Staff Memo

Two essays on the magic number 4

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Foreword[1]

Two essays on the magic number 4

The second greatest computer in all of time and space, Deep Thought, was created "to calculate the answer to the ultimate question of Life, the Universe and Everything". On the book's last page the answer is revealed to be: "forty-two".

"Forty-two!" yelled Loonquawl. "Is that all you've got to show for seven and a half million years' work?"

"I checked it very thoroughly," said the computer, "and that quite definitely is the answer. I think the problem, to be quite honest with you, is that you've never actually known what the question is."

The Hitchhiker's Guide to the Galaxy (Douglas Adams, 1952-2001)

The OECD has existed for 50 years. I have had the pleasure of attending OECD meetings over more than 30 years of its life, and it has not only been a pleasure but an important source of information and inspiration. The meetings generally span one to two days. At times, I sit at the table and participate in the discussion. Other times, I am among the backbenchers and follow the discussion while paging through the background documents. More than 30 countries are members of the OECD. Daily monitoring of developments in each member country is naturally beyond anyone's capacity so I avail myself of my backbench time to check the pulse of the economy in the various countries. Is the state of the economy reasonable healthy or are some countries heading towards difficulties? My 30 years of experience have taught me a few simple rules for selecting the quantitative variables I should look at.

- Is *inflation* higher than 4 per cent? If so, does this indicate that macro stabilisation is out of kilter and that price stability is not firmly anchored?

- If *unemployment* is higher than 4 per cent, does this indicate that the labour market is not functioning well? There are many OECD countries that have a long way to go here.
- The most important variable I check is the government *budget balance*. If the balance shows a deficit of 4 per cent over time, the country is not in a sustainable fiscal position. Average annual growth in the OECD area has been about 3 per cent. If the budget deficit is 3 per cent or less, a country will normally be able to grow out of its debt problems. If the deficit is higher than 3 per cent, this will not be possible. A deficit of 4 per cent is therefore a rough rule of thumb indicating that fiscal policy is on an unsustainable path.
- It may also be the case that the budget is in balance, but tax receipts flow in from a bloated domestic sector propped up by an unsustainable level of demand. Until just recently, for example, Spain was running a balanced budget. But a large portion of tax revenues came from a large construction industry. In the pre-crisis years, the construction industry accounted for 13 per cent of employment in Spain, while 6-7 per cent was the general average in other OECD countries. The figure for Spain is now closer to the average and the budget balance shows a substantial deficit. The true budget deficit was hidden by an unsustainable domestic sector. But a look at Spain's current account deficit brought the unsustainability problem to light. More than 30 years of reading OECD documents from the "back benches" have taught me to look at whether the *current account balance* shows a deficit of 4 per cent or more.

In recent years, during the financial crisis, I have also developed an eye for looking at the size of a country's banking sector. Iceland was the first country affected. The country's banks encountered problems and the government had to intervene as lender of last resort. But the ensuing financial burden was too heavy for the country to bear. The next country affected was Greece, but the causes were rooted in other imbalances. Ireland had a large banking sector, almost ten times greater than GDP. On average, euro area countries have a banking sector that is a good three times GDP. I wondered if the number 4 was of significance in this context as well. Was 4 also a magic number indicating that a banking sector had become too big? Was this a rule of thumb I could use in my country studies from the "back benches" at the OECD?

I asked Nikka Husom Vonen if she could use the OECD database to check more systematically whether my intuitive 4 per cent rule, derived from 30 years' experience, could identify which countries would encounter problems. Today in 2011 we know which countries these are. Could we have identified them earlier using such a rule? Her answer is provided in the first essay "Would the simple 4 per cent rule have uncovered that there was a crisis in the offing?".

I asked Sigbjørn Atle Berg whether he could take a closer look at how large a country's banking sector can grow before a country's government no longer has the capacity to bail out the banking industry. The answer turned out to be – not that far from 4! His analysis is presented in the second essay "When is a banking industry too large?".

So while Nikka Husom Vonen applied a rule and verified whether the rule provided the answer that we today know is the right answer, Sigbjørn Atle Berg's assignment was to establish a rule. They started at opposite ends. One started with the number 4. The other ended up with the number 4. Unlike the computer in *"The Hitchhiker's Guide to the Galaxy"*, my answer is 4 and not 42.

Jan Fredrik Qvigstad

Oslo, 28 February 2011

Would the simple 4 per cent rule have uncovered that there was a crisis in the offing?

The aftermath of the recent financial crisis has demonstrated that lax fiscal policy may have widespread and severe consequences. In this paper, we examine how selected variables may be useful indicators of an unsustainable fiscal/economical condition.

1. Introduction

Through the last 50 years, the OECD has monitored and supervised its member countries on a wide range of issues. Numerous publications with figures, tables and charts illustrating various aspects of the member countries' economies have been provided. Simply by studying such data over time a clear message becomes evident: It is absolutely necessary for a country to keep its public sector finances in order. Although this does not require a balanced budget in every period, it is necessary to keep expenses in line with revenues over time. A budget deficit of a certain size is not incompatible with a stable debt level. However, the deficit should not be too large; neither should it be maintained for too long.

A prospect of large and sustained deficits needs to be met with firm fiscal action in terms of reduced public spending and higher taxes, possibly complemented by structural reforms. History has shown that some countries manage to change direction and carry out programs of fiscal adjustment (Alesina and Perotti, 1996). Other countries fail to do so and slide further down on an unsustainable path. In particular, when deficits exceed a given threshold, and especially if this is maintained for several years, this may be taken as a signal of trouble lying ahead. It may result in accelerating debt levels and increasing vulnerabilities, possibly ending with a hard landing as the ability to manage shocks could be weakened. The most recent crisis may serve as an example. Countries that pursued an expansionary policy *prior* to the downturn were probably less able to weather off the crisis. However, when necessary precautions are not taken, one cannot claim being an innocent bystander to the line of events.

But even countries with balanced budgets may run into trouble. For these, explanations are found in other imbalances. For example, temporary high investment in tax-generating sectors, such as in Spain's construction industry in recent years may help move the budget towards balance or even into surplus. But the counterpart of this may be a large current account deficit. Hence, surveillance of the budget balance[2] should be complemented by monitoring of the current account.

Most policymakers are probably aware of the need for sound fiscal policies over time. A temporary deviation from balance is in line with Keynesian theory, and reasoning along these lines can justify large-scale spending during economic downturns. For the equation to balance, this requires an equivalent restraint in good times. However, there are signs of an inherent asymmetry in fiscal policy as it seems to be easier to spend than to save. Long-term

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[2] The terms budget balance and fiscal balance will be used interchangeably.

considerations may fade when budgeting for the present, with myopic preferences and electoral pressures being hard to resist. The time inconsistent policies that often emerge run parallel to the time inconsistency problem in monetary policy, where an inflationary bias may exist. A common solution to this problem is the delegation of monetary policy to an independent central bank. But time inconsistency in fiscal policy cannot be handled in the same fashion, as fiscal policy by its very nature *is* politics in a much clearer sense. Still, attempts at remedying the deficiency may be inspired by the monetary policy solution. Even without a real policy mandate, surveillance by an independent fiscal body could be useful. Inspection of budget balances, current accounts and debt levels would be highly relevant in this respect.

This simple, yet profound insight is the background for the empirical investigation undertaken in this paper. For a selection of industrialized countries, we study each country's debt level, its budget balance and its current account balance, all measured as shares of GDP. When these variables exceed certain thresholds we take this as a possible sign of trouble lying ahead: Large imbalances may signal an unsustainable situation and a need for fiscal action may thus be identified.

2. Theoretical considerations

The performance of fiscal policy may be assessed along several dimensions. Giammarioli, Rother and Vidal (2007) use the concept of fiscal soundness, emphasizing both the need for fiscal *stability* in the short run and fiscal *sustainability* in the long run. In assessing these two aspects there is a need for adequate indicators. While more sophisticated measures exist, budget balances and debt levels are two of the more straightforward measures to use. Budget deficits will contribute to a build-up of public debt, and larger deficits imply a faster debt accumulation process.

