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Maastricht Criteria versus Stability Pact

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Maastricht Criteria Versus Stability Pact

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March 2005

Abstract

It is generally believed that fiscal consolidations should occur prior to a country's admission to the European Monetary Union (EMU). This paper argues that the fiscal Maastricht Criteria require badly timed, costly adjustments while not guaranteeing sustained fiscal restraint. An effective Stability Pact is not only necessary, but should replace the Maastricht Criteria altogether. These conclusions are based on simulations scrutinising the effects both of contractionary fiscal policies and of joining a monetary union. In a case study type analysis it is shown that there is a strong case for both policy changes to happen at the same time.

JEL classification: E63; F42, F47

Keywords: transition to a monetary union, fiscal policy, European Monetary Union; regime change; simulation, MULTIMOD.

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1 Introduction

"Unsustainable" fiscal policies in countries participating in the European Monetary Union (EMU), or indeed any monetary union, may have negative consequences for other member countries. First, fiscal policy effects include macroeconomic spill-overs on other countries. For instance, expansionary fiscal policies in one country drive up union-wide interest rates and thus borrowing costs in every member country. Second, if interest rates are pushed up by fiscal deficits, there may be pressure on the European Central Bank (ECB) to relax monetary policy in order to bring interest rates back down again. Third, if a country's indebtedness goes through the roof, it is not clear if a credible commitment can be made – due to the danger of contagion – not to bail that country out in case of default (despite clear rules laid out by the Maastricht Treaty on the European Union (EU, 1992)).

For these reasons, rules were laid down for candidate countries to adhere to *prior* to being awarded membership in the EMU.[1] It was expected that prospective members would be keener on satisfying fiscal limits when their membership could still be jeopardised. Once in the union, it was thought to be easier to keep their fiscal policies in check. This strategy does not seem to work though. Greece got away with cheating on the entry criteria and several countries got away with violating the agreed-upon standards for countries already participating in the EMU.[2] Moreover, various onslaughts on the Pact as a whole, particularly by French President Chirac and German Chancellor Schröder, indicate a willingness to break or alter the commitment to fiscal limits.

Thus far, I have given answers to the following questions: (i) what are the negative consequences of excessive deficits and debt; and (ii) which political economy measures were devised in the real world to avoid them? The public and academic debate on fiscal consolidations in/for the EMU largely centres on those questions. At the same time, there is a conspicuous absence of studies trying to capture the *joint* macroeconomic effects of fiscal retrenchment policies *and* the start of a monetary union (notwithstanding investigations (see below) on each of the two issues separately). Such joint analyses are, however, important, if one wants to justify the timing of fiscal consolidations as required by the

[1] The fiscal Maastricht Convergence Criteria are specified in the Treaty on European Union (EU, 1992, article 109 j (1)) as well as attached protocols (cf. ÖNB, 1995, 107-111). They refer to requirements prior to the start of the EMU in January 1999, but will also be applied to newly joining member countries: government budget deficit (not primary deficit; deficit-GDP-ratio of not more than 3 %), and national debt (debt-GDP-ratio of not more than 60 %).

[2] The "Stability and Growth Pact" signed in Amsterdam in June 1997 urges all EMU member countries to work towards a near balanced budget, with fines envisaged if the fiscal deficit exceeds 3 % of GDP. However, France and Germany did not get fined despite their violations in 2002 and subsequent years.

Maastricht Criteria. If it turns out, as it does, that fiscal retrenchment policies are less costly, if they occur together with (rather than *prior* to) the start of the EMU, the value of the consolidation exercise envisaged by the Maastricht Treaty is put in question altogether. This is particularly true when acknowledging that political economy measures put in place for preserving stringent fiscal policies (Stability Pact) are not working, thus undoing part of the success in limiting budget deficits and government debt (achieved by the Maastricht Criteria before the start of the EMU). A workable Stability Pact would not only guarantee sustained fiscal stability, but also make costly fiscal adjustments prior to the admission to the EMU unnecessary.

This paper studies fiscal consolidation policies in a monetary union from a purely macroeconomic perspective. In a case study, retrenchment policies in Italy are examined using a multi-country simulation model. The direct impact as well as spill-over effects on inflation, economic growth and other key variables are analysed for EMU member countries. While the need for fiscal consolidations is not questioned, it is argued that requiring fiscal adjustments from a prospective member country *prior* to joining the EMU may be unjustified from a macroeconomic point of view. The basic argument is simple. Fiscal consolidations mean contractionary policies, whereas becoming a member in the EMU produces (as shown in this paper) expansionary effects for a country like Italy. Hence, negative effects of both events could be reduced, if they happened at the same time. Based on macroeconomic similarities between Italy and some of the prospective candidate countries it is then inferred that the same reasoning applies to the future enlargement of the EMU.

It is not straightforward to show the countervailing effects produced by contractionary fiscal policies on the one hand and those caused by joining the EMU on the other hand. The conceptual difficulty is to model the transition to a monetary union in such a way that the macroeconomic effects of the regime change can be captured (see next paragraph). To my knowledge this has not been done in the literature thus far (see indications on the literature further down). The reason is probably that there is no standard approach for analysing such a problem. Consequently, several methodical innovations (as indicated still further down in this introduction) had to be introduced for being able to conduct the analysis envisaged for this paper.

Membership in a monetary union requires acceptance of a common currency and a common central bank irrespective of cross-country differences in initial conditions. This is sometimes called the "one-size-fits-all" problem. From the perspective of an individual country, the common monetary policy induces interest rate changes relative to interest rates obtained under national monetary autonomy, because short term nominal interest

rates are equalised across the union. At the same time, national currencies are irrevocably fixed to the common currency at certain conversion rates. There are induced exchange rate changes compared to exchange rates obtained in a situation without a monetary union. Given that both nominal changes are not exogenous they cannot be called shocks. Instead those changes are henceforth referred to as interest and exchange rate *impulses*. The word impulse also signifies that they exhibit macroeconomic effects in member countries of the union.

Despite the fact that interest and exchange rate impulses caused by the transition to a monetary union are known, they are typically ignored in the literature. Either the fiscal convergence criteria of the Maastricht Treaty are analysed without modeling the EMU itself (Hughes Hallett and McAdam, 1998a/b, and von Hagen and Lutz, 1996); or various aspects of a monetary union are examined for a situation with the EMU already in place (e.g. fiscal consolidations by Hughes Hallett and Ma, 1996, effects of asymmetric shocks by Hughes Hallett and Vines, 1993, or the response to symmetric shocks when national preferences differ by Masson and Melitz, 1991).

Szapáry (2001) explicitly considers interest and exchange rate impulses, but for a different purpose. He argues verbally that the Maastricht Criteria would lead new members into managing their macroeconomic indicators inefficiently. Only Clausen (1998) comes close to analytically tackling interest and exchange rate impulses by discussing the "inappropriate choice of the conversion rates" (relating to the exchange rate impulse) and the "uncertainty with respect to the future stance of monetary policy" (relating to the interest rate impulse). But his small theoretical model does not allow him to capture interest rate impulses for individual countries caused by the *transition* to a common monetary policy. Nor does he evaluate the *joint* effect of interest and exchange rate impulses or interdependencies with fiscal consolidations required by the Maastricht Treaty.

This paper accounts for all of these effects and interdependencies. By using a large econometric dynamic multi-country simulation model (MULTIMOD, developed by the IMF), the transition to the EMU *and* the period after its start can be included in one and the same model. Thus it is possible to pinpoint interdependencies between interest and exchange rate impulses caused by forming a monetary union, and effects produced by fiscal retrenchment policies. This could not have been done by using a small theoretical model because the explanatory power of small analytical models is limited in a dynamic multi-country world, even if the structural break is not included.[3] A calibrated macromodel

[3] Ideally there should be three countries with two of them forming a monetary union and a third one joining. Even using Aoki's (1981) method of averages and differences does not allow us to work with more

would have been possible, in principle, but there are several disadvantages. In particular, a calibrated model lacks detail and estimated relationships (of large econometric models) necessary for being able to use real world data.[4]

As is standard in the simulation literature, this paper uses a counterfactual analysis to study the effects of fiscal policies and of joining a monetary union, i.e. the baseline (benchmark) scenario is compared to alternative simulation scenarios. For methodological reasons, it is, however, not possible to study the real world case of a country which actually joined the EMU. The only case of a country joining the existing EMU, Greece in 2001, happened too recently to be used for conducting counterfactual simulation studies. Similarly, individual countries who participated in the formation of the real world EMU cannot be analysed, because there is not enough data as of yet. Furthermore, simulations cannot be based on a future time period, because certain effects produced by joining a monetary union cannot be captured (as discussed in section 2). Therefore, a hypothetical monetary union is constructed for a historical time period which is characterised by conditions qualitatively similar to those observed for real world candidate countries. Even though a simulation analysis typically produces quantitative results, this paper looks at them qualitatively. The underlying effects can thus be revealed and interpreted.

