

Fool the markets? Creative accounting, fiscal transparency and sovereign risk premia

Kerstin Bernoth* and Guntram B. Wolff**

Amsterdam and Frankfurt

first draft: January 2006; this draft: March 9, 2006^{††}

Abstract

We investigate the effects of published official fiscal data and creative accounting signals on interest rate spreads between bond yields in the European Union. Our model predicts that risk premia contained in government bond spreads should increase in both, the official fiscal position and the "creative" parts of fiscal policy. The relative importance of these two signals depends on the transparency of the country. Greater transparency reduces risk premia. Creative accounting is measured by stock-flow adjustments following von Hagen and Wolff (2006) and 'gimmickry' following Koen and van den Noord (2005). One fiscal transparency measure is taken from Hallerberg, Strauch, and von Hagen (2005), a second measure is developed in this paper. For the empirical investigation, we employ the framework developed in Bernoth, von Hagen, and Schuknecht (2004). The empirical results confirm the hypotheses. Creative accounting increases the spread. It strongly increase risk premia on sovereign debt if financial markets are unsure about the true extent of creative accounting. Fiscal transparency reduces risk premia. Instrumental variable regressions confirm these results by addressing potential reverse causality problems and measurement bias.

JEL: G12, E43, E62, H6, F34

Keywords: Risk premia, government bond yields, creative accounting, stock-flow adjustments, gimmickry, transparency

*Dutch National Bank and ZEI-University of Bonn, email: k.bernoth@dnb.nl.

**Deutsche Bundesbank, ZEI-University of Bonn, UCIS-University of Pittsburgh; email: guntram.wolff@bundesbank.de

^{††}We thank Mark Hallerberg for many suggestions and for the provision of one fiscal transparency indicator. Wolfgang Lemke, Harald Uhlig, the research department of the DNB and the Deutsche Bundesbank and participants at the the University of Münster workshop provided very helpful comments. Remaining errors are ours. The opinions expressed in this paper do not necessarily represent the views of the Deutsche Bundesbank, the Dutch National Bank or their staffs.

"In fact, irrespective of any formal fiscal rules, governments may wish to put the best possible gloss on the accounts presented to the outside world, including the so-called 'bond market vigilantes'." (Koen and van den Noord 2005)

1 Introduction

The effect of fiscal variables on bond markets is hotly debated. A topic of particular importance concerns the question, whether and to what extent bond markets price in the possibility of (partial) sovereign default by demanding higher interest rates. If a worsening in the fiscal position of an issuer country increases the default probability, it should also be reflected in an increase of the default risk premium contained in bond yields, measurable by an increase in the interest rate spread towards a low risk benchmark country.

In the previous literature, fiscal determinants of sovereign default risk are quantified by the official fiscal position of a country, usually the official debt and deficit figures (Capeci (1991, 1994), Alesina, De Broeck, Prati, and Tabellini (1992), Bernoth, von Hagen, and Schuknecht (2004)). The general empirical finding is that bond yields depend positively on the debt and deficit level.

Official reported fiscal variables might, however, not give an accurate picture of the true fiscal position of a country for many reasons. Politicians might want to hide deficits if voters dislike them.¹ Governments might also want to engage in additional spending without having parliamentary approval. Parliamentary control can be reduced by fiscal misreporting.² Finally, fiscal rules such as constitutional deficit limits and international rules such as the Stability and Growth Pact (SGP) constitute limits on official fiscal data. This might increase the incentive of governments to hide away deficits by reverting to window-dressing or shifting fiscal expenditures off the budget (Milesi-Ferretti 2003). We label all these activities 'creative accounting'. Especially the use of creative accounting to 'comply' with the European fiscal rules, namely the excessive deficit procedure (EDP) and the SGP, has recently become an important policy concern in Europe.

Numerous studies investigate the effect of fiscal rules on budget outcomes and cre-

¹Alt and Lassen (2006) provide evidence that electoral cycles depend on fiscal transparency. They are less pronounced, the more fiscally transparent a country is. von Hagen and Wolff (2006) show that creative accounting moves with the business cycle.

²This is the idea behind the sub-index on fiscal transparency developed in von Hagen (1992).

ative accounting for US states and cities (Bunch (1991), von Hagen (1991), Kiewiet and Szakaly (1996), Bohn and Inman (1996)). The general conclusion from this literature is that binding restraints induce fiscal actors to use other instruments to dampen the effect of the rule. Relatively few studies investigate the use of "creative" accounting in the EU. Dafflon and Rossi (1999) surveys the accounting tricks used in the run-up to the Euro. They find that numerous countries have used tricks to qualify for EMU membership. Similarly, Milesi-Ferretti and Moriyama (2004) find that during the period leading up to 1997 governments reduced the public debt ratio by decumulating government assets in order to qualify for EU membership. von Hagen and Wolff (2006) are the first to analyze accounting tricks in order to comply with the rules of the SGP. In particular they argue that stock-flow adjustments (SFA), i.e. the difference between the reported annual change in debt levels and the reported deficits, were systematically used after the SGP was in place to reduce the official deficit figures, while no systematic use of SFA was made in the period before the Euro introduction. Koen and van den Noord (2005) collect information on single one-off measure in EMU (fiscal gimmickry) and show that the probability to observe such measures increases with the budget deficit. The empirical evidence thus confirms the view that fiscal policy figures are purposely changed to officially comply with fiscal rules. Significant use of one-off measures can be detected in Europe.

The reaction of financial markets to creative accounting is an important policy topic. If financial markets do not price in the de facto deterioration of the fiscal position due to creative accounting, governments have an additional incentive to cheat as creative accounting would lower risk premia. To our knowledge, no study so far analyzes whether financial markets take note of fiscal window-dressing when pricing government bonds. This is the purpose of our study. In particular, we study whether spreads react, besides official fiscal data, to stock-flow adjustments or to an alternative measure of creative accounting by Koen and van den Noord (2005).

Furthermore, we investigate, in how far fiscal transparency affects risk spreads. Kopits and Craig (1998) argue that international financial markets are likely to demand lower premiums from governments that are forthcoming about their fiscal position and risk. The argument is that markets can be more certain about a fiscally transparent government's ability and willingness to service its obligation. On the other hand, a more transparent budget process helps financial markets to detect creative accounting easier and to assess the true fiscal position of a country. Glennerster and Shin (2006) investigate in how far the release of macroeconomic information in the form of publication of the IMF article IV consolidation reduces

spreads. They find a significant positive effect. Their measure does not cover fiscal transparency, however. Gelos and Wei (2005) find that international funds prefer to hold more assets in more transparent countries.

These questions are addressed in the framework of Bernoth et al. (2004). In this paper the authors derive a simple portfolio model, which shows that the yield spread between a risky and a risk-free country is explained by a default risk premium, a liquidity risk premium, and a country specific risk premium. In their empirical part, they make use of an innovative data set, which consists of spreads between Deutsche Mark (Euro after 1999) and US\$ denominated bond issues of 14 EU governments and Germany or the US government respectively. They show that the interest differentials between sovereign bonds increase with the official figures of the debt and deficit to GDP ratios. We modify the basic portfolio model by differentiating between the true fiscal position and the official fiscal position. The default probability assessed by financial markets might differ from the true default probability to the extent that creative accounting exists and is unknown. Transparency by itself, on the other hand, reduces uncertainty about the degree of cheating and therefore reduces risk premia.

The next section outlines the model and derives the principle hypothesis. We then present the empirical approach and discuss the data. Section 3 develops the measures of creative accounting and transparency. Section 4 presents and discusses the econometric results while the last section concludes.

2 Risk premia in government bond markets

2.1 A portfolio model of interest rate differentials

The theoretical model to analyze the impact of creative accounting on bond yield spreads between two countries is an extension of the portfolio model of interest differentials described in Bernoth, von Hagen, and Schuknecht (2004). We modify this model by assuming that governments might use creative accounting, which makes the true fiscal position of a country difficult to observe.

Consider a representative international investor maximizing a utility function that depends positively on expected real wealth, $E_t[w_{t+1}]$ and negatively on its variance, $Var_t[w_{t+1}]$:

$$Max U \{E_t[w_{t+1}], Var_t[w_{t+1}]\}, U_1 > 0, U_2 < 0. \quad (1)$$

The investor allocates a fraction θ_t of his real wealth w_t to a risky security of country A and a fraction of $1 - \theta_t$ to a safe security of country B. Both securities and real wealth are priced in the same currency.

For simplicity, we assume that the invested money in A's bonds is lost in case of government default.³ Investors incur transaction costs proportional to their investment in bonds which decrease with the liquidity of the bond market. We assume that the bond of country B has benchmark status, i.e., its market is considered to be more liquid than the bond market of country A. Expected wealth then is:

$$E_t(w_{t+1}) = w_t(1 - \theta_t)(1 + r_t^B) - \theta_t w_t l_t^A + \theta_t w_t(1 + r_t^A)(1 - P_t^e) \quad (2)$$

where l_t^A is the expected transaction/liquidity cost on trading a bond of country A and r_t^i denotes the interest rate on the bond of country i , with $i \in A, B$.⁴ P_t^e denotes the investor's expected default probability, which depends positively on the expected fiscal position of the risky country. Its determinants will be discussed later in in this section.

Due to the uncertain investment return of securities of country A, the variance of next period's real wealth of the investor is non-zero and given by:

$$Var(w_{t+1}) = \theta_t^2 w_t^2 (1 + r_t^A)^2 ((1 - P_t^e)P_t^e), \quad (3)$$

Note, that there is no uncertainty regarding the transaction costs in the B market, nor regarding the interest rate on the two different bonds.

Following Dumas (1994), we substitute equation (2) and (3) into the utility function and derive the optimal share invested in the securities of country A, and get $\hat{\theta}_t$, the optimal share of investment in country A, by utility maximization:

$$\hat{\theta}_t = \frac{(1 - P_t^e)(1 + r_t^A) - l_t^A - (1 + r_t^B)}{\Phi(1 + r_t^A)^2((1 - P_t^e)P_t^e)}, \quad (4)$$

where $\Phi = -2w_t U_2 / U_1$ denotes the coefficients of relative risk aversion for the representative investor.

Let S^A be the total supply of bonds issued by the government of country A. Equilibrium in the bond market requires that supply is equal to demand and therefore:

$$S_t^A = \hat{\theta}_t w_t = \frac{w_t[(1 - P_t^e)(1 + r_t^A) - l_t^A - (1 + r_t^B)]}{\Phi(1 + r_t^A)^2(1 - P_t^e)P_t^e}. \quad (5)$$

³As shown in Bernoth et al. (2004), this model can easily be extended to the more general case of partial default, i.e. that investors receive a fraction of their gross payment in case of default.

⁴Note that we normalize the transaction cost of the risk free bond market to zero.

which can be solved for the interest rate differential:

$$\frac{r_t^A - r_t^B}{1 + r_t^A} = P_t^e + \frac{l_t^A}{1 + r_t^A} + \frac{S^A(1 + r_t^A)^2(1 - P_t^e)P_t^e}{(w_t/\Phi)(1 + r_t^A)}. \quad (6)$$

In what follows, by the interest rate spread or differential, we mean the term on the left hand side of the equation.