Among others, Reinhart and Rogoff (2009) have studied the relationship between debt levels (debt/GDP) and sovereign default, one possible result of accelerating debt levels. But even leaving out this option of outright default, there are still other possible consequences of high and growing debt that warrant concern. High debt levels may be detrimental to growth, at least when debt levels exceed certain thresholds (Reinhart and Rogoff, 2010). Furthermore, for a given level of interest rates, a larger debt requires a larger share of the budget used for interest payments. This will in itself constrain the scope for fiscal policy. In addition, a high debt level may lead to higher interest rates as the perceived risk of default increases, e.g. if investors lose confidence in the government's ability to honor its obligations. These are just a few among several challenges associated with high and growing debt levels. Our point of departure is therefore that a low and stable debt level is desirable.

However, a stable debt/GDP ratio does not require a balanced budget in every period. Nor does it imply that a limited budget deficit is incompatible with long-run sustainability. The exact debt level a country can uphold varies between countries and economic conditions. This may be dependent on such factors as a country's ability to collect taxes, its history of public

debt and its growth potential (Gjedrem, 2010). Analytically, the debt-deficit dynamics may be illustrated by the following formula (see e.g. Larsen and Støholen, 2010):

$$\Delta\frac{debt_t}{GDP_t} = \frac{(interest\ rate_t - GDPgrowth_t)}{(1 + GDP\ growth_t)} \cdot \frac{debt_{t-1}}{GDP_{t-1}} - \frac{primary\ balance_t}{GDP_t}$$

Or, equivalently, using symbols:

$$\Delta\frac{D_t}{Y_t} = \frac{(r_t - y_t)}{(1 + y_t)} \cdot \frac{D_{t-1}}{Y_{t-1}} - \frac{PB_t}{Y_t}$$

Changes in the debt ratio are determined by the nominal interest rate (r) paid on debt (D), the nominal GDP growth rate (y) and the size and sign of the primary balance (PB, the budget balance excluding interest payments) as a share of nominal GDP (Y). Setting the left-hand side of the equation equal to zero gives the necessary conditions for the debt/GDP ratio to stay at a constant level. The relative size of the interest rate and the growth rate determines the necessary sign of the primary balance. A growing economy facing relatively low interest rates, such that y > r, can run a primary deficit and still manage to keep a stable debt ratio. On the other hand, if the interest rate exceeds the growth rate; it requires a certain primary surplus in order to avoid a rising debt level. If r exceeds y by more than the size of the primary surplus, the debt/GDP ratio will increase. This potential "snowball effect" is highlighted by the circles in the formulas.

In a similar line of reasoning, Hoel and Qvigstad (1986) show how an economy may follow two very different trajectories depending on the relative size of the interest rate paid on debt and the rate of GDP growth. Departing from a given debt level and running a primary deficit, the debt level will tend to increase. However, as long as the real interest rate is lower than the growth rate, the economy will converge to a stable, non-explosive debt/GDP ratio over time. On the other hand, if there is a primary deficit in an environment where the interest rate exceeds the growth rate, this will lead to an explosive path of an ever-increasing debt level. This may become an unbearable situation in a relatively short time.

In the longer run, there is a close relationship between real (and nominal) interest rates and growth rates, with interest rates often seen to be around the same levels as growth rates. In this case, the *primary* balance needs to be around zero as seen from the formula above. This still allows for a budget deficit (the ordinary budget balance including interest payments on debt) of a given size, provided the economy is growing. However, moderate growth rates in industrialized countries constrain the feasible size of these deficits, as can be seen by studying the OECD countries: During the period 1971-2007, the average real growth rate of the OECD countries has been three per cent per year. A budget deficit of three percent thus seems possible to maintain, while higher deficit levels point towards less sustainable developments.

However, the level of public debt and the budget balance are not the only relevant factors to monitor when assessing fiscal soundness and the health of the overall economy. Excessive investment in certain sectors can generate large tax receipts and thus improve the budget balance. But this excess demand somehow needs to be financed. Consequently, the counterpart of a sound budget balance may be a substantial current account deficit.

The current account reflects transactions by both the public and the private sector, as may be illustrated by the following basic identity: $CA = S_{pr} - I_{pr} + S_g - I_g$: The difference between aggregate saving and investment, here divided into the private (pr) and public (g) sector components, determines the current account balance (Abbas et al., 2010). As documented in Blanchard (2007), there has been a steady increase in current account imbalances in the OECD countries during the last two decades. Focusing on the negative numbers, a current account deficit may be perfectly consistent with a long run sustainable development, e.g. as countries in an early phase of development borrow internationally to finance infrastructure and other growth-enhancing investments. However, sustained deficits *may* signal unsound conditions and misallocation of resources. Over-investment in property and construction, as seen in Spain in recent years, may serve as one example.

Turning to public spending, fiscal deficits may or may not show up in the current account, or rather, the direction in which the influence goes is a priori ambiguous. Whether there is a positive or negative relationship between the fiscal balance and the current account balance will in part depend on how the private sector reacts to a change in the fiscal balance (Nickel and Vansteenkiste, 2008). If the private sector's behavior is fully Ricardian, higher public spending (or lower taxes) should be exactly offset by an increase in private saving, and thus not affect the current account. At the other extreme, a Keynesian view predicts a close and positive relationship between the two accounts: A larger fiscal deficit (say due to reduced taxes) leads to higher private spending as households consume out of current rather than lifetime income, and an increase in the current account deficit follows. This line of reasoning also supports the possibility of twin deficits that has developed in certain countries (Barnes, Lawson and Radziwill, 2010).

Reality is probably somewhere in between the two theoretical extremes: The fiscal and current accounts are linked, but it is far from clear just how close this tie is. Nickel and Vansteenkiste (2008) find that the effect of fiscal deficits on the current account depends on the public debt level, indicating that the relationship between the fiscal and current account is not constant. Barnes, Lawson and Razdiwill (2010) claim that the two accounts are typically positively correlated, albeit much less than one-for-one. They point at Portugal and Greece as countries where public deficits have been important contributors to current account deficits. On the other hand, different mechanisms such as excessive housing investment may explain a large part of the external imbalances recently seen in Ireland and Spain.

To sum up, even though mechanisms and relationships differ, examining the current account is a useful supplement to debt and fiscal deficit surveillance. For this reason, in the empirical section we also assess the current account balance to get a more nuanced and comprehensive measure of the overall conditions. We see this as a form of structural adjustment of the budget

balance, and as will be shown; it leads to somewhat different conclusions than those following from an observation of the budget balance alone.

Threshold levels

In the empirical analysis below we will make use of predefined thresholds for the three variables in question. These levels are based on theoretical considerations as well as being inspired by empirical observations.

Various thresholds for sustainable government debt levels are cited in the literature, in part used for varying purposes. For example, Reinhart and Rogoff (2010) find a debt threshold of 90 per cent of GDP beyond which growth is negatively affected. Ostry et al. (2010) establish limits for the relative size of debt that a country can sustain without requiring a change in policy compared to its historical record of fiscal adjustment. This is based on a notion that for moderate debt levels, increases in debt elicits a sufficient increase in primary fiscal balances to sustain a stable debt level. However, for debt levels beyond a certain threshold, this historical response of the fiscal balance may be insufficient, and unstable debt dynamics may emerge. As conditions may be more fragile as this debt limit gets closer, it is advisable to stay well below this level. Establishing general one-size fits all thresholds is clearly a crude approach. Much of what influences the exact sustainable debt level is country specific and time dependent. Furthermore, maturity structure and the composition of domestic versus external debt are other relevant factors that come into play. Keeping these variations in mind, we choose a debt threshold of 60 per cent of GDP. This is close to the median level of debt in the advanced countries prior to the most recent crisis (IMF, 2010). It is also the level used in the Maastricht Criteria for the Euro Zone countries.

Our second variable of interest is the government budget balance. Departing from reasonable levels of growth rates and interest rates as discussed above, a budget deficit around three per cent seems possible to maintain. Therefore we assume that a budget deficit of *four* per cent of GDP may serve as a threshold level: A deficit beyond this level seems more likely to induce unstable dynamics. Furthermore, a budget deficit sustained for several years is believed to be more severe than a temporary high deficit in just one single year. Therefore, we also take this time dimension into account.

The third variable for which we wish to establish a threshold level is the current account. As described above, a current account deficit can be justified or even desirable for some time, in part depending on the exact factors causing the deficit. As international borrowing and lending is beneficial in several ways, a certain deficit need not necessarily be reason for concern. However, increasing and sustained deficits may signal unhealthy tendencies. Furthermore, large and sustained deficits will contribute to a built-up of *foreign* debt – in much the same way as budget deficits add to public debt. With this parallel in mind, we choose the same threshold for the current account deficit as the one chosen for the budget deficit, namely four percent of GDP. An analogous time dimension is also applied to this

variable. Having defined these threshold values, we now proceed to the empirical part of the paper.