Overall, the approach incorporates various innovations. First, notwithstanding the Lucas (1976) Critique, the transition to the EMU is modeled explicitly and simulation results account for the macroeconomic effects *caused by* becoming a member of the EMU. Second, simulation results for a hypothetical monetary union are interpreted *qualitatively*. The findings refer to economic effects as they would have been obtained, if a small analytical model could have been used. Third, some adjustments had to be made to the solution algorithm because the structural break (requiring fixed exchange rates) is inconsistent with the *terminal conditions* of the baseline (with different exchange rates).[5]

The remainder of the paper is organised as follows. Sections 2 presents key features of the model and clarifies the simulation strategy. The following three sections discuss the main scenarios: (i) monetary union; (ii) fiscal policy (without monetary union); and (iii) fiscal policy under monetary union. Section 3 demonstrates that a monetary union produces interest and exchange rate impulses year after year – relative to a situation without a

than 6 equations. Two equations per country are obviously not enough.

[4] Aforementioned Hughes Hallett and Vines (1993) used a three country Dornbusch model in the Oudiz and Sachs (1984) and McKibbin and Sachs (1991) tradition.

[5] A procedure was devised for endogenously modifying steady state exchange rates. Further details can be obtained from the author upon request.

monetary union. A potential trade-off between interest and exchange rate impulses is revealed. In Italy, the nominal pre-EMU interest rate is considerably higher than the one prevailing after the start of the EMU. At the same time, the Italian Lira is undervalued (relative to purchasing power parity). Overall, Italy's membership in the EMU generates an expansionary interest rate impulse which dominates the contractionary exchange rate impulse. Section 4 introduces contractionary fiscal policies in Italy and analyses effects in a situation without a monetary union. Section 5 combines a monetary union with a fiscal retrenchment and pinpoints interdependencies between fiscal policies and interest and exchange rate impulses caused by the EMU. If they happen at the same time, it is shown that some of the (negative) effects of both policy changes cancel out.

Section 6 summarises findings and limitations, and derives some policy recommendations. There are similarities in the underlying macroeconomic situation between Italy and some of the prospective EMU applicants. Therefore, we infer that the reasoning in the Italian case can also be applied to the future enlargement of the EMU. Joining the EMU is likely to produce a dominating interest rate impulse. If there is no undervaluation of the exchange rate, the overall expansionary effect of EMU membership will be even stronger. Contractionary fiscal policies at the same time would be advantageous. Given that interest rates adjust a couple of years prior to the actual start of the EMU, contractionary fiscal policies could already be phased in at that time. Given that the Stability Pact is not fully working, it is then argued that prospective EMU candidates should not be required to consolidate their finances prior to any adjustment of nominal interest rates; instead, fiscal retrenchment policies should be conducted at the time a country is credibly believed to join the union in the near future.

2 Experiment Design

Main Model and Simulation Characteristics

The simulation analysis presented in this paper is based on a 1991 variant of MULTIMOD (cf. IMF, 1991), an annual econometric multi-country model. It was developed by the International Monetary Fund and is widely used for international policy analysis (as described in Masson, Symansky, and Meredith, 1990). 470 equations depict ten countries and regional blocs: the seven G7 countries, the rest of the OECD, the oil exporters, and the rest of the developing world. MULTIMOD incorporates rational expectations (in financial markets and the decision-making by firms and households) and complete information.

This means it is a perfect foresight model requiring perfect credibility of policy decisions (e.g. on membership in a monetary union as well as on its monetary and fiscal policies).

MULTIMOD follows "the prevailing paradigm in which a broadly neoclassical view of macroeconomic equilibrium coexists with a new Keynesian view of short-to-medium term adjustment" (Mitchell, Sault, Smith and Wallis, 1998). It is a modified (dynamic) Mundell-Fleming model combining short run demand determination and IS-LM structure with long run steady state properties determined by capital accumulation and aggregate supply. Inflation dynamics depend on capacity utilisation (a Phillips curve type relationship), imported inflation effects, sticky prices, and a forward-looking component. However, for the long run, nominal neutrality obtains, because short run nominal rigidities are smoothed out over time. MULTIMOD accounts for stocks of debt, money, and net foreign assets as well as for international trade and financial flows.[6] In the following sections, the transmission of policy will be described in detail.

The model is used to conduct a counterfactual analysis. A benchmark scenario, the historical baseline, is compared to various alternative scenarios, to a monetary union (in section 3), to contractionary fiscal policy (in section 4) and to fiscal policy under monetary union (in section 5). In principle, we can choose between ex post and ex ante simulations (Wallis, 1988, p. 226). The former are based on a historical time period (and historical baseline data), the latter on the future (and, hence, forecast baseline data). However, the impact of joining a monetary union can only be captured adequately by ex post simulations because historical baseline data reveal important asymmetries which are less clear in model forecasts (as used in econometric multi-country models in general and in MULTIMOD in particular). Forecasts for the immediate future typically represent an adjustment path to a steady state equilibrium. Once the steady state is reached, interest and exchange rates are constant, and interest rates are equal across countries. Participating in or joining a monetary union would, therefore, not produce interest and exchange rate changes. Nor would induced effects appear in such an ex ante analysis. First, the introduction of a monetary union could not have an interest equalisation effect. Second, underlying appreciations and depreciations in the historical baseline would not feature in a steady state baseline. Hence, there could not be any effects caused by changes in exchange rate expec-

[6] A more complete description of the model can be found in Masson, Symansky, and Meredith (1990). It includes theoretical underpinnings, estimation details (univariate, multivariate, pooled estimations; error correction models; calibrations), examples for using MULTIMOD in policy analyses, and standard simulation exercises illustrating the properties of the model. Inter alia cf. Bohn (1997) for a stylised core model of MULTIMOD, and Mitchell, Sault, Smith and Wallis (1998) as well as Bryant, Hooper and Mann (1993) for comparisons with other multi-country models.

tations which are induced by a monetary union. Third, it could not be demonstrated that interest and exchange rate effects are typically countervailing.

To evaluate effects for Italy, it is preferable, therefore, to use an ex post analysis (based on historical data) instead of the seemingly more realistic scenario for the EMU starting in 1999 (which, soon after its start, is ex ante from the perspective of any existing simulation model). Based on the same argument, the enlargement of the EMU (starting some time in the future) cannot be captured adequately based on ex ante simulations.

Simulation Scenarios

There are also reasons for choosing a particular historical time period for analysing the effects of becoming a member of the EMU. The 1980s are preferred to the 1990s. After 1983, the European Monetary System (EMS) was fairly stable in comparison to the previous period, and there was no realignment between 1987 and 1992. In contrast, monetary turmoil with the break-up of the Exchange Rate Mechanism and ensuing exchange rate instability, especially for the Lira, could be observed in 1992. Moreover, from 1983, GDP growth rates were positive and very close to one another in the large real world EMU member countries Italy, France, and Germany (baseline data is shown in the appendix; in Britain business cycles followed a somewhat different pattern). Hence, possible recession or overheating effects caused by the hypothetical introduction of a monetary union cannot be blamed on divergent underlying business cycles of the historical baseline.

Nonetheless, by choosing the historical conditions of the 1980s as the point of reference, considerable nominal disparities among European countries (much larger than in the 1990s) are incorporated in the analysis. Due to historically large interest rate differentials between prospective EMU member countries and exchange rates far away from Purchasing Power Parity (Hill, 1986), large adjustments (particularly in Italy) are induced by the hypothetical introduction of a monetary union in the 1980s. There are three consequences: First, simulation results exaggerate effects compared to those observed and expected for the real world EMU before and after 1999. Second, quantitative outcomes are less ambiguous, thus facilitating qualitative interpretations. Moreover, synchronised business cycles and large nominal disparities provide ideal conditions for analysing transmission mechanisms of macroeconomic effects that are caused by a monetary union. Third, the underlying macroeconomic conditions in Italy correspond more closely to those of some of the prospective EMU member countries. Thus, the Italian case provides lessons for the enlargement of the EMU.

Based on the outlined ex post analysis, it remains to specify the baseline scenario and the alternative scenarios. Basically, the *baseline scenario* is defined by model specifications in MULTIMOD to capture the historical real world situation. Alternative scenarios refer to (i) the hypothetical introduction of a European monetary union in 1983 (henceforth *CP scenario*[7]); (ii) more or less contractionary fiscal policy in Italy (henceforth lax, moderate and tight *fiscal-baseline scenarios*); or (iii) a combination of both (henceforth lax, moderate and tight *fiscal-CP scenarios*). All scenarios differ with respect to fiscal policy and/or monetary policy and the exchange rate regime. Both the CP and the fiscal-CP scenarios are called hypothetical EMU scenarios. The hypothetical EMU is modeled to consist of Germany, France and Italy, but not the smaller European countries, because they are not accounted for separately in the version of MULTIMOD used for this paper.