Equation (6) separates the yield spread between the two bonds into three terms. The first term on the right hand side reflects the *default risk premium*. The larger the expected default probability, the larger will be the spread. Second, the bond yield differential depends on the *liquidity risk premium*. The more liquid the A bond market, the smaller will be the liquidity risk premium, or the larger the transaction cost, the larger the liquidity risk premium. The last term is the country-specific risk premium. It depends positively on the variance of the perceived default probability of country A, $(1 - P_t^e)P_t^e$, the gross nominal return $(1 + r_t^A)$, and the level of the relative risk aversion of the representative investor Φ . The more the investor cares about the variance of his future wealth w_{t+1} (the larger U_2), the larger will be the interest rate differential between the risky and the risk-free country. Furthermore, the country specific risk premium increases with the total supply of the risky bonds, S^A .

In the following, we discuss in more detail the determinants of the expected default probability, this is also, where transparency and creative accounting enters the model. We assume that one determinant of the expected default probability P_t^e is the degree of fiscal transparency. A more transparent budget process helps financial markets to detect creative accounting and signals the willingness and ability of governments to serve its obligation. Therefore, we expect that fiscal transparency itself has a negative impact on the expected government's default probability and therefore also on risk premia. This argument finds support in e.g. Kopits and Craig (1998) and Glennerster and Shin (2006).

A further important determinant of the expected default probability, P_t^e , is the expected fiscal position of country A, $E_t(B_t)$.⁵ The expected default probability increases strictly with the expected true fiscal position $\frac{\partial P_t^e}{\partial E_t(B_t)} > 0$. For the formation of the expectation of the true fiscal position, the investor makes use of two information sources. The first is the official publication of the fiscal position, which we call the 'official signal', and the second is a signal coming from news agencies

⁵Due to the uncertainty concerning the government's use of creative accounting, the expected true fiscal position can differ from the actual true fiscal position.

observing the actual fiscal behavior of governments, which we call the 'news signal'. The official signal is given by:

$$B_t^O = B_t + \eta_t \quad (7)$$

where η_t is normally and independently distributed with mean zero and variance $\sigma_{\eta_t}^2$. The official fiscal position B_t^O is thus equal to the real position B_t and an error term. We think of the difference between the real fiscal position and the official one as creative accounting ($B_t - B_t^O = CA_t = -\eta_t$). The precision of the official signal is given by $\alpha_t = \frac{1}{\sigma_{\eta_t}^2}$.

The news signal the investor receives about the true fiscal behavior is described by:

$$B_t^P = B_t + \varepsilon_t \quad (8)$$

where ε_t is again normally and independently distributed with mean zero and variance $\sigma_{\varepsilon_t}^2$. The precision of this signal is accordingly given by $\beta_t = \frac{1}{\sigma_{\varepsilon_t}^2}$.

Following Bayesian inference, the investor's expectation about the true fiscal position is:

$$E(B_t) = \frac{\alpha_t B_t^O + \beta_t B_t^P}{\alpha_t + \beta_t}. \quad (9)$$

Thus, the larger e.g. β_t relative to α_t , the more precise and less distorted is the information collected by news agencies about B_t , and the more weight does the investor put on the news signal for forming his believe over B_t . Rearranging equation (9) leads to:

$$E(B_t) = B_t^O + x_t(CA_t + \varepsilon_t), \quad (10)$$

with $x_t = \frac{\beta_t}{\alpha_t + \beta_t}$ denoting the informativeness of the news signal relative to the informativeness of the public signal. We see that the investor's expectation about the true fiscal position of the government is equal to the officially reported one, B_t^O , plus a correction term due to the use of creative accounting, which is weighted by the relative informativeness of the news signal, x_t . If the informational content of the second signal converges towards zero ($x \rightarrow 0$), the expectation of the true fiscal position will be equal to the official announced fiscal position.

Fiscal transparency might have a significant influence on the relative informativeness of the news signal. Fiscal transparency has a disciplinary effect on governments by not only reducing government deficits (see e.g. Alt and Lassen (2006)), but also the use of creative accounting (compare e.g. Koen and van den Noord (2005)). In

this case, the precision of the public signal, α_t depends positively on fiscal transparency. Alternatively, the more fiscally transparent the budgetary process of a country is, the easier it is for news agencies to detect creative accounting, which increases also the precision of the news signal, β_t . Therefore, depending on which effect is stronger, fiscal transparency can have a positive or a negative effect on the relative informativeness of the news signal, x_t , and therefore on the effect of creative accounting on the expected default probability.

2.2 An empirical model determinants of risk premia

To test our model empirically, we estimate equation (6) as:

$$\begin{aligned} \frac{r_{it} - r_{jt}}{1 + r_{it}} = & \text{fiscal}_{it}(\mu_1 + \mu_2 EMU) + CA_{it}(\xi_1 + \xi_2 \gamma_{it} + \xi_3 EMU) + \eta_1 \gamma_{it} + \\ & + z_{it}(\alpha_1 + \alpha_2 EMU) + \alpha_3 EMU + \epsilon_{it} \end{aligned} \quad (11)$$

where ϵ_{it} is an error term with usual properties, which includes, depending on the specification, either a constant, or country or time dummies. The dependent variable is the yield spread between a bond issued in EU country i and a benchmark country j , both denominated in the same currency. Looking at spreads between bonds issued in the same currency has the advantage that one can neglect the issue of exchange rate risk so that data coming from the pre-EMU and post-EMU regimes can be analyzed in one data set.⁶ We regard Germany and the USA as benchmark countries and the joint currency of issuance is the Deutsche Mark (Euro after 1999) or the US\$, respectively.

The government bond data are taken from Capital Data Bondware.⁷ Capital Data Bondware provides a data set with information on the yield, maturity, and underlying currency of government bond issues. If available, an equivalent benchmark bond is matched to the bond issues, between which the yield spread is then calculated. Capital Data Bondware defines a benchmark bond in the following way. First, it is issued in the same currency, second, it is issued by the government of the country, which owns the issuing currency, third, it has the same coupon payment structure, and, finally, the issuing date is close that of the comparable bond issue it has a comparable time to maturity.

⁶Favero, Giavazzi, and Spaventa (1997) discuss the relative performance of this measure with using swap spreads to correct for exchange rate depreciations. They conclude, that both "proxies obviously tend to measure the same phenomenon".

⁷Thanks to Evi Koch for help with Capital Data Bondware.

We compare government bonds issued by 14 EU countries, i.e. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, the Netherlands, Portugal, Spain, Sweden, and the UK, between 1991 and beginning 2005 that are denominated in Deutsche Mark (DM) before 1998 and subsequently in Euro or alternatively in US\$. Accordingly, the interest differential is measured as the difference in the yield to maturity at the time of issue between the national bond under consideration and an equivalent German government bond in the case of DM/Euro denominated bonds or an equivalent US government bond in the case of a US\$ bond.

$fiscal_{it}$ denotes a vector with two officially reported fiscal variables that stand in the focus of policy debates. These are the (lagged) debt to GDP and deficit to GDP ratios. All fiscal data that we use to approximate the expected default probability of a country are taken from the AMECO database and are in the definition of the EDP. While the debt level is a stock variable measuring the financial position of a country, the deficit measures the deterioration of that position. CA_{it} is a measure for creative accounting and will be discussed in the next section. The fiscal variables and the creative accounting term are measured as the difference relative to the benchmark country Germany and the USA respectively.

γ denotes a variable measuring the (budget) transparency of the issuing country. This variable is added linearly in our regression equation and is, as suggested by equation (6), also interacted with the creative accounting term. We will discuss the different empirical measures of this variable below.

z_{it} is a vector containing several variables affecting the yield spread of the issuing country, i.e. an indicator of the cyclical stance of the economy, a liquidity variable, a maturity variable, and a variable measuring the general investors' risk attitude.

The *liquidity* variable serves to estimate the liquidity premium. We cannot follow one of the conventional approach to use bid-ask spreads, which reflect trading costs in trading securities (Flemming 2003) as a measure for liquidity, since this information is not reported for primary issues. Gravelle (1999) shows that the correlation between bid-ask spreads and the total supply of debt is significantly negative. This suggests that the total volume of supply of a security has a positive effect on its liquidity. Following this reasoning, we assume as Bernoth, von Hagen, and Schuknecht (2004)) that liquidity depends on market size and, additionally, that all debt issued by a government in a given currency is homogeneous up to maturity. Thus, the liquidity premium is assumed to be proportional to the ratio of the debt issued by a government in DM/Euro or US\$ to the total debt of EU countries issued

in DM/Euro or US\$.⁸

The inclusion of an indicator of the cyclical stance follows the suggestion of Alesina et al. (1992) that default risk depends on the overall economic situation of a country. In an economic slow-down, government revenues decrease, while expenditure increase, and the probability of default may rise. Since such effects most likely relate to severe recessions and strong upswings rather than small cyclical movements, our indicator takes the value 1, when the nominal GDP of a country is more than half a standard deviation above its trend (boom), (-1) when it is more than half a standard deviation below its trend (recession), and 0 otherwise. Using sample standard deviations accounts for the fact that the volatility of the business cycle varies substantially across countries. The difference of this variable between the issuer and the benchmark country is zero, if both countries are in the same cyclical position; it is (-2) and (2) , if one is in a strong boom and the other in a strong recession, and (-1) and 1 in the case of less severe differences in the cyclical stance.

The *maturity* variable contained in vector z_{it} measures the time to maturity of the bonds at the time of issue and controls for the fact that default premia vary with the length of the contract. We expect, that an investor receives a compensation for investing in long-term bonds instead of buying short-term bonds and rolling them over.

Our model suggests that the general *investors' risk aversion* towards credit risk determines the yield spread between countries. This suggestion is supported by empirical observations. Dungey, Martin, and Pagan (2000) provide strong evidence of a common international factor in many yield differentials. Codogno, Favero, and Missale (2003) and Pagano and Thadden (2004) also note considerable co-movement of yield spreads, probably driven by international risk factors. Bernoth, von Hagen, and Schuknecht (2004)) confirm as well that interest differentials between EU countries are significantly affected by international risk factors and that the USA and Germany enjoy a 'safe haven' status. Since investors' risk aversion is not directly observable, we use, similar to Codogno, Favero, and Missale (2003) Favero and Giavazzi (2004), and Bernoth, von Hagen, and Schuknecht (2004)), the yield spread between low grade US corporate bonds (BBB) and benchmark US government bonds as an empirical proxy.⁹

⁸We also used the issue size as an alternative proxy for liquidity, but since this variable shows insignificant coefficients, we exclude it from reported regression analysis.

⁹A variable that measures the respective corporate bond spread for the complete Euroarea is

To estimate the effects of EMU on yield spreads, we introduce an *EMU* dummy which takes the value of one for all EMU member countries as of 1998 and for Greece as of 2000 and zero otherwise.¹⁰ A significant coefficient on this dummy points to a general effect of EMU on yield spreads of all member countries. Furthermore, we interact the *EMU* dummy with the fiscal variables, and the liquidity variable to see whether EMU has changed the effect of the fiscal variables, creative accounting, and market liquidity on interest rates. Finally, all regressions are estimated with and without time and country fixed effects, λ_t and ϑ_i .