3. Data

Inspired by theoretical considerations and observations of data we have conducted a simple empirical analysis. We have studied data from the OECD Economic Outlook database for 28 countries. In addition, data for Cyprus is collected from the EU Commission, leaving us with a total of 29 countries in our data set. The main variables of interest are the level of public debt, the public budget balance and the current account balance, all expressed as shares of GDP. More specifically, annual figures for the following variables are retrieved:

- General government gross financial liabilities. Per cent of GDP. Labeled (D).[3]

- Government net lending (or equivalently: General government financial balances). Per cent of GDP. (Positive numbers indicating surplus, negative numbers are deficits). Labeled (B).

- Current account balance. Per cent of GDP. (Positive numbers indicating surplus, negative numbers are deficits). Labeled (CA).

The empirical section is covered by data from 1970-2009, although there is great variation between countries and between the different variables. This poses some potential challenges, as will be commented on in the following section. Starting dates for debt series range from 1970 to 2002. Data series for budget balances and current account balances start between 1970 and 1995.

4. Empirical procedure

In analyzing the data we proceed in three steps. First, a "Misery Index" is constructed, intended to work as an indicator of "trouble" lying ahead, meaning that the current situation is unsustainable. Second, we proceed to combine the budget balance and the current account balance to create an "overall balance." We filter out countries based on this measure. Third, based on the index and the filtering procedure we select a set of countries for a closer inspection of their debt/balance profiles.

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[3] Note that this differs from the symbol used in the formula in the theoretical section, as we now take D as shorthand for debt *as a percentage of GDP*.

Creating a Misery Index

The index builds on values for the three variables B, D and CA as described in the data section. The threshold levels defined above are summarized in table 1.

Table 1	Threshold level (per cent/GDP)
Budget balance	-4
Current account balance	-4
Gross public debt	60

We define a set of binary indicators which take the values 0 or 1 depending on whether these predefined thresholds are exceeded for any one variable The index itself is constructed by simply adding these indicator values together, making the maximum value of the index equal to three in any one year. An increase in the index implies an increased budget deficit, an increased current account deficit, an increased debt level, or any combination of these. An increase in the index may thus be interpreted as a worsening of fiscal/economical conditions. This may be taken as a signal of trouble lying ahead unless some change is undertaken.

Index time series are constructed for each country, and plotted graphically. In interpreting these index series, the fact that data availability differs between countries and variables is worth having in mind. Lack of data for earlier periods can stand out as apparent changes in deficits or debt that are not real. An increasing index value may indicate a deterioration of fiscal conditions. However, an increased index value could be due to the entry of new data rather than an actual change in the underlying variables. If this is the case, it would be wrong to identify the point in question as a time of real change. Ideally, missing data entries should have been filled by adding data from other sources. However, problems of comparison may then occur. Furthermore, and more importantly, relevant data may not even exist or they may be hard to access. To remedy this insufficiency, when identifying episodes and classifying countries, raw data has been consulted to ensure that such changes are not merely due to new data entry. One should also note that such missing data may blur country comparisons. With these caveats in mind we proceed to take a closer look at indexes for a selection of countries, see figure 1.

Figure 1:
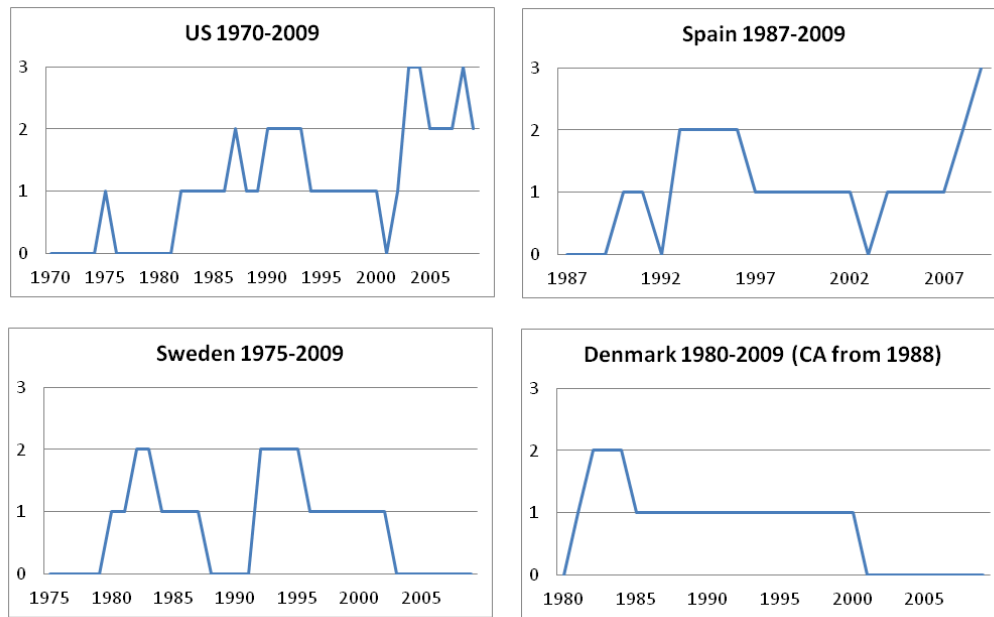
Across countries a rather clear pattern emerges: Some countries seem to be building up imbalances over time, gradually moving further away from an index value of zero. The US and Spain may be seen as relevant examples. Other countries may have followed such a path for a while, after which the index value eventually falls, creating an image of a more sound condition. Sweden and Denmark can serve as illustrations. Based on these rather stylized descriptions we categorize the various countries as either *sliders* or *rebounders*. As this is a very rough measure, we are not able to classify all countries, and so some are labeled *borderline* countries.

It should be noted that the actual dynamics of deficits and debt are far more complex than what is indicated by this simple index. It is reasonable to believe that a high budget deficit is more problematic with an already high level of debt. Similarly, budget deficits combined with current account deficits, so called twin deficits, are likely to be more severe than a deficit of a similar size in only one of the accounts. To account for such possible non-linearities and interaction effects, we created a number of alternative indexes. In one version, a country was given extra points if *both* B and CA exceeded their respective thresholds, over and above the two points given in the basic index described above. In a similar fashion, extra points were assigned if *both* the budget balance (B) threshold and the debt threshold (D) were exceeded. In another version, index points were assigned according to the *size of deviations* from thresholds. The further away from a threshold, the more points were given. These alternative indexes give a more nuanced picture than what follows from the simple approach taken in the basic method. However, the main impression from the basic setup was confirmed, and possibly strengthened. Thus, we retain the simplest index and base our notion of *sliders, rebounders* and *borderline* countries on that. We proceed to a more detailed inspection and filtering process.

B + CA = the overall balance (O)

Some countries get at fairly high index value even if their budget is not too far out of balance. This highlights the importance of considering additional factors. We choose to examine countries more closely by looking at the budget balance *and* the current account in combination. We do this simply by adding the budget balance to the current account balance to create what we term the overall balance (O)[4]. A country with a budget deficit of one per cent and a current account deficit of seven per cent would thus have an overall deficit of eight per cent according to our measure. The goal is to filter out countries based on this overall balance. Our hypothesis is that the abovementioned sliders will reemerge as countries with large overall deficits.

Filter 1

We depart from the same thresholds as those used in the indexes and filter out countries in two slightly different ways. First, to focus on countries running a twin deficit, we single out countries where *both* the current account *and* the budget is in deficit by more than four per cent of GDP. This entails a minimum level for our overall deficit variable of eight per cent of GDP. As an attempt of a sensitivity analysis we gradually apply larger threshold levels of 10, 12 and 16 per cent in order to differentiate further between countries. In addition we add a time dimension to our filter. Deficits sustained over several years are likely to be more problematic than one-year events. Therefore, for each of the threshold levels, we distinguish between two separate cases. First, we filter out countries where threshold levels are exceeded for a maximum of three consecutive years. Next, countries where limits are exceeded for four or more consecutive years are listed. The results from this procedure are shown in table 2, with two columns for each threshold level. The filtering is based on all available country-years, covering the period from 1970 to 2009. The table can be read from left to right: As higher thresholds are applied, fewer countries remain in the table.

