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Jürgen von Hagen and Matthias Brückner

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Jürgen von Hagen* and Matthias Brückner**

Abstract

The introductory phase of the European Monetary Union ended with the emission of euro currency in 2002. We present a review of the experiences with the new monetary union. Using a Taylor-rule, we analyze the ECB's conduct of monetary policy. The empirical results suggests that the ECB applies similar weights to inflation and the output gap as the Bundesbank in the past, but more than proportionate weight to economic developments in Germany and France. Next, we show that the link between monetary developments and inflation in the euro area is empirically very stable. ECB monetary policy was too loose in the first four years to keep inflation below the bank's upper limit of two percent defining price stability. In the last section we analyze the fiscal framework of EMU and show that it has not succeeded in safeguarding fiscal discipline especially of the large member states.

Key words: European Monetary Union, monetary policy, fiscal policy, Stability Pact

JEL classification: E52, E58, E61, and E63

* Professor, ZEI, University of Bonn, Indiana University, and CEPR
(E-mail: vonhagen@uni-bonn.de)
** Senior Fellow, ZEI, University of Bonn
(E-mail: brueckne@united.econ.uni-bonn.de)

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1. Introduction

The creation of a monetary union in Europe on 1 January 1999 was the cap stone of the 'Maastricht Process,' which shaped the monetary and fiscal policies of the countries striving for membership in European Monetary Union (EMU) over much of the 1990s.[1] EMU started with the conversion of the national currencies of the member states into euros and the beginning of the operations of the new Euro System, the new European Central Bank (ECB) and the national central banks of the participating states (NCBs).[2] Interbank and most non-cash payments have been denominated in euros since the start and European financial markets quickly adopted the euro as unit of account. The replacement of the national currency signs by euro cash at the start of 2002 completed the starting phase of EMU.

EMU has changed the framework for monetary and fiscal policy in Europe. All EMU member states now participate in a common monetary policy, which is under the control of the ECB. In addition, EMU sets up a framework for fiscal policy in Europe with rules for public sector deficits and debts and processes guiding and monitoring the budgetary policies of the member states. This framework was created to assure fiscal discipline in EMU and to rule out that the stability of the common currency be undermined by mounting public sector debts.

Now that the initial phase of EMU is over, this paper reviews the experience with monetary and fiscal policies in the first years of EMU. In section 2, we provide some institutional background. In section 3, we discuss the ECB's monetary policy. In section 4, we look at the evolution of monetary conditions in the euro economy and assess the central bank's policy on that basis. Section 5 discusses fiscal policy in EMU. Section 6 concludes.

2. Institutional Background

The Treaty on European Union (the Maastricht Treaty of 1991 and the Amsterdam Treaty of 1997) provides the institutional framework for EMU and the ECB. It requires that the national central banks (NCBs) of all participating states must be politically independent. The ECB is similarly independent from the governments of the member states and the

[1] For a review of fiscal policies in the EMU member states during the 1990s see Hughes-Hallett, Strauch and von Hagen (2001).

political bodies of the European Union. The ECB is owned by the NCBs. Its name, European Central Bank, is actually a euphemism, since the ECB is not a "bank," as a look at its balance sheet reveals. Like the Federal Reserve Board of Governors in the US, the ECB is the central decision making institution within the Euro System, and like the Board of Governors, it relies on others to implement monetary policy actions. Unlike the Board of Governors, these "others" are all rather than one of the participating NCBs.

The Maastricht Treaty delegates the common monetary policy to the Euro System and gives the ECB the task of executing it (Art. 3 and 5 of the Statutes of the ESCB). Monetary policy decisions are made by the Governing Council (Council, for short) whose members are the NCB presidents and the six members of the ECB Board.[3] Formally, Council decisions are taken by majority vote, with each member having one vote and the ECB president a second one in the case of a tie. In practice, decisions commonly seem to be carried by consensus, i.e., a broad majority of the Council members.[4]

The Treaty mandates the ECB to regard price stability as the principal objective of monetary policy. The ECB defines price stability as an average rate of inflation below two percent in the medium run. The principal mandate is qualified (Art. 105(1)) by the call to support the general economic policy in the European Community contribute to the policy goals defined in Art 2 as long as this does not compromise the goal of price stability. Issing et al (2001) explain that the ECB does not interpret this as saying that output stabilization is a secondary goal for monetary policy.

Fiscal policy in the EU and EMU is subject to the strictures of the Excessive Deficit Procedure (EDP), which was part of the Maastricht Treaty, and the Stability and Growth Pact (SGP), which was partly introduced with the 1997 Amsterdam Treaty and is partly based on simple EU legislation.[5] The Maastricht Treaty unconditionally obliges EMU member states to avoid excessive deficits. Whether or not a country has an excessive deficit is determined by the European Council based on an assessment procedure, which is triggered, when the country has a public sector deficit larger than three percent of GDP or a public debt larger

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[2] In addition to the Euro system, there is also the European System of Central Banks (ESCB), which consists of the ECB and the NCBs of the European Union member states.

[3] The president of the European Council and a member of the European Commission have the right to participate in ECB Council meetings.

[4] For a discussion of voting rules on the central bank council of monetary unions see von Hagen and Süppel (1994), De Grauwe et al. (1999), Dornbusch et al (1998), and von Hagen (1999a), who discusses the role of consensus voting in that context.

than 60 percent of GDP. Under the EDP, countries with an excessive deficit can be admonished, secretly or openly, by the European Council and, if the deficit is not sufficiently corrected, they can be subject to financial fines. During the 1990s, the EDP carried another penalty for excessive deficits, *viz*. the threat of being denied entry to the monetary union, which was reserved for states without excessive deficits. Beyond that, the SGP obliges EMU member states to keep their public sector budgets close to balance or in surplus. The member states have to present annual Stability Programs that spell out their fiscal targets for the coming years and explain how they intend to reach these targets. All member states are supposed to have reached balanced budgets in the year 2004.

The essential goal of the fiscal strictures is to stabilize the public debt ratios of EMU member states and to reduce them where this was deemed necessary. Low and stable debt ratios are perceived as essential preconditions for the stability of the common currency. Economic reasoning and historical experience confirm this view. It is one way to express the governments' intertemporal budget constraint, which says that, ultimately, public sector deficits must be backed by future surpluses. An obvious practical difficulty with this concept, however, is how to translate the intertemporal budget constraint, which is essentially a long-run constraint, into meaningful constraints on year-to-year fiscal policies (Perotti et al, 1998). Focusing on the long run alone, the intertemporal budget constraint has no practical implications for the short run, as governments can always promise future surpluses to excuse current deficits. The role of the annual deficit constraint in the EDP and SGP is to create the necessary link between the long and the short run. As we will see below, however, focusing too much on the annual deficit may undermine the credibility of the procedures, because the resulting constraints may keep countries from adopting policies that would violate the deficit constraint initially but help reduce public debts in the medium and long run.

3. Monetary Policy in EMU

The ECB's monetary policy evolves within a "Two-Pillar" strategy.[6] The focal point of the first pillar is a "reference value" for the annual growth rate of a broad monetary aggregate, M3. The reference value is derived from a simple quantity equation of money. The second pillar consists of an analysis of short-run price movements using a broad

[5] For a detailed description of the EDP and the SGP see Buti and Sapir (1998).
[6] For a detailed discussion of the strategy see von Hagen and Brückner (2002).

collection of data and a broad menu of alternative models. The ECB insists that the strategy is neither "monetary targeting" in a narrow sense of following a fixed money growth rule, nor "inflation targeting" in the sense of trying to achieve a given target rate of inflation over a specified time horizon. Instead, the two pillars serve to organize monetary policy debates. The role of the first pillar is to focus attention on the medium and long run consequences of monetary policy. In this regard, the ECB's strategy resembles the Bundesbank's earlier practice of monetary targeting (von Hagen, 1999b). Short of an explicit intermediate target of monetary policy, the ECB's policy is best judged on the basis of its main policy instrument, the interest rate on its main Repo operations.

Many observers had expected the ECB to start its monetary policy by pushing up interest rates in order to prove that it was hard-nosed on inflation (e.g. Dornbusch et al., 1998). The opposite happened. In a concerted step generally considered the Euro System's first policy action, all NCBs reduced their interest rates to 3 percent on 3 December 1998.[7] On 8 April 1999 the ECB cut its interest rate to 2.5 percent. This was a surprising move, as most EMU economies were already recovering form the economic crisis in late 1998.[8] The ECB reversed its course in November 1999. Its interest rate peaked at 4.75 percent in October 2000. On 11 May 2001 the ECB started to cut its interest rate. A week after 11 September, it lowered its interest rate in two steps of 50 basis points each. Table 1 reports the ECB's interest rate policy since 1999. The table shows that the ECB now has almost completed one full interest rate cycle.

Taylor rules have become a popular tool for describing and interpreting central bank interest rate policies under very diverse circumstances. The simple Taylor rule (Taylor, 1993) found empirical support for the Euro area already before the introduction of the Euro (see, e.g., Gerlach and Schnabel, 2000). In view of that, it has received considerable attention as a benchmark for the ECB's actual policy.[9] Of course, we are fully aware of the fact that the ECB, like all central banks, has repeatedly affirmed that it does not follow a Taylor rule, and we do not want to suggest that it blindly applies a technical relationship. Nevertheless, Taylor

[7] The Bank of Italy cut its rate to 3.5 percent and to 3.0 percent later that month. See Gaspar (2000) for a review of this action.

[8] Gaspar (2000) explains that move as a protection against deflationary risks in the euro area, although signs of inflation creeping up already existed.

[9] See Peersman and Smets (1999),Taylor (1998), Alesina et al. (2001), Faust et al. (2001), von Hagen and Brückner (2002) as well as the financial press, e.g. Financial Times Deutschland.

rules are a useful device to summarize empirically observed patterns of central bank policy. Here, we follow the same approach. We base our exercise on the following specification:

$$i_t = 4.0 + 1.2(\pi_t - \pi^{ob}) + 0.2 y_t \qquad (1)$$

where i_t, π_t, π^{ob}, and y_t denote the main Repo rate, the inflation rate, the inflation objective, and the output gap, respectively. We set π^{ob} =1.5%, the value implicitly used by the ECB for their calculation of the reference value for M3, and assume an equilibrium interest rate of 4.0%, the sum of the ECB's assumed long-run real GDP growth rate and the inflation objective. Since the measurement of the output gap is particularly uncertain for the Euro area due to data problems, we use a simple average of the estimates provided by the OECD (OECD, 2002), the IMF (IMF, 2002), and the European Commission (EU, 2001) to obtain a robust measure.

The coefficients of the Taylor rule in equation (1) are chosen to resemble empirical estimates for the Bundesbank prior to EMU, a plausible benchmark for the ECB (e.g. Faust et al. 2001). This parameterization was also used in our previous study (von Hagen and Brückner, 2002), allowing for a simple robustness check of earlier results. One advantage is that this parameterization yields a value of the Taylor rule for the euro area of 3% in December 1998, which corresponds to the actual value at the start of EMU. We prefer to impose such plausible parameterization to than estimating it, because the short time span does not allow to obtain estimates that are robust against changes in the number of data points or changes in the series used to obtain EMU wide output gaps. In contrast to Faust et al., we concentrate on Taylor rules based on the current rather than on an expected future inflation rate. The main reason is that calculating expected inflation rates from the data would force us to shorten the sample. As we show below, this does not change the results significantly.[10]

[10] The alternative way to proceed in the analysis would be to use EMU data for inflation and output gaps and the ECB's interest rate and estimate the coefficients. Empirical studies doing this find a smaller coeffecient on inflation and a larger coefficient on the output gap, suggesting that the ECB places more weight on output stabilization and less on combating inflation than the Bundesbank did in the past (e.g. Neumann, 2002). Our procedure thus implicitly assumes that the ECB resembles the Bundesbank more strongly in its relative weights on ourpur and inflation.

