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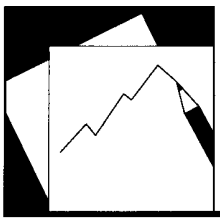

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Fiscal Adjustments: Determinants and Macroeconomic Consequences

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Fiscal Adjustments: Determinants and Macroeconomic Consequences

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Abstract

The paper analyzes the determinants of success of recent fiscal consolidations in the OECD countries as well as the short-run and long-run effects of fiscal adjustments on economic activity by looking at fourteen case studies, panel data for OECD countries, and the results of simulations using a non-Ricardian multi-country dynamic general equilibrium model. The study finds that while fiscal consolidations tend to have short-run contractionary effects, they can be expansionary in the long run, provided that they do not rely excessively on cuts in productive government expenditure. They can also create positive spillover effects for the rest of the world.

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I. INTRODUCTION

This paper examines the experience of industrial countries that undertook fiscal consolidation, managed to stabilize public finances, and substantially reduce debt without adverse effects on the pace of economic activity. Complementing the analysis of a number of recent studies that have explored this issue, the novelty of the paper lies in using both case studies and econometric analysis, including model-based simulations, to explore a broad range of determinants of the success of fiscal adjustments. Using a cross-sectional framework, the paper studies the determinants of the success, as well as obstacles on the way to fiscal adjustment by examining the following: economic conditions at the start of consolidation; the composition of expenditure and revenue measures; the role of accompanying structural reforms; the contribution of institutional factors; and government actions aimed at garnering public support. The paper also examines the short and long-run effects of fiscal consolidations on economic activity.

The cross-country econometric study of the determinants of fiscal adjustment effort is complemented by fourteen case studies of fiscal adjustments in OECD countries, including each of the G-7, during the 1990s and 2000s. The analysis of the effects of fiscal consolidations on economic activity is based both on case studies and on simulations using the Global Integrated Monetary and Fiscal Model (GIMF) developed at the International Monetary Fund (IMF).

The case studies based on the OECD country experience suggest that budgetary difficulties tend to spur adjustment efforts, which are facilitated by a supportive domestic and international growth environment. Fiscal adjustments that rely on cuts in current expenditure have tended to be more durable than revenue-based consolidations. Higher governmental stability and higher institutional quality are also associated with more successful fiscal consolidations.

Regarding the macroeconomic effects of fiscal consolidations on economic activity, the case studies indicate that while adjustments tended to have a moderating influence on growth in the short run, it was not as pronounced as generally anticipated, and in a number cases, the consolidations could even be described as "expansionary." The GIMF-based experiments suggest that the short-run contractionary effects are smallest when the consolidation involves increases in consumption taxes, and largest when it involves cuts in productive public infrastructure spending. In addition, fiscal consolidation can have positive long-run effects, particularly when the greater fiscal space available after debt has been reduced is used to cut capital income taxes. However, these long-run gains may not occur if the consolidation involves cuts in public infrastructure spending. Fiscal adjustment is also found to have substantial positive spillover effects when implemented by a large economy such as the United States.

The remainder of the paper is structured as follows: Section II identifies a number of recent adjustment episodes in the OECD countries; Section III analyzes case studies based on a selection of these episodes; Section IV conducts a cross-section analysis of the determinants

of the adjustment effort; Section V examines the impact of consolidation on economic activity based both on case studies and simulations using the GIMF; and Section VI concludes.

II. Identifying Episodes and Determinants of Fiscal Adjustment

A. Identifying Episodes of Successful Fiscal Adjustment

Fiscal consolidations are usually deemed to be successful if they are sustained, and are substantive. A standard approach has been to define a fiscal consolidation (FC) relative to a specific improvement in the cyclically adjusted primary balance (CAPB), over a 1–3 year period.[2] In addition, a number of existing studies distinguish successful from unsuccessful consolidations by measuring the size of the fiscal adjustment, its duration, or its impact on the debt-to-GDP ratio (e.g. Alesina and Perotti, 1995, and Tsibouris and others, 2006).[3]

For the purposes of the case study analysis presented in this paper, FCs are defined as years in which the ratio of the CAPB to cyclically-adjusted GDP improves by at least 1 percentage point. To determine how successful a given FC is, this paper follows Alesina and Perotti (1995), and Darby and others (2005), and focuses on the degree of debt reduction achieved over the following three years. In particular, the FC can be considered very successful if, three years after the start of the consolidation, the debt-to-GDP ratio is at least five percentage points below the level observed immediately prior to FC. Depending on the degree of debt reduction achieved, FC attempts are also categorized as either "moderately successful" or "unsuccessful," as explained in Appendix I.

Based on this approach, fiscal adjustments are identified amongst the 24 OECD countries considered in this paper during 1990–2005.[4] To allow an evaluation of the success of FC that occurred during 2003–05, the paper relies on forecasts of public debt for 2006–07 provided by the OECD (2006). The full list of FC episodes is reported in Appendix Tables A1–A3, along with the estimated and projected changes in the CAPB and debt ratios.

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[2] Focusing on the change in the CAPB in percent of cyclically adjusted GDP permits a more accurate measure of fiscal effort than the unadjusted primary balance, as the CAPB focuses on discretionary changes in fiscal policy net of contributions of cyclical factors.

[3] Data on the cyclically-adjusted primary balances and public debt for all countries considered in this paper are taken from the OECD. The OECD's method of computing the cyclically-adjusted fiscal balance is described in Giorno and others (1995). For tax revenues, the cyclical components are calculated by multiplying output gaps estimated using a production function approach by estimated elasticities with respect to output. In terms of revenues, four different types of taxes are distinguished in the cyclical adjustment process: personal income tax; social security contributions; corporate income tax and indirect taxes. The sole item of public spending treated as cyclically sensitive is unemployment-related transfers. For a recent update of the tax elasticities used to calculate the cyclical component of tax revenues, see Girouard and André (2005).

[4] The 24 OECD countries considered in the analysis are as follows: Australia, Austria, Belgium, Canada, Denmark, Germany, Finland, France, Greece, Ireland, Iceland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and the United States.

Fourteen of these fiscal adjustments are selected for the purposes of the case studies. These selected episodes include recent examples of FC by each of the G-7 countries and the adjustment in Germany since 2003.[5] In addition, they include selected recent consolidations in other OECD countries (Denmark, Ireland, the Netherlands, and New Zealand) and several episodes of adjustment that are deemed to have been particularly successful (Finland, Spain, and Sweden). All the FCs occurred during the 1994–2005 period, as reported in Table 1. The list is by no means exhaustive (for instance, case studies of successful consolidations in Australia and Belgium are not reported due to space constraints), and therefore the results should be interpreted in conjunction with those of the econometric analysis with a broader country coverage.[6]

Table 1. Fiscal Consolidation Episodes Used for Case Studies

Country	*Years*
Canada	1994–97
Denmark	2004–05
Finland	1998
Germany	2003–05
France	1996–97
Ireland	2003–04
Italy	1997
Japan	2004
Netherlands	2004–05
New Zealand	2003
Spain	1996–97
Sweden	1994–98
United Kingdom	1995–98
United States	1994

Source: OECD, and IMF staff calculations.

B. Potential Determinants of Fiscal Consolidation Success

A wide variety of economic, political, and institutional factors have been identified as likely contributors to FC success (see, for instance, Alesina and Perotti, 1995, Von Hagen and Strauch, 2001**,** Darby and others (2005) and Alesina et al 2006). These include macroeconomic and political background before and during the consolidation; the design of adjustment (relative importance of expenditure and revenue measures); subnational government participation (for example, via cuts in the provincial wage bill); adoption of

[5] The adjustment in Germany does not formally qualify as a consolidation episode as the gradual improvement in primary structural balance has not exceeded 1 percent of GDP in any year. Nonetheless, it presents an interesting case of a recent multiyear consolidation initiative.

[6] It is worth emphasizing that, unlike the case study analysis, the econometric cross-section analysis does not rely on specific thresholds for identifying consolidations. Rather, the cross-section approach relates the full data set on primary balances to the underlying determinants of fiscal policy using statistical inference.

structural reforms (for instance, in the area of social security) and changes in institutional framework (for example, introduction of an medium-term expenditure framework, MTEF); and use of various strategies to mobilize public support for the adjustment (for example, highlighting long-run sustainability considerations in the government's communication strategy). The findings of the literature regarding the relationship between these factors and FC success are briefly summarized below.

It has been widely suggested that budgetary difficulties can oftentimes lead to a consensus to deal with them. High and rising debt-to-GDP ratio has the potential to spur effective FC, and the empirical evidence is generally supportive of this notion (see, for example, Von Hagen and Strauch, 2001, henceforth VHS). It has been also suggested that domestic economic conditions can affect the likelihood of FC starting, and succeeding. The evidence on the direction of the impact is, however, inconclusive. On the one hand, Drazen and Grilli (1993) argue that reform is more likely when "things are going badly," and VHS (2001) find that FC has a higher chance of becoming successful when the domestic economy is in a cyclical downturn, although the likelihood of a FC being attempted is higher during domestic economic expansions. On the other hand, Alesina and Perotti (1995) find that the probability of successful FC is lower when the economy is in recession.

While the success of FC is also likely to depend on the macroeconomic situation of major trading partners, there is no consensus on the direction of this effect. On the one hand, VHS (2001) find that FCs starting in periods when both the domestic and the international economies are weak are more likely to be successful. On the other hand, Alesina and Perotti (1995) and McDermott and Wescott (1996) find that many successful fiscal adjustments took place in the second half of the 1980s, i.e. a period of high OECD economic growth, and that efforts of FC in the early 1980s, when economic growth in the OECD was low, typically failed.

It has also been argued that the success of FC depends on a simultaneous easing of monetary policy: however, the empirical evidence for OECD countries is again inconclusive. Lambertini and Tavares (2005) find support for this hypothesis, while VHS (2001) report that the monetary policy stance has no explanatory power for the success of FC.

A number of studies have emphasized the importance of political economy factors in determining the outcome of FCs. For instance, coalition governments have been found to be less likely to succeed than single-party and minority governments (Alesina and Perotti, 1995). Alesina and others (2006) report that newly-elected governments, and governments in presidential systems with a large majority of the party in office have a higher likelihood of success. By contrast, frequent changes in governments tend to be associated with larger fiscal deficits, as documented by Alesina and Tabellini (1990), and Tytell and Wei (2004).