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[4] Note that this artificial variable is in itself not really meaningful/it has no interpretation in itself.

Table 2	Countries filtered out by sum of budget balance and current account balance. Only countires with budget deficit exceeding 4% *and* current account deficit exceeding 4%.							
All countries	Sum > 8	Sum > 8, ≥4 years	Sum > 10	Sum > 10, ≥4 years	Sum > 12	Sum > 12, ≥4 years	Sum > 16	Sum > 16, ≥4 years
Australia	Australia		Australia					
Austria								
Belgium								
Canada								
Switzerland								
Czech Republic	Czech Republic		Czech Republic		Czech Republic			
Germany								
Denmark								
Spain	Spain		Spain		Spain		Spain	
Finland	Finland		Finland					
France								
UK								
Greece	Greece	Greece	Greece	Greece	Greece		Greece	
Hungary	Hungary	Hungary	Hungary	Hungary	Hungary	Hungary	Hungary	
Ireland	Ireland	Ireland	Ireland	Ireland	Ireland	Ireland	Ireland	Ireland
Iceland	Iceland		Iceland		Iceland		Iceland	
Italy	Italy		Italy					
Japan								
South Korea								
Luxembourg								
Netherlands								
Norway								
New Zealand								
Poland	Polen							
Portugal	Portugal		Portugal		Portugal		Portugal	
Sweden								
US	US		US					
Slovak Republic	Slovak Republic	Slovak Republic	Slovak Republic	Slovak Republic	Slovak Republic	Slovak Republic	Slovak Republic	
Cyprus	Cyprus		Cyprus		Cyprus			

During the most recent crisis the so-called PIIGS countries are, among other things, characterized by the poor state of their public finances and high debt levels[5]. It therefore comes as no surprise that these countries remain in our table even when threshold values are increased. Iceland is another well-known case, with a high overall deficit and a twin deficit of a certain size. The entry of the Slovak Republic may be more surprising. Its recurrent appearance in the table motivates a closer inspection of this country in the more detailed analysis below.

Filter 2

As mentioned above, there may be good reasons to examine cases with deficits on only one of the accounts. Balance in one account may be combined with a large deficit in the other account. Such a "hidden" deficit may still be a reason for caution. We therefore repeat the filtering procedure for the same time period, but this time including all countries, not just those running a deficit of more than four per cent on both accounts. A country with a balanced budget, but with a current account deficit of eight per cent of GDP would thus be filtered out at a threshold level of eight per cent. We apply the same threshold levels and the same time dimensions as in the first filtering exercise. The results are shown in table 3. It can be read in a similar fashion, just keeping in mind that this latter procedure allows for a larger number of countries to be included.

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[5] Although there are important differences between these countries.

Table 3	Countries filtered out by sum of budget balance and current account balance. All countries.							
All countries	Sum > 8	Sum > 8, ≥4 years	Sum > 10	Sum > 10, ≥4 years	Sum > 12	Sum > 12, ≥4 years	Sum > 16	Sum > 16, ≥4 years
Australia	Australia	Australia	Australia					
Austria	Austria							
Belgium	Belgium	Belgium	Belgium	Belgium	Belgium	Belgium	Belgium	
Canada	Canada	Canada	Canada		Canada			
Switzerland								
Czech Republic	Czech Republic	Czech Republic	Czech Republic		Czech Republic			
Germany	Germany		Germany					
Denmark	Denmark		Denmark					
Spain	Spain		Spain		Spain		Spain	
Finland	Finland		Finland					
France	France							
UK	UK		UK		UK			
Greece	Greece	Greece	Greece	Greece	Greece	Greece	Greece	
Hungary	Hungary	Hungary	Hungary	Hungary	Hungary	Hungary	Hungary	
Ireland	Ireland	Ireland	Ireland	Ireland	Ireland	Ireland	Ireland	Ireland
Iceland	Iceland	Iceland	Iceland	Iceland	Iceland		Iceland	
Italy	Italy	Italy	Italy	Italy	Italy	Italy		
Japan	Japan							
South Korea	South Korea							
Luxembourg								
Netherlands								
Norway	Norway		Norway					
New Zealand	New Zealand							
Poland	Poland	Poland						
Portugal	Portugal	Portugal	Portugal	Portugal	Portugal	Portugal	Portugal	
Sweden	Sweden		Sweden		Sweden			
US	US	US	US		US			
Slovak Republic	Slovak Republic	Slovak Republic	Slovak Republic		Slovak Republic			
Cyprus	Cyprus		Cyprus					

Certain differences emerge when comparing the two tables, as some countries show up only in the latter table. Even in absence of large twin deficits, these countries' overall deficits have been large enough to "survive" our filtering process. Belgium, Canada and the US are countries that "survive" a larger threshold in this filtering than in the one behind table 2. However, the overall picture from the two procedures is quite similar. The fact that the PIIGS countries as well as other well-known deficit countries are identified by this crude procedure indicates that our method can be useful as a rough guide.

As seen in both table 2 and table 3, some countries have run large deficits in only one or a few years, and do not show up in the "more than four year column." Notice, however, that the use of absolute thresholds create a cliff effect as illustrated by the following example: Imagine a country running a deficit for three years of e.g. 8,5 per cent, interrupted by one year with an overall deficit of 7,9 per cent and followed by another three years with a deficit exceeding the eight per cent threshold. This case will *not* show up in the table as a country with a deficit above eight per cent for *more than four years*, even though this is a rather persistent case. This problem will in part be remedied in the next section when a more discretionary inspection is done.

Through the filtering process, countries with large deficit problems (at some point in time, these could be historical) are identified, while those countries absent may be believed to be in relatively sound condition. However, the method gives no indication as to *when* these episodes of large deficits have arisen. If a country has had a large and persistent overall deficit it will show up in the tables and could be a possible "slider." On the other hand, if a large deficit was sustained for some time, but then followed by fiscal action taken to change this trend, the country could correspond to our notion of a rebounder. However, it would still show up in our tables. A more detailed examination is therefore needed, with the timing of deficits being one important aspect to add. Furthermore, not only the flows of deficits but also the stock of debt is worth considering. Some possible interaction effects are already mentioned. These aspects are taken into account in our final stage of the analysis. Based on the indexes and the filtering process a number of countries are selected for a visual inspection of the data.

A closer look

We make two different plots for each country. First, the "overall balance" together with a threshold of minus eight is outlined. Next, we plot the three different balances – the budget balance, the current account balance and the overall balance. In the same graph we also add the development of the public debt. In what follows, graphs for selected countries are presented and commented on. It should be noted that this is mainly an inspection of the data rather than a study of what has actually happened. However, interpretations may of course be influenced by a general knowledge of historical events, and references to such are made in certain cases. The selected countries are grouped into the categories of sliders, borderline countries and rebounders. All variables are given in per cent of GDP. Balances and thresholds are shown on the left-hand scale, while debt is on the right-hand scale. Starting dates for data series are indicated.

Sliders

In general, the "slider" countries have an overall deficit for most of the period in question (1970-2009). Such deficits will probably be difficult to sustain over time. This may leave a country less able to handle shocks should they occur.

Spain   (B: 1970, CA:1975, D: 1987)

Spain B+CA
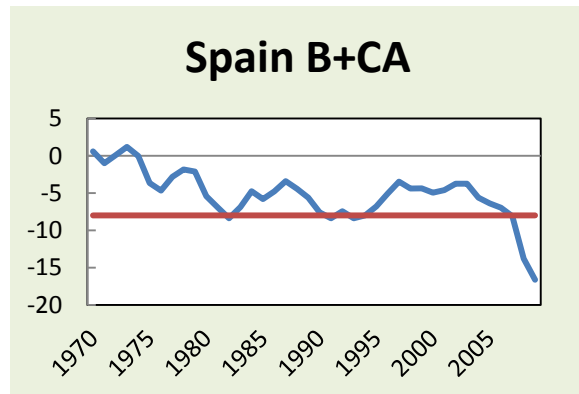
Except right at the very beginning of the period, the overall balance has been negative throughout. It has been fairly stable through much of the period, but well below zero. There has been a considerable rise in deficits during recent years. Spain appears to be a **slider**.