The start of the hypothetical EMU in 1983 is preceded by a one year announcement period (1982). It may be argued that – for most countries – markets predicted EMU membership more than a year in advance, and that future applications for membership will be known at least two years in advance. However, since MULTIMOD requires perfect credibility and full information, the most realistic assumption is to limit the announcement period to one year. As a consequence, real world anticipation effects may be exaggerated by simulation results, because expectations switch abruptly from one (annual) period to the next and all adjustments are squeezed into one period only.

3 Monetary Union

Interest Rates

In the baseline model, the behaviour of the Bundesbank and those central banks – like the US Federal Reserve – which do not participate in the European Exchange Rate Mechanism (ERM) is described by monetary targeting. All other ERM member countries are assumed to commit to exchange rate targeting vis-à-vis the DM. Once the hypothetical EMU has started, the nominal interest rate in member countries is no longer determined by a national interest rate reaction function, but by the interest rate reaction function of the hypothetical ECB. The ECB commits to monetary targeting. There is no conceptual change like, for instance, a switch to inflation targeting. The common European interest rate is modeled as the instrument, and the European money stock as the (intermediate)

[7] The name originates from the chosen procedure for fixing EMU conversion rates at the central parity (CP) rates of the European Exchange Rate Mechanism (ERM). See next section.

target for obtaining its price stability objective. As for previously national central banks, the hypothetical ECB exercises full control over short term interest rates:

$$i^U \;=\; i^U_{-1} \;+\; \left[r * \ln \frac{mt^U}{M^U} \right]. \tag{1}$$

The change of the union-wide common interest rate ($i^U - i^U_{-1}$) depends on the aggregation of the quantity of European money M^U (money refers to demand and supply in MULTIMOD), and on the construction of exogenous European monetary target mt^U (see below). Under the assumption of behavioural invariability, the negative coefficient r is unchanged from national equations (r is identical across countries), and, more importantly, the aggregated European money stock is derived as the sum of its components, i.e. $M^U = \sum \frac{M^k}{e^{k,U}_{t\geq 1983}}$. (As defined further down, $e^{k,U}_{t\geq 1983}$ is the fixed conversion rate in the union used here to express the quantity of money for each member country k in terms of Euro, the common currency in the union.)

The monetary stability orientation of a central bank is expressed by the time path of its exogenous monetary target (mt_t). Given the level of money M^U in equation 1, the European interest rate is determined by (changes in) the monetary stability orientation of the hypothetical ECB. Once the hypothetical EMU has started, an expansionary (contractionary) policy – implying lower (higher) union-wide interest rates – is caused by increasing (lowering) the level of mt^U relative to the level of M^U.

EMU means – by definition of a monetary union – a single monetary policy, but allows for various levels of union-wide monetary stability orientation. In the approach chosen, the 'intermediate' monetary policy stance of the hypothetical EMU is based on the average of historical national monetary stability orientations which correspond to the development of actual money supply in the historical baseline. The hypothetical European monetary target is constructed endogenously by aggregating national baseline targets: $mt^U = \sum \frac{mt^k}{e^{k,U}_{t\geq 1983}}$. This is analogous to the aggregation of the European money stock, M^U.

This approach may be criticised from two angles. First, simply adding up national target values given in the baseline of MULTIMOD is a crude way for describing the hypothetical ECB policy as an average of historical European monetary policies. Nonetheless, this procedure suffices to capture a crucial feature of any monetary union, the equalisation of short term nominal interest rates. Second, the real world EMU is expected to conduct a more stability-oriented monetary policy. However, any specification of the European stability orientation is arbitrary as long as we cannot observe the actual monetary policy

of the real world ECB. Moreover, (qualitative) findings of this study do not depend on a realistic modelisation of the ECB behaviour.

On a theoretical level, the transition to a common monetary policy in the hypothetical EMU – based on average monetary stability orientation – can be expected to produce average interest rates across the union from 1983 onwards. Relative to national baseline rates, interest rates fall in some countries and go up in others thereby affecting interest-sensitive national money demand (hence M^U) as well as the real side. Some countries are likely to experience contractionary, others expansionary effects. Hence mere averaging of the monetary stability orientation in Europe produces macroeconomic effects in each member country in each year – relative to the baseline.

However, during the transition to the hypothetical EMU, the link between a change in monetary stability orientation (relative to the baseline) and a change in interest rates is not straightforward any more. For instance, higher monetary stability orientation (lower mt) caused by the transition to the monetary union does not imply higher short term nominal interest rates and the typical (contractionary) real short run effects. Instead, the structural break causes a shift in each country in the long run relationship between stability orientation and interest rates: either from high mt *and* high i to lower mt *and* lower i; or vice versa.

More specifically, a country with a historically low monetary stability record (like Italy) typically exhibits high nominal interest rates in the baseline. Hence, if nominal interest rates are averaged in the union, they decrease for that country. At the same time, its monetary stability orientation rises relative to the baseline, i.e. the stability orientation of the ECB is higher (lower growth rates of mt) by comparison to the (formerly independent) national central bank. A change in nominal interest rates – relative to the baseline – is not brought about by an exogenous change of central bank policies. Instead, it is the endogenous response to joining a monetary union. Therefore, nominal interest rate changes – relative to the baseline – are not referred to as shocks, but as interest rate impulses.

Thus far, we have only argued on a theoretical level. But the findings of nominal interest rate impulses are confirmed by the simulation results for the CP scenario as presented in appendix B (similarly in appendix D for fiscal-CP scenarios). The following generalisation is useful for the discussion of induced effects further down in this section:

Observation 1 (Interest Rate Impulse) *A member country of a monetary union experiences short term interest rate impulses due to the common monetary policy in the*

union. – Impulses for countries with a low monetary stability record (e.g. Italy) are typically expansionary.

Overall effects for each country depend, however, on two impulses caused by joining a monetary union: interest rate and exchange rate impulses. For instance, it is shown further down that the real interest rate does not necessarily go down when the nominal interest rate decreases because of the countervailing exchange rate impulse.

Exchange Rates

In MULTIMOD, exchange rates are determined by the open interest parity condition (relative to the US). In the baseline, there are separate exchange rate equations for France, Germany, and Italy. For the hypothetical EMU scenarios, individual exchange rates for member countries are replaced by a single Euro-$ rate (and conversion rates are used to fix each national currency to the Euro). The (log) exchange rate of the (hypothetical) Euro vis-à-vis the US-$, e^U, depends on two components: the expected (log) Euro-$ exchange rate for next period Ee^U_{+1} (E is the expectation operator); and the differential between the union-wide short term interest rate i^U (determined by the ECB) and the corresponding US rate i^{US}. Thus the European (open interest parity) exchange rate equation is given by:

$$e^U \;=\; (i^{US} - i^U) + Ee^U_{+1} \tag{2}$$

Normalising the Euro at 1 DM as of 1983, the start of the hypothetical EMU, reduces the number of conversion rates needed. French and Italian exchange rates to the Euro ($e^{k,U}$), i.e. to the DM ($e^{k,G}$), are irrevocably fixed at (yearly averages of) their previous period bilateral ERM central parities to the DM ($cp^{k,G}$, again in logs), which are exogenous to the model: $\overline{e^{k,U}_{t\geq 1983}}\left[\frac{local.currency}{Euro}\right] = \overline{e^{k,G}}\left[\frac{local.currency}{DM}\right] = cp^{k,G}_{1982}$. Hence the name CP scenario.[8] This largely corresponds to the conversion procedure chosen for the actual EMU at the EU Summit in May 1998 (EU, 1998): previously determined central parities of the European Exchange Rate Mechanism were declared to be the "irrevocably fixed conversion rates".

Based on these fixed conversion rates, Lira and FF exchange rates can be calculated for the monetary union scenario. CP scenario simulation results presented in appendix B show

[8] Two other conversion rate procedures were also examined: fixing at purchasing power parity rates (taken from outside the model), and at market conversion rates (i.e. at bilateral 1982 exchange rates obtained by simulations). For Italy, however, the same qualitative simulation results obtain.

that – relative to the baseline – the Lira and the FF appreciate vis-à-vis (i) the US-$ as well as (ii) the DM (similarly in appendix D for fiscal-CP scenarios). The latter result seems obvious, because Lira and FF can no longer depreciate in a monetary union as they did in the historical baseline. Nonetheless, an appreciation vis-à-vis the DM does not necessarily obtain. From 1983, comparative exchange rate impulses between two member currencies of the hypothetical EMU (k and G) can be represented by a tautology consisting of the difference between baseline (b) and simulated (s) cross rate identities (expressed in logs):

$$e_t^k(s) - e_t^k(b) = \left(e_t^G(s) - e_t^G(b)\right) + \left(\overline{e^{k,G}(s)} - e_t^{k,G}(b)\right). \tag{3}$$

A comparatively appreciative (exchange rate) impulse is defined by $e_t^k(s) - e_t^k(b) < e_t^G(s) - e_t^G(b)$. It means, for instance, that the Italian Lira vis-à-vis the US-$ (e_t^k) appreciates – relative to the baseline – by comparison to the DM-$ rate e_t^G. For each year, t, there is a comparatively appreciative impulse, if and only if the given bilateral conversion rate $\left(\overline{e^{k,G}(s)}\right)$ represents a revaluation relative to the corresponding bilateral baseline exchange rate $\left(e_t^{k,G}(b)\right)$. If the exogenously chosen conversion rate corresponds to the 1982 market rate (or represents a revaluation), then a historically weak currency exhibits a comparatively appreciative exchange rate impulse which is reinforced over time (because the baseline exchange rate depreciates). By imposing a devalued conversion rate, however, a comparatively depreciative exchange rate impulse could be produced – relative to the baseline – for a certain period of time after the start of the monetary union. But this is not realistic for a country like Italy whose economic situation is characterised by an undervalued currency both in terms of purchasing power parities and in terms of real effective exchange rates (as of the 1980s as well as of the 1990s; cf. Hill, 1986, and OECD, 2002).