A number of studies (e.g., Alesina and Perotti, 1995, and VHS, 2001) have examined the composition of fiscal adjustments and found that while successful and unsuccessful adjustments involve, on average, the same improvement in the cyclically-adjusted primary balance, the former rely mostly on expenditure cuts and the latter tend to rely more on tax increases. Within expenditure, successful adjustments tend to be characterized primarily by

cuts in transfers and wage bill. The limited expenditure cuts that occur during unsuccessful adjustments come mainly from government investment.

The involvement of the subcentral tiers of government has often contributed to the success of FCs. For example, Darby and others (2005) find that, for OECD economies over 1979–99, involvement of the subcentral tiers of government was crucial to achieving cuts in expenditure, particularly in relation to the overall size of the government wage bill. In addition, central governments appear to have exerted a strong influence on the expenditure of subcentral tiers through grant allocations, and control of these allocations appears to have had a considerable impact upon the overall success of FC attempts.

Governments used a wide range of strategies to mobilize popular support for fiscal consolidation, including involvement of independent fiscal agencies in the assessment of the unsustainability of a given fiscal policy stance; explicit references by governments to fiscal objectives that need to be attained to address sustainability concerns (i.e., emphasizing long-run pressures on social security, the importance of "halving the deficit by year x", and the promotion of a "golden rule"); explicit references to an external anchor, in particular, the need to meet Maastricht criteria; including fiscal consolidation in a package of structural reform measures; and promoting enhanced fiscal transparency that facilitates monitoring of the fiscal stance by the public (as discussed by Tsibouris and others (2006)).

A number of studies suggest that higher-quality fiscal institutions make an important contribution to the success of FC. For example, higher-quality fiscal institutions were shown to be associated with greater expenditure discipline, even after controlling for political pressures (Fabrizio and Mody, 2006).[7] The contribution of institutional quality, as measured by strong and impartial bureaucracies and high democratic accountability, has also been found to be important for fiscal policy performance.[8] In particular, Alt and Lassen (2006) find that a higher degree of fiscal transparency is associated with lower public debt and deficits, after controlling for other explanatory variables.

III. CASE STUDIES

The case studies provide a number of useful insights into the determinants of fiscal consolidations and their successes.[9] It is important to emphasize that the analyzed episodes of fiscal consolidation differ widely in terms their size and composition, economic and political

[7] The quality of fiscal institutions is typically measured using indices composed of variables that evaluate the budget-preparation stage, budget authorization stage, and budget implementation stage (for example, as constructed by Gleich, 2003, and Yläoutinen, 2004).

[8] See for example, IMF (2003). Interestingly, Abiad and Baig (2005) find that, in emerging market countries, better-quality institutions are associated, on average, with larger deficits. They interpret this seemingly counterintuitive finding as indicating that better institutions are associated with lower risk premia and, hence, a lower need for fiscal adjustment.

[9] A number of recent studies have employed a case study approach to analyzing fiscal adjustments, including Tsibouris and others (2006), Haputmeier and others (2006), and Annett (2006).

background, adjustment strategy, accompanying reforms, and outcomes. Nevertheless, a wide range of substantive conclusions do emerge from the analysis, and are summarized in this section.

A. Political, Macroeconomic, and Fiscal Background

(i) About three quarters of the surveyed fiscal adjustments were initiated by newly-elected governments (Table 2). This finding is intuitive for the following reasons. First, as in a number of European countries and in Canada in the 1990s, new governments are given an explicit mandate for fiscal adjustment. Secondly, new governments proposed new approaches to tackling old problems. Thirdly, new governments were better positioned to develop a medium-term strategy for fiscal adjustment with maximum ownership. Finally, political costs of initiating an adjustment may well be the smallest at the beginning of a government's elective office, and would be expected to increase as an election date approached.

(ii) Most fiscal consolidations were launched during economic downturns or the early stages of recovery from a recession. While launching fiscal consolidation during an upswing may have the obvious merits, including ensuring counter-cyclicality of fiscal policy, less than a quarter of the fourteen adjustment episodes were initiated against the background of a strong economic outlook (the exceptions being the U.K., New Zealand, and, to a lesser extent, Spain). This finding is consistent with the notion that it is easier to build a broad consensus about the need for fiscal consolidation during or shortly after a sharp downturn in economic activity.

(iii) Fiscal consolidations were also typically preceded by sharp deterioration in government fiscal balances accompanied by rapid increases in public debt levels. The rationale for this may appear self-evident, although there are plenty of instances where a deterioration in the fiscal positions has not been followed by relatively rapid adjustment. Notable exceptions are the recent cases of Denmark and New Zealand, where fiscal consolidations were to a significant extent motivated by the dire long-term outlook of public finances given the fiscal costs of aging population, and Ireland, where fiscal consolidation represented an attempt to arrest the deterioration of budget balance at an early stage.

Table 2. Recent Fiscal Consolidation Attempts in Selected Countries: Background

Episode	*Political Background*	*Macroeconomic Background*	*Government Finances*
Canada, 1994–97	Majority federal government elected in 1993 to address fiscal issues; similar election result in 1994–95 in the two largest provinces.	Recovery from recession; low inflation; high output gap and unemployment; exchange rate deprecation; improving current account balance.	Sizable deficit and debt stock; large share of debt held at short term and by nonresidents; high tax-to-GDP ratio; expending entitlements; sub-federal fiscal issues.
Denmark, 2004–05	The ruling center-right coalition entered the second half of its term with a diminishing voter support.	Continued economic slowdown (since 2001) characterized by gradually rising unemployment.	A moderate level of public debt (of about 50 percent of GDP), a near-balanced budget.
Finland, 1998	Both the coalition elected in 1991 and the grand coalition elected in 1995 had a clear mandate for EMU membership.	Gradual consolidation (from 1992) started at the time of deep recession characterized by high output gap, rising unemployment, low inflation, and depreciating exchange rate. By 1998 the economy had recovered and enjoyed a growth rate well above the EU average.	High deficit and medium-level but rapidly increasing debt, high tax-to-GDP ratio and expanding entitlement programs.
France, 1996–97	The president brought forward parliamentary elections by one year to ensure that the new government had a clear mandate for fiscal consolidation and that domestic elections did not interfere with the pre-EMU meeting of the European Council in early 1998.	The consolidation was launched against the background of a slow recovery from a recession, characterized by relatively high unemployment, low inflation, and exchange rate depreciation.	The expansionary policy in response to the 1993 recession left France with a large fiscal deficit and a medium-level but rapidly rising public debt, falling short of the EMU criteria.
Germany, 2003–05	The coalition led by the Social-Democratic Party narrowly won the elections in September 2002. The comprehensive reform plan (Agenda 2010) was unveiled in March 2003.	Three years of static output, high unemployment, concerns about possible deflation, heavy losses in the financial sector.	Fiscal deficit widened to about 3.7 percent of GDP in 2002, with public debt hovering around 60 percent of GDP.
Ireland, 2003–04	The coalition government enjoyed a strong parliamentary majority since 2002. In addition, there were few differences of views within the coalition.	After a decade of strong growth, economic activity (excluding profits of multinationals) decelerated markedly in 2002 and remained subdued in 2003.	Relatively low level of public debt (below 35 percent of GDP), a near-balanced budget, a relatively low tax-to-GDP ratio.
Italy, 1997	The consolidation was preceded by the electoral reforms at both the central and regional levels, which resulted in more stable governments with longer political horizons.	The consolidation attempt was launched during the time when growth turned negative in late 1996 - early 1997 after strong performance in 1995, and the return of the recession of the early 1990s was perceived as likely. Inflation was declining but the unemployment remained high.	Very high debt (of over 115 percent of GDP in 1997), rising in spite of fiscal consolidation attempts since early 1990s.
Japan, 2004	Ruling coalition since 2000. In 2004, the positions of the ruling party in both houses of parliament shrank as the government's approval rating hit the low of 36 percent (compared to 70–90 percent in 2001), partly due to the passage of pension reforms.	Gradual economic recovery since mid-2002, with contributions from both exports and domestic demand, characterized by gradually declining unemployment and easing of deflation.	A decade of high fiscal deficits (about 8 percent of GDP in 2003) led to a rapid accumulation of public debt, which reached 160 percent of GDP. The revenue-to-GDP ratio remained below 30 percent, while social security outlays kept rising.

Table 2 Recent Fiscal Consolidation Attempts in Selected Countries (concluded)

Episode	*Political Background*	*Macroeconomic Background*	*Government Finances*
Netherlands, 2004–05	As a result of early elections in January 2003, center-right coalition government took office.	There had been a significant downturn in activity since 2000. During the two years, growth averaged barely 0.2 percent, with unemployment rising. Activity began to pick up in 2004 and growth was projected at about 1 percent in 2004 and 1¾ percent in 2005. The authorities had the challenge of nurturing the emerging recovery while ensuring fiscal sustainability.	There had been a sharp deterioration in the fiscal position with the 3 percent Maastricht deficit ceiling breached in 2003. The general government balance worsened by almost 5½ percentage points during the first three years of the decade, as a result of the 2001 tax reform, increases in health care and education spending, and a higher deficit of local governments (reaching 0.6 percent of GDP).
New Zealand, 2003	Competitive political environment, with the opposition calling on the ruling Labour Party to introduce more tax cuts and improve the quality of health and education services. However, the September 2005 elections did not lead to any significant relaxation of fiscal policy and the incumbent party was re-elected with a confirmed mandate for continued fiscal consolidation.	Solid and accelerating economic growth, narrowing current account deficit, unemployment at a 16-year low.	A slight budget surplus and a moderate level of public debt (of about 40 percent of GDP), which exceeded, however, the government's long-term target of 30 percent of GDP.
Spain, 1996–97	Elected in March 1996, the coalition government had a mandate for fiscal consolidation.	A relatively rapid economic recovery after the recession that culminated in a negative growth in 1993. While economic activity was on the rise and inflation gradually subsided, high unemployment (at above 20 percent of labor force) proved to be persistent.	Public financed have been gradually deteriorating since 1988 with fiscal deficit exceeding 7 percent of GDP in 1995. Public debt has rapidly risen to over 70 percent of GDP.
Sweden, 1994–98	The Social Democrat minority government launched fiscal consolidation following the 1994 general elections.	The deepest recession since the 1930s, accompanied by high inflation, quickly rising unemployment, exchange rate depreciation and associated improvement in the current account balance.	Fiscal deficit exploded to over 12 percent of GDP as a result of the cyclical downturn and the underfinanced tax reform of 1990–91, with public debt reaching 80 percent of GDP.
United Kingdom, 1995–98	The popularity of the conservative party by the middle of the term was low. After 18 years of being in opposition, the Labour Party won elections in May 1997 with an overwhelming majority in Parliament. The new government confirmed the course of fiscal consolidation and introduced a number of new policy reforms, including transferring the responsibility for setting interest rates from the Treasury to the Bank of England.	Three successive years of solid economic growth, led by private consumption. Unemployment was falling rapidly, while inflation remained relatively low.	Public sector fiscal deficit increased to over 7 percent of GDP by 1994, the debt-to-GDP ratio was on the rise and already exceeded the target level of 40 percent by about 8 percentage points.
United States, 1994	New Democratic President took over in January 2003. The Congress was also Democratic and there was expectation of an initiative to reduce debt.	Economic activity had been weak for some time, and unemployment was rising.	The federal government fiscal situation had been deteriorating at a sharp pace. The deficit was almost 5 percent of GDP. In nominal terms federal debt had quadrupled over 1980–92 and the debt ratio was projected to continue rising at a high rate.