Spain
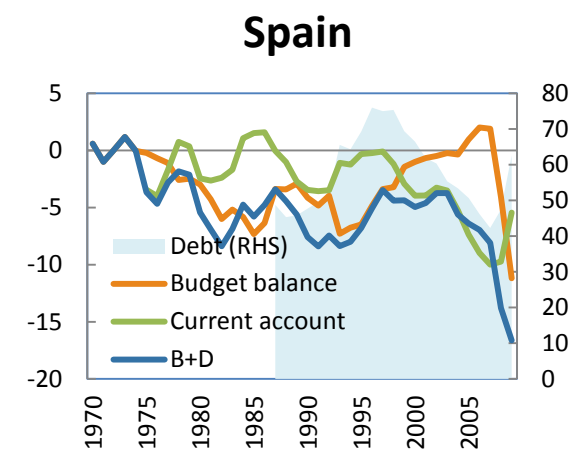
The overall balance paints a more severe picture than the budget balance alone. There is a clear negative correlation between the budget balance and the current account balance. This shows the importance of assessing more than just the budget balance.

Debt data starts in 1987. First a period of rising debt, then followed by a falling debt level in the 2000s in pace with improvement in and surplus on the budget balance. Its counterpart is a substantial current account deficit. This has been followed by deterioration in the budget balance and the overall balance over the past couple of years and a new rise in the debt level.

Greece   (B: 1970, CA:1975, D: 1995)

Greece B+CA
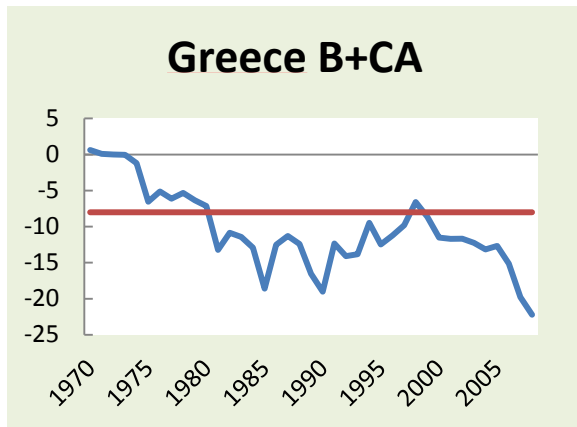
The overall balance has been negative throughout the period. This overall deficit has been reduced in periods, but the *level* has remained relatively high. Greece appears to be a **slider**.

Greece

Legend:
- Debt (RHS)
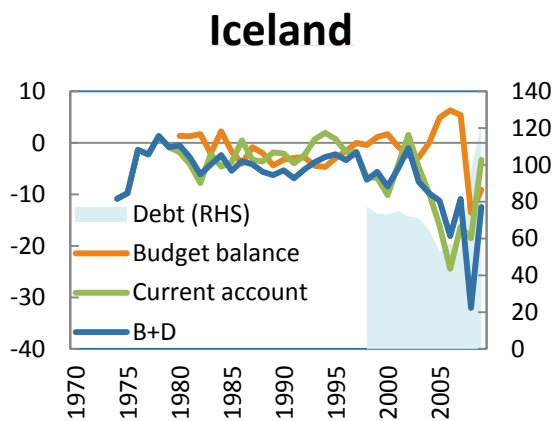- Budget balance
- Current account
- B+D
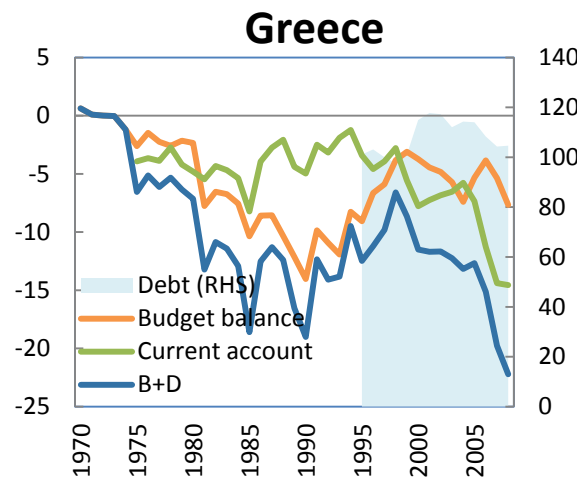
No pre-1995 data for debt, but an overall deficit throughout the period has led to a gradual build-up of debt to the current high debt level. There has been a clear deterioration in balances in recent years.

Iceland   (B: 1980, CA:1974, D: 1998)
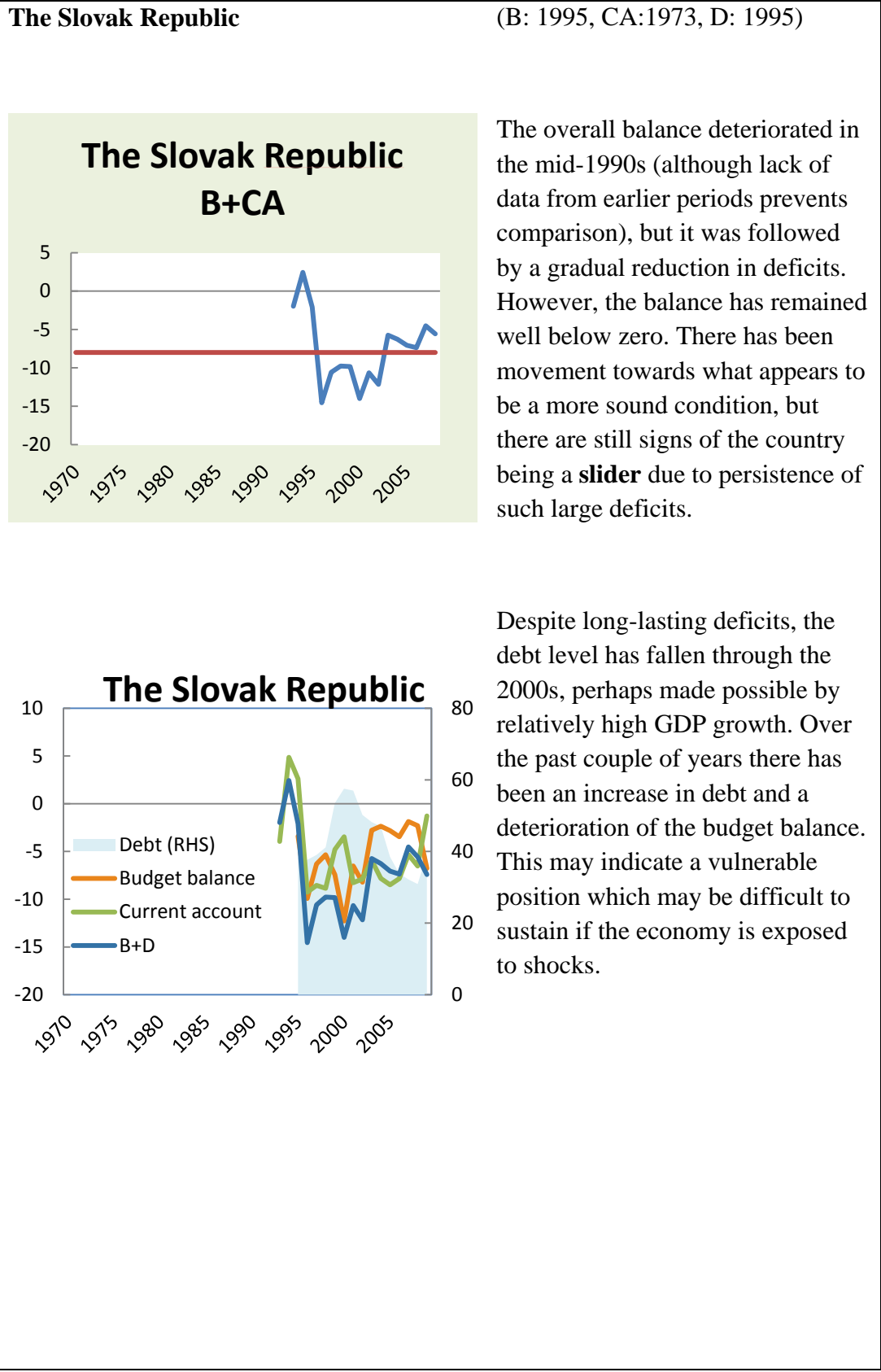
Iceland B+CA
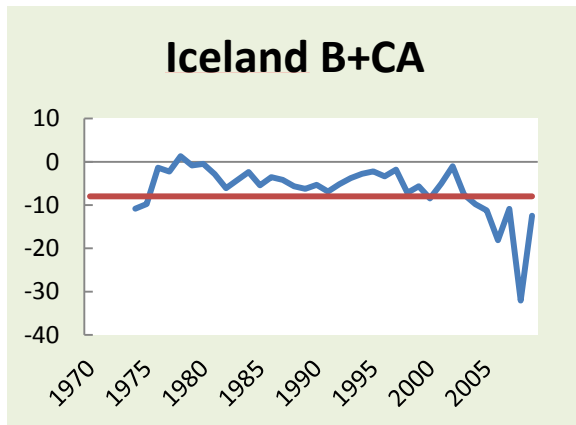
The overall balance was stable up until 2002, but negative through most of the period. The deficit *level* has been relatively high. There has been a clear deterioration since 2002 with an overall balance of minus 32 per cent in 2008. This indicates a vulnerable situation and hints at Iceland being a **slider**