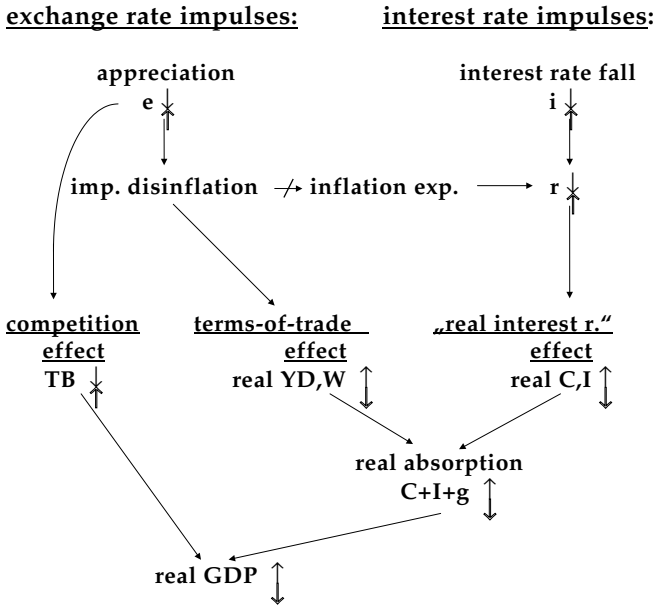
Observation 2 (Exchange Rate Impulse) *In a monetary union with exogenously fixed conversion rates, there are exchange rate impulses between member countries.*
– Impulses for countries with historically weak currencies (e.g. Italy) are typically comparatively appreciative, unless depreciative impulses are produced by imposing (e.g. for political reasons) an even more unrealistic conversion rate.

Transmission of Impulses

Interest and exchange rate impulses produce macroeconomic effects in each country which participates in the monetary union. Compared to France and Germany, results are more clear-cut in Italy (cf. figure 1 and appendix B). Nominal appreciations and decreasing

Figure 1:

Transmission of Impulses in Italy



nominal interest rates produce basically three effects: a long-lasting negative (i.e. contractionary) competition effect (real effective exchange rates appreciate); a long-lasting positive (i.e. expansionary) terms-of-trade effect on wealth and income due to lower import prices; and a real interest rate effect that is strongly positive in the short run (real interest rates are more than 9 % below the baseline in 1983), but dies out in the medium term.

As a result, Italian GDP is permanently above baseline levels. Despite a build-up of capital, capacity utilisation increases in the short and medium term (not shown in figure 1, but in the appendix).[9] There are enormous overheating effects. The ensuing inflationary impact (due to the Phillips curve relationship) is strong enough to overcompensate imported disinflation effects (which are caused by the nominal appreciation). Since prices are sticky, future inflation goes up as well, so do inflation expectations ($\hat{P}^e$) due to rational expectations. Hence the impact of decreasing nominal interest rates (i) is reinforced,

[9] In MULTIMOD, capital accumulation rests on Tobin's q-theory. The market value of capital is the stream of capital income discounted by prevailing real interest rates. Supply side effects are accounted for because the capital stock determines capacity output (labour supply is exogenous) and, thereby, affects capacity utilisation. – The decisive role of capacity utilisation for inflation is again confirmed by Corrado and Mattay (1997).

so that the real interest rate (r) effect on consumption (C) and investment (I) must be positive and very strong (government spending g is exogenous). This is further augmented by positive terms of trade effects (real disposable income YD and wealth W go up). The overall impact on GDP remains positive despite the negative competition effect on the trade balance (TB) caused by falling exchange rates (e) and rising inflation.

In France, similar effects occur. In both countries, initial interest and exchange rate effects are countervailing. However, French GDP goes down in the short run as well as in the longer term (after 10 years) relative to the baseline, because the exchange rate impulse is stronger than in Italy and dominates. Since interest rates equalise in the monetary union, Italy enjoys – compared to France – a more drastic decrease from historically high interest rate peaks.

In Germany, the situation resembles Italian conditions, but with opposite signs. Contractionary effects caused by increased interest rates – relative to the baseline – dominate because exchange rate impulses are weak. In nominal terms, the DM depreciates – relative to the baseline – vis-à-vis the Lira and the FF, but there is a countervailing exchange rate effect until 1986, because the DM appreciates vis-à-vis the US-$ – relative to the baseline. Nonetheless, in all countries overall results can be explained by the relative importance of nominal interest and nominal exchange rate impulses despite (cyclical) dynamics produced by price stickiness and capacity utilisation effects.

Observation 3 (Real Effects) *Real macroeconomic effects for individual countries forming or joining a monetary union depend on real interest rate effects and various terms of trade effects (competition, income, and wealth effects). They are caused by interest and exchange rate impulses and a potential trade-off between them.*

4 Fiscal Policy

Modeling Fiscal Retrenchment

Protocol 5 of the Maastricht Treaty specifies the so-called fiscal convergence criteria of the EMU: a debt-to-GDP ratio of not more than 60 % and a ratio of the government budget deficit to GDP of not more than 3 % in each member country. Before discussing fiscal consolidation programs by EMU member countries, however, it is useful to analyse the effects of such retrenchment policies in a situation without a monetary union. More

specifically, the macroeconomic effects of tax-financed debt and deficit reductions are examined.[10] Adjustment policies are modeled to start in 1982, but compliance with the Maastricht Criteria takes us well beyond 1983 (the start year of the hypothetical EMU).

In MULTIMOD, the *average* tax rate t governs tax revenues thereby affecting government debt and deficit. The original (baseline) tax rate equation is a feedback rule based on the deviation of endogenous debt and deficit levels from exogenous target values. Since these (variable) targets represent the actual development of debt and deficit in the historical baseline, any departure from the baseline leads to a tax rate response. In the modified tax rate reaction function used here, fixed ratios of nominal debt (B) and deficit ($B - B_{-1}$) to nominal GDP (GDP^n) are targeted explicitly (to capture the Maastricht requirements):

$$t \;=\; t_{-1} \;+\; \tau_1 * \left(\frac{B}{GDP^n} - 0.6\right) \;+\; \tau_2 * \left(\frac{(B - B_{-1})}{GDP^n} - 0.03\right) \tag{4}$$

Since France and Germany do not exceed the Maastricht debt and deficit limits, fiscal consolidation rule (4) is only applied to Italy. As debt and budget deficit relative to nominal GDP ($\frac{B}{GDP^n}$ and $\frac{(B-B_{-1})}{GDP^n}$, respectively) exceed their exogenous target at the outset, the tax rate goes up in the first years (depending on exogenous response parameters τ_1 and τ_2 which are explained further down). Typically, raising government revenues eventually pushes the deficit ratio below its target. Nonetheless, the tax rate continues to rise as long as the tax rate increasing effect of the debt component (above its target ratio) outweighs the tax rate decreasing effect of the deficit component (below its target ratio). When the debt ratio approaches its target value (but is still above), the deficit ratio (still below target) dominates, thus causing the tax rate to go down again. A relatively smooth landing is achieved. Once the initial adjustment has been completed, the development of debt and deficit is cyclical, but stays near target ratios.