Sources: Country authorities, OECD, Economist Intelligence Unit, and IMF staff reports.

B. Adjustment Basis

(i) Fiscal consolidations were approximately equally split between revenue-based and expenditure-based adjustments, with many episodes combining both types of measures (Table 3). On the expenditure side, a number of adjustments relied substantially on capital expenditure cuts (e.g., France, Italy, and more recently Ireland), and across-the-board sequestration of discretionary spending programs (e.g., Sweden, Finland, and more recently Japan).

(ii) However, the consolidation attempts based on cuts in current expenditure were more sustained on average, possibly because cuts in current expenditure were often accompanied by structural reforms. Reduction in wage bill and social security spending (including social transfers, health care, and unemployment benefits) made an important contribution to fiscal adjustment in a number of cases (e.g., Canada, Finland, Spain, and more recently the Netherlands). Such cuts were usually facilitated by structural reforms aimed at improving the efficiency of public services provision and the incentive structure of insurance schemes. In contrast, tax increases and capital expenditure cuts were accompanied by structural changes in only a few instances (e.g., tax reforms in Canada and introduction of medium-term capital budgeting in Ireland). In addition, politically difficult measures, such as current expenditure cuts or general tax increases, may well have signaled a strong commitment to continued fiscal consolidation.

(iii) While revenue measures ranged widely from one-off tax surcharges to major overhauls of tax systems, successful revenue-based adjustments tended to rely to a significant extent on tax base broadening. In some instances (e.g., in Spain), tax reforms aimed at simplifying the tax system and reducing tax burden on small and medium-sized businesses resulted in higher tax buoyancy and higher revenues over the medium term.

(iv) Successful fiscal adjustments were often gradual: spanned periods of time of up to a decade (e.g., Finland, Sweden, Spain). The long duration of successful consolidations underscores the importance of anchoring policy objectives within a medium-term framework with a credible commitment to chosen strategies. It also highlights the lags between the adoption of certain types of core structural reforms (in particular, in the area of social welfare) and their full impact.

Table 3. Recent Fiscal Consolidation Attempts in Selected Countries: Adjustment Basis

Episode	*Adjustment Basis*	*Size and Composition*	*Revenue Measures*	*Expenditure Measures*
Canada, 1994–97	Expenditure, complemented by some revenue measures.	Cyclically adjusted primary fiscal balance improved by 6.6 percent of GDP over 1994–97. Expenditure cuts accounted for about 85 percent of the improvement.	Higher excises, broadening of the personal income tax and corporate income tax bases, and increases in corporate income tax rates.	Cuts in wage bill, unemployment benefits, defense spending, agricultural and business subsidies, and transfers to provinces.
Denmark, 2004–05	Mixed, with emphasis on expenditure restraint.	Cyclically adjusted primary fiscal balance improved by about 2.9 percent of GDP over 2004–05. Expenditure restraint accounted for approximately half of the improvement.	Tax revenues exceeded expectations, largely owing to rising oil and gas prices, in spite of a reduction in personal income tax rates in 2004, and a "tax freeze" in effect since 2002.	Caps on expenditure growth in real terms led to a gradual reduction in the expenditure-to-GDP ratio.
Finland, 1998	Expenditure, complemented by some revenue measures.	Cyclically adjusted primary fiscal balance improved by about 1.7 percent in 1998 (and by cumulative 10 percent of GDP over 1992–2000). Expenditure cuts accounted for about 85 percent of the improvement.	Broadly revenue-neutral tax reform raising payroll taxes and user fees.	Across-the-board cuts in social benefits, transfers to municipalities, subsidies, wages, and capital spending.
France, 1996–97	Revenue, complemented by some expenditure measures.	Cyclically adjusted primary fiscal balance improved by about 3 percent of GDP over 1996–97. Revenue measures accounted for more than 85 percent of the improvement.	Broadening of tax base, temporary profit tax surcharges, increase in VAT rate in 1996, one-off dividend payments.	Reduction in capital spending, curtailing health care and defense expenditure.
Germany, 2003–05	Expenditure, with some revenue measures foreseen in the future.	Cyclically adjusted primary fiscal balance improved by about 0.6–1.6 percent of GDP over 2003–05 (according to different estimates), mainly as a result of expenditure measures.	Income tax cuts partly offset savings achieved through expenditure measures.	Reduction in health care spending, tightening unemployment benefit entitlements.
Ireland, 2003–04	Revenue, complemented by some expenditure measures.	Cyclically adjusted primary fiscal balance improved by about 2.9 percent of GDP over 2003–04. Revenue measures accounted for more than 90 percent of the improvement.	Increases in VAT and excises, changes in capital gains taxation.	Reduction in capital spending, the 2003 wage agreement presented a considerable wage moderation relative to the past.
Italy, 1997	Mixed, with emphasis on revenue.	Cyclically adjusted primary fiscal balance improved by about 2 percent in 1997 (and by cumulative 3.5 percent of GDP over 1994–97). Expenditure and revenue measures approximately equally contributed to the improvement.	A number of temporary and permanent measures, including personal income surtax, levy on severance payments funds, and an increase in VAT rates in 1998, boosted revenues to the record high of over 47.5 percent of GDP.	Curtailed capital spending, reduced transfers to subnational governments; persistent increases in pension and health care outlays were arrested.

Table 3 Recent Fiscal Consolidation Attempts in Selected Countries: Adjustment Basis (concluded)

Episode	*Adjustment Basis*	*Size and Composition*	*Revenue Measures*	*Expenditure Measures*
Japan, 2004	Mixed, with emphasis on expenditure restraint.	Cyclically adjusted primary fiscal balance improved by about 1.3 percent of GDP in 2004 (and by another 0.2–0.8 percent (according to different estimates) in 2005), mainly as a result of higher revenues combined with expenditure restraint.	Rollback of past income tax cuts, higher-than-expected tax revenues were saved.	Gradual reduction in capital spending; containing growth of social security expenditure; across-the-board cuts in discretionary spending programs.
Netherlands, 2004–05	Expenditure complemented by some revenue measures.	The structural deficit narrowed by about 2.3 percent of GDP over 2004–05. Expenditure measures accounted for more than 75 percent of the improvement.	There were modest base-broadening tax policies, natural gas revenues increased.	A significant cut in civil service employment, a general cut in subsidies; freeze of public sector wages and social security benefits; a reduction in the coverage of the basic public health care package, including abolition of disability insurance scheme for the self-employed.
New Zealand, 2003	Mixed, with a major contribution from buoyant revenues being saved.	Cyclically adjusted primary fiscal balance improved by about 1.4 percent of GDP in 2003 (and by cumulative 3.3 percent since 2000). Expenditure restraint accounted for approximately 40 percent of the improvement.	Tax revenues and surpluses of public enterprises turned out to be higher than expected.	Caps on current expenditure led to a gradual reduction in the expenditure-to-GDP ratio.
Spain, 1996–97	Expenditure, complemented by some revenue measures.	Cyclically adjusted primary fiscal balance improved by about 2.8 percent in over 1996–97 (and by cumulative 4.1 percent of GDP since 1993). Expenditure cuts accounted for about 60 percent of the improvement.	Tax reforms aimed at simplifying the tax code and reducing burden on small businesses, coupled with strengthened tax administration, resulted in a significant increase in tax buoyancy.	Reduction in current expenditure, including cuts in social transfers, wage bill, and health care spending.
Sweden, 1994–98	Expenditure, complemented by significant revenue measures.	Cyclically adjusted primary fiscal balance improved by about 11 percent of GDP over 1994–98. Expenditure cuts accounted for approximately 75 percent of the improvement.	Increases in social security fees, full taxation of dividends and capital gains, increase in personal income tax rates.	Reduction in pension and welfare spending, including unemployment benefits, and cuts across a broad range of spending programs.
United Kingdom, 1995–98	Expenditure restraint, accompanied by revenue measures.	Cyclically adjusted primary fiscal balance improved by 6.4 percent of GDP over 1995–98. Expenditure restraint accounted for about 75 percent of the improvement.	Increases in indirect taxes, and some duties. For equity reasons, VAT on some items was lowered. Abolition of advanced corporation tax rebate, accompanied by a small reduction in corporate tax rate. One-off windfall levy on profits of privatized utilities.	Containing increases in health care and educations spending, some other relatively minor expenditure measures.
United States, 1994	Mainly revenue measures.	Multi-year adjustment with the structural deficit to improve by 2½ percentage points of GDP over the following three years.	Increase in income tax rates (on the top 1.2 percent of taxpayers), and in the corporate tax rate; social security tax increase for the top 15 percent of the social security recipients.	Virtually no expenditure measures, in particular no cuts in social and health care spending.

Sources: Country authorities, OECD, Economist Intelligence Unit, and IMF staff reports. The size of fiscal adjustment is estimated using the OECD data.