Iceland

Debt (RHS)
Budget balance
Current account
B+D

The development was fairly stable until the end of the 1990s, but balances have generally been negative. There has been wide fluctuations starting from 1997, with an improvement in the budget balance being offset by a deterioration in the current account balance (and vice versa – clearly a negative correlation). A substantial overall deficit in recent years has been combined with a doubling of the debt level.
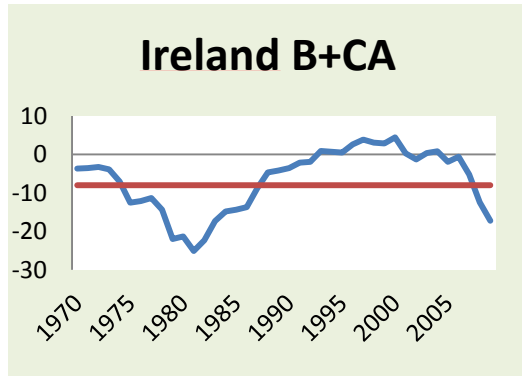
Borderline countries

Some countries are more difficult to classify. Nevertheless, most of these lean more towards our notion of a "slider" than that of a "rebounder".

The Slovak Republic   (B: 1995, CA:1973, D: 1995)

The overall balance deteriorated in the mid-1990s (although lack of data from earlier periods prevents comparison), but it was followed by a gradual reduction in deficits. However, the balance has remained well below zero. There has been movement towards what appears to be a more sound condition, but there are still signs of the country being a **slider** due to persistence of such large deficits.

Despite long-lasting deficits, the debt level has fallen through the 2000s, perhaps made possible by relatively high GDP growth. Over the past couple of years there has been an increase in debt and a deterioration of the budget balance. This may indicate a vulnerable position which may be difficult to sustain if the economy is exposed to shocks.

Ireland   (B: 1970, CA:1975, D: 1998)

Ireland B+CA

The substantial deficits in the years around 1980 have been reduced, and the overall balance was positive in some periods during the 1990s. However, there has been clear deterioration since 2000. Ireland appears to be a former "**rebounder**" that now shows signs of being a **slider**. The situation is probably not sustainable – as seen by the most recent developments following the bank rescues during the autumn of 2010.

Ireland
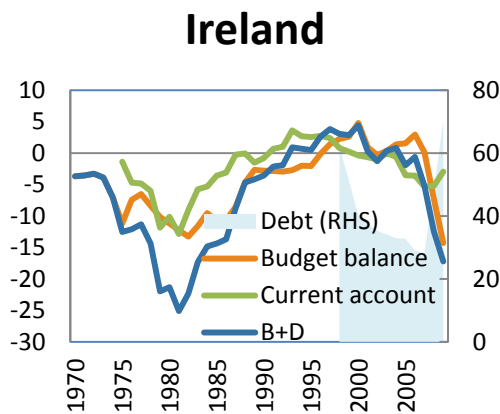
The debt level was considerably reduced during the 2000s, but it has shown a sharp increase in the past couple of years. The balances were close to zero in the 2000s, but then followed by a fairly abrupt transition to higher debt and substantial deficits in the past couple of years.

Rebounders

The "rebounders" have, at least in periods, run a surplus on their balances. In general, they show smaller level of deficits and lower or falling debt levels.

Sweden   (B: 1970, CA:1975, D: 1970)

Sweden B+CA
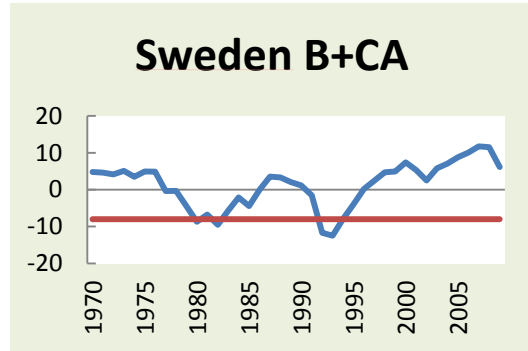
Sweden has gone through two periods of fairly substantial deficits. It seems to be able to recover and the overall balance has been positive since 1997. This could be a possible **rebounder.**

Sweden
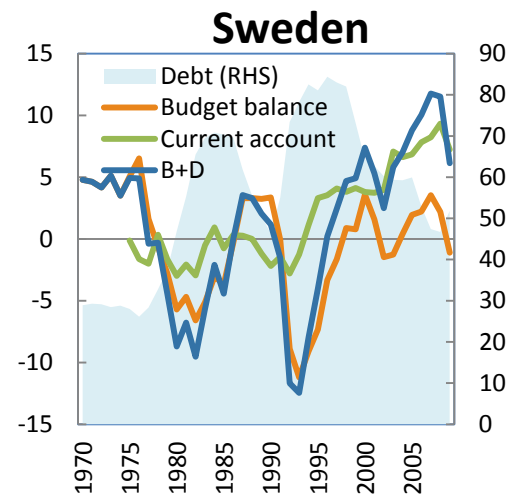
There has been two periods of increased fiscal deficits and approximately concurrent rise in the debt level. These developments have been "reversed" in both periods. This may indicate that fiscal action was implemented in order to influence the direction of developments.

Finland	(B: 1970, CA:1975, D: 1975)

Finland B+CA
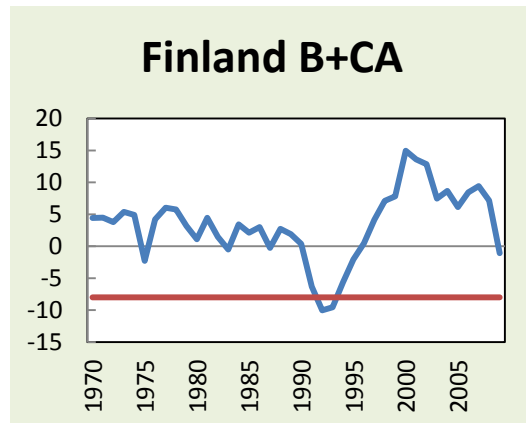
Finland has had a fairly even development with surplus through most of the period. One period of large deficits during the 1990s (in addition to the past couple of years). It seems to have recovered from this "dip" and appears to be a **rebounder.**
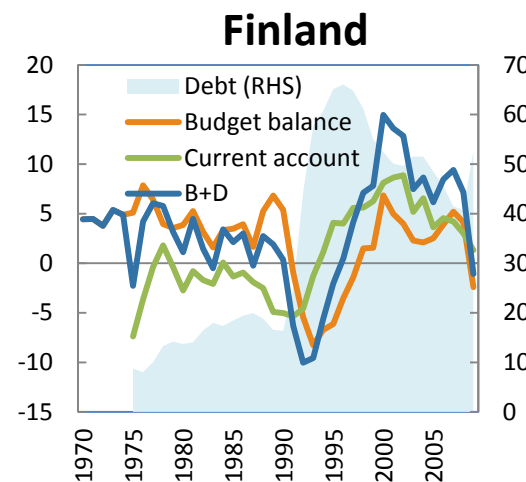
Finland

At the outset, Finland had a positive fiscal balance and a low debt level. There was a substantial change at the beginning of the 1990s, but developments in both the budget balance and the debt level are now largely reversed (although to a smaller extent with regard to debt level).