This fiscal consolidation rule allows for flexible policy responses; there are no pre-specified debt or deficit levels (or ratios) that must be achieved at a particular point in time during the adjustment process. If the weights of response parameters τ_1 (= 0.04) and τ_2 (= 0.3) are taken from the baseline tax rate function, the fiscal consolidation plan is henceforth called "moderate". For Italy with almost 40 % above the debt target and more than 6 % above the deficit target in the 1980s, both (debt and deficit) terms in the tax rate reaction

[10] It is not intended to evaluate the efficiency of alternative debt reduction strategies. Hughes Hallett and McAdam (1998a/b) find that tax increases are more effective than expenditure cuts. In contrast, Alesina and Perotti (1995a/b), for instance, argue that "... tax increases (particularly labour and social security taxes) lead to a fall in competitiveness, as wage demands increase to compensate for an increased fiscal pressure...". – Mitchell, Sault and Wallis, (2000) analyse alternative debt and deficit reduction tax rules for alternative macromodels including MULTIMOD.

function carry a similar weight. Hence limited changes of *relative* weights (in opposite directions) hardly affect the simulation outcome. To obtain results for tighter or laxer tax rate reactions, it suffices to change response parameters proportionately. Henceforth, "tight" refers to $\tau_1 = 0.0666$ and $\tau_2 = 0.5$ (baseline values multiplied by $\frac{5}{3}$), "lax" to $\tau_1 = 0.0133$ and $\tau_2 = 0.1$ (multiplied by $\frac{1}{3}$). Once again, fiscal consolidation strategies for Italy under baseline conditions are called lax, moderate, or tight fiscal-baselines. Analogously, lax, moderate or tight fiscal-CP scenarios refer to fiscal consolidation programs for Italy under hypothetical EMU conditions (with exchange rates fixed at central parities (CP); cf. next section).

Results

Results discussed here mainly refer to lax and tight consolidation programs (cf. appendix C). The focus is on Italy, because other countries are practically not affected. As for the lax fiscal-baseline, the average tax rate in Italy rises, temporarily, by up to 5.6 percentage points above the baseline. Targets are achieved in 1989 for the deficit ratio and in 1992 for the debt ratio. Relative to the (original) baseline, the deficit ratio declines gradually, whereas debt-to-GDP actually rises until 1985, because the denominator (nominal GDP) falls by more than the nominal debt. In fact, there is a sharp decline in real GDP in the first years of the adjustment program. A recovery period in the medium term (with GDP just above baseline levels in 1989) is followed by another downturn from 1990 onwards. Capacity utilisation is also reduced relative to the baseline (until 1986), because the loss in actual output (GDP) exceeds the reduction in capacity output caused by a shrinking stock of capital (reduced investment; cf. footnote 9, page 13). At lower levels of capacity utilisation, inflation rates, too, remain under their corresponding baseline values during these first years of the fiscal consolidation phase. Despite rising inflation rates, thereafter, the price level is still below its baseline value by 1993.

How can the changes in economic activity relative to the (original) baseline be explained? The fiscal consolidation program produces contractionary primary effects through real disposable income and real wealth. Income is reduced throughout the simulation horizon (until 1993), because elevated tax burdens diminish (real) net-of-tax labour and capital income relative to the baseline. At the same time, simulation results show that total (real) private sector wealth is unambiguously reduced permanently relative to the baseline. Nonetheless, wealth is affected by countervailing effects which are not quantified in the following brief discussion. On the one hand, the present value of the stream of current and future after-tax capital and labour income may be higher than under original baseline

conditions (despite lower capital and labour income in early periods) because lower tax rates are required in future periods once the debt burden has been successfully reduced. Also, (real) net foreign assets are build up compared to baseline levels (see discussion below). On the other hand, there is – relative to the baseline – a reduction in the real stock of money (see discussion below) and, particularly, in public holdings of real government debt.

Reduced wealth and income levels cause a decrease in investment and consumption in most years (despite lower real interest rates from 1987 onwards). Since aggregate demand decreases faster than capacity output, there is a strong disinflation – as already discussed in the previous section. Changes in price levels and inflation rates produce secondary effects relative to the baseline: competition effects (measured in terms of real effective exchange rates) and real interest rate effects. The competition effect is countervailing to the income and wealth effects. It is expansionary for the entire period until 1993. It originates in reduced price levels (nominal exchange rates in the ERM practically do not change) and leads to a real depreciation relative to the baseline, an improvement of the trade balance, and a lasting build up of net foreign assets.

Real interest rates (contractionary until 1986, expansionary thereafter) are basically driven by (rationally expected) next period inflation rates, because nominal interest rates hardly change. Under (baseline and) fiscal-baseline conditions nominal interest rates can hardly change, because Italy is a member of the ERM adhering to exchange rate targeting vis-à-vis the DM. Interest rates are only reduced, because there are (relatively small) contractionary spill-overs into Germany. Lower economic activity in Germany – relative to the baseline – causes reductions of German private sector real money holdings. Given that monetary targets of the Bundesbank are not changed from (exogenous) baseline target values for the nominal money stock, there is some automatic monetary loosening. To stay close to the central parities of the ERM, the Italian central bank must also reduce interest rates slightly (even less than in Germany).

To counterbalance the economic slump in most years – relative to the baseline – caused by the fiscal consolidation plan, some (discretionary) monetary loosening as suggested by Hughes Hallett and McAdam (1998a and b) would certainly have a stimulating effect on aggregate demand. Along these lines, it would be recommendable from a national perspective to leave the ERM so that expansionary monetary policies could be pursued. However, if fiscal consolidations produce expansionary effects in later years (as obtained for a moderate fiscal consolidation plan), monetary tightening would then seem advisable to preserve disinflation gains which were accrued in earlier years.

Under a tighter fiscal consolidation plan, the outcome differs. The targeted debt ratio is reached in 1988, four years earlier; the deficit ratio is almost at its target by 1983, the start year of the hypothetical EMU. To achieve this, taxes reach their peak as early as 1985 with 7.8 percentage points above the baseline (compared to +5.6 % in 1990 under the lax plan). As a result, the contractionary income effect – relative to the baseline – is stronger at first, but turns expansionary in 1991. Compared to the lax consolidation plan, the contractionary real wealth effect is weaker at first, but deteriorates thereafter (due to a steeper rise in inflation rates). The positive competition effect occurs sooner because of powerful disinflation effects, but weakens when inflation grows faster than under the lax fiscal-baseline. For the same reason, real interest rates rise by more until 1986 and drop more sharply thereafter.

Compared to lax fiscal policies in Italy, there is more volatility in growth rates, inflation, and real interest rates – relative to the original baseline. Overall, there are stagflationary effects (compared to contraction and disinflation effects under the lax fiscal-baseline). By 1993, GDP is reduced by more than 1 % relative to the baseline, but prices are some 6 % higher. The contractionary effect is larger in the early years due to stronger contractionary income and real interest rate effects – compared to the lax plan. In the medium term, a strong expansionary real interest rate effect (relative to the baseline) dominates and makes up for the higher GDP losses in the earlier years. At lower levels of capacity output, the strong expansion leads to higher inflation rates though (according to the Phillips curve relationship). Towards the end of the reported period, the real interest rate actually rises above baseline rates again (to start another cycle) and the wealth position worsens, but additional inflation (on top of baseline inflation) is reduced only gradually.

Interpretation

Policy recommendations for fiscal consolidation programs ought to account for the role of supply side effects under laxer and tighter fiscal-baseline scenarios. Tighter fiscal consolidations cause a more severe depletion of capital and a stronger reduction of capacity output in the short run. When GDP grows again in the medium term, capacity utilisation is much higher under a tighter fiscal strategy. Hence price levels (and in most cases inflation rates, too) are more unfavourable over an extended period of time. In 1993 (only as an example), the price level difference between the lax and the tight strategy amounts to 10 %, even though GDP levels are similar. From the perspective of this study, lax or moderate fiscal contractions are recommendable due to their limited supply side effects.

Despite these differences, the comparison of laxer and tighter consolidation programs for Italy in a historical simulation period (until 1993) reveals a clear pattern of effects and aggregate outcomes for all fiscal strategies. Relative to the baseline, there is an expansionary competition effect, a contractionary wealth and income effect (cf. page 16), and a change of sign for the real interest effect around 1986/87 from contractionary to expansionary. Irrespective of the actual fiscal consolidation program, the real interest rate effect has a decisive impact on the outcome, even though income and wealth effects ignite the adjustment process. Under all strategies, there are short term losses, but aggregate demand rises above the baseline in the medium run. If the consolidation program is tighter, cyclical swings are larger and the first peak occurs sooner. The following observation summaries these empirical results:

Observation 4 (Fiscal Consolidations) *Irrespective of the tightness of tax rate responses to achieve targeted debt and deficit ratios, macroeconomic effects of fiscal consolidations conducted by Italy show the same pattern. They cause primary income and wealth effects (contractionary) which, in turn, produce competition effects (expansionary) and decisive real interest rate effects (contractionary first, then expansionary). The outcome is contractionary in the short run, but expansionary in the medium run.*

Comparing transmission impacts described here (obtaining under a fiscal-baseline) to those resulting from the CP scenario (cf. section 3 and figure 1) reveals some fundamental differences. Fiscal consolidations trigger changes in income and wealth (one of the three aforementioned transmission effects) which immediately spread to the other transmission effects. In contrast, under the CP scenario, the three transmission effects are induced by (additional) impulses in terms of changes in nominal interest and exchange rates.