C. Adjustment at the Subnational Level

(i) A number of consolidation episodes were accompanied by the introduction of new mechanisms of policy coordination across different tiers of government (Table 4). In many cases fiscal adjustments involved actions on the part of subnational governments. Some countries prompted such actions by imposing numerical rules on local and regional authorities (the Netherlands, Sweden in 2000), while others adopted a cooperative approach to policy coordination, whereby the central and subnational governments negotiated fiscal targets, which then become binding (Denmark, Spain). At the same time, in the absence of formal mechanisms enforcement of collective decisions sometimes relied fundamentally on moral suasion and peer pressure, with fiscal adjustments nonetheless being successful (e.g., Spain). In some cases tight administrative controls over subnational public finance had already been in place (U.K., Ireland).

(ii) Clarification of expenditure responsibilities and revenue assignments of subnational governments made an important contribution to fiscal consolidation in several countries. Clarification of delineation of responsibilities between the tiers of government often helped to alleviate the problem of soft budget constraints and increased the political accountability of local authorities, potentially leading to net savings for the general government. Such reforms supported fiscal consolidations in Italy and Japan, although in some instances (e.g., U.S., France, and Germany) fiscal consolidation attempts appeared to lack support at the subnational level.

D. Structural Reforms

(i) In several cases, fiscal consolidations were accompanied by the introduction of a medium-term budget framework (Table 5). Multiyear budgeting helped to put fiscal consolidation into perspective, facilitating the adoption of other structural reforms and the communication of fiscal policy objectives to the voters. Several countries made important advances in incorporating the long-term fiscal sustainability analysis into the medium-term policy framework.

(ii) A number of fiscal consolidations were supported by structural reforms in the area of health care, unemployment benefits, and pensions. These reforms supported fiscal consolidations directly by raising the efficiency and reducing the cost of public service provision as well as indirectly by contributing to overall economic activity through strengthened incentives to work.

(iii) Structural reforms may also have facilitated future adjustment by developing the appropriate institutional framework. For example, recent fiscal consolidations in Denmark and New Zealand were facilitated by the previous successful consolidations of the 1990s, which laid the foundations of medium-term budgeting, incorporation of long-term fiscal projections, and improved expenditure control. In turn, fiscal consolidations provide an impetus for structural reforms, creating a virtuous circle of enhanced fiscal discipline and higher efficiency of government.

Table 4. Recent Fiscal Consolidation Attempts in Selected Countries: Subnational Adjustments

Episode	*Subnational Adjustments*
Canada, 1994–97	Cuts in the provincial wage bill, capital spending, and transfers to municipalities totaling 1.7 percent of GDP in FY 1993/94. Provinces raised education and health fees and excises and broadened the corporate income tax base. Ontario and Quebec eliminated deficits in the late 1990s (3 percent of provincial GDP).
Denmark, 2004–05	Starting from 2003, the counties became legally bound to comply with the budget targets (negotiated with the central government and expressed in nominal terms), but expenditure overruns at the local level remain an issue. A broader reform of governance at the subnational level involving a drastic reduction in the number of municipalities was agreed. It will come into force in 2007.
Finland, 1998	Reduction in transfers to municipalities; municipalities cut the wage bill and capital spending and raised property tax, improving their fiscal balances by 2.3 percent of GDP in 1994–95.
France, 1996–97	The consolidation largely lacked support at the subnational level. The "Stability Pact" capped the rate of growth of transfers to local governments by the rate of inflation.
Germany, 2003–05	The Internal Stability Pact (2002) did not result in an agreement on the division of responsibilities for compliance with the Stability and Growth Pact between the central and regional governments, and the attempts to reform the intergovernmental relations were in a political gridlock.
Ireland, 2003–04	No specific measures were introduced. However, the central government has traditionally maintained a tight administrative control over subnational government spending.
Italy, 1997	Tighter control over intergovernmental transfers since 1996, clearer delineation of expenditure responsibilities between the tiers of government, the electoral reform that arguably increased the accountability of local officials.
Japan, 2004	Devolution of tax and spending responsibilities to subnational government led to a cut in subsidies and some net savings, albeit modest. Further reform of the grant allocation system is being considered.
Netherlands, 2004–05	More explicit constraints on the operations of the local governments, including limitations on how much they could borrow; strong emphasis on closer cooperation between the central and local governments. Local governments supported the consolidation effort by improving their balances in 2004–05.
New Zealand, 2003	While no specific measures were adopted, subnational governments pursued prudent fiscal policies.
Spain, 1996–97	In 1992, Spain adopted a cooperative approach to regulating subnational public finances, whereby subnational fiscal targets were negotiated between the central and regional governments. The fiscal consolidation attempted launched by the central government enjoyed only partial support at the regional level.
Sweden, 1994–98	In 1993, the mechanism of distributing relief grants to municipalities was revised, which arguably alleviated the soft budget constraint problem. The central government consolidation attempts were supported at the local level in 1995 and 1997–98.
United Kingdom, 1995–98	No specific measures were introduced at the local authority level. However, the central government has traditionally maintained a tight administrative control over subnational government spending.
United States, 1994	The adjustment was carried out entirely at the federal government level.

Sources: Country authorities, OECD, Economist Intelligence Unit, and IMF staff reports.

Table 5. Recent Fiscal Consolidation Attempts in Selected Countries: Structural Reforms

Episode	*Key Fiscal Structural Reforms*
Canada, 1994–97	Introduction of medium-term budget framework; shift to block transfers; corporate income tax and personal income tax reforms; pension reform; unemployment insurance reform.
Denmark, 2004–05	Since 2001 fiscal policy has been explicitly guided by medium-term objectives based on the "Plan 2010" framework, reform of intergovernmental relationships.
Finland, 1998	Introduction of medium-term budget framework, shift to block transfers, tax reform aimed at broadening the tax base and reducing tax rates, pension reform.
France, 1996–97	Health care reform (including giving the Parliament a constitutional mandate to set social security spending ceilings), tax reforms aimed a broadening tax base.
Germany, 2003–05	Pension reform (2004, with a delayed effect); health care reform (2004), unemployment benefit reform.
Ireland, 2003–04	Introduction of rolling multi-year capital expenditure budgeting (previously used only for transport); preparation of long-term fiscal projections.
Italy, 1997	Pension reform (1992–97); reform of budget structure aimed at enhanced transparency (1997); strengthened tax administration.
Japan, 2004	Pension reform (2004, with a delayed effect); health care reform (2006); revision of revenue assignments and expenditure responsibilities of local governments.
Netherlands, 2004–05	Changes to the expenditure-based framework to avoid the use of cyclical revenue windfalls to fund permanent spending increases (as had happened in recent periods), and to avoid overperformance under one ceiling benefiting other ceilings; use of medium-term expenditure caps.
New Zealand, 2003	Earlier reforms of the 1990s established a strong institutional framework for medium-term budgeting with incorporation of long-term projections of pension and social welfare spending. In general, the 2003 increase in fiscal surplus largely reflected unexpectedly strong revenues from past reforms during an upswing in the economic cycle.
Spain, 1996–97	Gradual improvements in budgeting and monitoring that later were enshrined in the Fiscal Stability Law (2003); privatization and reorganization of public enterprises; strengthened tax administration.
Sweden, 1994–98	Reform of unemployment benefits with emphasis shifting from cash payments to training, revision of the transfer allocation to municipalities.
United Kingdom, 1995–98	Reform of unemployment benefits, including institution of "welfare to work" scheme to reduce youth unemployment.
United States, 1994	Consolidation was accompanied by intensive discussions regarding health care reform (the costs were rising at a very fast pace and were eating up a larger proportion of the budget). The system was regarded as dysfunctional and had to be changed. Also discussion and agreement on NAFTA.

Sources: Country authorities, OECD, Economist Intelligence Unit, and IMF staff reports.

Table 6. Recent Fiscal Consolidation Attempts in Selected Countries: Mobilization of Popular Support

Episode	*Strategies used by governments to mobilize support*
Canada, 1994–97	Majority federal government elected in 1993 to address fiscal issues; similar election result in 1994–95 in the two largest provinces.
Denmark, 2004–05	The success of the fiscal consolidation in the 1990s helped build a nation-wide consensus about the importance of prudent fiscal policies.
Finland, 1998	Public consensus emerged that fiscal consolidation was necessary to achieve EMU membership.
France, 1996–97	Partial public consensus emerged that fiscal consolidation was necessary to achieve EMU membership. However, the proposals to reform public pensions and railways triggered protracted strikes in late 1995.
Germany, 2003–05	Although the proposed spending cuts were widely criticized by the opposition and organized social groups, including the unions, voters seem to have been sharing a generals sense of crisis requiring drastic measures. In March 2003 the government identified a multi-year reform agenda to gradually bring labor markets, public finances, and welfare system back on track by 2010.
Ireland, 2003–04	Public support for fiscal consolidation was partial, with a strong opposition from the trade unions. The government responded to a rapid fall in its popularity by substantially reshuffling the Cabinet in September 2004, which revitalized the reform agenda.
Italy, 1997	Public consensus emerged that fiscal consolidation was necessary to achieve EMU membership.
Japan, 2004	Voter support for fiscal consolidation was limited but, despite strong popular resistance, the pension reforms were passed .
Netherlands, 2004–05	The government was determined to comply with the 3 percent deficit limit. Debt and deficit reduction objectives were put into multi-year perspective using medium-term fiscal framework. The role of the Bureau for Economic Policy Analysis (CPB) was seen to be important in bringing consensus on the needed measures.
New Zealand, 2003	The government reiterated the importance of commitment to the principles of medium-term budgeting established earlier (including the need to achieve a surplus on average over the cycle) and emphasized the need for higher savings in the light of future pension and health care obligations.
Spain, 1996–97	Public consensus emerged that fiscal consolidation was necessary to achieve EMU membership.
Sweden, 1994–98	While Sweden eventually decided to opt out of the EMU, the Maastricht criteria helped justify the need for fiscal consolidation. Nevertheless, fiscal consolidation was unpopular with a large share of voters. The September 1998 elections resulted in substantial losses for the Social Democrat Party, although it remained the most represented in the Parliament.
United Kingdom, 1995–98	Significant desire on the part of the population at large for a change in direction, while keeping options open to join EMU in 1999. As the government changed in May 1997, the new Chancellor reiterated his pre-election commitment to the golden rule and his intention to reduce the general government fiscal deficit of 4 percent of GDP in fiscal year 1996/97 to virtual balance by 1998/99 at the same time implementing tax reform to encourage investment.
United States, 1994	The president gave the lead in emphasizing right from the beginning the need to reduce the deficit, in spite of the concerns that it could further depress still weak economic activity. However, there was a recognition that an adjustment could lead to a decline in interest rates that could outweigh the contractionary effect of the deficit reduction. To ensure that the consolidation was credible to garner the maximum benefit from the adjustment, communication strategy was critical. The deficit package passed by an extremely narrow vote in the Congress: by just one vote in the House; and a tie which the Vice-President broke in the Senate. When the Democrat majority was lost in the mid-term 1994 elections the President demonstrated a strong commitment to the original position of continued fiscal discipline, opposed plans by some to provide a stimulus by a large tax cut, withstood the budget crisis in Congress in November 1995, and subsequently won the second term in November 1996.