5. Fiscal discipline

As can be seen from a simple visual inspection of the charts, countries differ substantially in terms of their fiscal position. However, it seems fair to say that on average, balances are more negative than positive. Some of the deficits shown may be related to Keynesian stimulus spending in times of economic downturn. However, if the principle of countercyclical fiscal policy was strictly adhered to, one should have seen symmetric fluctuations during economic booms. For the equation to balance, large scale spending during downturns requires an equivalent restraint in good times. But in reality, departures from responsible fiscal policy[6] is mainly due to lack of restraint in good times (Midthjell, 2010). Hence, there seems to be a

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[6] Exactly what is understood to be responsible fiscal policy can in itself be debated. Following Midthjell (2010), if a country's fiscal policy does not contribute to a large and sustained public debt and if it avoids large and sustained budget deficits, it can be said to be responsible,

certain asymmetry inherent in fiscal policy. In times when private consumption and investment is expanding, it may be hard for the government to convince the public about the need to constrain public spending. However, just as the recent recession has shown the need for fiscal stimulus, the austerity debate following the financial crisis has thrown light on the limitations of this very spending: If the "rules" haven't been adhered to in good times, there will be less room for stimulus in a subsequent downturn. A government entering a recession with a fiscal balance, or even a budget in surplus, will have far more fiscal space than what will be the case if it ran deficits during a preceding boom. The country may then be forced to tighten fiscal policy too early – possibly creating more damage – than what would otherwise have been the case. The fiscal position of the UK over the last years may serve as an illustration. Overspending during an economic upswing left the public sector with a budget in deficit at the onset of the crisis. The stimulus that followed the crisis thus quickly created double-digit deficits. Such large-scale deficits cannot be sustained for very long. The need for change of direction is reflected in the tight budget presented by the government in October 2010. In such a case, with insufficient restraint in good times, one cannot claim being an innocent bystander when a widespread economic downturn emerges, as precautionary measures could have been taken.

The need for fiscal discipline seems easier to "preach" than to live by. Time inconsistency in fiscal policy is thus often a real challenge more than just a theoretical possibility. An analogous issue is the well-known time inconsistency problem in monetary policy. Temptation to trade off inflation for real gains may create an inflationary bias with a sub-optimal outcome. A common solution to this problem is the delegation of monetary policy to an independent central bank. But fiscal policy is different from monetary policy. By its very nature, fiscal policy *is* politics in a much clearer sense, and thus harder to depoliticize. Therefore, restraint and discipline cannot be ensured in the same manner as for monetary policy. However, some countries are taking a step in this direction. Although not constituting "independent fiscal policy," an independent body monitoring or supervising fiscal policy may work as a disciplining device (Hagemann, 2010). As far back as in the 1930s Ragnar Frisch (1933) suggested a so-called cyclical council as a theoretical possibility. Today, Sweden's "Finanspolitiska Rådet" as well as the British "Office for Budget Responsibility," are two among several real life attempts at remedying some of the challenges of fiscal policy. The mandates, roles and goals of such bodies may differ, depending on institutional and historical factors. At any rate, one natural task would be to monitor the development of the state of public finances. Leaving aside possible challenges related to real time data, exercises as those described in this paper could be useful. Surveillance of such variables as the budget balance, the current account balance and the public debt level, preferably seen in relation to each other, would give valuable information. This does not require too much data, neither any sophisticated econometric techniques. What is likely to be challenging is taking the implications of such information into account and translating it into fiscal action if needed.

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When is the banking industry too large?

A government may have only a limited capacity to rescue its banking sector if a crisis should occur. Based on the experiences from the recent international crisis, this note discusses how large the banking sector can become before the rescue capacity of the government becomes insufficient.

1. Introduction

During the recent financial crisis first the Icelandic and then the Irish government have got into severe debt problems following the failures of their largest banks. In both countries the balance sheets of their banking sectors were about ten times their GDP. Some other very small countries within the EU (Malta and Cyprus) have also very large banking sectors, not to mention Luxemburg with a ratio of 28 between banking assets and GDP. Does a large banking sector by itself pose an unacceptable risk to government finances?

Among the larger European countries both Switzerland and the United Kingdom have banking sectors around five times their GDP. These countries appear to be worried about the risk that this may pose to government finances. The Swiss government has responded by imposing very high capital requirements on their largest banks. The UK government is openly concerned with the increase in government debt following the bail-out of several large UK banks.

Within the euro area the weighted average ratio between banking sector assets and the GDP stood at 3.5 by the end of 2009, and the median ratio was 3.4. Most countries seem to be comfortable with ratios around three. Is there really an important difference in country risk exposure between a banking sector three times the GDP and a sector five times the GDP?

Looking beyond the countries with very large banking sectors relative to GDP, several European countries without large banking sectors are also in a debt squeeze after the financial crisis. That currently includes Greece, Portugal and Spain, with Italy and Belgium closest to follow. Each of these countries have relatively modest banking sectors, with ratios to GDP between 2.1 (Greece) and 3.7 (Belgium); i.e. below or close to the euro area median. Governments may clearly have debt problems that are not specifically associated with large banking sectors. This is the case in Greece and Portugal, where the banking sector problems may derive from government or national debt problems and not vice versa. To some extent the same goes for Spain and Italy.

2. Recent related studies

Gerlach et al.(2010) investigates the relationship between large banking sectors and sovereign CDS spreads in the euro area. They find that a high ratio of banking sector assets to GDP tends to widen the spread relative to German Bunds in periods with significant macro risks as

measured by the US BBB corporate bond spread to Treasuries. When macro risks produce a BBB bond spread of 6-700 basis points, a one percentage point increase in the assets to GDP ratio is estimated to increase the sovereign spread by 13 basis points. The maximum impact they find during the recent crisis is an increase of only 80 basis points (for Irish sovereign debt). This estimate looks low and may partly reflect that the linearity assumption they impose is not valid.

Baglioni and Cherubini (2010) have estimated the market value of the implicit government guarantees to ten banking sectors in the euro area. They look at the 44 banks that were part of the CEBS stress testing exercise in July 2010, except for those without quoted CDS prices. From the CDS prices on bank and government debts they compute probabilities of failure and correlation between banks, which together determine the probability of a systemic event. Insurance against such events are then priced to obtain an estimate of the implicit debt obligations of governments that follow from the too-big-to-fail guarantees perceived by the market. We shall get back to their results below. Here we just notice that there is no one-to-one correspondence between the size of the banking sector and the implicit government debt associated with the banking sector.

An IMF (2010) paper also points out that the severity of the problems associated with a large banking sector may depend on a number of other factors than bank sector size. The paper provides a discussion of such factors, by comparing the recent experiences of Iceland, Ireland, Switzerland, Hong Kong and Singapore.

3. A look at the numbers

Table 1 below shows some key ratios from end 2008 for selected European countries, including those countries that are currently having problems refinancing their government debt. We should notice that the banking assets in the table are aggregates of the balance sheets of all banks resident in each country. There is no netting for cross institution exposures. This is reasonable in our context because each institution may have to be handled separately in a crisis scenario. The term "resident" means that the numbers include subsidiaries of foreign banks and foreign branches of domestic banks, but not the foreign subsidiaries of domestic banks.[7]

This latter omission may be important for Spain and Italy, which have four of the largest European banks resident in their countries (Santander and BBVA in Spain; Unicredit and Intesa Sanpaolo in Italy). Most of the foreign activities of these banks are organized in subsidiaries, and are in principle the responsibility of the host country authorities. Whether that will hold up in a crisis situation is an open question. We note that in the Fortis case[8] each of the host countries did take responsibility for their part of the banking group. But we also

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[7] The term is not defined in the ECB database, but the normal meaning would be as stated here.
[8] Fortis was a banking group based in the Benelux countries. After its failure in 2008, it was broken up and taken over by the Belgian and Dutch governments.

note that Western European banks have mostly taken responsibility for their ailing Central European subsidiaries during the recent market turmoil.

Table 1: Key ratios for selected European countries. All numbers are in per cent of 2008 GDP.