3 Creative accounting and fiscal transparency

3.1 Creative accounting

Measuring creative accounting is - by definition - difficult as it is an unpublished and hidden fiscal activity. Therefore, in our empirical exercise, we have to resort to approximate measures for the true extent of creative accounting. We employ two different measures, both measures only approximate the true extent of creative accounting. The first one is a noisy measure of creative accounting, namely stock flow adjustments in percent of GDP. Following von Hagen and Wolff (2006), they are calculated from equation (12) as the difference between the change in the debt level and the deficit.

$$B_t - B_{t-1} - D_t = SFA_t \quad (12)$$

The advantage of this measure is that it captures all events that have an effect on the debt level without being recorded in the budget. This advantage is also the measure's main weakness, as some operations might not reflect the attempt to improve the books but result from purely technical problems that do not necessarily have an effect on the default probability of a country. Positive SFA resulting from exchange rate re-valuation of foreign denominated debt are connected with a change in the ability of governments to service the debt, while positive SFA resulting from building up assets leaves the default probability unaffected. Overall, these "noisy"

not available, but the empirical literature on sovereign bond spreads of emerging markets shows that spreads are sensitive to US risk factors (see, e.g., Barnes and Cline (1997), Kamin and von Kleist (1999), Eichengreen and Mody (2000)). Therefore, data on US corporate-government bond yield spreads can be used as a good proxy for the overall investors' risk attitude.

¹⁰We included the year 1998 in the EMU dummy since the decision, which countries would participate was made public in May of 1998 and was probably already known before.

parts of this measure are probably random and should tend to cancel out over time (European Commission, DG for Economic and Financial Affairs 2003, p.79).. von Hagen and Wolff (2006), however, show that stock-flow adjustments observed in Europe are on average positive over long periods of time. They show that SFA is actively used by governments as a creative accounting tool. This creative accounting part contained in SFA should have a significant effect on interest rates, if it is recognized by financial markets as increasing the risk of default.

As a second measure of creative accounting, we employ the data presented in Koen and van den Noord (2005), who collect individual one-off measures to window dress the budget. The measure, called 'fiscal gimmickry', is a non-exhaustive inventory of events that have become public knowledge through media coverage. It is a more "fine tuned" measure of creative government activities than SFA. However, it is very likely, that many of such operations are unnoticed by news agencies and therefore not collected in this database. Thus, while SFA probably captures a broader range of creative accounting but is measured with noise because of "non-creative" parts of SFA, 'fiscal gimmickry' is a 'pure' measure of creative accounting but captures only the window-dressing activities that became public knowledge.

Figure 1 shows the relationship between stock-flow adjustments and one-off measures as collected by Koen and van den Noord (2005). We can clearly see a positive relationship, suggesting that the two measure probably both give similar and valuable information of "creative" accounting.

3.2 Fiscal transparency

Fiscal transparency is an important concept, which is, however, difficult to measure. The IMF's concept of fiscal transparency is defined in their manual on fiscal transparency.¹¹ This definition, which emphasizes being open to the public about the structure and functions of government, fiscal policy intentions, public sector accounts, and fiscal projections is based on Kopits and Craig (1998). The IMF code includes four general principles of fiscal transparency.¹²

¹¹<http://www.imf.org/external/np/fad/trans/manual/intro.htm>

¹²The first general principle, Clarity of Roles and Responsibilities, is concerned with specifying the structure and functions of government, responsibilities within government, and relations between government and the rest of the economy. The second general principle, Public Availability of Information, emphasizes the importance of publishing comprehensive fiscal information at clearly specified times. The third general principle, Open Budget Preparation, Execution, and Reporting,

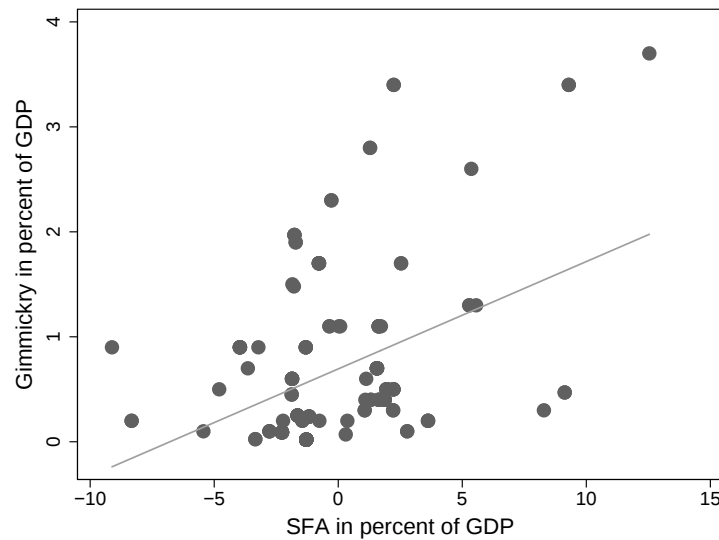


Figure 1: The relation between stock-flow adjustments and fiscal gimmickry taken from Koen and Noord (2005) in percent of GDP, when gimmickry is observed.

In our paper, we think of transparency in a more narrow sense as influencing the relative information content of the official deficit signal and further creative accounting news. Only the second and third IMF principle refer to availability of information. This narrower concept is also used to define transparency by Poterba and von Hagen (1999, pp. 3-4): "A transparent budget process is one that provides clear information on all aspects of government fiscal policy. Budgets that include numerous special accounts and that fail to consolidate all fiscal activity into a single 'bottom line' measure are not transparent. Budgets that are easily available to the public and to participants in the policymaking process, and that do present consolidated information, are transparent."

We capture the concept of informational transparency with two measures. One is a newly developed index of auditing, called *Audit*. This index is calculated on basis of the answers collected by an OECD and World bank survey conducted in 2003. A detailed description of the derivation of this index is given in the Appendix. *Audit* measures whether governments are financially audited externally, how independent the auditing can be performed and how well the obtained information is disseminated.

covers the type of information that is made available about the budget process. The fourth general principle, Assurances of Integrity, deals with the quality of fiscal data and the need for independent scrutiny of fiscal information.

The other index used is based on a part of the indicator developed in the seminal paper by von Hagen (1992), extended in Hallerberg, Strauch, and von Hagen (2001) and updated in Hallerberg, Strauch, and von Hagen (2005). We call this indicator *Transparency*, it is a measure of informativeness and transparency of the budget draft and includes an assessment of transparency given by government officials, the degree to which special funds are included in the budget draft, the information whether the budget consists of one document, whether it is linked to national accounts and finally whether government loans are included.

In comparison to *Audit*, *Transparency* is up-dated twice over the investigated time period, and therefore also takes the development of 'budgetary transparency' over time into account. Hallerberg, Strauch, and von Hagen (2005) show that there has been a general increase in the level of transparency in Europe over the covered time period. Figure 5 in the Appendix compares the two measures of fiscal transparency for the year 2003. As can be seen, both are positively correlated.

For both measures of fiscal transparency, we expect a negative impact on default risk premia asked by financial markets. Thus, the better governments are audited and the better the public information on the budget, the lower the spread. The hypothesis underlying this prediction is that financial markets know about transparency and will penalize in-transparent institutions, as they have less information on the true state of public finance. Furthermore, more transparency might increase the bargaining power of lenders in case of debt restructuring and thereby lower the risk of losing out completely on a credit.

Figures 6 and 7 in the appendix suggest that there exists a negative relationship between fiscal transparency and creative accounting. Thus, a country with a highly transparent budgetary process uses less fiscal window-dressing activities than a less transparent country. A logit regression between a binary variable, that takes the value of 1 if a country used fiscal gimmickry and zero otherwise, and the *Transparency* index confirms this result. However, the causality between these two variables is unclear. It might be that lower scores on fiscal transparency raise the odds of gimmickry, because the probability of detection is small. Alternatively, countries that have less incentive/need to hide parts of their fiscal position might introduce a highly transparent budgetary process to signal their trustworthiness to financial markets.

Figures 8 to 11 in the appendix plot the relation between the variance of publicly known creative accounting and the level of fiscal transparency. All four graphs

confirm the prediction, that transparency reduces the uncertainty of (measured) creative accounting.

A simple correlation analysis between spreads and the two measures of creative accounting provide first evidence, that financial markets demand higher risk premia for hidden fiscal policy. For stock-flow adjustments we find a positive correlation coefficient significant at a 5 percent level, while for gimmickry it is significant at a 1 percent level. The next section provides more reliable econometric evidence on these effects.

4 Results

The empirical results are presented in Tables 1-3 for the specification including the lagged debt level in the appendix. We pool the US\$ and DM/Euro debt issues in one regression. Before doing so, we tested with a poolability test, whether the two data sets can be combined. Except for the effects of corporate spreads, pooling is permissible, which means that the effects of the independent variables on the spreads are the same for both currency issues.

Our results confirm the previous results of Bernoth, von Hagen, and Schuknecht (2004). Deficits significantly increase risk premia, the effect of deficits on risk premia in EMU is however significantly reduced. In fact, an F-test on the sum of the coefficients for the deficit and deficit*EMU does not allow to reject the null hypothesis of no influence of the deficit on the spread in the specification with country dummies. For the specification without country dummies, a significant positive effect of deficits on spreads remains under EMU.

The change in the liquidity effect due to EMU is the same for US\$-denominated bonds and Euro denominated bonds. The lowering of the liquidity premium thus appears not to result from the fact that the issue of debt now becomes domestic (as it is Euro), since we observe the same effect for the US\$ denominated bonds. The weaker effect of liquidity on spreads thus appears to result from the improved integration of markets, which lowered transaction costs. Pagano and Thadden (2004) also conclude that liquidity premia play a smaller role in explaining yield differentials. In contrast, Gómez-Puig (2006) finds an increasing role of liquidity for sovereign spreads under EMU. Her estimation results, however, come from a short sample.¹³

¹³Her sample only extends over the period of 1996-2001. In addition, her estimation design may make it difficult to tell apart credit default from liquidity risk.

The other control variables have the expected signs and will not be discussed further at this place.

Regarding the effects of our measures of creative accounting, Table 1 presents the regression results for stock-flow adjustments and fiscal gimmickry taken from Koen and van den Noord (2005). For both measures, we find a significant and positive coefficient. Financial markets thus demand a higher interest rate if a country uses creative accounting. After acceptance to EMU, the effect of cheating on the risk premium becomes statistically insignificant similar to the weakening of the deficit effect. Once inside the Euro, financial markets thus basically become indifferent to the cheating of individual EMU members.

The significance of the coefficients of creative accounting remains in the specification with country dummies. This indicates, that financial markets do not take creative accounting exclusively as a signal of the country's general characteristics. They rather evaluate the actual deterioration of the fiscal position of the country resulting from creative accounting. The regression with country dummies furthermore is to be preferred, as we control for all unobserved country characteristics. Accordingly, we expect in this specification, that the other coefficients are unbiased estimates of the true underlying effect.

Interestingly, the effects of the two different CA measures, stock-flow adjustments and fiscal gimmickry, and the effects of the deficit, are quantitatively substantially different. While an increase in stock-flow adjustment by one percent of GDP increases the spreads by less than one basis point, the effect of an equivalent increase in gimmickry amounts to up to 30 basis points. Increasing the deficit by one percentage point will lead to an increase of the spread by 3.8 basis points. The difference in coefficient size needs to be explained. In fact, if all three variables were perfect measures of the factual deterioration of the fiscal stance of the economy, they should all equally affect the probability of default. The estimated coefficients should be the same as they measure the increase in the spread due to the equally increased default probability.