Sources: Country authorities, OECD, Economist Intelligence Unit, and IMF staff reports.

E. Mobilization of Popular Support

(i) The case studies point towards the importance of articulating a broad medium-term economic strategy and the role of fiscal discipline in it to mobilize popular support for the adjustment (Table 6). In the case of European countries in the 1990s such strategies were shaped by the objectives of EMU membership. In other instances, they may be seen in the context of long-term developments as well as past successful consolidation episodes (Denmark, New Zealand).

(ii) Political leadership is likely to have played an important role in ensuring commitment to fiscal consolidation. Fiscal consolidations may well have been associated with political costs and strengthened the opposition. Hence strong political leadership was needed to ensure continuity of the consolidation policies, as exemplified by the experiences of the U.S. and Japan.

(iii) The adoption of fiscal rules by themselves does not generally appear to be sufficient to produce a sustained fiscal adjustment. Nonetheless, fiscal rules developed in the course of fiscal consolidations, presumably signaling heightened policy commitment, do seem to have helped sustain the consolidation efforts. Such rules then often became a permanent feature of legislation (e.g., in Spain) facilitating future adjustments.

IV. Cross-Section Analysis

This section complements the above case study analysis with cross-section evidence based on the latest available data. While the above analysis focused on case studies of particular episodes of fiscal adjustment, this Section uses a wider sample of OECD countries over 1972–2006 and explores the relationship between the magnitude and durability of fiscal adjustment and a number of underlying determinants.[10]

In particular, the analysis examines the correlation between the average fiscal policy stance over three years, as measured by the average CAPB, and the following five sets of variables: (i) public debt at the beginning of the first year; (ii) domestic economic activity at the start of the three-year period; (iii) trading-partner economic activity at the start of the three-year period; (iv) the level of inflation and the stance of monetary policy in the first year; and (v) political and institutional factors.

To facilitate the interpretation of the results, Subsection A examines bivariate relationships between each variable and fiscal policy effort individually, with conditional relationships evaluated in Subsection B using a more rigorous multivariate panel regression approach.

It is worth emphasizing that the approach and results of the empirical investigation reported below are consistent with existing studies. As such, the section complements and extends the results in the existing literature using the latest available data for the OECD countries.

[10] All the data used in the cross-section analysis come from the OECD *Economic Outlook* (2006) database.

A. Bivariate Relationships

The correlation coefficients between the CAPB and macroeconomic variables reported in Table 7 are consistent with prior work. Primary balances are, in general, positively correlated with the public debt-to-GDP ratio. The higher the public debt level, the tighter the cyclically adjusted fiscal stance over the subsequent three years. Table 7 also suggests a positive relationship between cyclically-adjusted primary surpluses and per capita real GDP growth. This finding is consistent with the notion that initiating and sustaining a deliberate fiscal consolidation is easier during periods of high growth. The unconditional correlation of the CAPB with the output gap is not statistically significant. There is also a negative and statistically significant correlation between the CAPB and inflation, suggesting that relatively tight fiscal policies are associated with a low-inflation environment. In addition, the relationship between the average CAPB and the real interest rate in the first year (measured by the short-run nominal rate minus current CPI inflation) is weak and not statistically significant.[11]

Cuts in current expenditure are correlated with a strong and statistically significant subsequent improvement in primary balances. In contrast, while the correlation between increases in cyclically-adjusted revenues and subsequent average fiscal surpluses is positive, it is of a substantially smaller magnitude and not statistically significant. Consistent with the previous findings, including those of Alesina and others (2006), the relationship between governmental stability and fiscal policy effort is positive, as is the relationship between institutional quality and the capacity to maintain a tight fiscal policy stance.[12]

[11] While some studies, such as VHS (2001) find that easing monetary policy can encourage governments to undertake a consolidation, others, such as Tabellini (1986) have argued that monetary tightening—in the form of lower monetary financing of budget deficits—might raise the governments' incentives to initiate FC.

[12] The stability of the government is measured using an index ranging from 1 to 12 which is computed by the *International Countries Risk Guide* (2006) and takes into account the governments' unity, legislative strength, and popular support. Institutional quality is measured by a composite index constructed from the *International Countries Risk Guide* index components "bureaucracy quality," "law and order," "democratic accountability," "corruption," and the country's "investment profile."

Table 7. Cyclically Adjusted Primary Balance: Correlations with Explanatory Variables 1/

Public debt-to-GDP ratio	0.326 (0.000)***
Domestic growth	0.201 (0.005)***
Domestic output gap	-0.062 (0.403)
Trade partner growth	0.189 (0.011)**
Trade partner output gap	-0.085 (0.247)
Inflation	-0.342 (0.000)***
Real interest rate	0.046 (0.553)
Change in cyclically adjusted current expenditure	-0.510 (0.000)***
Change in cyclically adjusted revenue	0.089 (0.233)
Governmental stability	0.106 (0.193)
Institutional quality	0.134 (0.100)

Sources: OECD and ICRG.

1/ Unconditional correlations evaluated using non-overlapping three-year averages of CABP over 1972–2005, and variable measured in the first year; p-values in parentheses. Values significant at the 1 percent level are marked with ***; at the 5 percent level, with **.

B. Multivariate Analysis

This subsection looks at the determinants of fiscal policy effort using multivariate panel regressions.[13] As before, the dependent variable is the three-year average of the CAPB. The panel regression results for the macroeconomic variables (growth, output gap, inflation, interest rates) are summarized in Appendix Table A4.[14] Lagged debt is estimated to be significantly positively associated with subsequent fiscal effort. A 10 percentage point improvement in the debt-to-GDP ratio is associated with a 0.5 to 0.7 percentage point

[13] For the details of the econometric methodology employed see Appendix 2.

[14] Given the high correlation between domestic and average OECD growth, the panel framework focuses on domestic economic activity only without explicitly including average OECD growth and output gaps.

improvement in the CAPB ratio. This result is consistent with the notion that countries in this sample appeared to attempt to stabilize the debt-to-GDP ratio.

Regarding the contributions of fiscal adjustment composition, the results reported in Appendix Table A5 suggest that countries that implement cuts in current expenditure tend to succeed in maintaining a tight fiscal policy stance. In particular, the CAPB ratio has, on average, improved by 1.1 percentage points over the three years following a 1 percentage point reduction in cyclically adjusted current expenditure. The effect of fiscal consolidations that rely on current expenditure cuts thus appears to be long-lasting. On the other hand, a 1 percentage point increase in cyclically adjusted revenue is correlated with only 0.4 percentage point improvement in the average CAPB over the following three years.

The results also suggest that higher governmental stability and higher institutional quality have significant explanatory power for subsequent fiscal consolidation success. Frequent changes of government and poor institutions are associated with higher fiscal deficits. Again, these results are consistent with the prior literature.

V. Macroeconomic Developments Following Fiscal Adjustments

This section discusses a number of factors that can, in principle, mitigate the possible contractionary effects of FC in the short run, and allow FCs to have expansionary effects on economic activity over the medium term. The discussion starts by reviewing the channels by which fiscal policy has been found, both in theory and empirical literature, to affect output. The section then reports the results of model-based simulation experiments (using the IMF's Global Integrated Monetary and Fiscal Model—GIMF) that distinguish the effects on output according to the composition of fiscal adjustment. Finally, the section reviews the case-study evidence.

A. Prior Work

The traditional presumption that short-term fiscal multipliers are always positive has been challenged on both theoretical and empirical grounds. In theory, it has been noted that once the impact on risk premiums and expectations is taken into account, the negative demand impact of lower fiscal deficits may be more than offset by an increase in private domestic demand. A growing empirical literature has also critically reassessed the short- and long-term effects of fiscal policy among different countries and time periods. One of the more remarkable findings of this literature has been the possibility of negative fiscal multipliers connected to strong fiscal consolidations. The famous adjustment episodes in Ireland and Denmark in the 1980s—where consolidation was followed by a sharp upturn in growth—triggered several studies suggesting that negative multipliers may in fact be more widespread than suggested by conventional wisdom (Giavazzi and others, 2000). If such instances were indeed quite common, and if the effect of fiscal adjustment on economic activity were related to specific policy design or economic conditions, this could have a profound influence on fiscal policy advice. Finally, fiscal adjustments in large economies may induce positive spillovers for other economies, as discussed in Kumhof and others (2005).

B. GIMF Simulations

This subsection uses simulations based on GIMF to investigate how fiscal consolidations affect economic activity both in the short run and in the long run, depending on the composition of the fiscal adjustment.

The model

GIMF is an open economy general equilibrium model developed at the IMF that is equipped for both monetary and fiscal policy analysis (Kumhof and Laxton, 2007). The model's nominal and real rigidities, monetary policy reaction function, multiple non-Ricardian features, and a fiscal policy reaction function yield plausible macroeconomic responses to changes in fiscal and monetary policy. For the purposes of this paper the model is calibrated to include a large open economy (calibrated with U.S. data) and the rest of the world.

Ricardian equivalence does not hold for four reasons. First, the model features overlapping generations agents (OLG) with finite lifetimes, i.e., a nonzero probability of death in each period. These agents are myopic in the sense that they perceive debt-financed tax cuts as an increase in their human wealth, and attach a low probability to having to pay for them in the future.[15] Second, workers have a life-cycle labor productivity pattern that implies a declining rate of productivity as workers age. This feature means that workers discount the effects of future payroll tax increases as they are likely to occur when individuals become older and less productive. Third, the model contains liquidity constrained consumers (LIQ) who do not have access to financial markets to smooth consumption, and change their consumption one-for-one with changes in after-tax income. Finally, the model includes payroll and capital income taxes that are distortionary because labor effort and private investment respond to relative price movements that result directly from variations in tax rates.

