIA for East Asia;
EM EUR for Emerging Europe; DEVD for Developed countries.
2/ AG stands for Aguiar and Gopinath (data is available at
http://www.economics.harvard.edu/faculty/gopinath/papers/datapage.html);
DX for dXtime from EconData; PSO for Polish Statistical Office.

III. What Triggers the Reforms of Budget Institutions? The Case of Hungary in the European Context[26]

A. Introduction

67. **Hungary faces a double fiscal problem: it needs to consolidate its fiscal position and to regain the ability to deliver on its fiscal deficit targets.** Following a loss of fiscal discipline, Hungary has the largest fiscal deficit and public debt among the new member states (Table 1) of the European Union. The persistent overshooting of the deficit targets in recent years reflects a combination of overspending and revenue shortfalls. Unrealistic expenditure and revenue planning along with the absence of corrective mechanisms to take prompt measures have required the upward revision of the fiscal deficit targets several times during the same year.

Table 1. New Member States: Fiscal Indicators, 2006
(in percent of GDP)

Country	Public Debt	Fiscal Balance
Hungary	**65.6**	**-9.1**
Poland	47.8	-3.9
Slovakia	30.7	-3.4
Czech Republic	30.4	-2.9
Slovenia	27.8	-1.4
Lithuania	18.2	-0.3
Latvia	10.0	0.4
Estonia	4.1	3.8

Sources: Eurostat (2007); and staff estimates.

68. **A strengthened institutional framework for the budget process can help improve fiscal discipline and performance**. A growing literature has theoretically and empirically identified the relationship between budget institutions and fiscal performance. Scholars such as Alt and Lowry (1994), Poterba (1994), von Hagen and Harden (1995), Hallerberg and von Hagen (1999), Alesina and others (1999), and Stein and others (1999) show that checks and balances in the formulation and implementation of the budget have real effects on budget outcomes. Fabrizio and Mody (2006), controlling for a comprehensive set of economic and political conditioning factors, isolate the role of the budgetary institutional structure for the new European member states and show that budget institutions—the mechanisms and rules of the budget process— have significant value even when politics is representative but undisciplined, and when long-term structural forces are unfavorable.

69. **Hence, the crucial question is: what triggers the reforms of budget institutions?** If budget institutions are so important in determining fiscal outcomes, identifying the factors

[26] Prepared by Stefania Fabrizio (EUR). This chapter draws on ongoing research with Ashoka Mody. Comments from seminar participants at the European Central Bank and the Magyar Nemzeti Bank are gratefully acknowledged.

that prompt the reform of budget institutions becomes crucial for promoting fiscal discipline. This paper makes an attempt to answer to this question.

70. **The findings suggest that a country could enter into a fiscally "virtuous" or vicious" cycle**. In "favorable fiscal times," when the fiscal performance is good, reforms are relatively easy to undertake. But in "bad fiscal times," when reforms have significant distributional implications (e.g. expenditures favoring specific interest groups need to be curtailed), reforms are delayed. These findings are in line with Alesina and Drazen (1991), who argue that, when budgetary resources are limited and there are many claimants, there is a "war of attrition,' namely that no policymaker wants to give in, so no reforms are pushed forward. These results would imply that a country could enter into a virtuous cycle, in which better budget institutions induce better fiscal performance, which, in turn, facilitates the further reform of budget institutions. Alternatively, the country could be trapped in a vicious cycle, in which reforms in budget institutions are delayed because of poor fiscal performance, which, in turn, would deteriorate further because of weak budget institutions.

71. **A disciplined fiscal framework is sometimes induced by economic "shocks" but may require concerted leadership.** The analysis carried out in this chapter suggests that economic shocks (if they are large enough) can help focus the minds of those competing for scarce budgetary resources and hence help build a constituency for improving budget institutions. However, to the extent that markets are forgiving and accommodate these economic shocks, even this form of external pressure may be insufficient. Forward-looking leadership appears to be a necessary ingredient of the solution.

72. **The rest of the chapter is organized as follows.** Section B provides a brief theoretical overview of how budget institutions affect fiscal performance, and why reforms of budget institutions, though so important, can be delayed. Section C presents the index of the quality of budget institutions used in the analysis and the data and the results of the empirical analysis. Some lessons for Hungary are discussed in Section D.