The difference in coefficient sizes can result from two sources. First, as we have discussed in the data section, SFA is a very rough measure of creative accounting. It is well known, that if variables are measured with error, the coefficient is biased towards zero (**attenuation bias**, see, e.g. Greene (2000, pp. 375-80)). The estimated significant coefficient for sfa is thus a lower bound for the true impact of creative accounting on spreads. If SFA measures the actual deterioration of the fiscal position

with more noise than the deficit, and if the noise is well-behaved, the difference in size of the coefficient vis-a-vis the deficit coefficient might actually result from this attenuation bias. However, quantitatively, *sfa* must be extremely noisy to actually explain the difference in coefficient size to gimmickry by the attenuation bias.

Therefore, we believe that the large size of the fiscal gimmickry coefficient must result from something else. The data on which "gimmickry" is based come from creative accounting events that become public knowledge in the media. Apparently, financial markets react more strongly to these events than to more hidden creative accounting, which we capture with *sfa*. This probably shows that financial markets are unsure about the true extent of creative accounting behind fiscal gimmickry and assume that the gimmickry becoming public knowledge is just the tip of the iceberg. In this interpretation, gimmickry data represent a huge signal of additional hidden fiscal profligacy, which is penalized accordingly by financial markets.

Tables 2 and 3 extend the regression by two alternative measures of fiscal transparency. For our newly calculated transparency measure *Audit*, we find a significant reduction of the spread, the better the quality of auditing is. Unfortunately, we cannot control for country dummies in this regression, since *Audit* is time invariant. For the transparency measure taken from Hallerberg, Strauch, and von Hagen (2005), the evidence for a risk reducing effect is weaker. In fact, we do not find a statistically significant coefficient. For both transparency measures, we find the statistical significance of the coefficients on creative accounting to remain unaffected. This shows, that the significant results of creative accounting do not result from an omitted variable bias because of missing transparency proxies. Overall, our evidence suggest that fiscally more transparent countries have to pay lower risk premia. This evidence confirms the prediction by Kopits and Craig (1998) that financial markets can be more certain about a fiscally transparent government's ability and willingness to service its obligation and therefore demand lower risk premia.

Table 7 presents the estimation results for creative accounting interacted with fiscal transparency *Audit*. The interaction term is insignificant for the stock-flow adjustment measure. We find a strong negative effect for gimmickry interacted with *Audit*. This indicates that financial markets are less worried about gimmickry of a transparent country. This probably means that gimmickry is not perceived as a very bad signal of the tip of the iceberg in transparent countries. In terms of the model interpretation, improved auditing has a stronger effect on the reliability of the official signal as compared to the precision of the news signal.

Our results provides evidence, that financial markets know about creative accounting. Creative accounting results in higher risk premia. Since creative accounting is significant in all specifications, even when including country dummies, financial markets appear to value the de facto deterioration of the inter-temporal budget situation. They do not just punish countries, with a bad track record of fiscal gimmickry. The different size of the coefficient for gimmickry and sfa provides some evidence, that public knowledge of this creative accounting plays a crucial role for financial markets. Recall that the gimmickry data are based on cases of fiscal cheating that made it in the news. These bad "cheating-news" strongly degrade the perception of risk of a country. Financial markets' risk assessment is, however, less affected by gimmickry, the more transparent a country is.

4.1 Robustness checks

Tables 4-6 in the appendix show the regression results after dropping the insignificant stock variable, the lagged debt level. The other estimated coefficients do not change much.

In one set of IV regressions, we address the attenuation bias resulting from the imprecise measurement of creative accounting through stock-flow adjustments. If the coefficient is downward biased because of the attenuation bias, we expect the coefficients on sfa to be larger in the instrumental variables regressions. We instrument sfa with fiscal gimmickry and find the expected result. The coefficient for sfa is now larger and close to the one on fiscal gimmickry, see Table 8.

As the title and the first citation suggest, governments might use creative accounting to "fool" the financial markets. In this case, the estimated coefficients will be biased, as they are driven by reverse causality. In this view, governments engage in creative accounting when the spreads are larger in order to reduce the risk premium and the connected interest payments. While it is very likely that other factors, especially fiscal rules and electoral motives, determine the incentives of governments more than the relatively small spreads in the EU, we want to make sure that our coefficients are not driven by a possible reverse causality problem. Therefore, we perform a second sets of instrumental variable regressions in Table 8.

In the second set of IV regressions, we instrument sfa with political economy variables. It is reasonable to assume, that variables measuring political and especially institutional features of an economy are exogenous to the interest rate spread.

They are, however, very likely to be connected to the amount of creative accounting. In particular, we employ the transparency measure *Transparency*, a dummy variable taking the value 1 in election years, a variable measuring the quality of the budget process and a variable for the raw ideological distance (vetoman) within a government.¹⁴ Following Hallerberg (2004), we expect better budgeting institutions to contribute to lower use of sfa, while governments might be particularly tempted to use sfa in election years. Finally, we expect that the larger the ideological distance in a government, the more difficult it will be to agree on hiding parts of the budget from the books. The first stage regressions confirm these predictions. As Table 8 shows, the instrumented sfa has the expected effect on the spread and is statistically significant when controlling for country or time dummies. We are therefore confident, that our measured coefficients on creative accounting are not driven by reverse causality.

5 Conclusions

We develop a portfolio model of interest differentials based on Bernoth, von Hagen, and Schuknecht (2004). The model is augmented to account for fiscal creative accounting and fiscal transparency. We show that creative accounting should increase risk premia contained in government bond yields to the extent that markets learn about this cheating. Fiscal transparency should reduce spreads through lowering of uncertainty of fiscal policy.

The empirical results confirm the hypotheses derived from the model. Creative accounting increases risk premia. The gimmickry events, that make it in the financial news, have strong effects on risk premia. This is especially true, if a country is in-transparent, as financial markets then take gimmickry as a "tip of the iceberg" signal. Fiscal transparency is connected with lower risk premia. Instrumental variable regressions confirm the results by addressing potential simultaneity and attenuation biases.

¹⁴Thanks to Mark Hallerberg for providing us with the data on raw ideological distance. Raw ideological distance is measured according to the Manifesto Project, which codes the distance among parties based on their election manifestos in multiple dimensions.

References

- ALESINA, A., M. DE BROECK, A. PRATI, AND G. TABELLINI (1992): "Default Risk on Government Debt in OECD Countries," *Economic Policy*, 15, 427–451.
- ALT, J. E., AND D. D. LASSEN (2006): "Transparency, Political Polarization, and Political Budget Cycles in OECD Countries," *American Journal of Political Science*, 50(3).
- BAELE, L., A. FERRANDO, P. HÖRDAHL, E. KRYLOVA, AND C. MONNET (2004): "Measuring European Financial Integration," *Oxford Review of Economic Policy*, 20(4), 509–530.
- BARNES, K., AND W. CLINE (1997): "Spreads and Risks in Emerging Market Lending," *Institute of International Finance Working Paper*, No. 97-1.
- BERNETH, K., J. VON HAGEN, AND L. SCHUKNECHT (2004): "Sovereign Risk Premia in the European Government Bond Market," *ECB Working paper*, 369.
- BOHN, H., AND R. P. INMAN (1996): "Balanced Budget Rules and Public Deficits: Evidence from the U.S. States," *NBER Working Paper*, 5533.
- BUNCH, B. S. (1991): "The Effect of Constitutional Debt Limits on State Governments' Use of Public Authorities," *Public Choice*, 68, 57–69.
- CAPECI, J. (1991): "Credit Risk, Credit Ratings, and Municipal Bond Yields: A Panel Study," *National Tax Journal*, 44 (1), 41–56.
- (1994): "Local Fiscal Policies, Default Risk, and Municipal Borrowing Costs," *Journal of Public Economics*, 53, 73–89.
- CODOGNO, L., C. FAVERO, AND A. MISSALE (2003): "Yield Spreads on EMU Government Bonds," *Economic Policy*, pp. 503–32.
- DAFFLON, B., AND S. ROSSI (1999): "Public Accounting Fudges Towards EMU: A First Empirical Survey and some Public Choice Considerations," *Public Choice*, 101, 59–84.
- DUNGEY, M., V. MARTIN, AND A. P. PAGAN (2000): "A Multivariate Latent Factor Decomposition of International Bond Yield Spreads," *Journal of Applied Econometrics*, 15, 697–715.

- EICHENGREEN, B., AND A. MODY (2000): “What Explains Changing Spreads on Emerging Market Debt?,” in *S. Edwards (ed.), Capital Flows and the emerging economies: theory, evidence, and controversies, NBER conference report series, University of Chicago Press*, pp. 107–134.
- EUROPEAN COMMISSION, DG FOR ECONOMIC AND FINANCIAL AFFAIRS (2003): *Public Finances in EMU 2003*. The European Commission, Brussels.
- FAVERO, C., AND F. GIAVAZZI (2004): “Inflation Targeting and Debt: Lessons from Brazil?,” *NBER Working Paper*, No. 10390.
- FAVERO, C., F. GIAVAZZI, AND L. SPAVENTA (1997): “High Yields: The Spread on German Interest Rates,” *The Economic Journal*, 107, 956–85.
- FLEMMING, M. J. (2003): “Measuring Treasury Market Liquidity,” *Federal Reserve Bank of New York Economic Policy review*, 9, 83–108.
- GELOS, R. G., AND S.-J. WEI (2005): “Transparency and International Portfolio Holdings,” *The Journal of Finance*, 60 (6), 2987–3020.
- GLENNERSTER, R., AND Y. SHIN (2006): “Do Sovereign Bond Markets Reward Transparency?,” *mimeo*.
- GÓMEZ-PUIG, M. (2006): “Size Matters for Liquidity: Evidence from EMU Sovereign Yield Spreads,” *Economics Letters*, 90, 156–162.
- GRAVELLE, T. (1999): “Liquidity of the Government of Canada Securities Market: Stylized Facts and some Market Microstructure Comparisons to the United States Treasury Market,” *Bank of Canada Working Paper*, 99-11.
- GREENE, W. H. (2000): *Econometric Analysis*. Prentice Hall International, London etc.
- HALLERBERG, M. (2004): *Domestic Budgets in a United Europe: Fiscal Governance from the End of Bretton Woods to EMU*. Cornell University Press.
- HALLERBERG, M., R. STRAUCH, AND J. VON HAGEN (2001): “The Use and Effectiveness of Budgetary Rules and Norms in EU Member States,” Discussion Paper Report, Dutch Ministry of Finance.
- (2005): “Fiscal Rules in the European Union 1991-2001: Updating the Von Hagen Fiscal Index,” *mimeo*.