A particularly important feature of GIMF for fiscal policy analysis is that it relaxes the assumption of conventional models that all government spending is wasteful and does not contribute to aggregate supply. Instead, GIMF allows for productive public infrastructure spending that adds to the public capital stock, and enhances the productivity of private factors of production. Real rigidities embedded in the model include consumer habits that induce consumption persistence, investment adjustment costs that induce investment persistence, and import adjustment costs. Nominal rigidities include sticky prices and wages, and pricing to market. (For further details regarding the model, see Kumhof and Laxton, 2007).

[15] The model's overlapping generations structure with finitely-lived agents makes it particularly well suited to analyzing the implications of public sector deficits and debt both for the United States and for the rest of the world. The model is complementary to the IMF's Global Fiscal Model that has been used to analyze a variety of fiscal policy and structural reform issues.

Calibration

Following Kumhof and Laxton (2007), the model is calibrated to contain two countries, the United States and the rest of the world. The fiscal parameters, such as the ratios to GDP of government transfers, purchases of goods and services, and public investment are calibrated based on data from the authorities. The productivity of public capital is calibrated following Ligthart and Suarez (2005) who present a meta analysis of large number of studies of the elasticity of aggregate output with respect to public capital, and estimate this elasticity at 0.14. Accordingly, the model is calibrated so that a 10 percent increase in public investment is associated with a long-run increase in GDP of 1.4 percent. Given that public investment represents 3 percent of GDP, this elasticity of 0.14 implies an average annualized rate of return on public investment of about 3 percent over 50 years (net of depreciation).[16] The depreciation of public capital is set at 4 percent per year. The remaining parameters values are set following Kumhof and Laxton (2007).

The experiments

Each of the five fiscal adjustment experiments conducted using the model involves a permanent reduction in the debt-to-GDP ratio of about 15 percentage points. This adjustment is implemented by reducing the fiscal deficit by 2.5 percent of GDP in the first two years of the adjustment, and then keeping fiscal deficit 0.5 percentage points of GDP below the original level.

In each scenario, the reduction in the fiscal deficit relies on a different adjustment tool, as follows: (a) increases in payroll taxes; (b) increases in consumption taxes; (c) increases in corporate income taxes; (d) reductions in government purchases of goods and services; and (e) both reductions in both government purchases and cuts in productive government investment. To stabilize the public debt at the lower level, the additional fiscal space available due to the lower interest costs is used either to reduce the initial tax increases (in simulations a, b, and c), or to undo part of the expenditure reductions (simulations d and e). The results are reported in terms of deviations from the baseline scenario, a steady state in which the economy is operating at its potential and the public debt-to-GDP ratio remains stable.

Results

Figures 1 and 2 report the implications of each fiscal adjustment strategy for the principal macroeconomic variables, including GDP and consumption, both in the United States and in the rest of the world. Fiscal tightening induces a near-term reduction in output in all

[16] The average annualized rate of return of 3 percent is obtained as follows. A 10 percent increase in public investment, i.e. an investment of 10 percent × 3 percentage points of GDP = 0.3 percentage points of GDP, yields, after about 50 years, a 1.4 percent increase in GDP. The geometric average annual rate of return over the 50-year period is thus $\left(\frac{1.4}{0.3}\right)^{1/50} - 1 = 0.031$, i.e. about 3 percent.

scenarios. The fiscal consolidation that relies on cuts in consumption taxes has the smallest contractionary effect, reflecting the broad base of consumption taxes and, therefore, their relatively low distortionary effects. However, cuts in productive government investment induce a much sharper short-run negative impact on economic activity. In all scenarios the adverse effect of fiscal tightening on the aggregate demand is in part offset by monetary stimulus that occurs because the central bank manipulates nominal interest rates to lower real interest rates in response to the inflation decline. In addition, the short-run contraction is mitigated by the ability of households to smooth consumption. However, credit-constrained households who cannot smooth their income experience a sharp cut in their consumption in the short run.

Over the medium to long term, fiscal adjustment is seen to yield substantial output gains. These occur when the additional fiscal space available after the reduction in public debt and the associated interest costs is used to cut distortionary taxes. For example, a long-run cut in payroll taxes stimulates output by encouraging labor supply. The supply-side gains are largest when the long-run tax cuts fall on capital income. In addition, when the fiscal consolidation occurs in a large economy such as the United States, long-run output gains also accrue because the increased government savings raise the supply of loanable funds and, other things equal, the real interest rate declines. The lower interest rate in turn crowds in private activity both in the domestic economy and in the rest of the world. Finally, the analysis also reveals that, if the adjustment involves cuts in public investment, the long-run output gains associated with fiscal consolidation may not occur. In particular, as the long-dashed line in Figure 1 illustrates, when the adjustment involves a 10-percent cut in public investment, the long-run output gains become negligible.

Figure 1. Impact of Fiscal Consolidation on the Domestic Economy (United States)

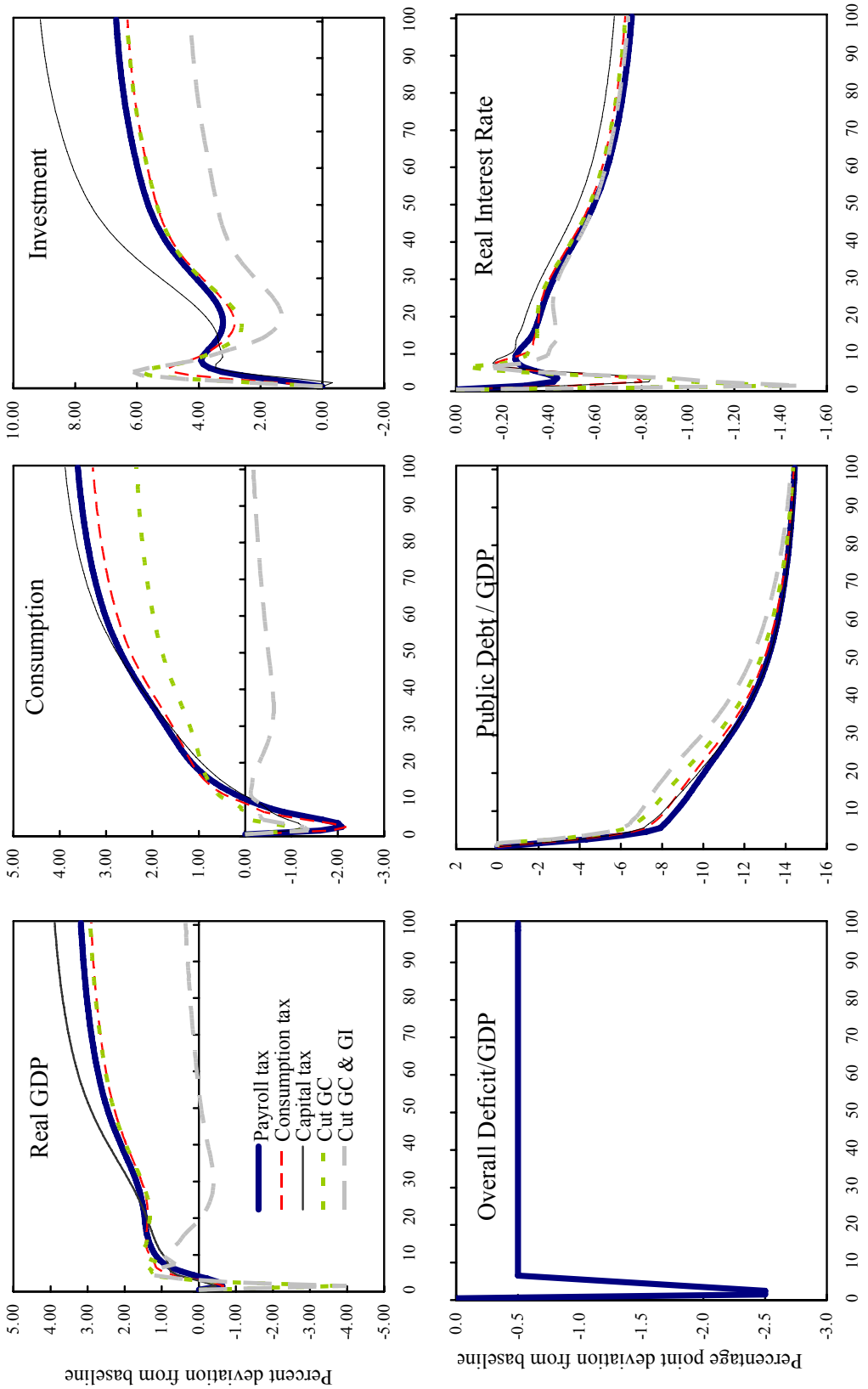
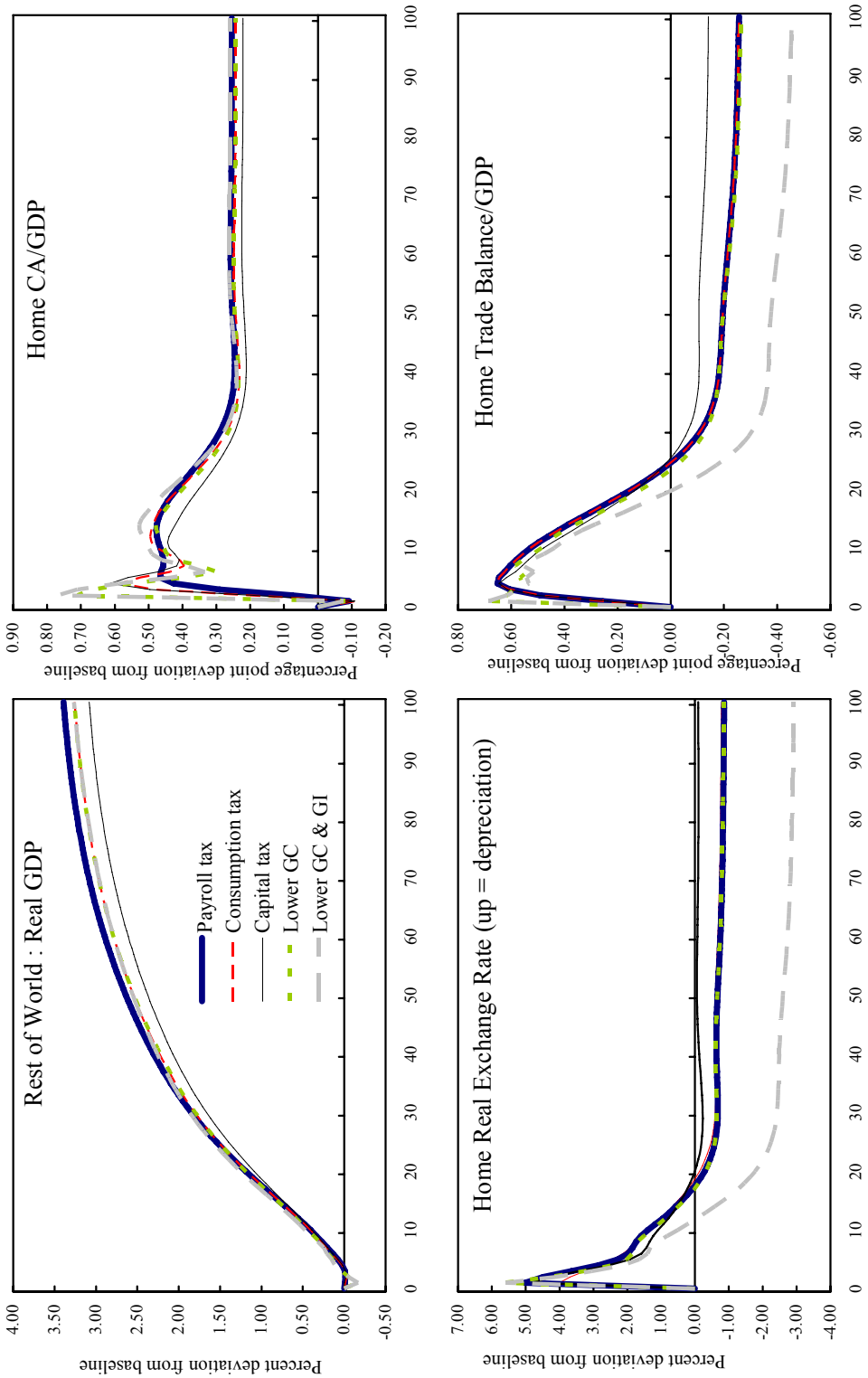