B. Budget Institutions: Their Importance and Impediments to Reform

73. **As with non-renewable resources, the fiscal budget is subject to a common-pool problem** (Shepsle and Weingast, 1981 and Weingast and others 1981). When many claim access to a valuable resource for which they pay only a part of the cost, the pressure will be to over-consume the resource. In the context of the budget, a tendency will arise for public spending in favor of interest groups who bear only part of the cost (in terms of higher taxes or debt) of financing the expenditures that benefit them.

74. **Budget institutions help overcome the common-pool problem and promote fiscal discipline.** Budget institutions are mechanisms and rules that determine the preparation,

authorization, and implementation of the budget process. Two approaches to the design of budget institutions have been identified (Hallerberg and von Hagen, 1999). Under the centralized approach, budgetary power is concentrated in the hands of key policymakers (e.g., the finance minister) who are presumed to rise above interest group politics and have an incentive to internalize the costs and benefits of public activities. In contrast, under the cooperative bargaining approach, cooperative decision making induces policymakers to collectively negotiate on, and mutually commit themselves to, budget targets. Some combination of these two approaches, supported by sound structures and devices to transparently and efficiently monitor and enforce budget decisions, promote fiscal discipline.

75. **However, strengthening budget institutions may create a war of attrition and, consequently, their improvement can be "too costly" for policymakers.** If better budget institutions help improve fiscal outcomes, why do countries with large fiscal imbalances not take prompt measures to improve their budget institutions? Alesina and Drazen (1991) propose that improving budget institutions can have significant distributional consequences, which creates a "war of attrition" among policymakers with conflicting expenditure objectives, which in turn, aggravates the common-pool problem. So the process is delayed due to a political stalemate over distribution of budgetary resources. A strengthening of budget institutions occurs when political consolidation resolves the distributional conflict. This is unlikely when fiscal deficits are large and resources are scarce. Instead macroeconomic distress and/or a strong political commitment can create the needed political reorientation. The rest of this chapter assesses the empirical validity of these propositions.

C. Empirical Analysis

Data and sources

76. **A quantitative index of the overall quality of budget institutions was constructed for 23 European countries.** The countries under consideration are Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxemburg, the Netherlands, Poland, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom. The goal is to summarize the features of the budget process, such that a larger value implies greater checks and balances. Following Fabrizio and Mody (2006) and Hallerberg and others (2007) values were assigned to the three phases of the budget process: (i) the preparation stage, when the budget is drafted; (ii) the authorization stage, in which the draft budget is approved and formalized; and (iii) the implementation phase, where the budget is executed and may be modified/amended. Sources of information on these features include the countries' annual fiscal budget laws, the Fiscal Transparency Module of the International Monetary Fund's Reports on the Observance of Standards and Codes (ROSC), and direct contact with the

countries' authorities. Fabrizio and Mody (2006) and Hallerberg and others (2007) were also relevant sources of information.

77. **The relevant features of budget preparation, authorization, and authorization, are described in Appendix Table 1**. As noted, good budget institutions are based on two principles, a strong hierarchy and cooperative bargaining. For the preparation stage, the following features are considered as contributing to discipline: (1) fiscal rules that limit deficit spending; (2) budget parameters and norms; and (3) the relative dominance of the finance minister/prime minister in the budget negotiation process. The authorization phase requires (1) limits on the scope of amendments; (2) an appropriate sequence of decision making in the legislative budget process; and (3) balancing the power of the executive and parliament. In the implementation stage, firmness in the execution of the budget is needed, together with the procedures governing adjustments to unforeseen shortfalls or unexpected overspending.

78. **On this basis, an index representing the overall quality of budget institutions for each country was constructed (Appendix Table 2)**. This index was obtained by aggregating the three indices for the three different stages (as in Fabrizio and Mody, 2006). Appendix Table 1 reports the weights used in the aggregation.

79. **To identify the determinants of budget institutions reforms, various economic an political variables were considered.** These comprise inflation, the unemployment rate, and the current account balance-to-GDP ratio from the IMF WEO database; the primary fiscal balance from EUROSTAT; and the degree of government fragmentation (1 minus the Herfindhal index), with higher values indicating more fragmented coalitions. Details on coalitions were obtained from *Parties and Elections in Europe* (www.parties-and-elections.de) and *Elections around the World* (www.electionworld.org). A dummy variable for the countries under the excessive deficit procedure (EDP) was constructed, taking value 1 if the country in a specific year was under the EDP, and zero otherwise. The basis for including this variable is to examine if external "pressure" from the EU fiscal framework helped create the incentive for improving budget institutions.