- KAMIN, S., AND K. VON KLEIST (1999): “The Evolution and Determinants of Emerging Market Credit Spreads in the 1990s,” *Board of Governors of the Federal Reserve System, International Finance Discussion Papers*, No. 653.
- KIEWIET, D., AND K. SZAKALY (1996): “Constitutional Limitations on Borrowing: Analysis of State Bonded Indebtedness,” *Journal of Economics, Law, and Organization*, April, 62–97.
- KOEN, V., AND P. VAN DEN NOORD (2005): “Fiscal Gimmickry in Europe: One-Off Measures and Creative Accounting,” *OECD Economics Department Working Paper*, 2005(4).
- KOPITS, G., AND J. CRAIG (1998): “Transparency in Government Operations,” *IMF occasional paper*, No 158.
- MILESI-FERRETTI, G. (2003): “Good, Bad or Ugly? On the Effects of Fiscal Rules with Creative Accounting,” *Journal of Public Economics*, 88, 377–394.
- MILESI-FERRETTI, G., AND K. MORIYAMA (2004): “Fiscal Adjustment in EU Countries: A Balance Sheet Approach,” *IMF Working Paper*, 04/143.
- PAGANO, M., AND E.-L. V. THADDEN (2004): “The European Bond Markets under EMU,” *Oxford Review of Economic Policy*, 20 (4), 531–554.
- POTERBA, J., AND J. VON HAGEN (1999): *Fiscal Institutions and Fiscal Performance*. University of Chicago Press, Chicago.
- VON HAGEN, J. (1991): “A Note on the Empirical Effectiveness of Formal Fiscal Restraints,” *Journal of Public Economics*, 44, 199 – 210.
- (1992): “Budgeting Procedures and Fiscal Performance in the European Communities,” *Economic Papers*, 96.
- VON HAGEN, J., AND G. B. WOLFF (2006): “What Do Deficits Tell Us About Debt? Empirical Evidence on Creative Accounting with Fiscal Rules in the EU,” *Journal of Banking and Finance (CEPR DP 4759)*, forthcoming.

6 Estimation results

Table 1: Creative accounting and risk premia in government bond markets

deficit	4.46	3.56	6.94	deficit	1.53	1.99	1.20
	2.96	2.75	3.55		1.57	2.2	1.09
sfa	0.83	0.65	1.44	gimmickry	31.56	17.16	32.18
	2.35	2.16	2.84		6.26	3.83	7.77
debt(-1)	0.10	0.13	0.10	debt(-1)	-0.05	-0.17	-0.04
	1.03	0.87	1.08		-0.6	-1.18	-0.51
liquidity	-74.71	-83.83	-60.38	liquidity	-37.73	-50.11	-20.19
	-1.53	-2.18	-1.44		-1.38	-1.78	-0.64
corspread	0.09	0.05	-0.03	corspread	0.07	-0.01	-0.07
	2.03	1	-0.4		1.46	-0.09	-0.94
US	-38.39	-45.33	-36.65	US	-51.49	-62.43	-45.65
	-3.83	-4.2	-3.66		-5.52	-5.96	-4.77
corspread*US	0.37	0.43	0.36	corspread*US	0.44	0.51	0.41
	7.19	7.06	6.22		8.56	8.57	7.63
cycle	-2.32	-3.09	-3.15	cycle	0.00	-0.53	0.65
	-1.87	-2.48	-2.31		0	-0.39	0.43
maturity	0.96	0.84	0.98	maturity	1.06	1.18	0.97
	3.59	2.8	3.76		3.75	3.64	3.7
SGP	-10.20	-14.68	-24.42	SGP	0.76	0.45	-3.29
	-1.57	-2.4	-2.87		0.16	0.09	-0.56
deficit*SGP	-2.96	-4.08	-5.31	deficit*SGP	0.13	-1.12	-0.21
	-1.92	-2.76	-2.73		0.12	-1.1	-0.16
sfa*SGP	-0.74	-1.58	-1.29	gimmickry*SGP	-29.81	-24.25	-28.26
	-1.43	-2.8	-2.05		-5.7	-5.52	-6.15
debt(-1)*SGP	0.00	-0.15	-0.02	debt(-1)*SGP	0.19	0.14	0.13
	0	-0.97	-0.18		1.72	1.27	1.14
liquidity*SGP	63.14	95.69	54.85	liquidity*SGP	5.90	27.17	-2.03
	1.28	2.08	1.27		0.18	0.86	-0.06
cons	7.74	12.28	15.34	cons	-0.13	-23.76	20.89
	0.99	1.36	1.11		-0.02	-1.34	1.63
country dummies	no	yes	no		no	yes	no
year dummies	no	no	yes		no	no	yes
N	235	235	235	N	208	208	208
r2	0.54	0.64	0.62	r2	0.67	0.73	0.71

Notes: t-values below the coefficient.

Table 2: The role of audit for risk premia in government bond markets

deficit	3.54	5.51	deficit	1.18	0.73
	2.76	2.86		1.18	0.67
sfa	0.76	1.26	gimmickry	24.44	27.40
	2.36	2.52		4.92	5.44
debt(-1)	0.07	0.07	debt(-1)	-0.06	-0.06
	0.85	0.81		-0.82	-0.69
Audit	-38.46	-27.61	Audit	-38.92	-28.58
	-3.29	-2.86		-3.26	-2.24
liquidity	-37.76	-31.52	liquidity	-5.11	4.14
	-0.99	-0.79		-0.2	0.14
corspread	0.07	-0.06	corspread	0.05	-0.08
	1.6	-0.76		1.25	-1.04
US	-50.53	-44.35	US	-58.80	-51.36
	-5.63	-4.58		-6.65	-5.32
corspread*US	0.42	0.39	corspread*US	0.46	0.42
	8.82	7.2		9.44	8.14
cycle	-3.40	-3.40	cycle	-0.24	0.40
	-2.67	-2.6		-0.15	0.27
maturity	0.83	0.89	maturity	1.08	0.99
	2.88	3.4		3.99	3.83
SGP	-10.20	-21.22	SGP	1.98	-1.07
	-1.73	-2.72		0.44	-0.19
deficit*SGP	-3.18	-4.96	deficit*SGP	-0.18	-0.03
	-2.26	-2.65		-0.16	-0.02
sfa*SGP	-1.07	-1.35	gimmickry*SGP	-28.30	-27.99
	-2.03	-2.18		-5.88	-6.02
debt(-1)*SGP	-0.12	-0.09	debt(-1)*SGP	0.16	0.11
	-1.04	-0.85		1.57	1.02
liquidity*SGP	41.03	37.54	liquidity*SGP	-22.57	-22.78
	1	0.92		-0.72	-0.64
cons	14.73	24.72	cons	7.79	26.38
	1.83	1.84		0.98	2.04
country dummies	no	no		no	no
year dummies	no	yes		no	yes
N	234	234	N	207	207
r2	0.58	0.63	r2	0.69	0.71

Notes: t-values below the coefficient.

Table 3: The role of transparency for risk premia in government bond markets

deficit	4.22	3.48	6.81	deficit	1.19	0.86	0.95
	2.67	1.96	3.33		1.04	0.84	0.77
sfa	0.86	0.64	1.47	gimmickry	31.95	19.53	32.38
	2.41	2.11	2.89		6.28	4.14	7.62
debt(-1)	0.10	0.06	0.10	debt(-1)	-0.05	-0.12	-0.05
	1.05	0.37	1.08		-0.67	-0.8	-0.55
Transparency	-8.79	-7.34	-4.86	TransparencyMH	-10.44	-29.59	-6.36
	-1.06	-0.37	-0.48		-1.07	-1.75	-0.6
liquidity	-80.74	-87.13	-63.81	liquidity	-44.69	-49.72	-23.94
	-1.65	-2.3	-1.56		-1.66	-1.78	-0.75
corspread	0.08	0.05	-0.03	corspread	0.07	0.03	-0.07
	1.94	0.86	-0.36		1.41	0.45	-0.89
US	-37.59	-46.67	-36.14	US	-50.59	-56.95	-45.43
	-3.76	-4.08	-3.59		-5.44	-5.03	-4.75
corspread*US	0.37	0.44	0.36	corspread*US	0.44	0.49	0.41
	7.2	6.89	6.19		8.53	7.59	7.64
cycle	-2.35	-3.23	-3.14	cycle	0.09	-0.30	0.75
	-1.88	-2.62	-2.3		0.06	-0.22	0.5
maturity	0.96	0.81	0.98	maturity	1.07	1.17	0.98
	3.56	2.62	3.63		3.75	3.6	3.67
SGP	-10.10	-13.64	-24.21	SGP	0.72	-1.47	-3.21
	-1.53	-2.28	-2.83		0.15	-0.3	-0.54
deficit*SGP	-2.98	-3.94	-5.36	deficit*SGP	0.24	0.22	-0.18
	-1.92	-2.04	-2.73		0.21	0.19	-0.14
sfa*SGP	-0.82	-1.60	-1.33	gimmickry*SGP	-30.48	-26.64	-28.45
	-1.56	-2.86	-2.1		-5.69	-5.72	-6.06
debt(-1)*SGP	0.00	-0.19	-0.02	debt(-1)*SGP	0.20	0.15	0.14
	-0.02	-1.21	-0.18		1.86	1.3	1.24
liquidity*SGP	66.95	102.39	56.82	liquidity*SGP	9.81	40.78	-0.51
	1.35	2.39	1.33		0.31	1.25	-0.01
cons	14.56	18.69	18.33	cons	7.72	-4.97	25.05
	1.47	0.89	1.3		0.7	-0.23	1.94
country dummies	no	yes	no		no	yes	no
year dummies	no	no	yes		no	no	yes
N	234	234	234	N	208	208	208
r2	0.54	0.65	0.61	r2	0.67	0.74	0.71

Notes: t-values below the coefficient.

Table 4: Creative accounting and risk premia in government bond markets

deficit	4.84	3.79	7.32	deficit	1.40	1.76	1.10
	3.38	2.94	3.97		1.51	1.93	1.05
sfa	0.78	0.59	1.43	gimmickry	31.30	16.98	31.98
	2.22	1.93	2.86		6.02	3.59	7.24
liquidity	-73.74	-87.59	-60.28	liquidity	-37.36	-49.50	-20.47
	-1.5	-2.17	-1.45		-1.37	-1.72	-0.65
corspread	0.10	0.03	-0.02	corspread	0.09	0.03	-0.06
	2.37	0.66	-0.3		1.85	0.48	-0.81
US	-37.33	-49.16	-35.55	US	-48.95	-56.19	-43.85
	-3.7	-4.87	-3.48		-5.2	-6.15	-4.63
corspread*US	0.36	0.45	0.34	corspread*US	0.42	0.48	0.40
	6.92	7.57	5.99		8.09	8.74	7.46
cycle	-1.97	-2.89	-2.81	cycle	-0.44	-0.93	0.29
	-1.66	-2.36	-2.08		-0.32	-0.71	0.21
maturity	0.98	0.78	0.99	maturity	1.04	1.19	0.96
	3.65	2.64	3.82		3.62	3.67	3.63
EMU	-11.40	-16.39	-25.32	EMU	0.09	0.52	-3.86
	-1.75	-2.52	-2.96		0.02	0.1	-0.65
deficit*EMU	-3.03	-4.39	-5.43	deficit*EMU	0.52	-0.73	0.04
	-2.06	-2.78	-2.93		0.48	-0.72	0.03
sfa*EMU	-0.65	-1.46	-1.24	gimmickry*EMU	-28.82	-23.76	-27.61
	-1.26	-2.62	-1.96		-5.4	-5.29	-5.81
liquidity*EMU	72.77	89.52	63.22	liquidity*EMU	21.81	38.36	8.90
	1.48	2.07	1.5		0.71	1.32	0.26
cons	7.13	17.80	15.75	cons	-4.00	14.89	18.62
	0.95	2.15	1.14		-0.49	1.39	1.5
country dummies	no	yes	no		no	yes	no
year dummies	no	no	yes		no	no	yes
N	235	235	235	N	208	208	208
r2	0.54	0.64	0.61	r2	0.67	0.73	0.71

Notes: t-values below the coefficient.