In Figure 1, we plot the Taylor rule from equation (1), labeled "euro", together with the ECB's main policy instrument ("main rate".) The figure shows that the ECB kept its interest rate well below the benchmark since January 1999. If the benchmark reflects what the Bundesbank would have done under similar circumstances, the figure suggests that the ECB's monetary policy was consistently less tight than Bundesbank policy would have been. Note that the difference between the actual rate and the benchmark is not well explained by interest rate smoothing. With interest rate smoothing, the actual rate would adjust to the rate implied by the Taylor rule gradually, i.e.,

$$i_t = \lambda i_{t-1} + (1-\lambda)(4.0 + 1.2(\pi_t - \pi^{ob}) + 0.2 y_t), \qquad (2)$$

where $\lambda > 0$. Figure 1, however, shows that the actual rate and the rate calculated from our Taylor rule move in opposite directions in at least two instances.

How can the difference between the actual rate and the benchmark be explained? It is sometimes argued that the ECB cares about (or should care about) core inflation instead of headline inflation. In figure 2, we show a Taylor rule with core inflation replacing headline inflation. Core inflation is measured by excluding food and energy prices from the CPI ("core 1"). This rule does not describe the ECB's policy better than the benchmark. Since core inflation rose slowly but steadily over most of the period under consideration, a Taylor rule based on core inflation rule captures neither the tightening of monetary policy in 2000 nor the easing in late 2001. A variant of this core-inflation rule is to increase the weight on the output gap. This follows the conjecture by Faust et al, namely that the ECB places more weight on output stabilization than the Bundesbank did in the past. Assuming a weight of 0.8 for output yields the rate labeled "core-2" in figure 2. It describes the ECB's policy quite well until early 2000, even though it does not explain the low interest rates between April and October 1999. As the first Taylor rule based on core inflation, it does not capture the behavior of the interest rate from spring 2000 onwards. We conclude that the ECB does not aim at stabilizing core inflation. This is consistent with recent results reported by CEPR (2002). [11]

An alternative explanation is based on the decision-making structure in the ECB. If ECB Council decisions were taken by simple majority, the median NCB president would have

[11] In contrast, a former version of the CEPR Report, Alesina et al (2001) claims that a core-inflation based Taylor rule performs well to describe ECB monetary policy.

considerable influence on them. This is important, because national inflation rates in the EMU exhibited quite a large degree of cross-country variation during the period under consideration.[12] Under majority voting on the ECB Council, significant inflation differentials could move the ECB's interest rate away from the benchmark. To evaluate this possibility, we calculate Taylor rules based on equation (1) using individual country data, and compute the median Taylor rate for each period.[13] In Figure 3, we plot this rate, labeled "median." The median rule would have implied a much faster and larger rise in interest rates in 1999 and especially 2000. Thus, Figure 3 suggests that the median NCB president does not play a large role in shaping interest rate decisions. This is consistent with the view, often given by the ECB president in his press statements, that council decisions are based on consensus.

A third possible explanation for the difference between the benchmark and the actual ECB policy is that the Council pays particular attention to the economic situation of the two largest economies, Germany and France. To explore this, we average the rates calculated from equation (1) for these two countries. The resulting rate, labeled "D-F", is shown in Figure 3. It does more to explain the actual interest rate than the original Taylor rule ("euro.") Interestingly, the ECB's first interest rate move in April 1999 pushed the actual rate closer to the "D-F" rate. The subsequent movements in the actual rate seem quite consistent with a smooth adjustment of the actual rate to that implied by "D-F." Thus, the evidence supports the idea that the ECB Council places more weight on the economic developments in Germany and France. Like all other benchmarks considered so far, the "D-F" rule would have called for a tighter monetary policy in the beginning of 2002 due to the jump in the inflation rate. However, most recently actual interest rates and the "D-F" rule coincide again.

For a more formal test, we regress the actual interest rate on the rate predicted by the D-F rule, see Table 2. All data are monthly. The sample period starts in November 1998. By including the lagged main rate, we allow for interest rate smoothing, which is significant empirically. The first regression has the actual rate depend on its own lag and the Taylor rule for Germany and France. The table shows that this model explains the actual rate very well. Adding one of our two "core" variables, or measures of the Taylor rule for the Euro area

[12] The largest inflation differential across countries started at 2.4% in January 1999. After falling to 2 percent at the end of 1999, it jumped to 4.1 percent in January 2000. Since then, it remained above 3 percent most of the time.

[13] Theoretically, it would be interesting to estimate country specific coefficients of the Taylor rule. However, as the voting behavior of the Council member is not released, we cannot estimate such national preference parameters.

countries except Germany and France leads to statistically insignificant coefficients. The estimates are very similar to, and not statistically different from, those obtained by von Hagen and Brückner (2002) for the period until June 2001. This indicates that the ECB's pattern of setting interest rates is quite stable.

The second regression is based on a forward-looking Taylor rule. It uses expectations of inflation and output gaps six-months ahead, proxied by their actual future observations. Thus, the regression runs from November 1998 to October 01. Due to the short time span, we did not estimated this equation by GMM but by standard OLS. We see that the coefficients are similar and the total fit slightly better.

In sum, it appears that predominant influence of the economic situation in Germany and France on the ECB's policy is a relatively robust finding. There are several possible explanations for this. It may reflect the acknowledgment of the other Council members of the importance of these two countries for European integration. Alternatively, it may reflect a shared view of the ECB Council that these two economies, which together represent half of the euro economy, represent the medium run developments of the euro area better than aggregate euro-area data used to compute the euro-area Taylor rule. Whether or not that is true is an empirical question that remains to be resolved. It could also be that the ECB uses German and French data as a proxy for EMU wide aggregates, because data in these countries are released considerably earlier.[14] Finally, note that Taylor rules computed individually for Germany and France evolved quite similarly during this period, as Germany had lower inflation rates but also a lower output gap than France. It remains an interesting question how ECB monetary policy react when the German and the French economies call for interest rate moving in opposite directions.

4. Monetary Relations in the Euro Area

In this section, we review the development of the relationship between money and prices in the Euro area. First, we look at broad money and inflation since November 1998 onwards. Next, we estimate a long-run money demand function and use it to develop a model for the long-run equilibrium price level. We then show that this model has considerable predictive power for price level movements in the Euro area.

[14] We would like to thank Nigel Jenkinson for suggesting this possible explanation.

4.1. Monetary Developments and Inflation

Measuring money growth is a difficult issue in EMU. The ECB's key monetary aggregate, M3, consists of cash, overnight deposits, deposits with fixed maturities of up to two years, deposits with statutory maturity of up to three months, repurchase agreements of financial institutions, money market fund shares, money market paper, bank certificates of deposit, and short-term obligations of maturities up to two years. Some of these elements are denominated in non-euro currencies, others are traded in secondary markets. These elements are subject to valuation changes as their market prices change. In calculating the monthly growth rate of M3, the ECB purges the monetary data from these valuation changes. The ECB's reasoning behind this is that changes in monetary assets caused by valuation changes rather than transactions do not cause portfolio adjustments and changes in private spending behavior (ECB 2001), and, therefore, have no implications for inflation. The empirical strength of this conjecture, which is not in line with standard portfolio choice models, remains unclear.

A second issue is that the ECB's original aggregate contained liabilities of euro-area financial institutions against non-banks residing outside the euro area. Noting that these liabilities were growing relatively fast from January 2000 onwards, and very much so in early 2001, the ECB decided to redefine its aggregate excluding all liabilities against non-euro area residents. This introduces a potential measurement bias, however, as the relevant liabilities are not statistically measured in all euro-area countries. Unfortunately, the ECB has suppressed the publication of the earlier series, so that an assessment of its claim that this is a more relevant measure of "money" is impossible.

In figure 4, we plot three measures of annual M3 growth rates. All three are adjusted for the reference value of 4.5 percent. Following ECB practice, they are calculated as centered three-month moving averages. The graph labeled "ECB index" is the ECB's official money growth statistic. It shows money growth being roughly in line with the reference value at the start of EMU. The official money growth rate rose continually from the start of EMU to peak about two percent above the reference value in April 2000. This confirms our earlier impression of a too easy stance of monetary policy during 1999 and 2000. The official growth rate fell back to reach the reference value in early 2001. With the renewed easing of monetary policy starting in May 2001, however, money growth accelerated again. Note that money growth accelerated faster in the period between May and September 2001 than afterwards. This is in contrast with popular suggestions that money growth accelerated due

to an increase in the precautionary demand for money following the terrorist attacks of September 11. Money growth as measured by the ECB stood at 7.4 percent in spring of 2002.

The measure of money growth labeled “M3 growth less reference value” is calculated from the end-of-period balance sheet data in the ECB’s monthly report. This series can be calculated only until June 2001 for lack of published data from then on. Between the start of EMU and early 2001, this growth rate is continually above the ECB’s official gauge of money growth. This is to be expected, since the euro tended to depreciate against the dollar during this period and the ECB’s adjustment of monetary figures for exchange rate changes biases the measurement of money growth downwards under such circumstances. Judged on this basis, money growth peaked at 3.5 percent above the reference value and it started to slow down later than shown by the official measure. It reached the reference value in May 2001. One implication is that monetary policy was considerably more expansionary in 1999 – 2000 than the ECB conceded in its own measurement. A second implication is that the amount of monetary tightening – expressed in the decline of money growth rates – applied between April 2000 and May 2001 was considerably larger than the ECB’s own money growth figures revealed. Monetary policy may thus have contributed more to the slowdown of the EMU economy in 2001 than the official figures suggest.

The third measure of money growth, labeled “M3 new” in figure 4, shows growth rates from monthly balance sheet data after taking out liabilities against non-euro area residents. This series was close to the reference value until the ECB’s first interest rate cut in April 1999. It accelerated faster than the original M3 series between April 1999 and April 2000, when it peaked at 6.9 percent, half a percent above the ECB’s official money growth number, but one percent less than the original M3 series. This indicates that deposits held by foreigners did indeed contribute much to the growth of the original M3 series. The growth rate of the new M3 series came down faster than the previous one during 2000, indicating that claims against euro-area financial institutions held by non-euro area residents grew at a faster rate than those held by euro-area residents during that period, too. It falls below the reference value in the first few months of 2001. Like the previous measure, it indicates a stronger monetary tightening during 2000 than the ECB’s official money growth rate. Starting in the Spring of 2001, the growth of the new M3 aggregate accelerated rapidly and it coincides with the growth rate of the ECB official index since the summer of 2001. The similarity with the ECB index is as expected, since this is a period in which the external value

of the euro is flat. Money growth measured in this way accelerated in October and November 2001, which is consistent with portfolio shifts due to the increased political uncertainty. Overall, however, this particular factor did not contribute much to the strong monetary expansion since May 2001.

In figure 4, we also plot the CPI inflation rate in the euro area. Eyeballing suggests a relationship between M3 growth and inflation over time. Inflation in the euro area picked up about six month after money growth started to accelerate in late 1998. Inflation slowed down six to eight months after the peak of money growth in April 2000, and decelerated after money growth had come closer to the reference value. Note that the visual link between money growth and inflation seems considerably weaker for the ECB's measure of money growth than for the two alternatives based on balance sheet data. A renewed revival of inflation in the near future is suggested by the renewed acceleration of money growth. A first impression, therefore, is that there is a link between money growth and inflation in the euro area. In the next section we pursue this issue in more detail.

4.2. Money Demand in the Euro Area

Several empirical studies in the 1990s investigated the existence of a stable long-run money demand function for broad monetary aggregates at the EMU level, see e.g. Browne et al. (1997), Hayo (1999), Fagan and Henry (1999), Coenen and Vega (1999) and Brand and Cassola (2000). Generally, they concluded that the stability of money demand at the level of the monetary union was greater than the stability of national money demand functions. Broad money demand is found to have standard properties, i.e., long-run real income and price level elasticities of unity and a negative and significant elasticity with respect to the yield on alternative financial assets.