Empirical results

80. **The lower is the initial quality of budget institutions, the greater the scope for further improvements in their quality**. The dependant variable is the change in budget institutions two years ahead. Because the changes take discrete values, changes in the quality of institutions are categorized into four groups: a large improvement, an improvement, no change, and a setback. Tables 2 and 3 present the results of ordered logit regressions. The gap between the highest possible institutional quality and the country's state of budget institutions is considered. This gap determines the scope of the subsequent improvements in

the budget institutions quality. Not surprisingly, results suggest that the larger is the gap in the quality of budget institutions at the beginning of the period, the greater the scope (and possibly incentive) for further improvements in their quality (Column 1, Table 2).

81. **The worse is the fiscal deficit, the more likely it is that fiscal budgetary reforms are delayed, as the "war of attrition" among policymakers becomes more intense.** In Columns 2-4 of Table 2 a larger fiscal deficit is associated with delays in budget reforms (a worse fiscal balance at time *t-1* is associated with a lower likelihood of improvements in budget institutions quality between *t+2* and *t*). This finding is consistent with a more intense "war of attrition" when multiple claims on the budget constrain reforms. Thus, when deficits are large and the need to reduce them is urgent, as in Hungary, is precisely when the ability to embark on reforms of budget institutions may, and paradoxically require, that the deficit itself be first brought under great control. There is no evidence of non-linearity in the relation between fiscal deficit and budget reform. Also, the EU fiscal framework, as proxied by the EDP, does not appear to create an incentive for budget reform. However, this result should be taken with caution, as data for the NMS cover the period 1994-2003, when these countries were not part of the EU and the EDP did not apply to them.

Table 2. Improving Fiscal Institutions May Be Subject to a War of Attrition

	Changes of budget institutions quality			
	(1)	(2)	(3)	(4)
Budget institutions quality gap	4.61	6.23	6.36	6.23
	(1.15)***	(1.53)***	(1.57)***	(1.53)***
Lagged primary balance-to-GDP ratio		0.50	0.71	0.50
		(0.20)**	(0.40)*	(0.20)**
Lagged primary balance-to-GDP ratio (high values) 1/			-0.16	
			(3.00)	
Dummy for excessive deficit procedure				-0.28
				(0.45)
Observations	102	102	102	102

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

1/ Takes value 0 if the lagged primary balance-to-GDP ratio is smaller than 1.37 percent of GDP.

82. **A strong political commitment can help reduce the war of attrition and increase the likelihood of reform.** Consistent with the war of attrition hypothesis, the results suggest that a less fragmented government is more supportive of budget reforms (Table 3). This is most evident when the full set of explanatory variables is included. Apparently, the effects of political fragmentation are non-linear, i.e. they are especially serious when fragmentation rises from low values (Table 3, Columns 3-4). Thus, a necessary ingredient to reverse an unfortunate possible dynamic of worsening the budget situation and checks and controls appears to be a strong and unified forward-looking leadership.

83. **Domestic and external economic shocks can also help reforms.** Economic shocks can help focus the mind of those competing for scarce budgetary resources and hence help build constituency for improving budget institutions. In this context, the findings in Table 3 suggest that a worsening of the domestic and external economic situation can raise the likelihood of reform. A higher unemployment rate and inflation appear to help pushing toward reform (Table 3, Column 3). At the same time, an increase in external vulnerability through higher current account deficits raises the likelihood of reform. These results would suggest that a deteriorating economic situation can create the needed political consolidation to exit from a vicious cycle of bad fiscal performance and delays in needed budget institutions reforms.

84. **Finally, historical country features create inertia in budget institutions**. The analysis also included country dummies to allow for the possibility that influences, not controlled for explicitly in the exercise, contribute to the likelihood of reform.[27] Findings suggest that in some cases, these effects are of considerable importance. In other words, historical country features create inertia in budget institutions and, apparently, this is the case for Hungary. Overcoming that inertia requires the leadership to make special efforts to undertake reforms.