The role of nominal variables (prices, exchange, and interest rates) can be scrutinised in more detail. First, under both sets of scenarios, prices and inflation rates play a central role in the dynamics of the economies. However, under the CP scenario (cf. section 3), changes in inflation are strongly affected by imported inflation, whereas here, they are almost exclusively determined by capacity utilisation effects (according to the Phillips curve relationship). Second, under the CP scenario, the competition effect hinges on changes in nominal exchange rates; here, price changes are the main cause. Finally, under the CP scenario, real interest rates result from a trade-off between changes in nominal interest rates and expected inflation. In contrast, nominal interest rates are practically not affected by fiscal consolidation policies (under baseline conditions otherwise), so that expected inflation governs real interest rates.

5 Fiscal Retrenchment in the EMU

Interdependencies between Fiscal Policy and Monetary Union

The joint macroeconomic effects of fiscal retrenchment policies and joining a monetary union (cf. appendix D) can be largely explained by "adding up" results for fiscal strategies per se (fiscal-baseline; cf. section 4) and those for the CP scenario per se (cf. section 3). However, interdependencies between fiscal consolidations in Italy and the hypothetical EMU do affect the overall outcome of fiscal-CP scenarios in several respects. On the one hand, hypothetical EMU conditions impinge on fiscal policies: differences of lax, moderate, and tight fiscal strategies become indistinct and alternative fiscal strategies amount to similar debt and deficit reductions (in terms of ratios to GDP). On the other hand, fiscal policies also affect the outcome of the hypothetical EMU: (i), all fiscal strategies produce a similar impact on interest and exchange rate impulses; and (ii), induced changes to exchange rate impulses entail an additional expansionary effect in all member countries. Once these interdependencies have been analysed, the overall impact on real GDP of a fiscal retrenchment in the hypothetical EMU is discussed.

As for the impact of hypothetical EMU conditions on fiscal contractions, tax rates of any fiscal-CP scenario are lower than those under the corresponding fiscal-baseline. Peak rates occur two to three years earlier, and they are more than 3.5 percentage points lower. The reason is that the EMU produces an expansionary effect on aggregate output in Italy (cf. section 3), which contributes to the reduction of debt-to-GDP and deficit-to-GDP ratios so that smaller tax rises are required.

Since deviations from debt and deficit ratio targets produce stronger tax rate responses for tighter fiscal rules, tax rates are reduced by more under a tighter fiscal-CP scenario compared to its corresponding fiscal-baseline, even though the expansionary effect caused by the hypothetical EMU is the same under all fiscal strategies. As a result, the difference between the peak tax rates of lax, moderate, and tight fiscal strategies is 0.5 percentage points smaller under fiscal-CP scenarios compared to those under the fiscal-baseline. Furthermore, it is shown further down (cf. real GDP in figure 3) that the overall outcome of fiscal-CP scenarios does practically not depend on the strictness of the underlying tax rule.

These findings can be explained by the role of the denominator in debt and deficit ratios:

Observation 5 (Denominator Effect under Fiscal-CP Scenarios)
If Italy joins the EMU and pursues fiscal retrenchment policies at the same time, there is a strong denominator effect, i.e. a reduction of debt and deficit ratios merely caused by output expansions induced by the hypothetical EMU. – Despite differences in tightness, alternative tax rate responses in Italy (to achieve targeted debt and deficit ratios) produce similar effects on debt and deficit ratios under the fiscal-CP scenario.

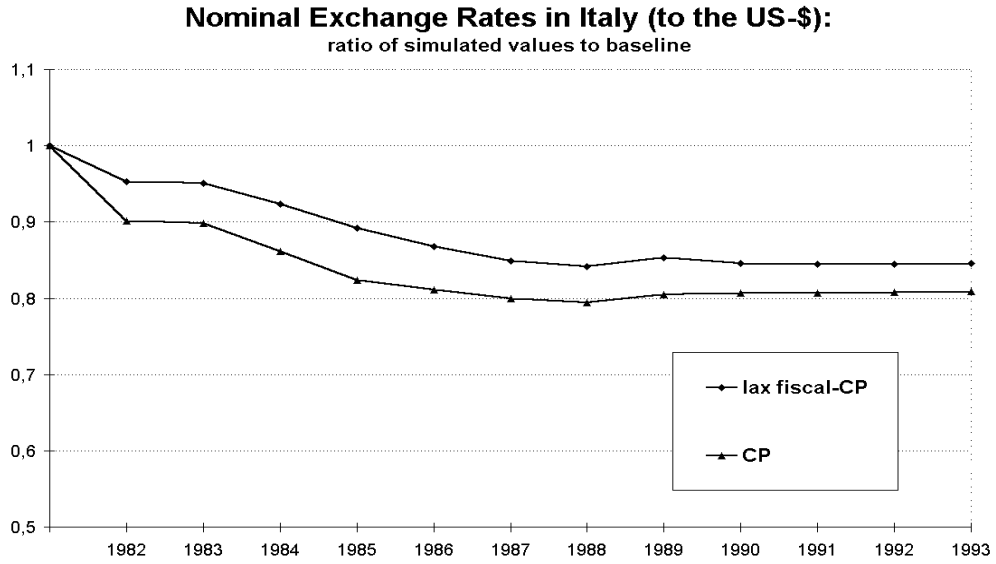
Impact of Fiscal Policy in a Monetary Union

As to the impact of fiscal consolidations on the hypothetical EMU, consider nominal interest and exchange rate impulses under any fiscal-CP scenario. *Exchange rates* vis-à-vis the US-$ are higher in Italy, but also in the other hypothetical EMU member countries – compared to the original CP scenario (cf. figure 2). This is due to monetary loosening over an extended period of time caused by the fiscal contractions in Italy. The basic mechanism rests on changes to money demand and different responses of central banks under different scenarios. In a situation without monetary union (i.e. under a fiscal-baseline scenario), Italy is part of the ERM and her central bank targets the exchange rate vis-à-vis the DM. Under such conditions, fiscal consolidations in Italy produce lasting reductions in the nominal money demand, which do not trigger *direct* interest rate responses by the Italian central bank to restore the initial volume of nominal money in the economy (as argued in section 4).

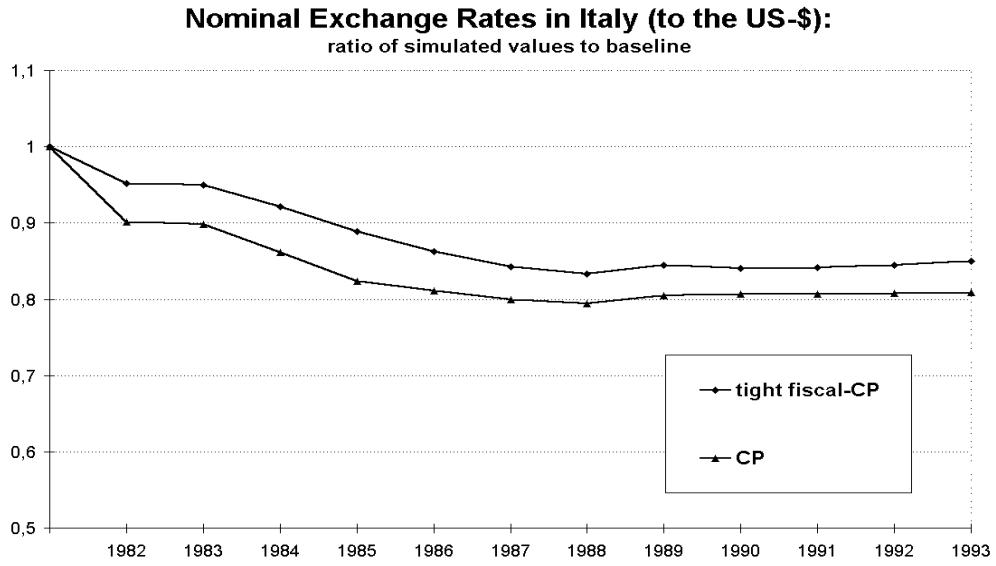
By contrast, under a fiscal-CP scenario there is monetary targeting conducted by the ECB (based on an exogenous aggregate nominal money supply target). Reductions in the union-wide nominal money demand (merely caused by the fiscal contraction in Italy) induce automatic monetary loosening (reduced interest rates) – relative to the baseline – in all hypothetical EMU countries such that the effect on the nominal money demand is limited. Hence the level of nominal money is higher in the longer term under a fiscal-CP scenario – compared to the corresponding fiscal-baseline (where monetary policy does not respond to the reduction in money demand). Moreover, reduced interest rates (relative to the baseline) produce a depreciative effect on exchange rates according to the open interest parity condition. For lax, moderate, and tight fiscal-CP scenarios, the change in exchange rates (relative to the baseline) is about 5 percentage points smaller than under the original CP scenario (relative to the baseline).