We estimate a long-run money demand function for M3 based on a cointegration framework. We use quarterly data from 1981 – 2001 as provided on the ECB's website. Our VAR contains the growth rates of real M3 balances (M3R) and real GDP (Y) and the yield on 10-year government bonds (i) in the euro area. Real M3 is calculated using the seasonally adjusted consumer price index for the euro area. We also include a dummy variable (D90), which is zero before the third quarter of 1990 and one thereafter and which accounts for the level effects of German unification on money and income. The VAR system has one lag for each variable, and the error correction term (ECT) from the cointegrating relationship. The

cointegration rank test and the maximum eigenvalue test both indicate the existence of at most one cointegrating relationship in this data. A maximum likelihood test for the restriction implied by using real M3 balances does not reject the hypothesis. Estimation yields the system reported in Table 3. The error correction term (ECT) is estimated as

$$ECT = 3.9 + \ln(M3R)_t - \ln Y_t + 0.037 i_t , \quad (3)$$

The standard error of the coefficient on the interest rate in the regression from which it is derived is 0.004. The hypothesis of a unit long-run income elasticity of real money demand is not rejected. The estimated relationship can be interpreted as a money demand function. The VAR estimates indicate that real money adjusts negatively to a gap between actual and long-run equilibrium balances. This supports the interpretation of the model as a long-run money demand function. The estimate is practically identical with that obtained by Hayo et al. (2000) who use data covering the period from 1981 to 1999. Our results thus confirm the impression that the long-run money demand function of the euro area is stable. Note also that the velocity of M3 implied by our long-run money demand function exhibits no exogenous trend, and including a trend in our model does not improve the estimate. This is in contrast with the ECB's claim that M3 velocity has a negative trend. That spurious trend is most likely a result of the decline in long-run interest rates over the sample period. Since the ECB adjusts its reference value for M3 growth for the supposed velocity trend, the reference value is biased towards too high money growth.

For a systematic analysis of the relationship between money and inflation, we apply the concept of an equilibrium price level (von Hagen, 1995) or P*-model (Hallman et al., 1991) for the euro area. We solve the money demand function for the equilibrium price level, P_t^* , that would result approximately, if all prices adjusted immediately to current output, money and interest rates in each period.[15]

$$p_t^* = m_t - y^r_t + 0.037\, i_t \quad (4)$$

The equilibrium price-level approach holds that the actual price level adjusts gradually to P* over time. Specifically, the rate of inflation follows the gap between the equilibrium price

[15] P* is only a proxy, since the level of output might be different in the hypothetical equilibrium.

level and the actual price level with a lag. To test this hypothesis, we estimate a model explaining the annualized quarterly change in the CPI price index by its own lag, the change in oil prices, and the lagged gap between the equilibrium and the actual price level:

Column (1) of Table 4 shows the estimate of this model for the period from 1981 to 1998, just before the start of EMU. The model fits the data very well. The Durbin Watson statistic indicates no residual autocorrelation. The estimates show that a one-percent increase in the gap between the equilibrium and the actual price level results in an increase in the quarterly inflation rate by 0.11 percent in the following period. Since the lagged inflation rate is significantly positive in this regression, the model implies that the increase in the price gap feeds into inflation in the following periods, too. CPI inflation also adjusts gradually to changes in oil prices. Column (2) of Table 4 shows the estimate for the same model, but extending the sample period to the end of 2001. The parameters are very stable, suggesting that the relationship did not change with the beginning of EMU. Column (3) of Table 4 presents the same estimate including the output gap as an additional regressor. It shows that the output gap has no additional explanatory power over and above the price gap. In sum, the estimates confirm the visual link between money growth and inflation suggested by Figure 4.

Figure 5 shows that actual, annualized quarterly change in the CPI ("CPI inflation") together with its one-step ahead forecast ("CPI inflation forecast") derived from this model for 1999-2001. In addition, the figure also shows the estimated price gap. The series shown in this figure are centered three-quarter moving averages. The figure indicates that the price gap rose quickly from the first quarter of 1999 through the first quarter of 2000, reflecting the fact that monetary policy was overly expansionary in the first year of EMU. This confirms our earlier discussion. Reflecting the tightening of monetary policy, the price gap fell between mid-2000 and early 2001, and returned to a rapid increase thereafter, Actual and predicted inflation track these movements with a lag and considerable smoothing. The empirical analysis thus indicates that the rising inflation in the euro area in 1999-2000 can be attributed in part at least to the ECB's monetary policy. The temporary increase in actual inflation above the prediction of the model is consistent with the ECB's view that non-monetary factors such as the spike in food prices following the outbreak of hoof and mouth disease in

Europe pushed prices upwards during that period. The widening of the price gap since early 2001 signals that a further inflation potential has been building up in the euro area.[16]

5. Fiscal Policy in EMU

In this section, we consider three issues. First, we review the fiscal consolidations of the EMU member states in the 1990s. We show that the consolidation experiences are very different for different member states. Second, we look at the fiscal performance since the start of EMU. We show that the fiscal strictures did not prevent the reemergence of fiscal laxity. Furthermore, fiscal policy has been procyclical in the first years of EMU and has been driven by electoral considerations after the start of EMU. Third, we show that there are very different patterns of fiscal adjustments. Countries that successfully reduced their debt ratios did so relying predominantly on creating sufficient growth. The data suggest that fiscal policy contributed to that by restructuring spending away from welfare spending and towards public investment. In contrast, countries that relied predominantly on reducing the growth of public debt did not achieve significant reductions in their debt burdens.

5.1. Fiscal Consolidations in the 1990s

In 1992, the EU's average debt ratio was almost 60 percent of GDP – hence the 60 percent limit foreseen in the Maastricht Treaty. This ratio climbed to almost 75 percent in 1997, the year whose fiscal data were the basis for the May 1998 decision which countries could enter the monetary union. Since 1997, the average debt ratio has fallen to 62.8 percent. At a first glance, these data suggest that the political process for fiscal consolidation started with the Maastricht Treaty was rather unsuccessful until the start of EMU.

Several qualifications apply. First, it is important to note that the increase in the average debt ratio was driven mainly by the large debt expansions in five states: Germany (from 44% to 61%), France (from 40 % to 56%), Spain (from 48% to 70%), Italy (from 109% to 124%), and the UK (from 42% to 55%). While Belgium and Luxembourg almost stabilized

[16] Our model closely resembles the price-gap model proposed by Gerlach and Svensson (2001). An important difference, however, is that these authors include a measure of a moving trend inflation as an explanatory variable. This moving trend is calculated for each quarter as the slope of a Hodrick-Prescott filter for inflation. We find that, with our data, we can reproduce the Gerlach and Svensson estimates, if we replace the D90 dummy by the inflation trend. Essentially, the moving trend reproduces the shift in the relationship after 1990. Implicitly, their model thus explains only the deviation of the inflation rate from trend on the basis of the equilibrium price level.

their debt ratios, the Netherlands and Ireland enjoyed falling debt rations during this period. The debt ratios of the other states were stabilized or fell after 1992.[17]

An institutional arrangement relying on enforcement by an external agent such as the European Council and the European Commission presupposes that the internal political processes of a country respond to external pressures. A country's size is probably a first indicator of the importance of an external enforcement body. Small countries typically pay more attention to international organizations than large countries do, and they do more so, the more they receive transfers from these organizations. This would suggest that the EDP works more powerfully in small EU states than in the large states. To assess this proposition, Table 5 reports the changes in the debt-GDP ratios for states whose GDP in 1997 was at least seven percent of EU GDP (large states, Germany, Spain, France, Italy, and the UK), intermediate states, whose GDP is between two and seven percent (Belgium, the Netherlands, Austria, and Sweden) and those, whose GDP was less than two percent of EU GDP (small states, Denmark, Greece, Ireland, Luxembourg, Portugal, and Finland). The combined GDP of the large states is 80 percent of EU GDP, that of the intermediate states 13 percent, and the small states have a combined GDP of 7.7 percent of EU GDP. The table shows that, between 1992 and 1997, the average debt ratio of the small states increased by just 3.3 percent, much less than that of the large states, which rose by almost 19 percent. Between 1997 and 2001, the small states achieved a reduction in their debt ratios by almost 20 percent, much less than the 5.3 percent of the large states. Intermediate states behaved much like small states during this period.

This evidence suggests that the fiscal framework of EMU is more effective in the small than in the large states. But this means that the framework is most effective where it matters the least. After all, a fiscal crisis in a small EMU member state would hardly pose a serious threat to the stability of the common currency. A fiscal crisis in a large state might do that, and the data suggest that the fiscal rules are much less effective in those member states. Recent anecdotal evidence confirms this impression. When the German government came under pressure in early 2002, an election year in Germany, for not complying with its fiscal targets, the German finance minister promised to balance the budget by 2004. This is widely regarded as a commitment that Germany cannot achieve given economic and public

[17] Austria's and Finland's debt ratios increased after 1992, but these countries were not bound by the EDP at the time.

revenue projections. Thus, the incident suggests that Germany expects to get away with making promises that will not be fulfilled. Shortly afterwards, the newly appointed French government announced that France plans to postpone balancing its budget until 2007, three years later than its commitments from the last two years had foreseen, and the Italian government stated a similar intention.

The second qualification is that the observation of fiscal consolidations in some EU states during the 1990s does not mean that these can be attributed to the institutional provisions of the European Treaty. In fact, since most European countries experienced sizeable fiscal expansions during the 1970s and 1980s, a period of consolidation could be expected in the 1990s anyhow. In a study of European fiscal policy in the 1990s, Hughes Hallett, Strauch and von Hagen (2001) consider this argument in more detail. They estimate empirical models explaining the likelihood and duration of fiscal consolidations for all EU countries using data from the 1970s and 1980s. They then use the parameters estimated in this exercise to calculate the probability and the expected duration of fiscal consolidations using 1990s data. The results show that the empirical models predict almost all of the observed consolidations correctly. In other words, given the high debt ratios and the economic environment of the 1990s, the observed consolidations could be expected just by extrapolating the patterns of fiscal performance of EU states in the 1970s and 1980s. This lends little force to the claim that the Maastricht process was important to make the EU countries embark on a process of fiscal consolidation.[18] Hughes Hallett, Strauch and von Hagen find some weak evidence of a "Maastricht effect" increasing the likelihood of fiscal consolidations in the years between 1992 and 1995. However, this effect only increased the likelihood of revenue-based consolidations, which are less likely to last than expenditure-based consolidations. Thus, if the creation of the fiscal framework of the Maastricht Treaty had any positive effect on the governments' willingness to undertake fiscal adjustments, the effect vanished early and its consequences were only short lived.

5.2. Fiscal Performance Since the Start of EMU

Since 1997, the EU countries enjoyed a decline in their debt ratios. With the exception of 2001, the same years, however, were also period of relatively strong growth in Europe. Since the fiscal performance is measured in terms of debt and surplus ratios relative

to GDP, it is not clear to what extent the observed reductions in government debt and deficit ratios can be attributed to government policy as opposed to windfall gains from strong economic growth. In this section, we assess the recent performance trying to separate policy from the effects of growth.