Table 3. Domestic and External Shocks, and a Unified Political Leadership Can Help Strenghten Fiscal Institutitons

	Changes of budget institutions quality			
	(1)	(2)	(3)	(4)
Budget institutions quality gap	6.34	6.661	9.71	12.75
	(1.53)***	(1.63)***	(2.39)***	(3.23)***
Lagged primary balance-to-GDP ratio	0.49	0.52	0.71	1.24
	(0.20)**	(0.22)**	(0.27)**	(0.31)***
Government fragmentation	-2.09	-8.57	-15.93	-23.75
	(2.26)	(5.48)	(7.27)**	(9.49)**
Government fragmentation (high values) 1/		6.5	13.19	19.38
		(4.94)	(6.71)**	(8.51)**
Inflation (logarithms)			6.11	9.17
			(2.60)**	(3.46)***
Unemployment rate			0.86	1.13
			(0.35)***	(0.42)***
Current account balace-to-GDP ratio				-0.44
				(0.18)***
Observations	102	102	102	100

Standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%
1/ Takes value 0 if the government fragmentation is smaller than 0.37, which corresponds to the median point of the government fragmentation variable.

D. Lessons for Hungary

85. **The quality of budget institutions in Hungary deteriorated in relative terms during the period under consideration.** Hungary ranks the lowest in the quality of rules

[27] Results are not reported, but are available under request.

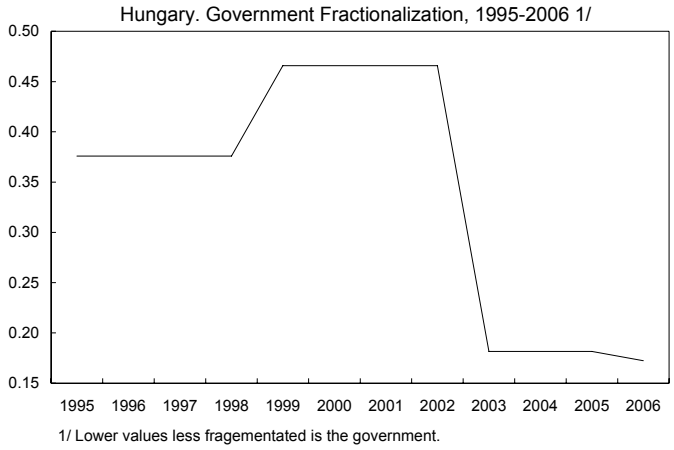
and procedures concerning the budget process among all European countries, old and new member states (Appendix Table 3). While old member states appear, in general, to have better budget institutions, some of the new member States, such as Estonia, stand out for their relative high quality. Others, such as Poland, made significant progress in improving the quality of their institutions over the period 1994-2003.

86. **Hungary has an important opportunity to push forward budget reform.** Despite the reprieve from financial market pressures that Hungary earned after the summer of 2006 with the fiscal package announced in September 2006, external and domestic vulnerabilities remain high (Table 4) and could be further aggravated by a prolonged slowdown in growth. This combined with the fact that Hungary is witnessing the most unified leadership over the last seventeen years (figure) indicates that the country has favorable conditions for promoting needed budget reforms. However, although the conjuncture of the economic and political factors is favorable to budget reforms, a special efforts is required to overcome the strong inertia of historical features that appears to be particularly strong in Hungary.

Table 4. New Member States: Vulnerability Indicators, 2006
(in percent of GDP)

Country	External Debt	Public Debt
Hungary	**91.3**	**65.6**
Poland	46.7	47.8
Slovakia	49.8	30.7
Czech Republic	36.9	30.4
Slovenia	79.5	27.8
Lithuania	55.4	18.2
Latvia	100.8	10.0
Estonia	99.3	4.1

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



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Appendix 1. Budget Institutions Index: Construction, Scores, and Ranking

Appendix Table I. Construction of the Index: Budget Institutions and Their Index Parameters