Figure 2: **Nominal Exchange Rates in Italy under Lax and Tight Fiscal-CP Scenarios**

(a)



(b)



Observation 6 (Exchange Rate Impulse under Fiscal-CP Scenarios)
Irrespective of the tightness of tax rate responses, fiscal consolidations in Italy produce an additional depreciative impact on nominal exchange rate impulses. Over an extended period of time, exchange rates are higher in all member countries because of lower interest rates in the union. As a result, there is an additional expansionary competition effect over and above effects caused by the fiscal strategy and by the hypothetical EMU on their own.

A more expansionary monetary policy by the hypothetical ECB should be reflected by larger *interest rate* impulses in Italy, i.e. union-wide nominal interest rates should be lower under a fiscal-CP compared to the original CP scenario. This is true for most years, but not for the first years of the hypothetical EMU. From 1983 to 1986, a paradoxical result obtains: interest rates are higher than under the original CP scenario. This is so despite the contractionary impact of higher taxes which should cause automatic monetary loosening (given that there is an exogenous nominal monetary target for the hypothetical ECB). However, since exchange rates are higher compared to the original CP scenario, prices and inflation are higher, too (due to imported inflation effects on the one hand, and a more positive competition effect leading to higher GDP, higher capacity utilisation and an additional inflation effect based on the Phillips curve relationship on the other hand). When GDP and prices go up, the public desires to increase its nominal money holdings. The central bank, however, tries to bring them down again (to the level of the exogenous nominal monetary target) by raising nominal interest rates.

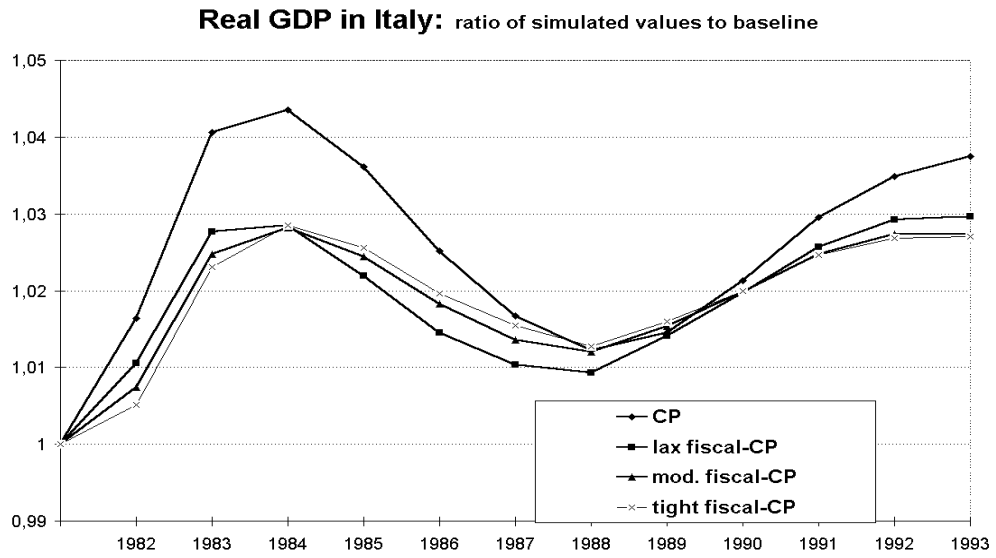
Since changes of the exchange rate impulse are almost identical under different fiscal strategies, the impact on interest rates is very similar, too. For all fiscal-CP scenarios, interest rates are (approximately 0.5 %) higher than those of the original CP scenario in the first three to four years of the hypothetical EMU, but below thereafter. It should though be remarked that – under all fiscal-CP scenarios – the impact of changes in nominal interest rates on real rates is practically eliminated by the aforementioned higher rate of (expected) inflation.

Real Effects

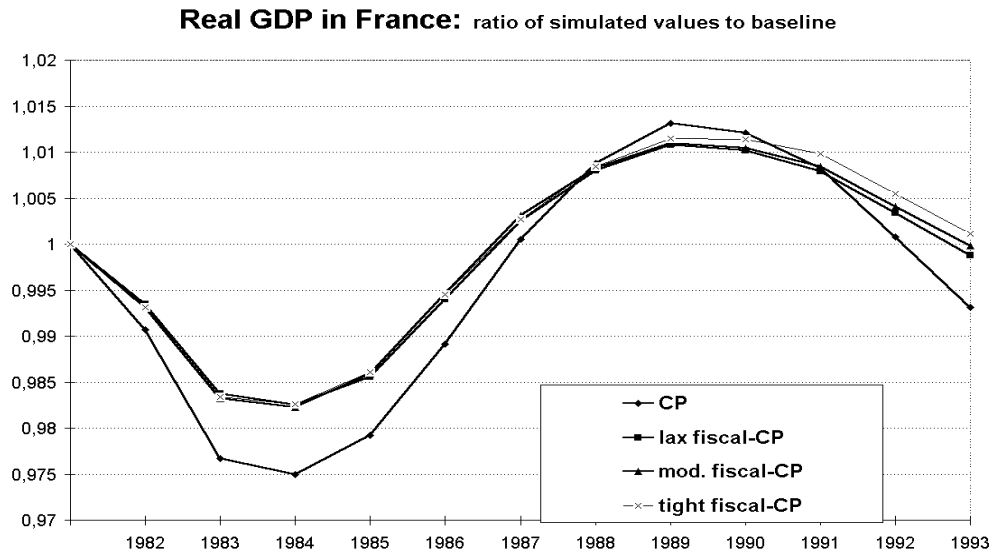
As for the overall impact on real GDP of various fiscal consolidation strategies under hypothetical EMU conditions, consider figure 3. In separate figures for Italy, France, and Germany, GDP levels – under various scenarios – are presented as ratios to baseline values. The figures confirm that – for each country – the simulated outcome for all fiscal strategies is very similar. For Italy, fiscal contractions lead to short term losses in aggregate output

Figure 3: **Real GDP in Italy, France, and Germany under CP and Fiscal-CP Scenarios**

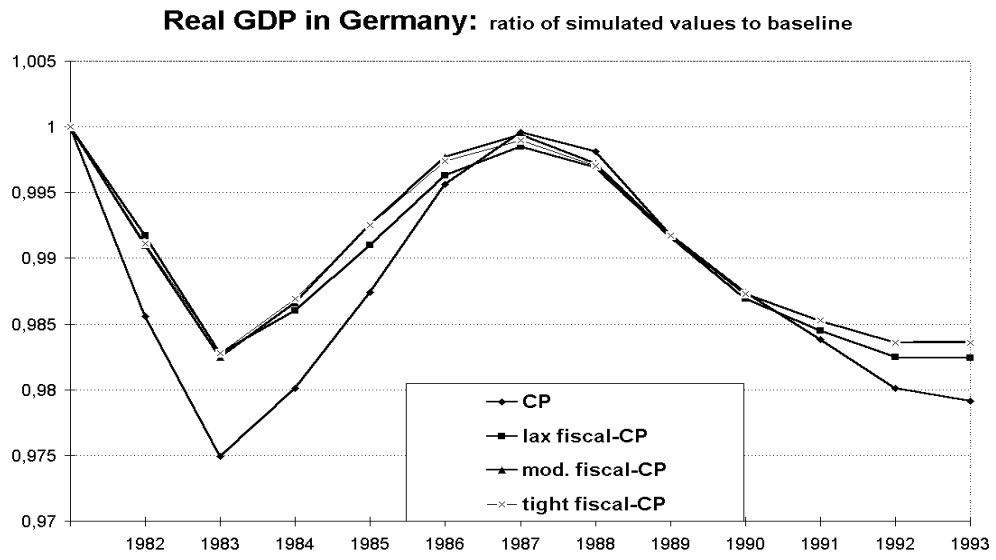
(a)



(b)



(c)



(of up to 1.5 % in 1984) – compared to the original CP scenario. These losses would be even larger without the additional expansionary effect stemming from the more depreciative exchange rate impulses under fiscal-CP conditions compared to the original CP scenario. Cycles are dampened and there is an overall loss of about 1 % by 1993 compared to the original CP scenario. (Even thereafter, the magnitude of the relative loss does not change much.) At the same time, inflation is also reduced. The price level in 1993 is between 3 % to 4 % lower under any fiscal-CP scenario compared to the original CP scenario.

In France and Germany, the situation is more favourable compared to the original CP scenario. Losses stemming from the hypothetical EMU are reduced in the short run as well as in the longer term due to less appreciative/more depreciative exchange rate impulses. Cycles are dampened in these countries (as in Italy). Over the longer term, losses occurring under the original CP scenario are reduced by more than 0.5 % and 0.3 % in France and Germany, respectively (even beyond 1993). This comes at the cost of higher price levels in each country in 1993 (some 2.5 % higher compared to the original CP scenario).