Separating the two requires some assumption about the contribution of growth to the deficit ratio. To do this, we use a simple method of growth accounting. For each year, we estimate the change in the government surplus ratio due to economic growth and a "neutral" policy. Subtracting the two from the observed change in the surplus ratio gives us an estimate of the active policy stance. [19] Let the primary surplus ratio, s_t , be

$$s_t = \frac{R_t - G_t}{Y_t} = (r_t - g_t), \tag{5}$$

where R denotes government revenues, G non-interest government spending, and Y GDP. The change in this ratio over time then is

$$\Delta s_t = \frac{\Delta R_t - \Delta G_t}{Y_{t-1}} - \frac{\Delta Y_t}{Y_{t-1}}(r_t - g_t), \tag{6}$$

where r=R/Y, and g=G/Y. We define a "neutral" fiscal policy as one that keeps the average tax rate, r, and the ratio of government spending to trend GDP constant. With this definition, the contribution of the neutral policy to the change in the surplus ratio is

$$\Delta s_t^N = \frac{\Delta Y_t}{Y_{t-1}} r_{t-1} - \left(\frac{\Delta Y}{Y}\right)^{trend} g_{t-t}. \tag{7}$$

The contribution of the business cycle to the change in the surplus ratio is defined as

$$\Delta s_t^G = g_t \left[\frac{\Delta Y_t}{Y_{t-1}} - \left(\frac{\Delta Y}{Y}\right)^{trend}\right]. \tag{8}$$

This is the change that would occur in addition to the neutral change, if the government simply allowed economic growth above or below trend to change the

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[18] An intriguing interpretation is that the governments wrote fiscal goals into the European Treaty that they were willing to try to achieve anyway.

[19] Alternatively, one might use the OECD's cyclically adjusted budget balance and the OECD's estimates of changes in structural balances. These estimates, however, are based elsticities derived from past data and policies. If the 1990s indeed brought a change in the fiscal policy regime in Europe, they could be quite misleading.

expenditure ratio. We estimate the trend growth rate as the average real growth rate during the 1990s. We obtain the policy-induced change in the surplus ratio as

$$\Delta s_t^P = \Delta s_t - \Delta s_t^N - \Delta s_t^G. \quad (9)$$

This is our indicator of fiscal policy stance, since it measures the contribution of any discretionary policy actions to observed changes in the surplus ratio. Table 6 has our calculations for the years from 1998 to 2001. Columns labeled "observed" give the raw changes in surplus ratios, while columns labeled "policy" give the estimated policy stance from equation (9). Since the decision on EMU membership was taken in 1998 on the basis of fiscal data for 1997, 1998 was the first year after 1992 in which the governments of the EMU member states were no longer under the risk of not making it into the monetary union due to excessively lax fiscal policies. In the table, a negative number indicates a fiscal expansion, a positive number a fiscal contraction.[20]

The table bears a number of interesting observations. The first is that the contribution of economic growth to the surplus ratios is large enough to hide the true policy stance in many cases. For example, France and Spain experienced rising observed surplus ratios in 1998, while their policy stance was actually expansionary. On average, the EMU surplus ratio remained unchanged in 1998 and 2000, while the weighted average policy stance was negative. In 2001, the observed change in the surplus ratio was negative in most countries and on average in the EMU, reflecting the weak economic growth in that year.

The second, interesting observation is that "consolidation fatigue" – the loss of political interest in pursuing further consolidations - emerged in many countries in the first year after the threat of not making it to EMU membership had disappeared. The (non-weighted) average fiscal impulse among the EMU member countries in 1998 was –1.0 percent of GDP, with a standard deviation of the mean of 0.25. This compares to an average fiscal impulse in all other country-years of –0.5 percent of GDP with a standard deviation of 0.19. The t-test rejects the Null hypothesis of equal means, which indicates that the 1998 fiscal impulses were significantly more expansionary among the EMU member states. Thus, these countries used the first opportunity to relax fiscal policies, and this although 1998 was a year of relatively strong economic growth. Interestingly, the countries that did not join EMU

[20] See Hughes Hallett, Strauch, and von Hagen (2000), and Hallerberg, Strauch and von Hagen (2001, 2002) for similar calculations and results.

in 1999, Denmark, Greece, Sweden, and the UK all maintained tight or contractionary fiscal policies in 1998.

The third observation from this table is a tendency for fiscal policy to be procyclical in the EMU.[21] While the trend growth rate over the 1990s was two percent for the EMU, the actual growth rates were 2.9 percent, 2.6 percent, 3.4 percent, and 1.6 percent during 1998-2001. Thus, the two years with the strongest economic expansions also saw the largest fiscal expansions, while the two years with less growth saw a more or less neutral policy. Furthermore, Belgium, Austria, Denmark, and Sweden all switched from a fiscal expansion in 2000 to a fiscal contraction in 2001, while Germany, Spain, France, Italy, and Portugal went from a fiscal expansion in 2000 to a more or less neutral policy in 2001. Only Greece, Ireland, Luxembourg, the Netherlands, and Finland managed to achieve a countercyclical fiscal impulse in the face of the incipient recession. The tendency to behave in a procyclical way may indeed be a result of a fiscal policy that relaxes in times of strong economic growth and tightens in times of recession for fear of hitting the limits set by the EDP and the SGP. This tendency could be caused by the fact that the fiscal criteria of the EDP and the SGP are related to raw surplus ratios unadjusted for cyclical effects.

A fourth observation emerges from considering the election dates in European countries in recent years. If governments use fiscal policies to improve their chances for reelection, one should expect fiscal expansions in the year preceding the election. Table 7 indicates which years were pre-election years in which EU country. Here we count both parliamentary and presidential elections where applicable.

Collecting the data from these country-cases, we find that the (unweighted) average fiscal impulse in pre-election years is –0.88 percent of GDP, with a standard deviation of the mean of 0.25. The average fiscal impulse in all other country-year cases is –0.49 percent of GDP with a standard deviation of the mean of 0.2. The t-test for the difference between the two averages is t=-2.5, which is significant at conventional levels. Thus, the data indicate that the fiscal strictures of the EDP and the SGP do not prevent governments from using fiscal policies to pursue electoral interests. Our estimates confirm similar results in Hallerberg, Strauch and von Hagen (2001), who use a somewhat different methodology.

[21] Such a tendency was also noted by the European Commission (2000). Buti et al. (1998) show that procyclicality is a property of EU fiscal policies already in the 1980s.

5.3. Patterns of Fiscal Adjustment in EMU

A rapidly growing literature has recently shown that the success of fiscal consolidations depends critically on the form of the budgetary adjustments undertaken. In this literature, success typically refers to the longevity of the fiscal consolidation: Consolidations are deemed successful, if the reduction in the public sector deficit ratio does not vanish soon.[22] A key finding of this line of research is that consolidations are more likely to be successful, if they rely primarily on spending cuts rather than raising additional revenues. Within the broad category of spending, cuts in transfers and public sector wages make consolidations more likely to be successful, while cuts investment spending reduce the likelihood of success. Such results, which have been confirmed for very different time periods and groups of countries, can be interpreted as saying that consolidations are more likely to be successful if the governments are willing to address sensitive political issues and choices.

A related issue on the European agenda is the call for an improvement of the "quality" of public finances first formulated by the European Council of Lisbon in 2000. Without defining precisely what the "quality" of public finances means, the Council recognized that the structure of public spending and taxation has important consequences for economic growth and called upon the EU member states to aim at a more growth-friendly structure of public finances. Endogenous growth theory broadly suggests that a shift from taxing factor incomes to taxing consumption and a shift from public consumption and transfer spending to public investment has positive growth effects (Aghion and Howitt, 1998). Empirical results in this area are mixed, but they suggest that fiscal policies do have effects on growth.[23]

Thus, the pattern of fiscal adjustment matters from a macro economic perspective. Subsequently, we characterize the fiscal policies of EMU member states to assess the strength of this conjecture. We do this with a series of cross section regressions focusing on the period since 1997. All data are taken from the Spring 2002 Statistical Appendix of European Economy, published by the European Commission. While the cross sections have

[22] e.g. Perotti et al. (1998); Strauch and von Hagen (2001); von Hagen, Hughes Hallett and Strauch (2002)

[23] see Cashin (1995), Tanzi and Zee (1997), Gerson (1997), Fölster et al. (1999), Kneller et al. (1999), Kneller (2000), and Gemmel and Kneller (2002).

obvious data limitations, the following bits of evidence add up to a picture that underscores the importance of the structure of fiscal adjustments more generally. [24]

We start by noting that the fiscal rules of the EDP and SGP focus on a reference value for public debt relative to GDP. For countries with ratios exceeding the critical limit, there are two ways to reduce it, by slowing down the growth of nominal debt or by speeding up the growth of GDP. Since inflation is no longer under the control of domestic monetary policy, the latter is equivalent to speeding up real GDP growth. A first question we look at considers the choice of the EMU government between these two options.

Let d = B/Y be the ratio of public debt, B, to GDP, Y. The relative contribution of growth in public debt and growth in real GDP to the change in this ratio in country i can be written as

$$C_i = 100\left(\frac{1+b_i}{1+g_i} - 1\right), \tag{10}$$

where b is the growth rate of nominal debt and g is the growth rate of real GDP. If $C_i > 0$, the growth of public debt contributed more to the change in the debt ratio than the growth of real GDP, otherwise, real GDP growth dominated.

Figure 6 shows a plot of C_i against the real growth rates of the EU countries for two time periods, 1992-97 and 1997 – 2001. Positive values on the x-axis indicate that the change in the debt ratio during the period considered was due to growth rates of public debt in excess of the growth rate of real GDP. This was true in almost all EU countries in the first period. In contrast, public debt grew less than real GDP in all countries since 1997. Significantly, the figure also shows a strong correlation between the average real GDP growth rate over the post-1997 period and the relative contribution of GDP growth to the change in the debt ratio. Such a relationship did not exist in the first half of the 1990s.

Figure 7 gives a plot of the relative contributions of debt and real GDP growth against the change in the debt ratio during the period under consideration. In the earlier period, when debt ratios increase, this was due to debt growing much faster than real GDP. In the later years, however, the pattern is reversed. Countries that achieved a large decline in the debt ratio are countries that achieved high real GDP growth rates relative to the growth rate of debt over this period. Countries that achieved little real growth relative to debt growth also

[24] To facilitate reading the following figures, note that an R-square of 0.20 in the following regressions corresponds to the 10 percent critical value, and an R-square of 0.26 to the five percent

did not manage to reduce their debt ratios significantly. The figure thus suggests that a successful strategy to reduce the debt ratio is one that focuses on growing out of the debt burden rather than one that focuses on slowing down the growth rate of debt while neglecting economic growth. Taking figures 6 and 7 together, a clear message emerges. Without reviving economic growth, a significant reduction in the debt burden is unlikely. Taking the two periods together, another message is that rising debt burdens come from a lack of control over public sector debt. But to reduce an excessive debt burden, controlling debt is only a necessary condition. Without reviving economic growth, a significant decline in the debt burden seems unlikely. This suggests that the fiscal framework of EMU is ill conceived. The focus on deficits and debt growth alone would be justified if EMU had started in a period in which public debt burdens could be regarded as compatible with long run equilibrium. Given that a reduction in the debt burden is necessary particularly in the large countries, the policy framework pays too little attention to the role of economic growth in achieving sustainable public finances.

Next, we turn to public sector revenues and spending. In figure 8, we look at the relative contributions of debt and real GDP growth to changes in the debt ratio together with the changes in a number of fiscal indicators. In this figure, “revenue” and “total spending” refers to the ratios of public sector revenues and expenditures to GDP; “social transfers” and “investment” relates to the shares of transfers to households and total capital expenditures in total spending. The figure plots the changes in these indicators over the 1997-2001 period for the EU countries. The figure shows, first, that countries where expenditure and revenue ratios fell during this period are countries that achieved a larger contribution of economic growth to the change in the debt ratio, hence a larger reduction in the debt ratio. The R-squares indicate that these relations are statistically significant. Importantly, this suggests that a strategy of raising tax rates to increase revenues is unlikely to succeed in reducing an excessive debt burden, because it slows down economic growth. This is the German predicament of fiscal policy after 1994. Repeated increases in tax rates only resulted in ever less growth, with the result that Germany did not manage to get close to budget balance nor to reduce its debt burden sufficiently.[25]

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critical value of the F-distribution of a test for statistical significance.

[25] For a detailed account of German fiscal policy in the 1990s see Strauch and von Hagen (1999).