	Weighting factors		
	Index	Sub-index	Numerical coding
A. Preparation	0.33		
1. General constraint		0.33	
a. Spending and debt as share of GDP			4.00
b. Spending as share of GDP or Golden Rule or limit on public borrowing			3.00
c. Balance and debt as share of GDP			2.00
d. Balance as share of GDP			1.00
e. None			0.00
2. Agend setting		0.33	
a. MF or PM determines budget parameters to be observed by spending ministers			4.00
b. MF proposes nudget norms to be voted on by cabinet			3.00
c. Cabinet decides on budget norms first			2.00
d. MF or cabinet collects bids subject to the pre-aggred guidelines			1.00
e. MF or cabinte collects bids from spending ministers			0.00
3. Structure of negotiations		0.33	
a. Finance ministry holds bilateral negotiations with each spending ministry.			4.00
b. Finance ministry holds multilateral negotiations.			2.00
c. All cabinet members are involved in the negotiations at the same time.			0.00
B. Legislation			
4. Parliamentary amendments required to be off-setting		0.33	
a. Are not allowed, or required to be off-setting			4.00
b. Do not required to be off-setting			0.00
5. Sequence of votes		0.33	
a. Initial vote on total budget size or aggregates			4.00
b. Final vote on budget size or aggregates.			0.00
6. Relative power of the executive vis-à-vis the parliament, can cause fall of government		0.33	
a. Yes.			4.00
b. No.			0.00
C. Implementation	0.33		
7. Changes in the budget law during execution.		0.25	
a. Only new budgetary law to be passed under the same regulations as the ordinary budget.			4.00
b. Requires parliament consent			2.00
c. At total or large discretion of government.			0.00
8. Transfers of expenditures between chapters (i.e. ministries' budgets)		0.25	
a. Not allowed			4.00
b. Only possible within departments with MF consent			3.20
c. Only possible within departments			2.56
d. Require approval of parliament.			1.92
e. Only if provided for in initial budget or with MF approval			1.28
f. Limited.			0.64
g. Unlimited.			0.00
9. Carryover of unused funds to next fiscal year		0.25	
a. Not permitted.			4.00
b. Limited and required authorization by the MF or parliament.			2.67
c. Limited.			1.33
d. Unlimited.			0.00
10. Procedure to react to a deterioration of the budget deficit (due to unforeseen revenue shortfalls or expenditure increase)		0.25	
a. MF can block expenditures .			4.00
b. MF cannot block expenditures.			0.00
d. none			0.00

Sources: Fabrizio S. and A. Mody (2006); and Hallerberg and others (2007).

Appendix Table II. Index of Quality of Budget Institutions

	A. Preparation stage					B. Authorization stage					C. Implementation stage						Overall quality index	
	Variable			1994	2003/04	Variable			1994	2003/04	Variable				1994	2003/04	1994	2003/04
	1	2	3	Score	Score	4	5	6	Score	Score	7	8	9	10	Score	Score	Score	Score
Austria	2	4	4	1.98	3.30	0	2	0	0.66	0.66	2	4	2.66	4	2.49	3.17	1.69	2.35
	0[1/]	2[1/]										1.28[1/]						
Belgium	4	2	2	2.64	2.64	4	4	4	2.64	3.96	0	0	0	4	1.00	1.00	2.07	2.51
	0[12/]	1[12/]	0[12/]			0[4/]	0[12/]				4[12/]	2.56[12/]		0[12/]				
Bulgaria	0	3	4	1.32	2.31	0	0	4	1.32	1.32	0	1.28	4	4	3.32	2.32	1.97	1.96
		0[1/]									4[2/]							
Czech Republic	0	3	4	1.32	2.31	0	4	4	2.64	2.64	4	1.28	1.33	0	2.32	1.65	2.07	2.18
		0[1/]											4[2/]					
Denmark	4	4	2	3.63	3.30	0	4	0	1.32	1.32	2	0	0	4	1.48	1.50	2.12	2.02
		3[1/]	4[1/]				0[1/]	4[1/]			4[1/]	1.92[1/]		0[1/]				
Estonia	3	3	4	3.30	3.30	4	0	4	1.32	2.64	4	1.92	2.67	4	3.15	3.15	2.56	3.00
								0[4/]										
Finland	4	2	2	1.65	2.64	0	0	4	1.32	1.32	0	4	4	0	2.00	2.00	1.64	1.97
	1[7/]																	
Germany	3	2	2	2.64	2.31	0	4	4	1.32	2.64	0	0.64	2.66	4	2.49	1.83	2.13	2.24
		1[1/]	4[1/]				0[1/]				2[1/]	1.28[1/]						
Greece	2	4	4	0.33	3.30	4	4	4	1.32	3.96	0	1.28	0	4	2.32	1.32	1.31	2.83
	0[1/]	1[1/]	0[1/]			0[1/]	0[1/]	0[1/]					4[1/]					
Hungary	0	3	4	2.31	2.31	0	0	0	0.00	0.00	0	0.64	1.33	0	0.49	0.49	0.92	0.92
Italy	2	1	4	1.65	2.31	0	4	4	1.32	2.64	0	0	1.33	4	0.00	1.33	0.98	2.07
	2[7/] 4[2/]		2[9/]			4[9/]	0[9/]	0[9/]					0[5/]	0[9/]				
Latvia	3	3	2	2.64	2.64	0	0	4	1.32	1.32	4	1.92	2.67	4	3.15	3.15	2.35	2.35
Lithuania	0	1	4	1.32	1.65	4	0	0	1.32	1.32	4	1.28	1.33	4	3.32	2.65	1.97	1.86
		0[6/]											4[2/]					
Luxemburg	4	4	0	2.31	2.64	4	0	4	2.64	2.64	4	4	4	4	3.00	4.00	2.62	3.06
	3[8/]											0[1/]						
Netherlands	3	2	4	2.64	2.97	0	4	4	2.64	2.64	0	1.92	1.33	0	0.33	0.81	1.85	2.12
	1[1/]	3[1/]										0[10/]						
Poland	3	1	4	1.32	2.64	4	0	4	1.32	2.64	4	1.28	2.67	0	1.99	1.99	1.53	2.40
	0[1/]	0[6/]				0[1/]												
Portugal	2	2	2	2.31	1.98	0	0	4	1.32	1.32	0	0	1.33	4	1.67	1.33	1.75	1.53
	1[1/]		4[1/]								4[1/]		2.66[1/]	0[1/]				
Romania	0	3	4	1.65	2.31	4	0	4	1.32	2.64	4	1.28	4	0	2.32	2.32	1.75	2.40
		1[4/]				0[4/]												
Slovak Republic	0	1	2	0.99	0.99	0	0	4	1.32	1.32	0	1.28	1.33	0	0.65	0.65	0.98	0.98
Slovenia	0	3	4	2.31	2.31	4	0	4	2.64	2.64	0	1.28	2.67	0	0.99	0.99	1.96	1.96
Spain	3	4	4	3.63	3.63	0	4	0	1.32	1.32	0	1.28	4	0	1.32	1.32	2.07	2.07
													1.33[11/]					
Sweden	3	3	4	1.32	3.30	0	4	4	1.32	2.64	4	4	2.66	0	1.33	2.67	1.31	2.84
	0[9/]	0[9/]					0[9/]					0[9/]	1.33[9/]					
United Kingdom	4	3	4	3.30	3.63	4	4	4	3.96	3.96	4	2.56	0	4	1.81	2.64	2.99	3.38
		2[1/]										1.92[1/]	1.33[1/]	0[1/]				