Table 5: The role of audit for risk premia in government bond markets

deficit	3.85	5.75	deficit	0.97	0.58
	3.27	3.18		1.03	0.56
sfa	0.73	1.25	gimmickry	23.98	27.07
	2.24	2.51		4.62	5.07
audit	-37.62	-27.58	audit	-39.45	-28.68
	-3.43	-3.03		-3.43	-2.31
liquidity	-39.40	-31.51	liquidity	-4.72	3.66
	-1.01	-0.79		-0.18	0.12
corspread	0.05	-0.06	corspread	0.07	-0.07
	1.4	-0.84		1.59	-0.94
US	-51.85	-45.23	US	-56.60	-49.84
	-5.83	-4.68		-6.47	-5.32
corspread*US	0.43	0.39	corspread*US	0.44	0.41
	9.05	7.39		9.14	8.12
cycle	-3.17	-3.18	cycle	-0.67	0.04
	-2.61	-2.46		-0.46	0.03
maturity	0.82	0.88	maturity	1.07	0.99
	2.87	3.37		3.88	3.75
EMU	-10.87	-21.57	EMU	1.72	-1.38
	-1.91	-2.81		0.4	-0.24
deficit*EMU	-3.59	-5.27	deficit*EMU	0.20	0.22
	-2.6	-2.96		0.18	0.17
sfa*EMU	-1.03	-1.33	gimmickry*EMU	-27.41	-27.44
	-1.94	-2.12		-5.53	-5.66
liquidity*EMU	37.56	35.28	liquidity*EMU	-11.14	-15.34
	0.95	0.88		-0.37	-0.45
cons	17.24	26.84	cons	4.46	24.16
	2.19	2.04		0.57	1.96
country dummies	no	no		no	no
year dummies	no	yes		no	yes
N	234	234	N	207	207
r2	0.58	0.63	r2	0.68	0.71

Notes: t-values below the coefficient.

Table 6: The role of transparency for risk premia in government bond markets

deficit	4.60	3.78	7.19	deficit	1.09	0.59	0.89
	3.08	2.23	3.74		1	0.6	0.75
sfa	0.82	0.63	1.46	gimmickry	31.61	19.42	32.13
	2.29	1.97	2.91		5.98	4.07	7.09
transparency	-8.90	-4.36	-4.76	transparency	-9.07	-32.43	-5.13
	-1.11	-0.23	-0.49		-0.91	-2.09	-0.47
liquidity	-79.92	-92.51	-63.73	liquidity	-43.40	-48.71	-23.51
	-1.62	-2.33	-1.57		-1.61	-1.72	-0.74
corspread	0.09	0.03	-0.02	corspread	0.09	0.06	-0.06
	2.26	0.52	-0.26		1.83	0.98	-0.76
US	-36.56	-48.83	-35.05	US	-48.02	-52.05	-43.57
	-3.63	-4.82	-3.41		-5.11	-5.57	-4.6
corspread*US	0.36	0.45	0.34	corspread*US	0.42	0.46	0.40
	6.93	7.56	5.96		8.03	8.16	7.44
cycle	-2.00	-3.04	-2.81	cycle	-0.40	-0.64	0.36
	-1.68	-2.48	-2.07		-0.29	-0.49	0.26
maturity	0.98	0.77	0.99	maturity	1.05	1.19	0.97
	3.62	2.58	3.68		3.61	3.6	3.58
EMU	-11.28	-15.18	-25.07	EMU	0.04	-1.47	-3.83
	-1.72	-2.35	-2.92		0.01	-0.3	-0.65
deficit*EMU	-3.06	-4.48	-5.49	deficit*EMU	0.64	0.71	0.07
	-2.05	-2.22	-2.93		0.58	0.62	0.06
sfa*EMU	-0.73	-1.52	-1.28	gimmickry*EMU	-29.33	-26.21	-27.73
	-1.39	-2.7	-2.01		-5.35	-5.72	-5.72
liquidity*EMU	76.38	91.87	65.03	liquidity*EMU	26.04	53.32	10.77
	1.54	2.27	1.56		0.86	1.79	0.32
cons	14.12	22.26	18.70	cons	2.59	33.06	21.84
	1.48	1.12	1.34		0.23	2.54	1.73
country dummies	no	yes	no		no	yes	no
year dummies	no	no	yes		no	no	yes
N	234	234	234	N	208	208	208
r2	0.54	0.64	0.61	r2	0.67	0.73	0.71

Notes: t-values below the coefficient.

Table 7: The role of *Audit* and creative accounting for risk premia in government bond markets

deficit	3.50	5.41	deficit	1.29	0.86
	2.99	3.11		1.39	0.83
sfa	0.83	1.30	gimmickry	22.08	24.97
	1.94	2.37		5.1	5.69
debt(-1)	0.08	0.07	debt(-1)	-0.05	-0.04
	0.95	0.89		-0.7	-0.57
audit	-36.53	-26.28	audit	-14.61	-5.87
	-2.98	-2.53		-0.91	-0.36
audit*sfa	-0.90	-0.77	audit*gimmickry	-18.82	-18.41
	-0.35	-0.32		-2.48	-2.44
liquidity	-37.99	-30.47	liquidity	-1.03	8.49
	-1	-0.8		-0.04	0.3
corspread	0.07	-0.06	corspread	0.06	-0.08
	1.57	-0.8		1.31	-1.05
US	-50.19	-44.25	US	-54.22	-47.57
	-5.62	-4.56		-5.97	-4.99
corspread*US	0.42	0.39	corspread*US	0.44	0.41
	8.79	7.24		8.83	7.92
cycle	-3.47	-3.41	cycle	-0.19	0.33
	-2.82	-2.62		-0.12	0.22
maturity	0.84	0.89	maturity	1.09	0.99
	2.9	3.38		4.05	3.92
SGP	-9.98	-20.90	SGP	1.23	-1.85
	-1.8	-2.82		0.27	-0.33
deficit*SGP	-3.25	-4.97	deficit*SGP	-0.22	-0.07
	-2.18	-2.69		-0.2	-0.06
sfa*SGP	-1.17	-1.42	gimmickry*SGP	-27.60	-27.49
	-1.81	-2.02		-6.47	-6.71
debt(-1)*SGP	-0.13	-0.10	debt(-1)*SGP	0.11	0.05
	-1.12	-0.95		0.95	0.39
liquidity*SGP	41.11	36.56	liquidity*SGP	-10.64	-10.79
	1.01	0.94		-0.34	-0.31
cons	13.63	24.92	cons	3.12	23.14
	1.75	1.84		0.37	1.8
country dummies	no	no		no	no
year dummies	no	yes		no	yes
N	234	234	N	207	207
r2	0.58	0.63	r2	0.70	0.72

Notes: t-values below the coefficient.

Table 8: Instrumental variables regressions for stock-flow adjustments

sfa	11.97	7.91	9.01	sfa	1.40	1.83	3.45
	2.21	0.43	2.91		1.17	1.67	2.27
sfa*EMU	-10.54	-13.99	-1.94	sfa*EMU	4.92	-0.31	4.01
	-1.91	-0.97	-0.39		1.52	-0.07	0.56
deficit	5.48	5.83	12.16	deficit	4.41	4.50	7.86
	1.84	0.73	3.62		2.83	2.65	4.51
debt(-1)	0.61	1.59	0.16	debt(-1)	0.08	0.21	0.06
	1.53	0.37	0.75		0.72	0.82	0.48
liquidity3	67.72	37.73	-5.43	liquidity3	-53.08	-88.30	-13.06
	0.42	0.17	-0.06		-1.06	-1.73	-0.23
corspread	0.02	0.04	0.22	corspread	0.08	0.01	0.11
	0.17	0.1	1.01		1.13	0.21	0.69
US	-27.88	-8.47	-3.21	US	-23.94	-38.94	-16.07
	-0.79	-0.04	-0.1		-1.58	-2.85	-0.72
corspread*US	0.34	0.34	0.18	corspread*US	0.27	0.40	0.22
	2	0.39	1		2.93	4.84	1.53
cycle	-21.06	-15.20	-11.73	cycle	-0.62	-3.17	-2.17
	-1.8	-0.56	-1.91		-0.19	-1.4	-0.44
maturity	1.30	2.33	0.77	maturity	0.84	1.21	0.79
	1.67	1.29	1.01		2.05	2.93	1.38
EMU	-4.12	12.88	-29.75	EMU	-12.27	-8.10	-29.19
	-0.23	0.36	-2.04		-1.37	-1.06	-2.6
deficit*EMU	-3.79	-16.36	-7.06	deficit*EMU	3.86	-2.53	-1.12
	-0.99	-1.61	-1.21		1.13	-0.46	-0.18
debt(-1) EMU	-0.60	-0.17	-0.16	debt(-1) EMU	-0.05	-0.06	-0.03
	-1.26	-0.31	-0.49		-0.27	-0.26	-0.15
liquidity3*EMU	-35.71	-6.74	6.55	liquidity3*EMU	21.17	61.62	-11.87
	-0.23	-0.02	0.06		0.39	1.09	-0.15
cons	1.23	-61.53	-29.48	cons	9.74	1.22	-5.60
	0.04	-0.5	-0.78		0.83	0.05	-0.22
country dummies	no	yes	no		no	yes	no
year dummies	no	no	yes		no	no	yes
instruments	gimmickry gimmickry*EMU				transparencyMH FisGovStructure elect2 vetoman		
N	208	208	208	N	225	225	225

Notes: t-values below the coefficient.

7 Graphs

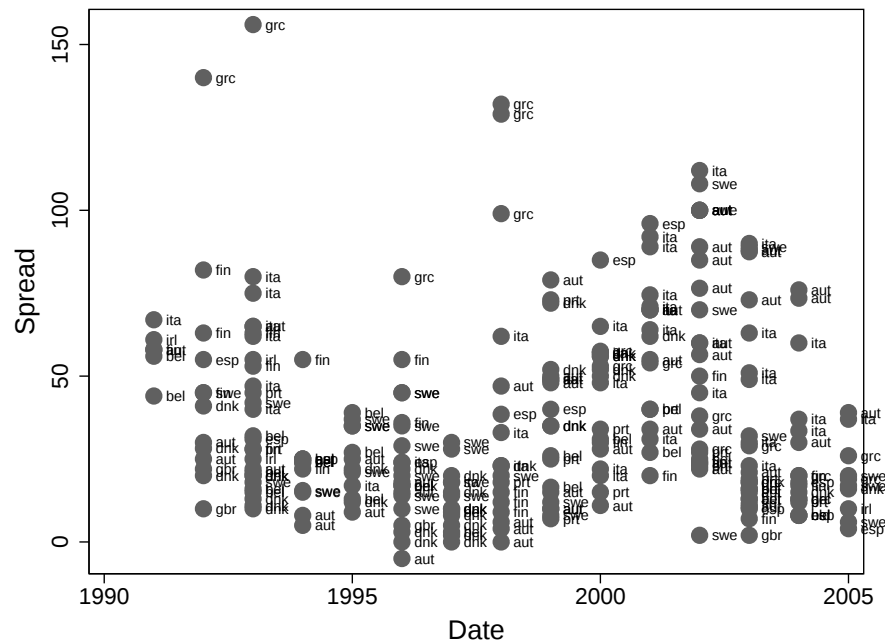


Figure 2: Interest rate spreads for central government primary debt issues vs benchmark countries Germany or USA in basis points.