The same figure also points to a critical role of investment spending and spending on social transfers. Countries that increased the share of investment spending tended to achieve a stronger contribution of GDP growth to the reduction in the debt burden, while the opposite is true for countries that increased the share of social transfers in total spending. We look at this issue n more detail below.

In Figure 9, we look at the tax burden and the composition of revenues. The figure plots the change in the tax burden and the change in the share of direct taxes in total revenues against the growth rate of real GDP. Direct taxes include social security charges on labor. We take direct taxes as rough proxies for the average tax rate on factor incomes. The figure shows that an increasing share of taxes on factor incomes goes along with a falling growth rate in this sample. Furthermore, a higher total tax burden in the economy goes along with a lower growth rate. Figure 10 supports this impression by plotting the change in the tax burden and the change in the share of direct taxes in total revenues against growth rate of real GDP over the 1997-2001. The statistical relation is weaker, but this may be due to a nonlinearity that is still compatible with a negative relationship between these two variables and economic growth. In sum, the evidence suggests that reducing tax burdens and shifting revenues from taxes on factor incomes to, say, consumption, helps to achieve higher growth rates. While this is admittedly painted with a broad brush only, it is also consistent with growth theory and the evidence from larger studies of tax policy and growth.

In Figure 11, we look at the composition of total government spending in connection with the average real GDP growth rate of the EU countries in 1997-2001. The figure shows a strong association of higher shares of public investment and real GDP growth. Clearly, this correlation must be regarded with some caution, as public investment is a notoriously vague concept in practice. Furthermore, the direction of causality might be that countries having exogenously low growth rates cut public investment first, as political opposition against cutting transfer spending is more powerful than political opposition against cutting spending on public infrastructure etc. In fact, such political economy effects may be particularly large under the conditions of the EDP and the SGP, when governments are forced to cut public spending quickly to avoid violating the numerical constraints. Still, one would have to assume that public investment has no positive effect on growth at all to argue that this would not eventually lead to lower growth rates. The same figure also suggests that higher shares of transfer spending in total spending go together with lower rates of growth, although this relation is only marginally statistically significant.

Figure 12 supports the impression from the previous graph by looking at the change in the shares of these two categories in total spending during the 1997 to 2001 period and the growth rate of real GDP. Here, we see that countries increasing the share of public investment enjoyed higher growth rates, while countries increasing the share of welfare spending realized weaker growth. Both relations are only marginally significant, however.

Finally, in Figure 13 we look at the correlation between fiscal consolidation and real GDP growth. We do this by plotting the growth rate of public debt together with the growth rate of real GDP for the two time periods, 1992-97 and 1997-2001. The figure and the two regressions indicate that there is no significant correlation between these two. High growth rates of public debt in the early period apparently did nothing to stimulate economic growth, and lower growth rates in the latter period did not reduce growth. Nor does the figure give much credence to the concept of "non-Keynesian" effects of fiscal consolidations, i.e., the notion that a reduction in public debt would have positive growth effects by stimulating private investment and consumption (Giavazzi and Pagano, 1990). Such effects would lead us to expect higher growth rates for those countries where public debt actually shrank in the period under consideration. Obviously, the present bivariate framework is not sufficient to achieve a strong conclusion on this matter. Nevertheless, it is in line with the results from a larger econometric model presented in Hughes Hallett, Strauch and von Hagen (2001), which do not indicate "non-Keynesian" effects of the fiscal consolidations in Europe in the past decade. In passing, we note that our evidence here points to a methodological problem of earlier studies of such effects. Specifically, most studies identify fiscal consolidations as periods of significant reductions in public debt or deficit ratios, and "non-Keynesian" effects as episodes where consolidations go along with vigorous economic growth. The European experience suggests that such episodes may have more to do with policies that succeeded in stimulating growth by restructuring public spending and taxation and reducing tax burdens than with a reduction in public debt or deficits.

We can summarize the evidence from this section by pointing out the emergence of two alternative strategies of fiscal adjustment in EMU, represented most clearly by two groups of countries (See Table 8). On the one hand, there is a low-growth group of countries consisting of Germany, France, Italy and Austria. On the other hand, there is a high-growth group consisting of Ireland, Finland, Spain, and Greece. Low-growth countries have relied relatively much on stabilizing the growth of public sector debt to achieve the targets under the SGP, while high-growth countries have relied mainly on achieving strong economic

growth. Clearly, the second group has been much more successful in moving towards sustainable public finances than the first group. The first group is also characterized by relatively small achievements in reducing tax burdens and by low and stable ratios of public investment. In contrast, the high-growth group, with the exception of Greece, has reduced their tax burdens and shifted government spending from welfare to public investment. Among the remaining countries, the Netherlands achieved an average growth rate of 5.3 percent and reduced its debt burden by almost 21 percent, relying much more strongly on growth than the low-growth group. Belgium, with a real growth rate of 3.9 percent and a reduction in the debt ratio of 23.4 percent follows a similar pattern. Portugal is more exceptional, as it achieved a relatively high growth rate of 5.3 percent, but reduced its debt ratio by no more than 8 percent.

Finally, it is interesting to observe that the non-EMU countries, Denmark, Sweden, and the UK look much more like the high-growth group in EMU during this period of time. The two Scandinavian countries in this group, however, reduced the share of public investment in total spending.

Do these results matter for EMU? After all, one might argue that the stability of the common currency depends only on the stability of public sector debt ratios. How this stability is achieved, might be left to the choice of the individual member states. The subsidiarity principle of the Treaty on European Union would then suggest that the EU should not interfere with these choices.

There are, however, at least two counterarguments to this. The first is that, if Europeans truly believe that public debt ratios must be low and sustainable, success in achieving this matters and is a valid concern for the Union. From this perspective, the current fiscal framework is incomplete, because it does not give EMU member states enough guidance for the choice of a successful fiscal strategy. Countries should be encouraged to adopt more growth-friendly policies by restructuring their tax and expenditure systems.

Second, it is necessary to recognize that EMU did not start under conditions of a long-run equilibrium as far as public finances are concerned. The low growth rates in Germany, France, and Italy in particular are the result of overregulated economies plagued by high tax burdens and welfare systems that discourage employment. The narrow focus of the EDP and the SGP on annual deficits, however, may keep governments from adopting reform policies that might result in larger deficits initially before the desired growth and employment effects kick in. If so, the current design of the fiscal strictures risks keeping

these countries in a state of low-growth with insufficient progress also as regards the reduction of debts and deficits. One may reasonably doubt that these large EMU states will continue to tolerate such a scenario, which is perceived as keeping them from adopting better economic policies for the sake of some fiscal targets imposed by the EU. The recent episodes involving France and Germany clearly indicate that they will not. But if the outcome were that these countries simply begin to ignore the goals of the EDP and the SGP, other states would follow and the fiscal framework of EMU would fall apart. A redesign of this framework to account for the circumstances of the large states seems necessary to avoid such a development.

6. Conclusions

In this paper, we have reviewed the monetary and fiscal policy experiences of the new monetary union in Europe in its first few years. On the monetary side, the experience is encouraging so far. Long run monetary relations continue to be stable, and a focus of monetary policy on monetary developments is justified from the data. Still, 2002 will be the third year in which inflation in the euro area is above the ECB's two-percent threshold above which price stability does not prevail. This suggests that the ECB's policy was not sufficiently tight particularly in its first year, and that it should pay more attention to the developments under the "First Pillar" of its strategy. In line with the ECB's (and our) interpretation of its strategy, what we mean by this is not that the ECB should blindly pursue a numerical target for M3 growth. It should, however, increase the weight of the implications for future inflation in its current decisions and reduce the weight given to the short-run considerations arising from the Second Pillar.

On the fiscal side, the picture is more mixed. The fiscal rules created by the EMU seem to be more effective where they matter less, namely in the small states. They did not keep EMU states from relaxing fiscal discipline after the critical decision on EMU membership had been made, nor from using fiscal policies for electoral purposes. There is also a tendency for fiscal policy to be pro-cyclical. Patterns of fiscal adjustment in recent years show that sustainable public finances need fiscal policies that stimulate and maintain sufficiently high long-run growth rates. The fiscal framework needs further improvements taking this insight into account.

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Table 1: ECB Interest Rate Policy

Date	Interest Rate	Date	Interest Rate
01/01/99	3.00	06/09/00	4.25
04/09/99	2.50	09/01/00	4.50
11/05/99	3.00	10/06/00	4.75
02/02/00	3.25	05/11/01	4.50
03/17/00	3.50	08/31/01	4.25
04/28/00	3.75	09/18/01	3.75
		11/09/01	3.25

Source: ECB, Monthly Reports

Table 2: Estimated Interest Rate Rules

	(1)	(2)
Constant	0.03 (0.22)	-0.31 (-1.65)
D-F	0.13 (2.58)	
$D\text{-}F_{+6}$		0.15 (3.48)
Lagged main rate	0.85 (14.33)	0.91 (21.75)
Standard deviation	0.19	0.19
ρ	0.24	0.1
R^2	0.94	0.95
Observations	43	37

Note: ρ is the first-order residual autocorrelation. Numbers in parentheses are t-ratios.

Table 3: VAR Estimates

Dependent Variable	Regressor						
	ΔM3R	ΔY	Δi	ECT	C	D90	R^2
ΔM3R	0.26 (0.10)	0.14 (0.11)	-0.0001 (0.002)	-0.03 (0.01)	0.006 (0.0013)	0.023 (0.005)	0.38
ΔY	0.14 (0.10)	-0.14 (0.12)	0.004 (0.002)	-0.04 (0.01)	0.008 (0.001)	0.005 (0.005)	0.19
ΔI	2.50 (6.48)	9.10 (7.48)	0.48 (0.10)	-1.16 (0.79)	-0.14 (0.08)	0.18 (0.52)	0.33

Note: Numbers in parentheses are standard errors

Table 4: A Model for the Euro-Area Inflation Rate

	(1)	(2)	(3)
Time period	1981:3-1998:4	1981:3-2001:4	1981:3-2001:4
Constant	1.89 (0.48)	1.89 (0.44)	1.92 (0.45)
ΔP_{t-1}	0.61 (0.09)	0.60 (0.08)	0.60 (0.08)
$P^{*}_{t-1}-P_{t-1}$	0.11 (0.04)	0.09 (0.03)	0.09 (0.03)
$\Delta p_{oil,t}$	0.006 (0.002)	0.007 (0.002)	0.007 (0.002)
D90	-1.21 (0.39)	-1.03 (0.22)	-1.07 (0.32)
YGAP			0.14 (0.13)
Adj. R^2	0.85	0.81	0.82
DW	2.3	2.3	2.3
F test (joint)	89.8	81.2	65.5

Note: Standard errors in parentheses.

Table 5: Country Size and Government Debt in the 1990s

Change in Debt Ratio (percent)	All EU Countries	Large States	Intermediate States	Small States
1992-1997	15.8	18.8	4.1	3.3
1997-2001	-12.0	-5.3	-18.2	-19.8

Note: Data source is European Economy Statistical Appendix Spring 2002, published by the European commission DG ECFIN.