Sources: Authors' calculations.
1/ Before 1998.
2/ Before 2001.
3/ Before 2000.
4/ Before 2003.
5/ Before 2002.
6/ Before 1999.
7/ Before 1996.
8/ Before 2004.
9/ Before 1997.
10/ Before 1995.
11/ Before 1994.
12/ Before 1993.
13/ Before 1992.

Appendix Table III. Budget Institutions Quality Index

	Rank 1/							
	1994				2003/2004 2/			
	Preparation	Authorization	Implementation	Overall	Preparation	Authorization	Implementation	Overall
Hungary	12	1	3	2	4	1	1	1
Austria	11	3	17	8	17	2	22	8
Belgium	16	18	6	16	11	21	5	16
Bulgaria	3	4	22	13	4	3	15	13
Czech Republic	3	18	14	17	4	11	11	17
Denmark	22	4	9	18	21	3	10	18
Estonia	20	4	20	21	17	11	20	21
Finland	8	4	13	7	11	3	14	7
Germany	16	4	17	19	4	11	12	19
Greece	1	1	14	1	17	21	6	1
Italy	8	4	1	4	4	11	8	4
Latvia	16	4	20	20	11	3	20	20
Lithuania	3	4	22	13	2	3	18	13
Luxemburg	12	18	19	22	11	11	23	22
Netherlands	16	18	2	11	16	11	3	11
Poland	3	4	12	6	11	11	13	6
Portugal	12	4	10	10	3	3	8	10
Romania	10	4	14	9	4	11	15	9
Slovak Republic	2	4	4	3	1	3	2	3
Slovenia	12	18	5	12	4	11	4	12
Spain	22	4	7	15	22	3	6	15
Sweden	3	4	8	5	17	11	19	5
United Kingdom	20	23	11	23	22	21	17	23

Sources: Fabrizio S. and A. Mody (2006); Hallerberg M. and others (2007); and authors' calculations.
1/ Higher rank indicates better quality (highest rank=23).
2/ Data for the new Member States are available up to 2003.