Figure 2. Impact of Fiscal Consolidation in the United States on the Rest of the World



C. Evidence from Case Studies

In most cases fiscal consolidations were followed by periods of robust economic growth (Table 8). While economic recovery was somewhat slow in Italy, and moderate decelerations of economic growth in the first years after fiscal adjustments were observed in Canada, the U.S., and New Zealand, other economies performed strongly following the initiation of consolidations. Although this observation may partly reflect the fact that the majority of surveyed fiscal consolidations were initiated during recessions or the early stages of economic recovery, it does suggest that fiscal tightening did not have a pronounced negative impact on economic activity. In some cases, there is evidence of a firming in activity with lower interest rates crowding in the private sector, and strengthening of incentives to work following structural reforms.

Overall, the experiences of the surveyed countries are broadly consistent with the view that fiscal consolidations do not have pronounced short-run adverse effects on activity. Indeed, in many cases they are accompanied by economic expansions, lower interest rates, and strengthened incentives to work.

In addition, most fiscal consolidations were supported by a decline in global interest rates. Lower interest rates led to a decline in the debt service expenditure, reinforcing the consolidation efforts, which in turn further reduced interest rate spreads. This positive dynamics played a particularly important role in fiscal consolidations in countries with particularly high levels of public debt, as in the case of Italy.

Table 8. Recent Fiscal Consolidation Attempts in Selected Countries: Subsequent Developments

Episode	*Macroeconomic Developments Following Fiscal Adjustment*
Canada, 1994–97	Initial growth spurt, led by exports and investment, followed by two years of slower growth, as adjustment was implemented. Sustained high growth followed with low inflation. Improved current account, led by improved public savings, sharply reduced net foreign debt.
Denmark, 2004–05	Economic activity picked up markedly in 2005, led by domestic demand, with the rate of economic growth substantially exceeding the Euro area average and the rate of unemployment reaching a 30-year low. A slight deceleration is projected in 2006–07. The success of the consolidation effort has been mixed so far, as the government relaxed caps on welfare spending.
Finland, 1998	Strong sustained recovery since 1994, led by investment and exports, in particular in the IT sector. Improved current account balance and strong growth resulted in elimination of net external public debt by 2002.
France, 1996–97	Economic activity picked up in 1998–2000, unemployment declined somewhat, and public debt was maintained below the 60 percent of GDP threshold.
Germany, 2003–05	Led by exports and business investment, economic activity picked up in 2006, while inflation remained moderate. Fiscal consolidation continued, with a VAT increase coming into effect in 2007.
Ireland, 2003–04	Economic activity picked up in 2004–06, inflation declined, and unemployment remained relatively low, the government maintained fiscal surpluses reflecting strong revenues and expenditure restraint.
Italy, 1997	Slow domestic-demand-driven economic recovery since the second quarter of 1997 with growth not exceeding 2 percent, accompanied by a deterioration of the current account and an increase in public external debt, while total public debt declined somewhat.
Japan, 2004	Driven by private consumption and business investment, economic expansion has strengthened, deflation has ended, and unemployment rate declined to an eight-year low. The authorities intend to proceed with consolidation aiming at achieving a primary balance (excluding social security) by 2011.
Netherlands, 2004–05	Initiated by exports, a mild recovery has been underway since mid-2005, characterized by gradually rising employment and absence of significant inflationary pressures. Fiscal deficit was reduced to 2.3 percent in 2004 and further to 0.3 percent of GDP in 2005. Neutral fiscal stance was pursued in 2006 and is expected for 2007.
New Zealand, 2003	After another year of strong economic activity, growth decelerated and the current account widened to 9 percent (or twice the 20-year average). Inflation picked up owing to both high oil prices and tight labor market conditions. The budget continued running high surpluses, as the authorities took into account the cyclical pressures on inflation in determining the timing of policy measures that would reduce the surplus to more normal levels.
Spain, 1996–97	Initially led by exports and subsequently by domestic demand, economic activity picked up markedly and growth averaged 3.4 percent in 1996–2003, while inflation moderated and unemployment rate fell by more than half. Fiscal consolidation efforts were sustained, supported by a sharp decline in interest rate spreads, with the debt-to-GDP ratio decreasing by 14 percentage points between over 1996–2002.
Sweden, 1994–98	Initially led by exports, economic growth picked up markedly in 1994–95 before moderating somewhat in 1996–97 and accelerating again in 1998–99, while inflation moderated from over 4 percent to under 1 percent.
United Kingdom, 1995–98	Economic activity further strengthened through 2000, resulting in buoyant government revenues. A neutral budget was combined with a marked relaxation of monetary policy.
United States, 1994	In spring of 1994, interest rates began to rise and there was a concern that it might choke off the recovery. The economy was getting back on the track, but to have an extended recovery one could not let the recovery get out of hand on the upside. After a slight slowdown in 1995, economic growth accelerated, led by private consumption and business investment, unemployment rate declined, while inflation stayed below 3 percent.

Sources: Country authorities, OECD, Economist Intelligence Unit, and IMF staff reports.

VI. CONCLUSION

This paper has analyzed the determinants of successful fiscal consolidations in OECD countries as well as the impact of fiscal adjustments on economic activity in the short and in the long run, on the basis of selected case studies of fiscal consolidations, cross-country econometric analysis for 24 countries, and GIMF-based simulations.

The analysis revealed that fiscal consolidations tend to be initiated during times of fiscal distress, as reflected in high and rising public debt levels, and relatively weak economic activity. Consolidations based on current spending restraint generally have higher chances of succeeding. Strong political leadership is typically required to sustain a fiscal adjustment effort, with strong institutions playing an important supportive role.

Case studies further suggest that while fiscal adjustments tend to have a moderating influence on growth in the short run, some fiscal consolidations appear to have had expansionary effects. The GIMF-based experiments suggest that the short-run contractionary effects are smallest when the consolidation involves increases in consumption taxes, and largest when they involve cuts in productive public infrastructure spending. In addition, fiscal consolidation can have positive long-run effects, particularly when the greater fiscal space available after debt has been reduced is used to cut capital income taxes. However, these long-run gains may not occur if the consolidation involves cuts in public infrastructure spending. Fiscal adjustment is also found to have large positive spillover effects when implemented by a large economy such as the United States.

There are a number of areas for further research. Perhaps the most important one relates to the distributional effects of fiscal adjustments. This is especially so given the ongoing process of globalization and structural changes in the world economy. Another area to explore would be the extent to which simultaneous adjustments in a range of countries might have effects that differ substantially from adjustment in a given country. Such simultaneous adjustment might be warranted by common challenges such as aging of populations or climate change that are being faced by a large number of countries both within the OECD and outside. It is by no means evident that adjustments undertaken in a large number of countries would necessarily be contractionary given the likely beneficial effects of deficit reductions in a number of countries for global interest rates.

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APPENDIX I: THRESHOLD APPROACH TO IDENTIFYING FISCAL CONSOLIDATION SUCCESS

For the purposes of this paper, a fiscal consolidation attempt is defined as a year in which the cyclically-adjusted primary balance-to-GDP ratio increases by at least 1 percentage point. FC can be either successful or unsuccessful. Following Alesina and Perotti (1995) and Darby and others (2005), the measure of success of a fiscal consolidation (the success index, *S*) takes into account the degree of debt reduction achieved over the following three years.

The index takes the highest value ($S = 3$) if the debt-to-GDP ratio falls by at least 5 percentage points in the three years following a FC. If the debt-to-GDP ratio is stabilized within ½ of a percentage point of the initial level or if it decreases by less than 5 percentage points, *S* is set to equal 2. The index takes the lowest value ($S = 1$) if the debt increases by more than ½ percent of GDP. The values of the index are reported in Tables A1–A3.