Table 6: Fiscal Policy Stance 1998-2001

Country	1998		1999		2000		2001	
	Observed	Policy	Observed	Policy	Observed	Policy	Observed	Policy
B	0.7	0.5	-0.3	-1.3	0.4	-1.5	-0.1	0.8
D	0.5	0.4	0.6	0.7	0.0	-1.1	-1.5	-0.4
EL	1.1	0.2	0.9	-0.2	0.6	-1.1	0.1	-1.6
E	0.1	-1.2	0.8	-0.4	0.4	-0.9	0.2	0.0
F	0.2	-1.4	0.8	-0.3	0.2	-1.2	-0.1	-0.3
IRL	0.4	-1.0	-1.0	-3.8	1.9	-1.4	-3.4	-3.5
I	-1.5	-1.8	-0.2	-0.3	-0.3	-1.5	0.2	0.0
L	0.3	-0.5	0.6	-0.4	1.9	-0.4	-0.7	-1.0
NL	0.0	-1.4	0.8	0.0	0.5	-0.2	-1.8	-0.4
A	-0.6	-1.9	-0.1	-0.6	0.7	-0.0	1.4	2.6
P	-0.5	-1.9	-0.2	-0.7	0.4	-0.1	-1.0	-0.2
FIN	2.2	-1.3	0.1	-2.1	4.8	1.1	-2.2	-1.0
DK	0.4	0.0	1.3	1.2	-1.1	-2.0	0.4	1.7
S	2.8	0.6	-1.4	-4.7	1.6	-0.6	0.3	0.8
UK	2.5	1.9	0.1	0.2	0.3	-0.3	-1.0	-1.0
EMU	0.0	-0.9	0.5	-0.1	0.0	-1.4	-0.4	-0.1

Note: Raw data are from *European Economy Statistical Appendix* (Spring 2002), European Commission, DG ECFIN

Table 7: Pre-election Years in EMU

Pre-election Year	1998	1999	2000	2001
Country	Austria, Belgium, Finland, Portugal Luxembourg	Spain, Finland, Greece	Denmark, Italy, Portugal, UK	Germany, France, Portugal, Sweden Netherlands, Ireland

Note: Source: www.electionworld.org

Table 8: Patterns of Fiscal Adjustment, 1997-2001

	Average Real Growth	Change in B/Y	Relative Contribution of Debt and GDP Growth	Change in Share of Transfers	Change in Share of Investment
Low Growth	2.8	-6.8	-7.6	0.6	0.8
D	2.3	-2.5	-4.0	0.0	0.7
F	2.3	-3.9	-6.4	0.2	0.5
I	3.1	-16.2	-12.9	1.0	0.4
A	3.3	-4.7	-7.0	0.6	1.4
High Growth	7.8	21.8	28.2	-1.5	4.0
Ire	12.6	-38.5	-51.3	-2.8	6.0
SF	6.2	-15.2	-25.5	-1.4	0.4
EL	6.7	-20.0	-16.7	-1.1	8.4
E	5.6	-13.6	-19.3	-0.7	1.2
Non-EMU	4.0	-18.3	28.3	-0.3	-0.3
DK	3.4	-19.9	-30.3	-0.9	-0.5
S	4.3	-19.9	-26.3	0.6	-0.6
UK	4.4	-15.1	-27.8	-0.6	0.8

Source: Raw data are taken from European Economy Statistical Appendix Spring 2002, EU Commission, Brussels