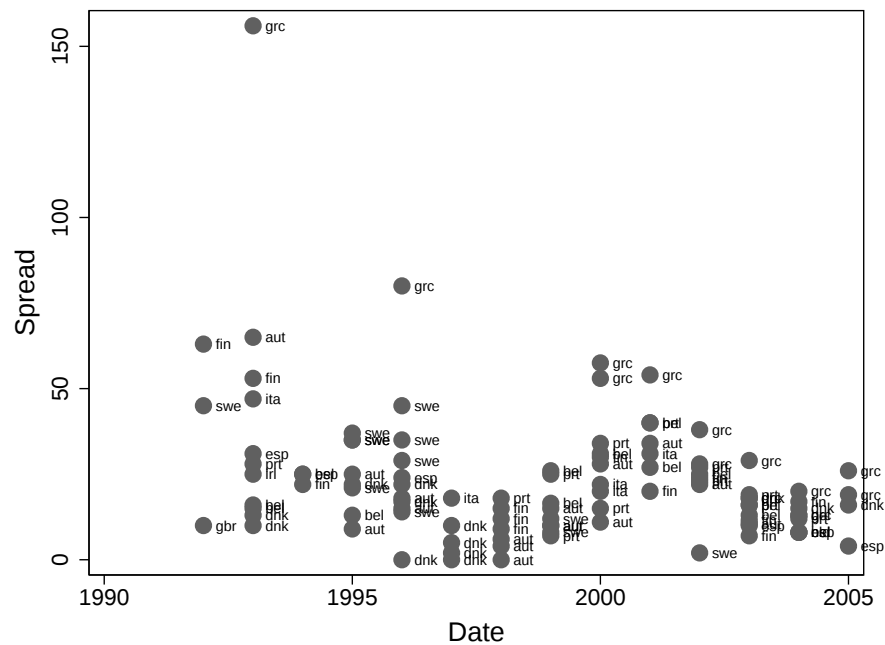


Figure 3: Interest rate spreads for central government primary debt issues in DM/Euro vs benchmark country Germany in basis points.

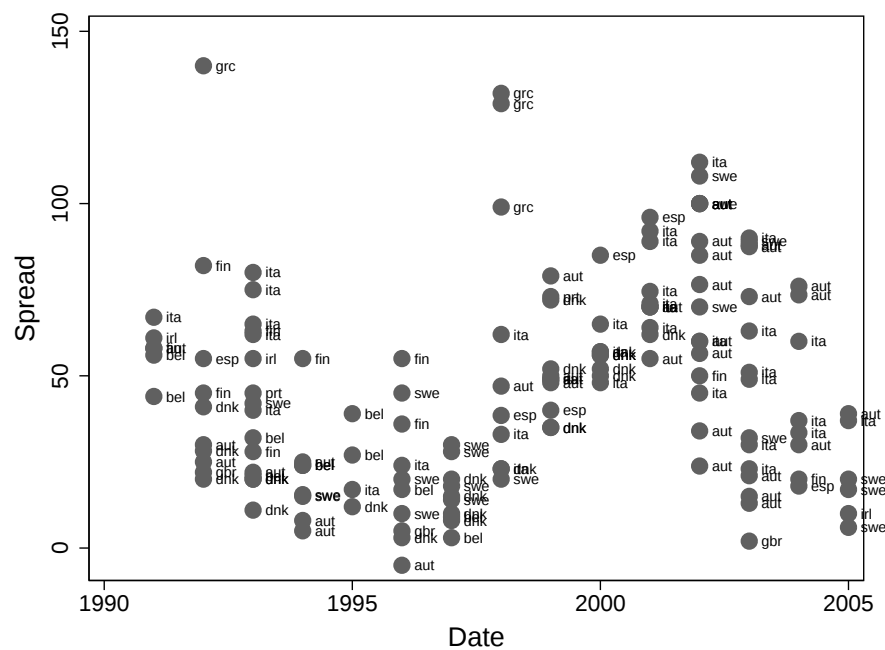


Figure 4: Interest rate spreads for central government primary debt issues in US\$ vs benchmark country USA in basis points.

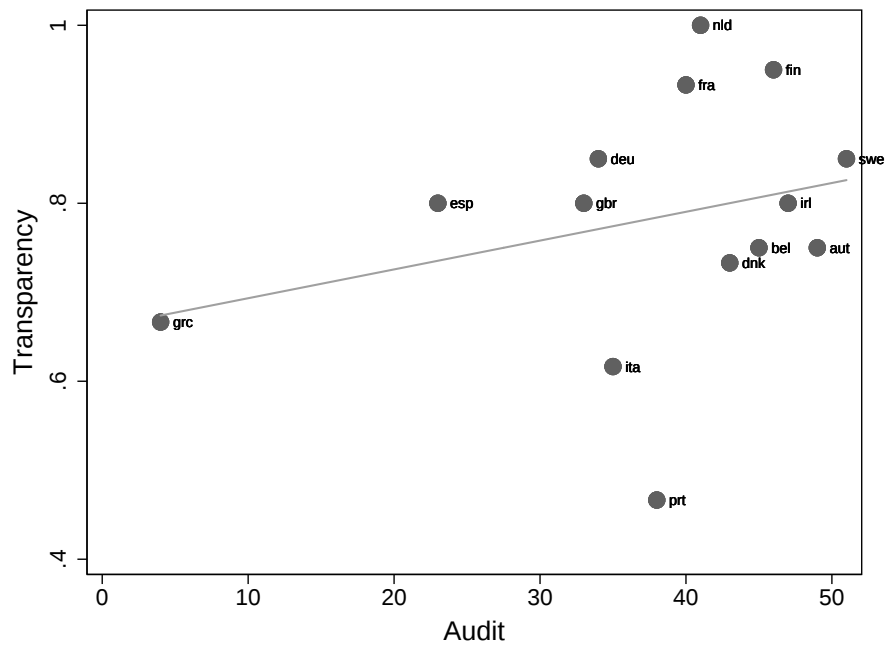


Figure 5: A comparison of two indices of fiscal transparency.

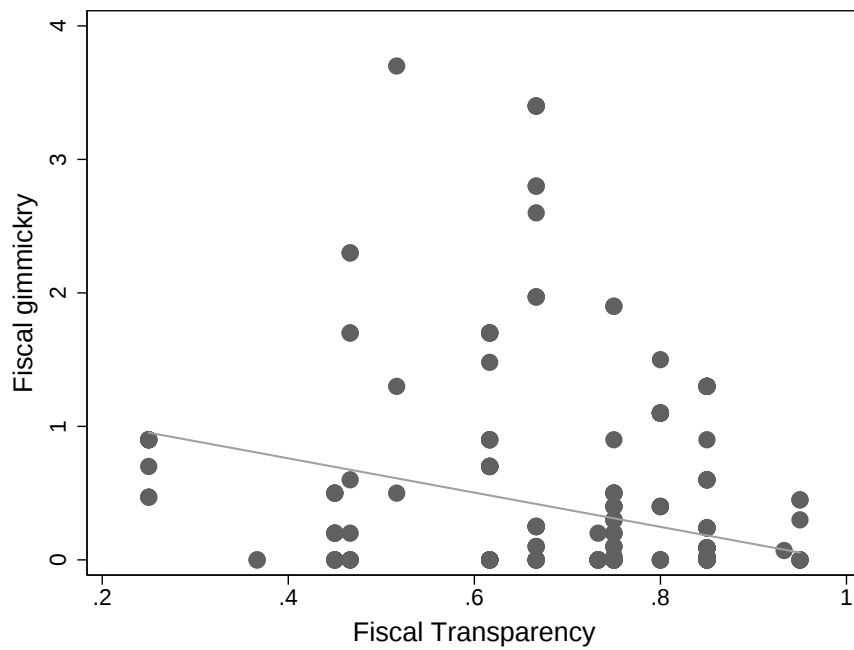


Figure 6: Fiscal gimmickry as a function of transparency.

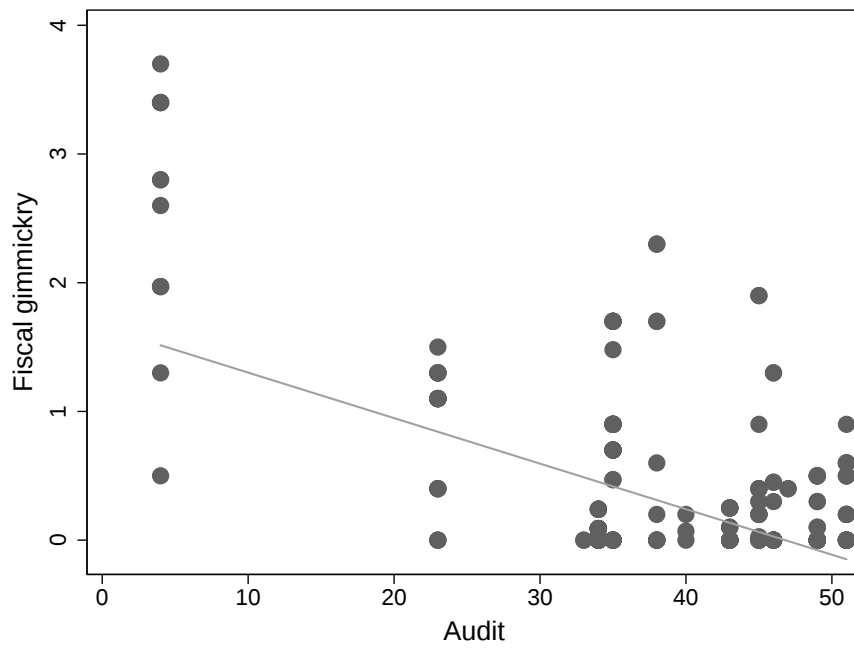


Figure 7: Fiscal gimmickry as a function of Audit.