Table A1. Fiscal Consolidations with Highest Success ($S = 3$), 1990–2005

Country	Year	ΔCAPB(T)	ΔOB(T)	ΔDebt(T+2)	Debt(T-1)
Australia	1997	1.0	1.7	-10.4	39.1
Belgium	1993	2.1	0.7	-5.5	136.5
Belgium	1998	1.1	1.3	-9.2	127.7
Canada	1996	2.6	2.5	-6.4	100.8
Canada	1997	2.3	3.0	-5.0	100.3
Denmark	1999	1.7	1.4	-9.4	69.0
Denmark	2004	1.4	1.8	-9.8	52.8
Denmark	2005	1.5	2.3	-7.4	49.4
Finland	1998	1.7	2.9	-7.9	64.3
Greece	1996	2.0	2.7	-6.8	114.4
Greece	2005	2.1	2.5	-5.4	128.3
Iceland	1995	2.1	1.7	-5.9	55.7
Netherlands	1993	2.6	1.3	-6.7	89.0
Netherlands	1996	2.3	2.4	-6.5	87.0
New Zealand	1992	2.6	2.7	-17.9	
New Zealand	1993	1.5	3.7	-19.5	75.3
New Zealand	2003	1.4	1.4	-5.1	33.7
Norway	1995	2.9	3.1	-8.5	36.9
Spain	1997	1.1	1.8	-6.0	75.6
Sweden	1997	1.6	1.7	-11.2	84.4
Sweden	1998	1.4	2.9	-17.4	82.5
United Kingdom	1998	1.9	2.3	-8.0	53.2

Source: OECD.

Table A2. Fiscal Consolidations with Moderate Success ($S = 2$), 1990–2005

Country	Year	ΔCAPB(T)	ΔOB(T)	ΔDebt(T+2)	Debt(T-1)
Australia	1994	1.4	1.0	-1.0	30.7
Australia	2002	1.2	1.3	-2.2	20.9
Austria	1996	1.8	1.7	-2.2	69.6
Austria	2001	2.2	1.5	-0.8	69.5
Canada	1995	1.7	1.4	-4.5	98.2
Finland	2000	3.7	4.9	-2.5	55.5
France	1997	1.1	1.1	-2.2	66.3
Greece	1993	1.1	-1.1	-1.5	102.5
Iceland	2005	2.4	3.0	-3.4	35.0
Ireland	2003	1.3	0.6	-2.7	36.1
Ireland	2004	1.6	1.4	-1.2	34.5
Italy	1997	2.1	4.3	-3.5	128.3
Luxembourg	1993	2.6	1.6	-0.2	4.8
Luxembourg	1997	1.8	2.5	-0.8	6.3
Netherlands	2004	1.6	1.1	0.3	61.9
Netherlands	2005	1.7	1.8	-0.6	62.3
New Zealand	1999	1.6	2.0	-4.2	42.2
New Zealand	2001	1.8	2.0	-3.7	37.4
Norway	1994	1.9	1.7	-1.0	40.5
Portugal	1995	1.4	2.1	-4.2	
Spain	1996	1.7	1.6	-1.1	68.9
Sweden	1996	4.3	4.1	-3.2	82.0
Sweden	2000	1.3	2.7	-4.1	71.3
Sweden	2004	1.3	1.8	-4.5	59.3
Switzerland	1999	1.6	1.5	-0.4	55.6
United Kingdom	1995	1.1	0.9	0.5	47.8
United Kingdom	1997	2.0	2.0	-4.5	52.5
United States	1994	1.1	1.4	-1.1	75.4

Source: OECD.

Table A3. Fiscal Consolidations with Low Success ($S = 1$), 1990–2005

Country	Year	ΔCAPB(T)	ΔOB(T)	ΔDebt(T+2)	Debt(T-1)
Austria	1992	1.1	0.9	7.8	57.6
Austria	1997	1.9	2.2	2.5	69.7
Canada	1994	1.1	2.0	2.1	96.9
Finland	1993	1.3	-1.7	7.3	44.7
Finland	1994	1.9	1.5	5.7	57.8
France	1996	2.0	1.4	3.6	62.6
Greece	1991	4.0	4.7	20.1	93.6
Greece	1992	1.1	-1.2	11.1	95.9
Greece	1994	5.3	4.1	2.9	115.9
Greece	1998	1.4	2.3	18.4	112.4
Iceland	1992	1.5	0.1	9.4	38.4
Iceland	1999	1.5	1.8	3.2	48.0
Italy	1991	1.7	0.1	21.7	92.8
Italy	1992	2.4	1.0	21.8	97.2
Italy	1993	1.9	0.4	3.1	102.4
Japan	1997	1.0	1.1	26.6	95.3
Japan	2001	1.5	1.3	15.0	137.1
Japan	2004	1.3	1.7	7.1	160.2
Luxembourg	1994	1.8	1.0	0.8	6.0
Luxembourg	1995	1.1	-0.2	0.6	5.5
Luxembourg	2000	1.3	2.6	1.2	5.6
Netherlands	1991	2.5	2.7	8.4	84.2
Norway	2000	1.3	9.3	5.8	30.9
Norway	2004	2.0	4.1	1.0	49.9
Portugal	2002	2.0	1.4	3.5	61.5
Portugal	2003	1.2	-0.1	6.1	64.9
Spain	1992	1.9	0.9	12.1	49.6
Sweden	1994	2.1	2.1	1.1	79.0
Sweden	1995	1.6	2.3	0.5	83.3
Switzerland	2000	1.5	2.3	4.4	52.6
United Kingdom	1996	1.5	1.6	1.2	52.7

Source: OECD.

APPENDIX II: CROSS-SECTION METHODOLOGY, DATA, AND RESULTS

The empirical specifications estimated in this paper are based on Equation (1), the fiscal policy reaction function that is consistent with the prior literature.

$$capb_{i,t} = \rho d_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{j,i,t} + \alpha_i + \varepsilon_{i,t}, \quad t = 1,...,T, i = 1,...,N \tag{1}$$

In Equation (1), $capb_{i,t}$ is the ratio of the cyclically-adjusted primary balance to cyclically adjusted GDP in country i and year t; $d_{i,t-1}$ is the public debt-to-GDP ratio observed at the end of period $t-1$; α_i is a country-specific intercept (fixed effect); and $X_{j,i,t}$ denotes an additional control variable j that explains the evolution of the CAPB. Equation (1) captures the fiscal reaction concept as follows: the coefficient ρ measures the response of the CAPB to deviations of public debt from the implicit target level, while the composite term, $\sum_{j=1}^{J} \beta_j X_{j,i,t}$, represents the response to other conventional explanatory variables. To investigate the extent to which changes in the CAPB are sustained over time, the specification in Equation (1) is estimated for three-year non-overlapping averages of the CAPB, i.e., with $\frac{1}{3}\sum_{k=0}^{2} capb_{i,t+k}$, as the dependent variable. The three-year non-overlapping periods are: 1972–74, 75–77, 78–80, 81–83, 84–86, 87–89, 90–92, 93–95, 96–98, 1999–2001, and 2003–05. Each right-hand-side variable is measured in the initial year of each three-year period.

All panel data regression equations are estimated using an annual data sample covering 1972–2005 and 24 OECD countries. The sources of the data are the OECD (2006) *Economic Outlook* and the *International Country Risk Guide* (2006).

Table A4. Estimation Results: Core Macroeconomic Controls

Dependent variable: cyclically adjusted primary balance (three-year non-overlapping averages, in percent of CAGDP) 1/					
Lagged debt (in percent of GDP)	0.050 [6.13]***	0.059 [7.20]***	0.059 [6.87]***	0.066 [6.63]***	0.071 [7.10]***
Growth of PPP GDP per capita (in percent)		0.235 [3.18]***	0.225 [2.85]***	0.156 [2.07]**	0.140 [1.84]*
Output gap (in percent of CAGDP)			0.023 [0.31]	0.029 [0.42]	0.057 [0.79]
Log of inflation				-0.238 [1.08]	-0.040 [0.17]
Real interest rate (in percent)					-0.053 [0.81]
Observations	187	179	172	168	162
Number of ifscode	23	23	22	22	22
R-squared	0.19	0.29	0.29	0.38	0.39

1 / Absolute values of t-statistics in parentheses. Values significant at the 1 percent level are marked with ***; at the 5 percent level, with **; at the 10 percent level, with *. All equations are estimated with country fixed effects. The three-year non-overlapping averages are: 1972–74, 75–77, 78–80, 81–83, 84–86, 87–89, 90–92, 93–95, 96–98, 99–2001, and 2003–05. Each right-hand-side variable is measured in the initial year of each three-year period.

Table A5. Estimation Results: Adding Composition, Political, and Institutional Factors

Dependent variable: cyclically adjusted primary balance (three-year non-overlapping averages, in percent of CAGDP) 1/				
Lagged debt (in percent of GDP)	0.041 [3.92]***	0.071 [7.15]***	0.078 [5.60]***	0.076 [5.58]***
Growth of PPP GDP per capita (in percent)	0.046 [0.66]	0.123 [1.63]	0.067 [0.70]	0.061 [0.68]
Output gap (in percent of CAGDP)	0.144 [2.19]**	0.052 [0.73]	0.029 [0.36]	0.043 [0.57]
Log of inflation	-0.099 [0.48]	-0.051 [0.22]	0.105 [0.38]	0.029 [0.11]
Real interest rate (in percent)	0.040 [0.66]	-0.090 [1.34]	-0.018 [0.21]	-0.059 [0.73]
Change in cyclically adjusted current expenditure (in percentage points of CAGDP)	-1.096 [5.96]***			
Change in cyclically adjusted revenue (in percentage points of CAGDP)		0.367 [2.20]**		
Governmental stability			0.237 [1.70]*	
Institutional quality				0.113 [2.60]**
Observations	162	162	127	127
Number of ifscode	22	22	22	22
R-squared	0.51	0.41	0.33	0.35

1 / Absolute values of t-statistics in parentheses. Values significant at the 1 percent level are marked with ***; at the 5 percent level, with **; at the 10 percent level, with *. All equations are estimated with country fixed effects. The three-year non-overlapping averages are: 1972–74, 75–77, 78–80, 81–83, 84–86, 87–89, 90–92, 93–95, 96–98, 99–2001, and 2003–05. Each right-hand-side variable is measured in the initial year of each three-year period.