Figure 1: Taylor rule and Interest Rates

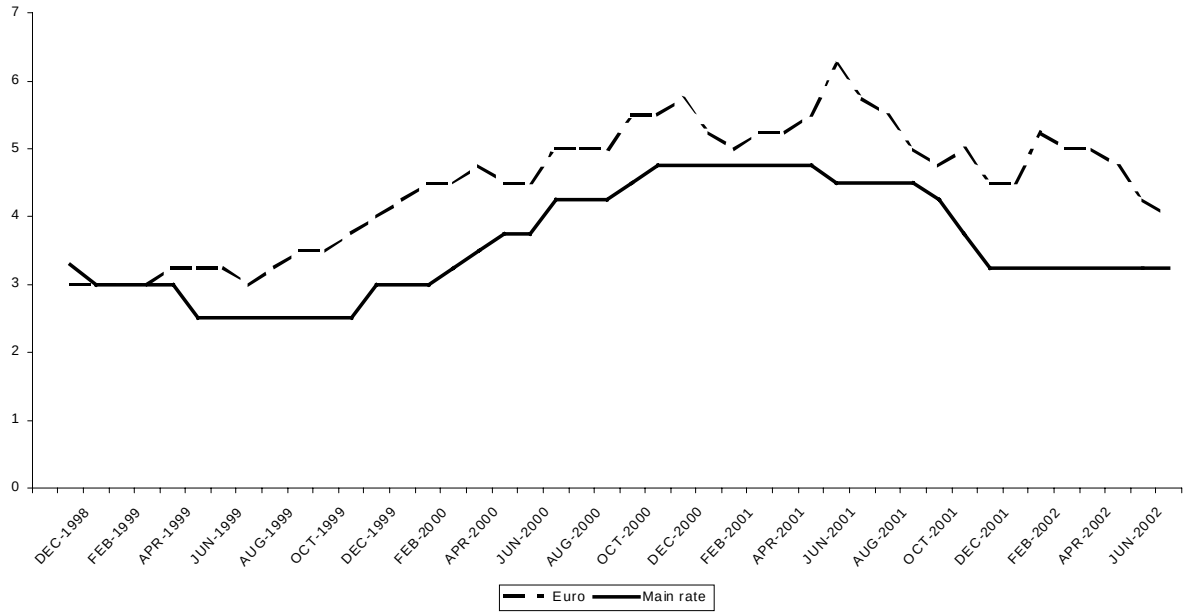

Figure 2: Taylor rules based on Core inflation

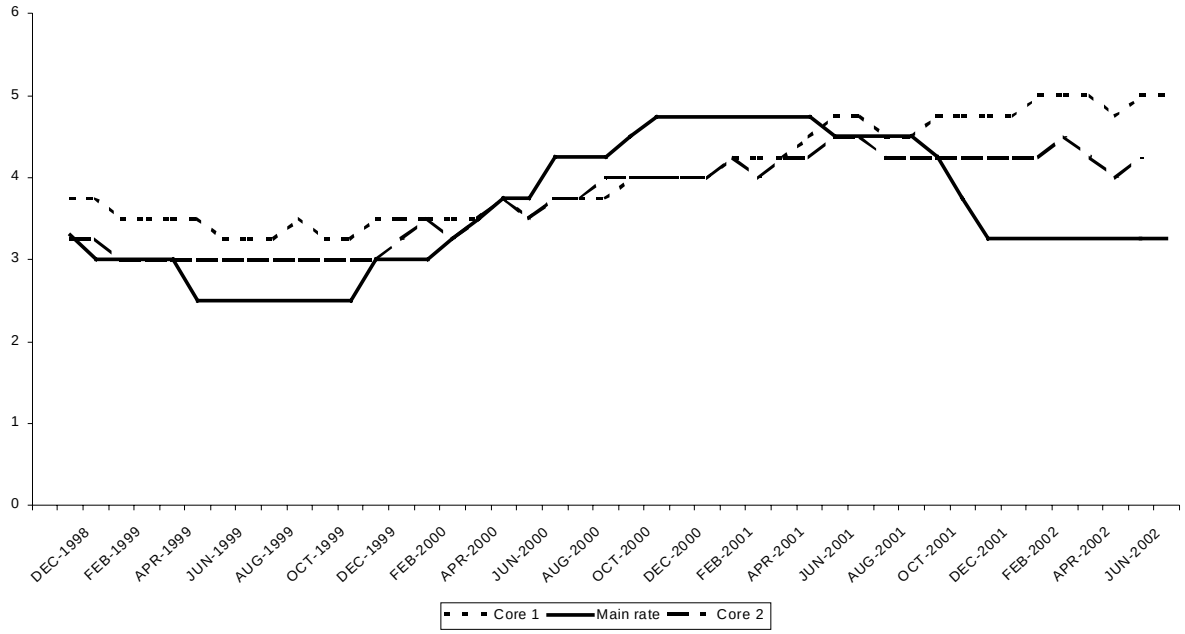

Figure 3: Taylor rules III

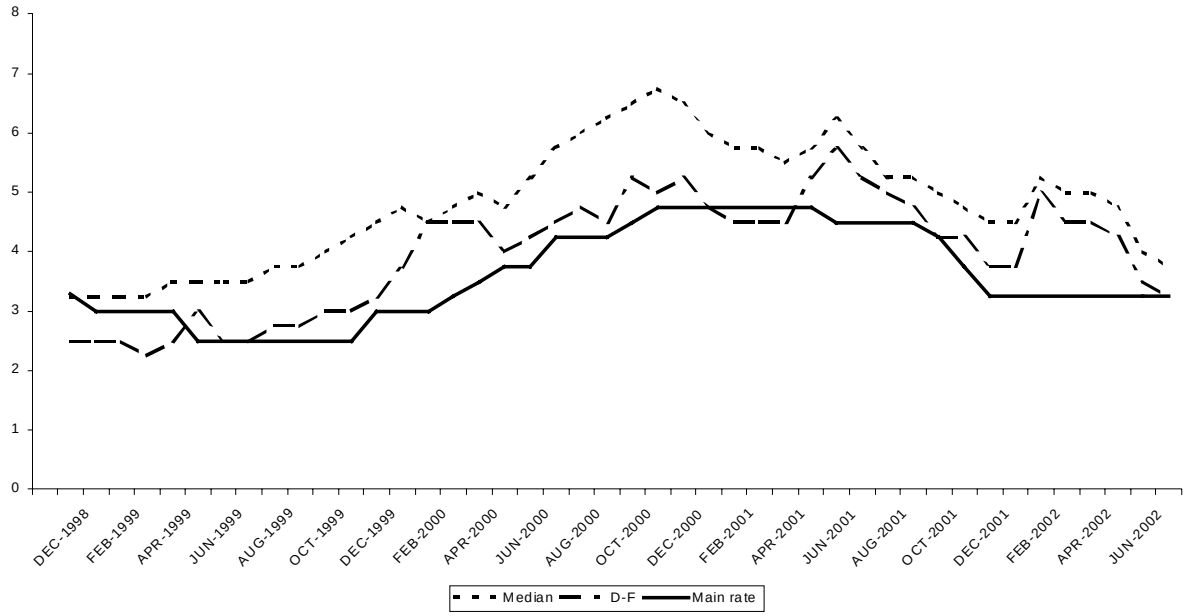

Figure 4: Money Growth and Inflation

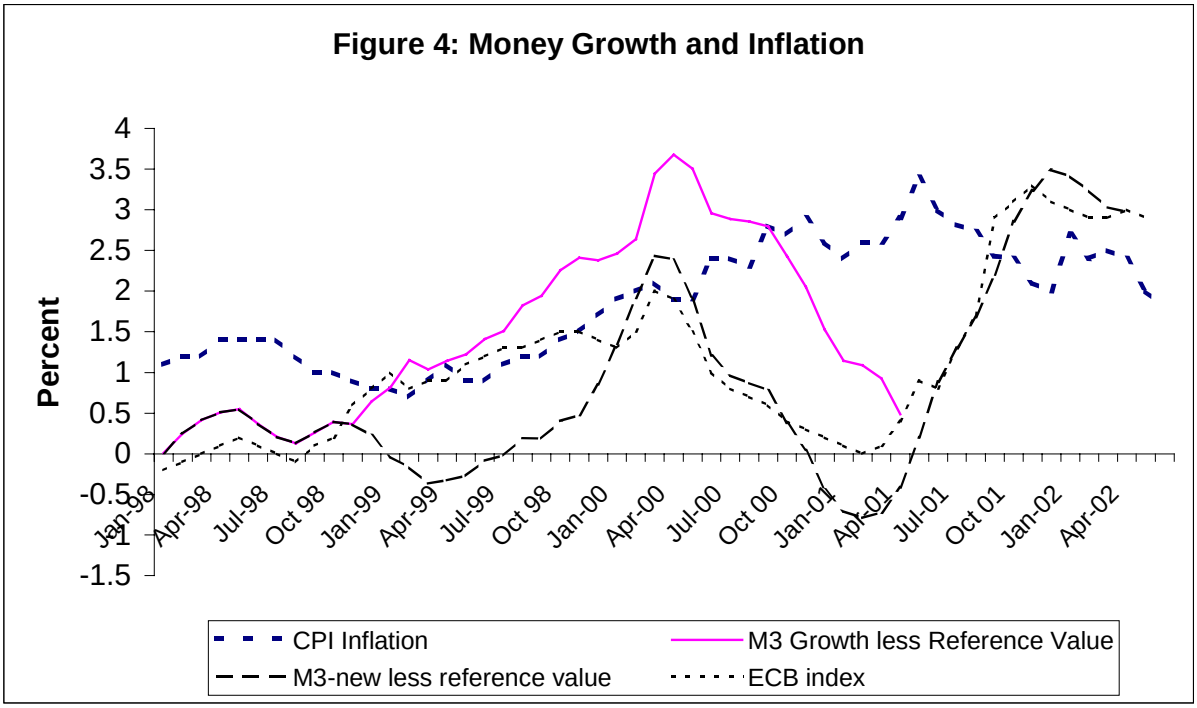

Figure 5: Inflation and the Price Gap

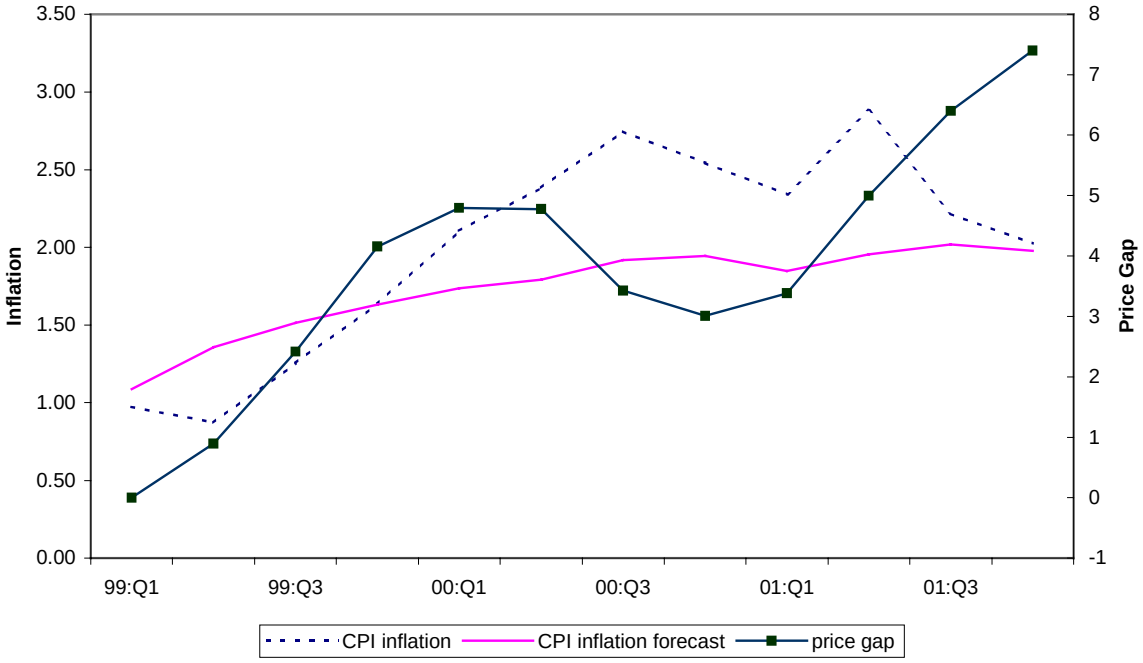

Figure 6: Fiscal Adjustment

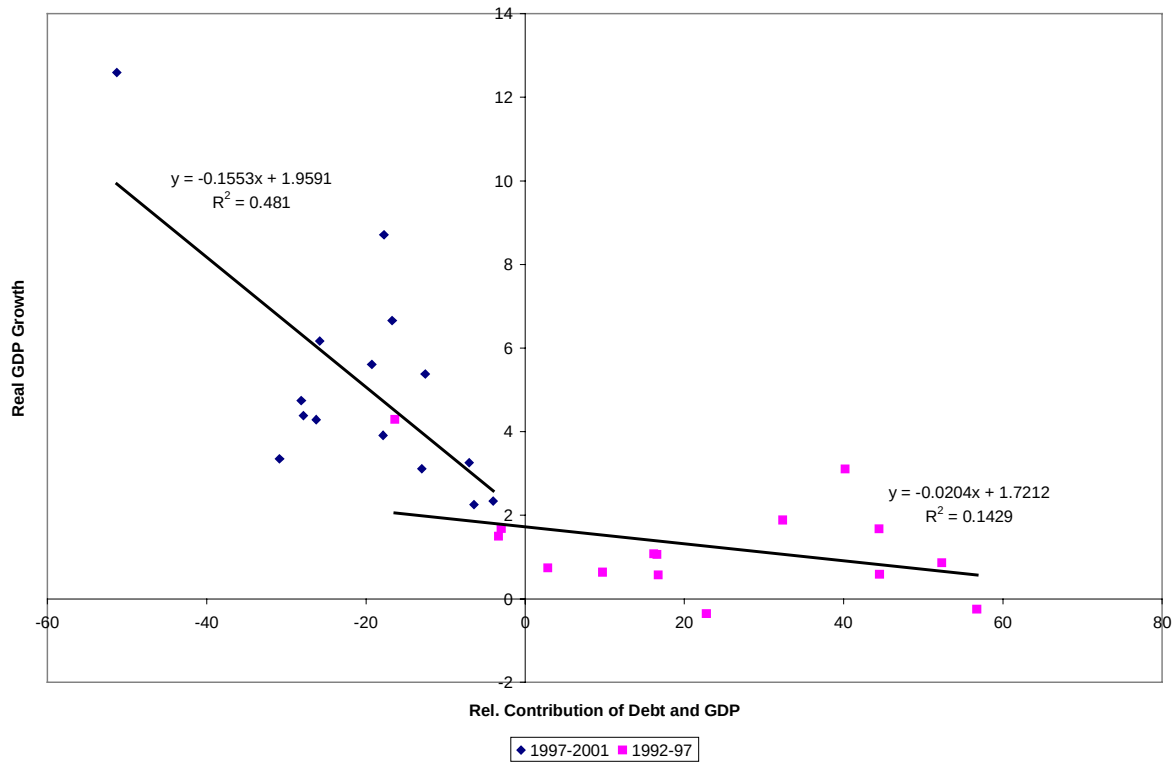