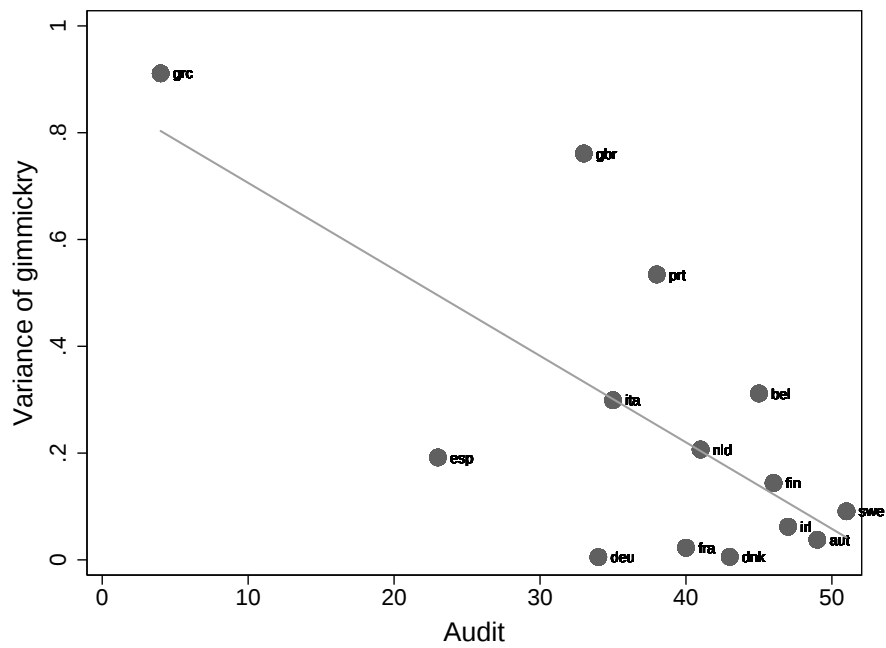


Figure 8: The variance of gimmickry as a function of audit.

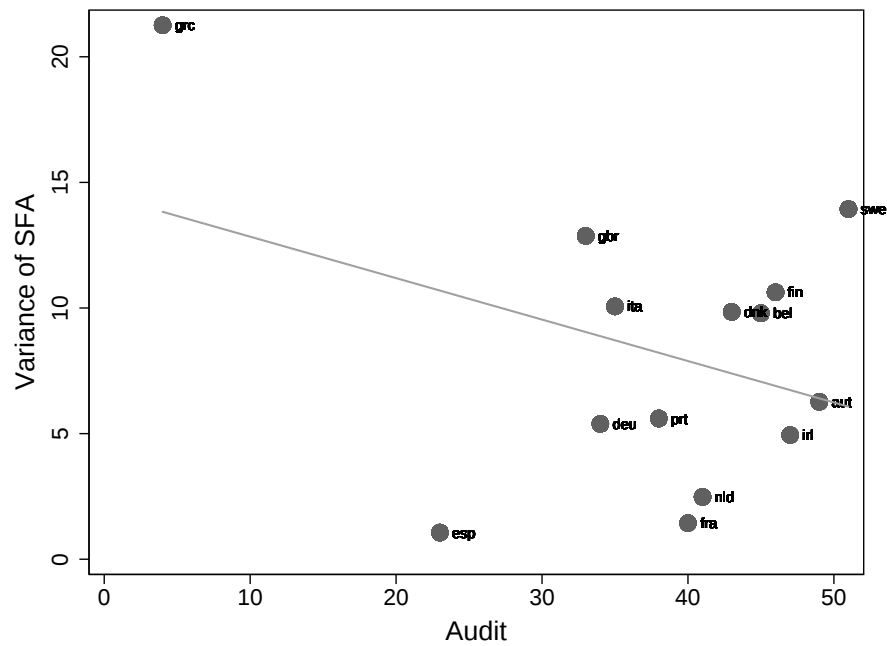


Figure 9: The variance of stock-flow adjustments as a function of audit.

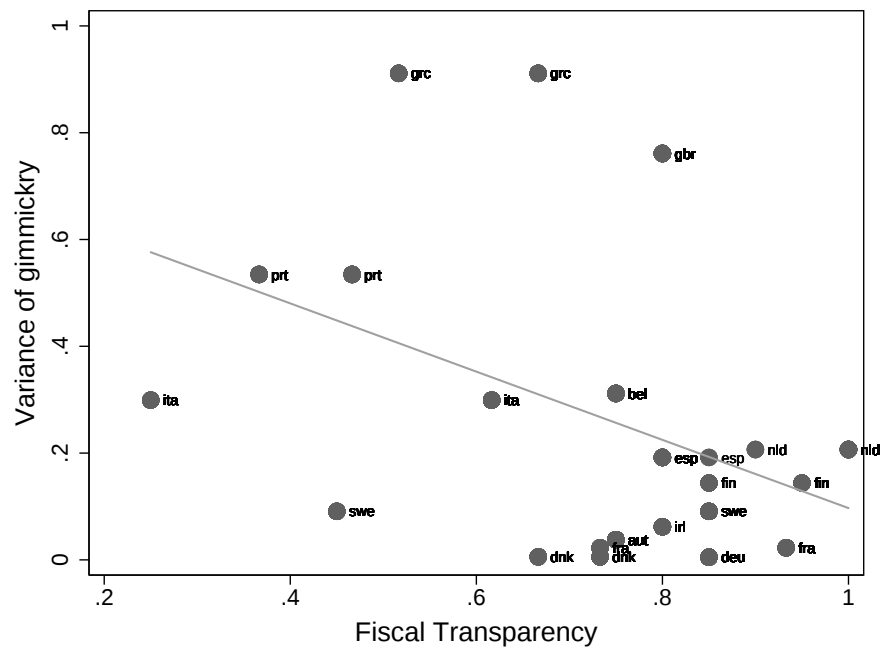


Figure 10: The variance of gimmickry as a function of transparency.

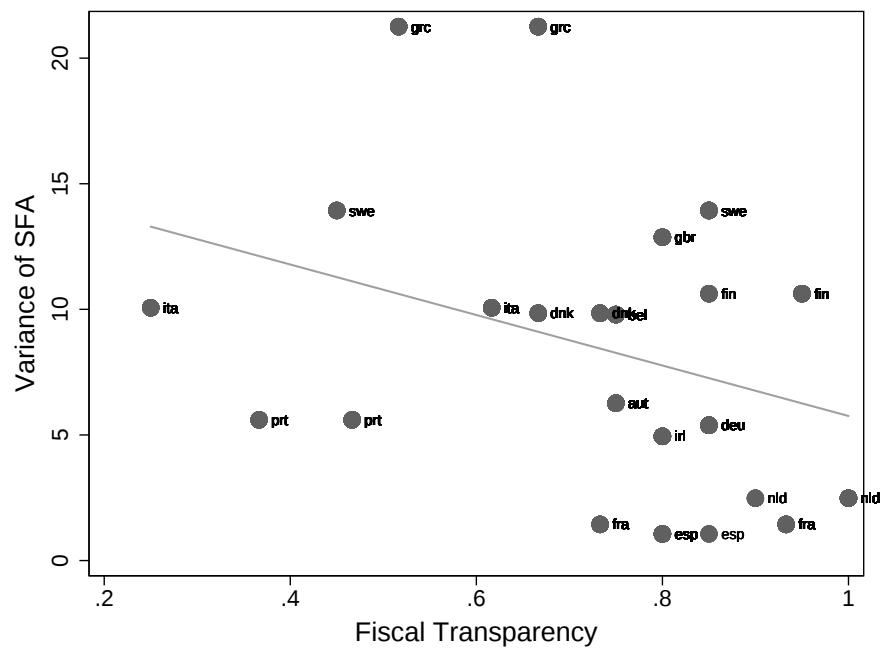


Figure 11: The variance of stock-flow adjustments as a function of transparency.

8 A new index of fiscal transparency

Fiscal transparency is an important concept, which is difficult to measure. In this paper, we focus on the narrow concept of "information" transparency. Our index "Audit" captures the degree to which fiscal book keeping is being audited and the extent to which the information of this auditing becomes public knowledge. A further aspect of *Audit* relates to potential political pressure that results from the auditing results.

Audit is based on a OECD/World Bank survey of budget practice, which was launched in February 2003, in more than 60 countries.¹⁵ In the survey, questions are asked regarding (1) general information on government budget organization, (2) budget formulation, (3) budget execution, (4) accounting, control and monitoring systems, (5) budget documentation and performance management, (6) fiscal relations among levels of government, and (7) special relationships and issues.

We took the responses on question in the area (4), more specifically 4.5a-4.5t. The questions and our coding are listed below. To each question, we assigned a value between zero and four, where four indicates the response most conducive to fiscal "transparency". The index is computed as the simple sum of the responses to all individual questions. We also computed the average response for every country. This alternative index, however, appears to capture the true extent of auditing less adequately, as non-response is not counted. Especially Greece leaves a significant amount of questions unanswered. We believe, that it is reasonable to assume that partial non-response is a sign of very bad auditing quality.

¹⁵The results are available at <http://ocde.dyndns.org/>

Table 9: The external audit index

Country	External audit, index value
AUSTRIA	49
BELGIUM	45
DENMARK	43
FINLAND	46
FRANCE	40
GERMANY	34
GREECE	4
IRELAND	47
ITALY	35
NETHERLANDS	41
NORWAY	41
PORTUGAL	38
SPAIN	23
SWEDEN	51
UNITED KINGDOM	33
UNITED STATES	40

Notes: Authors' calculation based on World Bank/OECD survey.

Question:**Coding of the answers developed by the authors.**

Are government entities subject to financial audits by an external auditor?

yes=4, no=0

Is there a central Supreme or National Audit Office

Yes, reports to legislative branch=4, Yes, reports to the executive branch=2, Yes, reports to judiciary branch=1; Other, please specify=0

Can the external auditor contract out to other entities?

Yes to private firms=4; Yes to other independent government bodies=2.5; Yes, other please specify=1, No=0

Is the National Audit Office peer reviewed by other countrys audit offices?

Yes, it is a routine practice=4, Yes, on an ad hoc basis=2, No=0

How would external audit arrangements be described?

There is no formal external audit of government accounts=0; The audit authority reports only within the executive (e.g., to the President)=1; A National Audit Body, independent of the executive, audits government accounts and reports to the executive=2; The National Audit Body is a legislative body=3; A National Audit Body, independent of the executive, audits government accounts and reports to the legislature=4

How is the independence of the National Audit Body from the executive established?

It is established in the constitution=4; It is established in law=3; It is set out in administrative regulation=1; It is not clearly set out in law=0

What mandate does the National Audit Body have?

0 to 4(most functions)

Are the findings of the National Audit Body available to the public?

Always=4; Generally, but with some exceptions (e.g., audits of the military)=2; Never or rarely=0

Does the external auditor conduct performance audits?

Yes=4, No=0

Is there a materiality level or other risk management procedure that limits the number of governmental organisations or entities subject to audit?

yes=0, no=4

Are audit results circulated and discussed in Parliament?

no=0, No, the reports are too late=1; Yes, by Budget committee=2; Yes, by oversight committee(s)=3; Yes, by General Assembly=4

How are the subjects of audits determined?

By legislative branch request=4; By request from the public or other civil society actor=3; Internally determined=2; By executive branch request=1; Other, please specify=0

Is there a system to track audit recommendations once issued?

Yes, keeps track of implementation of recommendations=4; Yes, an annual report is issued of recommendations=3; Yes, but the reports are kept internally=1; No=0

Is the executive branch required by constitution or legislation to follow up and respond to national audit body recommendations?

yes=4; Yes, but there is a procedure by which the executive may reject the recommendation=3; No, but it generally does=1; No=0

Does the Supreme Audit body coordinate with or use the reports of internal auditors?

all yes=4. No=0

Does the legislature have an audit body that is not affiliated with the National Audit Body?

yes=4, no=0