Country	Bank sector total assets 2008	Gross government debt 2008	Structural budget balance 2008	Current account 2008	Increase of government debt 2008-10
Euro area countries					
Belgium	369.9	89.7	-0.7	-2.9	10.5
Germany	318.1	66.3	-0.3	6.7	9.0
Ireland	961.9	44.4	-11.3	-5.2	49.3
Greece	197.1	99.2	-11.5	-14.6	31.1
Spain	313.3	39.7	-9.7	-9.7	23.7
France	396.0	67.5	-3.1	-1.9	16.7
Italy	235.6	106.1	-2.6	-3.4	12.3
Netherlands	374.3	58.2	-1.6	4.8	7.8
Austria	374.5	62.4	-2.1	3.3	17.8
Portugal	280.5	65.4	-4.0	-11.6	7.6
Finland	214.6	34.7	1.7	3.1	15.3
Other EU countries					
Denmark	467.1	42.3	2.6	1.9	1.9
Sweden	272.3	37.6	0.9	7.6	4.1
United Kingdom	480.7	52.1	-5.6	-1.6	24.6
Non-EU countries					
Iceland (Sept 2008)	1249.3	71.7		-26.0	43.9
Norway [9]	179.3	56.7		17.0	-2.4
Switzerland	*561,5*	*40.9*		*2.0*	*-1.4*
Unweighted mean	426.2	60.9	-3.4	-1.7	13.4

Sources: Bank assets from http://www.ecb.int/stats/money/aggregates/bsheets/html/index.en.html and central bank websites.

GDP and government debt from http://www.imf.org/external/pubs/ft/weo/2010/02/weodata/weoselgr.aspx

Looking at factors other than the size of the banking sector, we first notice that Greece and Italy had a high level of government debt before the crisis and were thus highly vulnerable. The other countries experiencing a debt crisis had much lower government debts in 2008. But Iceland, Ireland and Spain all had substantial budget deficits in 2008 and a large increase in government debt over the next two years. Their vulnerability thus came from government deficits that partly stem from bank rescue costs. It appears that nearly all of the crisis ridden countries either had a high initial level of government debt or was rapidly accumulating new debt.

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[9] Mainland Norway would have a ratio of 250 %, but the total economy is more relevant for the capacity to handle banking sector problems.

Portugal is the exception, with gross government debt and government deficits just a little above the European average: What made Portugal vulnerable was more likely their large current account deficit.

Looking at the two larger European economies with banking sectors five times their GDP, we notice that Switzerland looks rock solid; it has a low level of debt and a government budget that is largely in balance. The United Kingdom has not experienced severe debt refinancing problems either, despite the large increase in government debt after 2008 and a government deficit that is also on the high side.

4. The government costs following a banking crisis

A banking crisis will infer two kinds of costs on the government. There will be some costs directly related to the failing banks, which we may call rescue costs. In addition there will be some costs related to the downturn in the economy that is normally triggered or reinforced by a banking crisis. These costs will include reduced tax revenues as well as discretionary fiscal stimuli. How large costs must a government be prepared to take in the event of a banking crisis?

To get some idea about these costs, in table 2 we look at expected increases in government debt in the years after a banking crisis. Following Laeven and Valencia (2010), the third column of the table reports the IMF projections for gross government debt increase for the five years 2007-12 relative to the size of the banking sectors at end 2007. Laeven and Valencia used a number of criteria to determine which countries had a systemic banking crisis during the recent international turmoil. In table 2 we focus on the countries on the Laeven-Valencia list, except for Latvia and Luxemburg which we believe to be atypical in a European context. On the other hand we add Spain which undoubtedly had a domestically produced systemic crisis even if the largest banks were little affected.

While this is naturally a very crude approach, it indicates that one could expect government debt to increase by at least 5-10 per cent of bank assets in the aftermath of a severe banking crisis. The debt increase stems partly from support measures, but also from fiscal stimuli to the economy. In the Spanish case we find a debt increase of nearly 15 per cent of bank assets. This high number may reflect that the Spanish crisis is quite severe, but perhaps also that the financial position of the government before the crisis was sound enough to provide some leeway for less contractionary policies than in other countries.

Table 2: Government bank support commitments and increases in government debt following the 2008-2009 banking crisis

Country	Increased government debt 2007-12 (per cent of 2007 GDP)	Total banking assets 2007 (per cent of GDP)	Debt increase (per cent of bank assets)	Government commitments (per cent of bank assets)	Implicit government debt (per cent of GDP)
Austria	36.8	325	11.3	10.4	26
Belgium	36.0	389	9.3	25.2	NA
Denmark	19.5	427	4.6	61.8	NA
Ireland	64.4	878	7.3	43.5	163
Netherlands	33.2	379	8.8	14.9	17
Spain	42.5	285	14.9	11.1	38
United Kingdom	32.0	486	6.6	8.5	32

Sources: Government debts and bank assets: See notes to table 1. Government commitments: EU Commission (2010). Implicit government debt: Baglioni and Cherubini (2010), table 6.

The fourth column of table 2 reports an alternative indicator of the rescue costs, namely the commitments governments have made to provide funds to the banking sector. These commitments include guarantees, which make for very high numbers for Denmark and Ireland. The average commitments of the five other countries are around 15 per cent of bank assets, with Spain and the UK at the lower end and Belgium at the higher end. The take up rate of the support commitments varies between countries, but the EU average is around 50 per cent. Again this points to direct rescue costs of at least 5-10 per cent of bank assets, with costs in some countries substantially higher than that.

Given these three pieces of information we shall conclude that a severe banking crisis can easily cause the government debt to increase by an amount equivalent to around ten per cent of total banking assets. This is the estimate we take along to the summary section below.

The last column of table 2 reports estimated implicit government debts from Baglioni and Cherubini (2010) in the paper referred to above. These implicit government debts stem from the perceived too-big-to-fail guarantees to the banking sector. The numbers in this column are based on the CDS prices observed on 15 September 2010. The size and risk exposure of Irish banks then translated into an implicit government debt of 160 per cent of Irelands GDP. Spain and the UK had implicit government debts at 38 and 32 per cent of their GDP. These implicit debts could be added to the official debt levels, which at end 2010 were at 63 and 77 per cent of GDP for these two countries. They could perhaps be seen as border cases, with a somewhat vulnerable standing in the international capital markets. A debt level above 100 per cent of GDP might be around the limit of where market confidence becomes an issue. We get back to that question in the section below.

5. A simple-minded model of vulnerability

The Maastricht treaty requires the government debt of each country to be below 60 per cent of GDP and the government budget deficit below 3 per cent of GDP. The actual euro area averages for debts and deficits in 2008 were approximately at these levels. Notice that with a trend GDP growth rate at 3 per cent, the 3 per cent budget deficit will not cause government debt to increase relative to GDP.

Table 3 shows the IMF projections for government debt in selected countries by end 2012. All the countries that are projected to have debt levels above 100 per cent of GDP by the end of 2012 are already experiencing more or less severe debt problems. We may perhaps interpret 100 per cent of GDP as an upper limit for when a government can refinance without substantial risk premiums in the market. Some countries with lower levels of debt are currently also paying high premiums, implying that levels below 100 per cent is no guarantee to avoid problems.

Table 3: IMF projections for government debt relative to GDP

Country	Gross government debt end 2012
Euro area countries	*(per cent of GDP)*
Belgium	105.0
Germany	77.0
Ireland	104.0
Greece	143.6
Spain	75.1
France	89.4
Italy	119.7
Netherlands	72.1
Austria	74.0
Portugal	90.0
Finland	55.4
Other EU countries	*(per cent of GDP)*
Denmark	48.4
Sweden	39.2
United Kingdom	85.1
Non-EU countries	*(per cent of GDP)*
Iceland	101.1
Norway	54.3
Switzerland	36.5

Sources: See notes to table 1

If we combine a 100 per cent of GDP limit on government debt with a possible government cost of 10 per cent of bank assets for rescuing banks and stimulating the economy after a banking crisis, the maximum acceptable relative size of the banking sector becomes a function of the initial government debt and the initial government deficit relative to GDP growth:

Maximum bank sector assets relative to GDP

= (1 – government debt to GDP– structural budget balance to GDP + GDP growth) / 10%

That produces the critical levels in table 4. According to this rule of thumb an average euro area country with a government debt of 60 per cent of GDP and a budget deficit close to expected GDP growth should avoid having a banking sector with assets more than four times its GDP. But countries with higher debt levels or higher structural government deficits relative to GDP growth should be more conservative in their approach to banking sector expansion. Countries with less government debt and strict supervision of their banking industries can on the other hand be less restrictive without endangering their financial position.

Table 4: The acceptable size of the banking sector depends on the government financial position

	Ratio of government debt to GDP	50 %	60 %	70 %	80%
Structural government surplus plus the GDP growth rate	*Acceptable size of the banking sector*				
5%		5.5	4.5	3.5	2.5
0%		5	4	3	2
-5%		4.5	3.5	2.5	1.5

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