Figure 7: Change in Debt Ratio

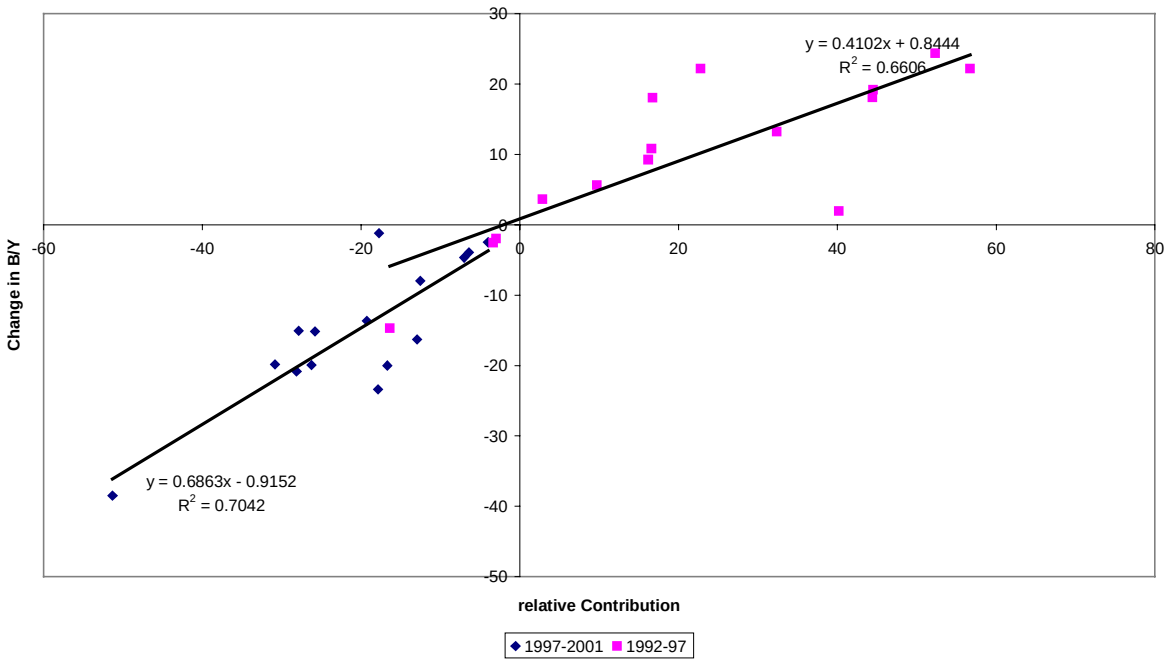

Figure 8: Fiscal Adjustments

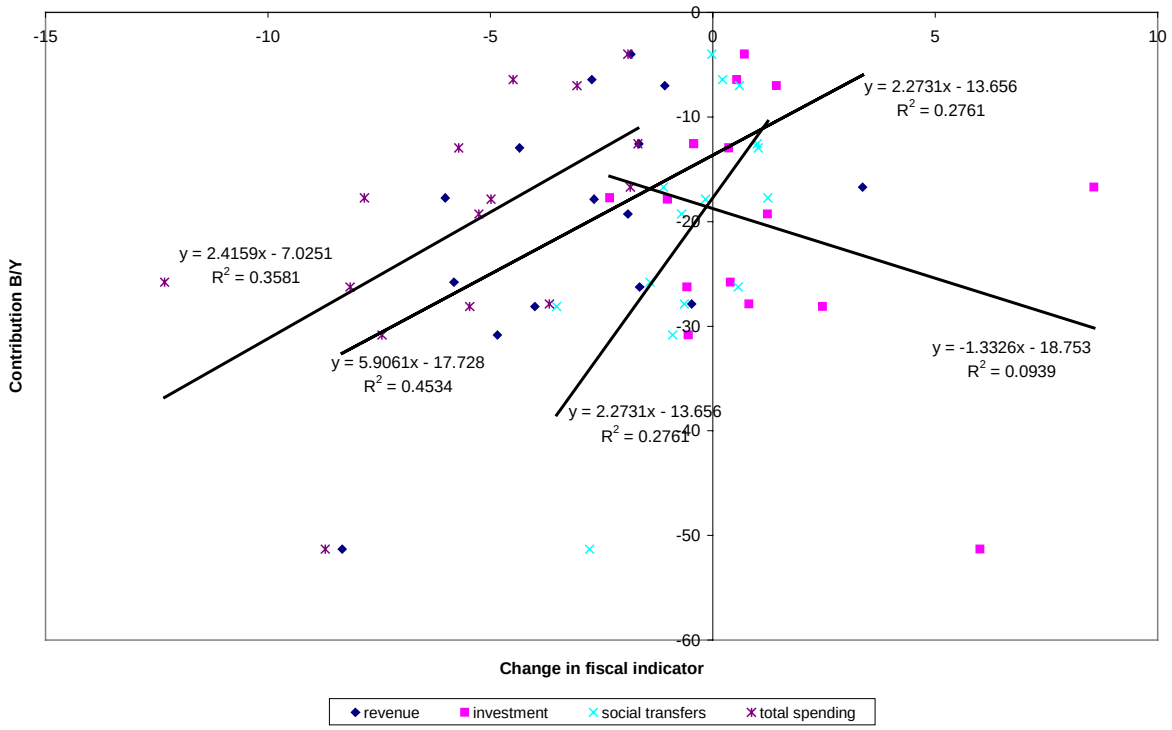

Figure 9: Revenue Structure

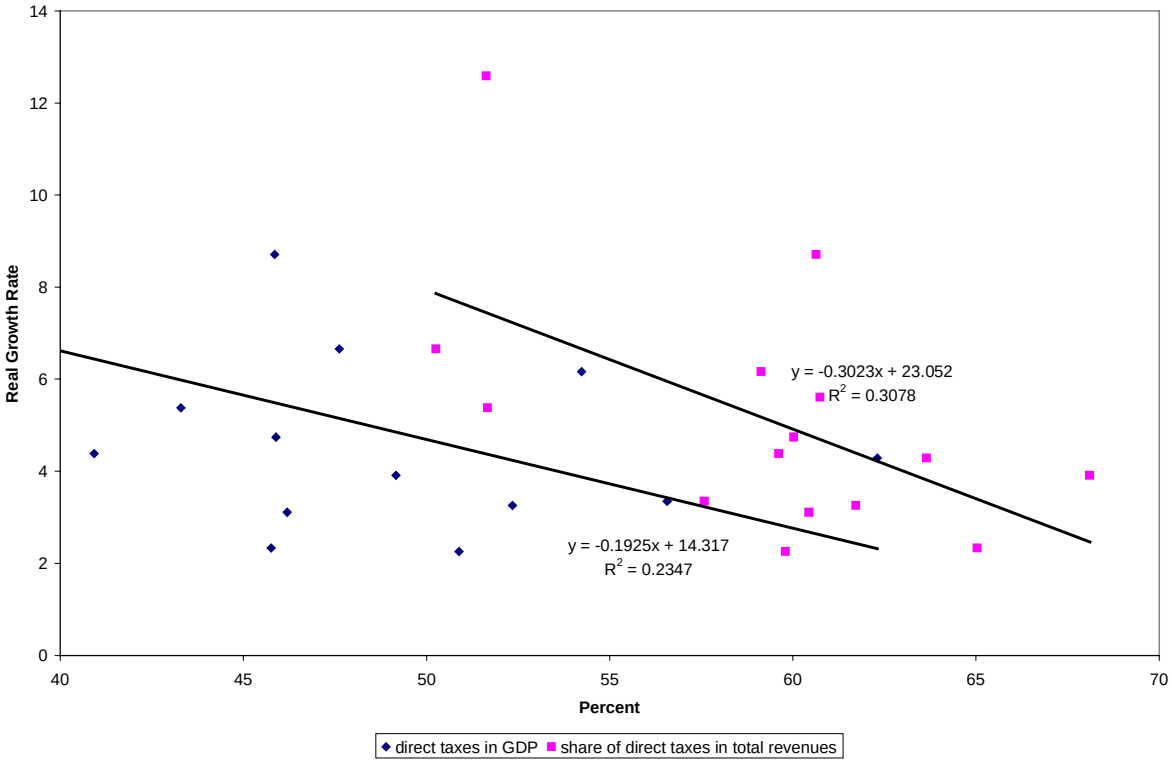

Figure 10: Revenue Adjustment

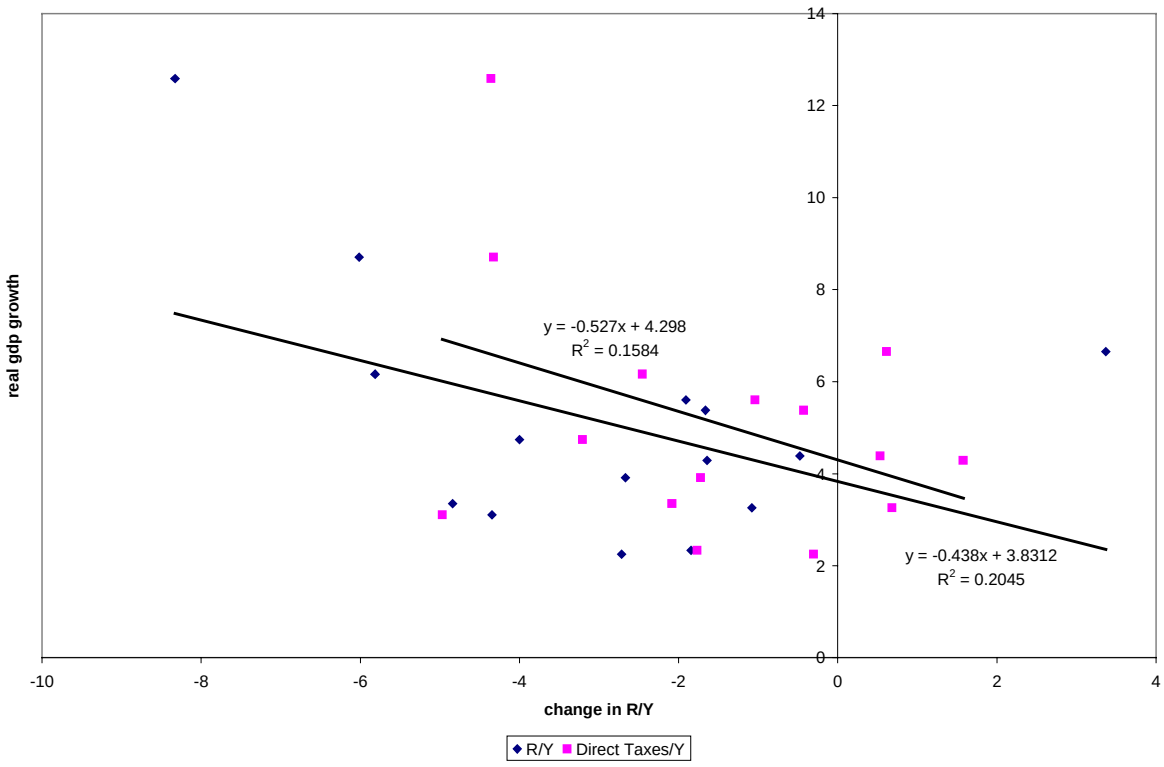

Figure 11: Spending Structure

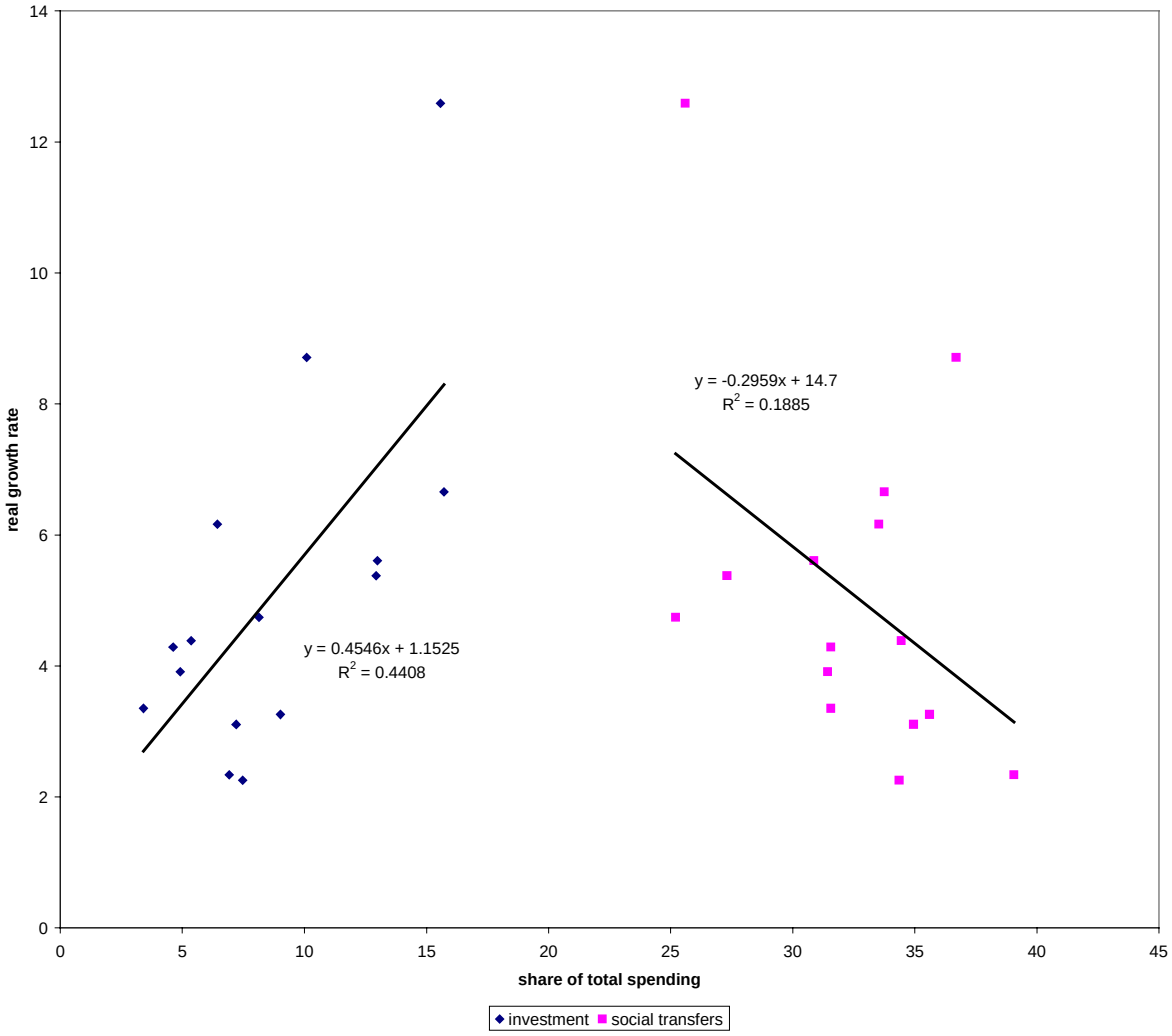

Figure 12: Spending Adjustment

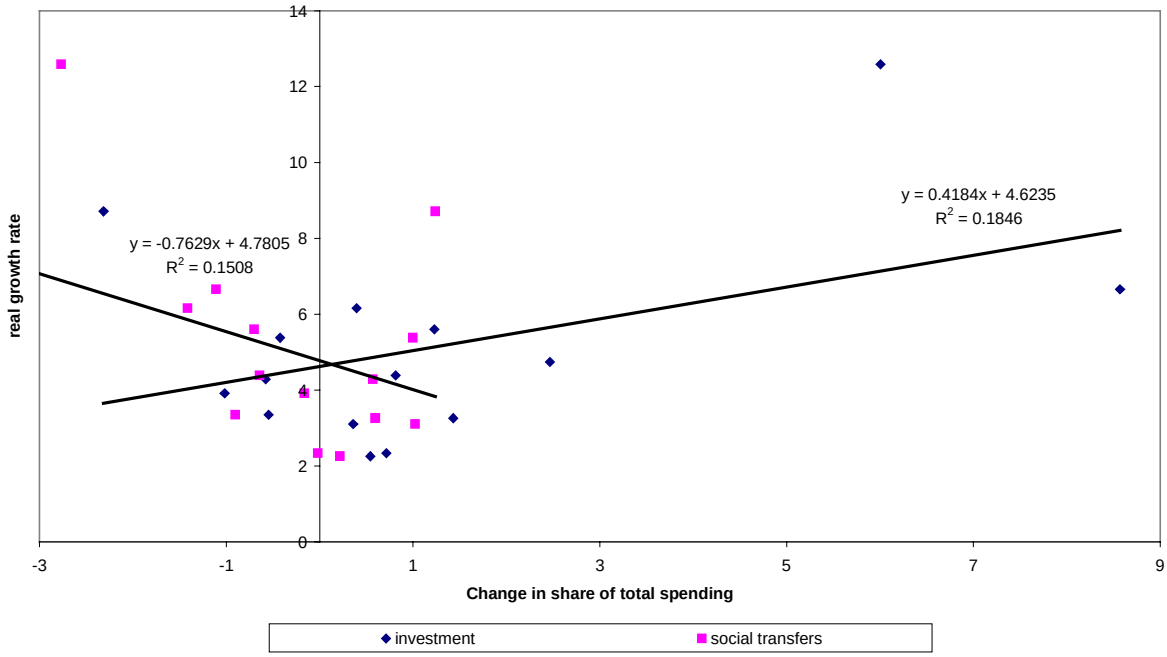

Figure 13: Fiscal Adjustment and Growth