In all countries, impulses, transmission effects, and the potential interest-exchange trade-off brought out in section 3 remain the same, qualitatively, under all fiscal-CP scenarios. However, the trade-off between nominal interest and exchange rate impulses turns more expansionary in all countries under any fiscal-CP scenario due to the more depreciative exchange rate impulse. Nonetheless, the fiscal contraction does take a toll in Italy under all fiscal-CP scenarios in terms of reduced aggregate output. (On the other hand, longer term inflation figures improve.)

Observation 7 (Real Effects under Fiscal-CP Scenarios)
Under any fiscal consolidation program conducted by Italy in the hypothetical EMU, the interest-exchange trade-off observed under the original CP scenario is retained, qualitatively. Due to interdependencies between fiscal consolidations and the hypothetical EMU, there are, however, additional real effects caused by: a denominator effect (observation 5) and more expansionary exchange rate impulses (observation 6).

Real effects of fiscal consolidations on the hypothetical EMU (observation 7) can now be compared to the impact of fiscal consolidations on the baseline (cf. section 4). For Italy, a fiscal consolidation plan under hypothetical EMU conditions (fiscal-CP) produces – as already seen – fairly little output volatility, but results in an overall loss in the longer term (after 10 years) – relative to the corresponding original CP scenario. In contrast, a

fiscal retrenchment under baseline conditions (fiscal-baseline) induces considerable output volatility, but may cause both contractionary or expansionary effects in the longer term – relative to the original baseline. (Whereas lax and tight strategies – under baseline conditions otherwise – lead to output losses, the moderate fiscal plan produces increased output of +0.8 % by 1993 at almost no additional inflation.) At the same time, short run contractions in Italy – observed for a fiscal retrenchment plan under baseline conditions otherwise – are reduced under hypothetical EMU conditions (relative to the original CP scenario) due to a denominator effect (observation 5) and more expansionary exchange rate impulses (observation 6). France and Germany enjoy favourable effects if Italy conducts her fiscal consolidation under hypothetical EMU conditions, whereas they are hardly affected under baseline conditions.

6 Conclusion

In a counterfactual simulation experiment, effects of forming a monetary union and changing fiscal policies are analysed. Four scenarios are compared: the historical baseline, the formation of a hypothetical monetary union, hypothetical contractionary fiscal policies in one of the member countries, and the combination of both assumptions (formation of a monetary union joint with contractionary fiscal policies). The case study type analysis is based on real world data and produces the following results for Italy. On the one hand, the hypothetical EMU per se generates expansionary effects overall: an expansionary interest rate impulse dominates a contractionary exchange rate impulse. On the other hand, fiscal retrenchment policies per se cause short term contractionary effects (as is well-known).

If, however, the fiscal retrenchment and the joining of the monetary union happen at the same time, the overall results are determined by three findings. First, the fiscal contraction and the EMU-induced expansion are countervailing, but overall expansionary. Second, the expansion (caused by the interest rate impulse) reduces deficit-to-GDP and debt-to-GDP ratios in any case (denominator effect), thus facilitating the fiscal contraction. Third, there is some additional help from the monetary side (i.e. there are more favourable exchange rate impulses), if the European Central Bank sticks to a pre-specified nominal monetary target. Overall, it can be shown, therefore, that joining the EMU offers favourable conditions for fiscal consolidations in a country like Italy.

Obviously, these findings rest on a number of assumptions made in the underlying model, on a specific class of fiscal consolidation programs for Italy (based on a tax rate reaction function), and on the application of fiscal strategies to hypothetical EMU scenarios as

defined in this paper. They are also based on a country that is characterised by an undervalued currency (relative to purchasing power parity; cf. Hill, 1986), high nominal interest rates as well as 'excessive' budget deficits and debt – as captured by the historical baseline as of the 1980s.

If it were intended to obtain results that can be directly applied to the real world EMU which began on 1 January 1999, it could also be criticised that the simulation exercise is based on the economic conditions of the 1980s. The debt problem in Italy in the 1980s resembles the situation in the wake of the real world EMU, but interest and exchange rate impulses are clearly overstated. Moreover, fiscal consolidations are only simulated for one country, whereas most countries made considerable fiscal efforts in the run-up to and in the first few years of the actual EMU as of 1999.

Most criticisms are, however, not relevant, if the findings are interpreted differently. As emphasised before this paper is not interested in quantitative results, but in the underlying effects. For given constellations of interest and exchange rates the paper produces clear-cut qualitative results: what are the effects of contractionary fiscal policies in countries joining a monetary union? In answering this question it is important, however, that our judgement of the interest rate constellation is based on the differential between the joining country and the union *prior* to any anticipation effects setting in. As for fiscal policies, it is not required that the joining country originally fails the Maastricht Criteria. Instead, the findings are more general: what are the effects of fiscal policies turning *more* contractionary?

Bearing this in mind, let us examine the relevance of this paper for prospective future member countries of the EMU. Just before having received candidate status for EU membership the macroeconomic situation of most of them resembled the conditions in Italy as of the 1980s. For instance, the Eastern Central European countries Poland, Hungary, Slovenia and the Czech Republic had short term nominal interest rates between 15 % and 20 % and their currencies were grossly undervalued relative to purchasing power parity (DIW, 1998). In 2002, nominal interest rates in these countries were still near or above 10 % (OEI, 2002). After that, anticipation effects based on the expectation of eventual membership in the EMU may have set in, thereby reducing interest rate differentials even further. Their fiscal situation was/is generally not as bad as it was/is in Italy. Hungary was the only one of these countries with debt and deficit ratios relative to GDP above those prescribed by the Maastricht Criteria. Nonetheless, all prospective member countries are asked to bring their fiscal *deficits* down to levels prescribed by the Stability Pact.

In summary, the case of Italy in the 1980s and the case of the current EMU candidates is qualitatively similar and the qualitative findings of this paper may be applied. This leads to the following policy recommendations: (i) it is highly recommendable to join the European Monetary Union; (ii) if fiscal consolidations are deemed necessary in a situation without a monetary union, they may produce favourable results in the longer term depending on the tightness of the fiscal contractions and their supply side effects; (iii) nonetheless, it may be advisable to combine a fiscal retrenchment with the participation in a monetary union (despite minor losses produced by fiscal contractions under fiscal-CP conditions relative to EMU conditions without fiscal adjustments), because effects caused by the fiscal retrenchment are clearly outweighed by overall gains from joining a monetary union; (iv) there may be scope for adjusting the tightness of fiscal contractions (in terms of tax rate responses) – under the conditions of a monetary union – to political circumstances, because the overall impact on the economy is hardly affected by the severity of the fiscal retrenchment; and (v) current member countries of a monetary union may gain (rather than suffer) from fiscal contractions conducted by newly joining members (due to a depreciative effect on exchange rates, cf. observation 6).

Considering the unraveling of the Stability Pact, even more general conclusions could be drawn on the basis of this study. In fact, I wonder if the EMU should reconsider its policy towards prospective candidates. If the Stability Pact does not work fully, the fiscal criteria of the Maastricht Treaty create unnecessary hardship with limited long term benefits. If the Stability Pact could be made to work, it would be better to pursue fiscal retrenchment policies in the first years of membership (or when there is a clear prospect of membership, i.e. when interest rates start adjusting), but certainly not as a precondition for membership . In other words, if the Stability Pact does not work, the fiscal Maastricht Criteria are damaging, and if the Pact does work, the fiscal criteria are costly. In any case, it seems unreasonable to delay the admission of candidate countries on the grounds of incomplete fiscal adjustments. The key issue is an effective Stability Pact, possibly based on an independent commission rather than the European Council.

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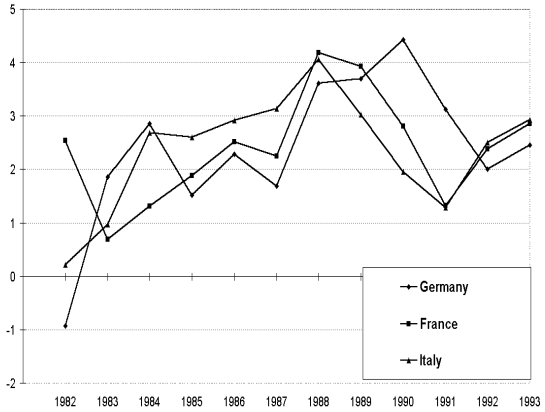
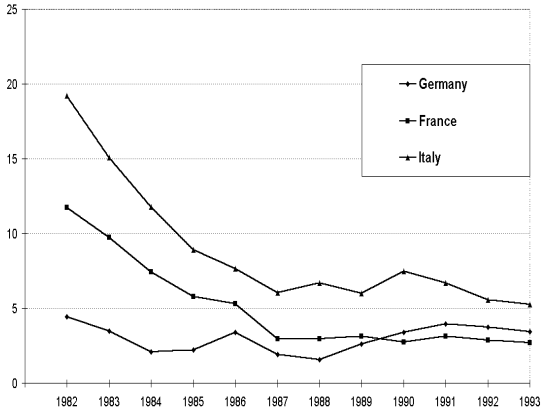
A The Baseline

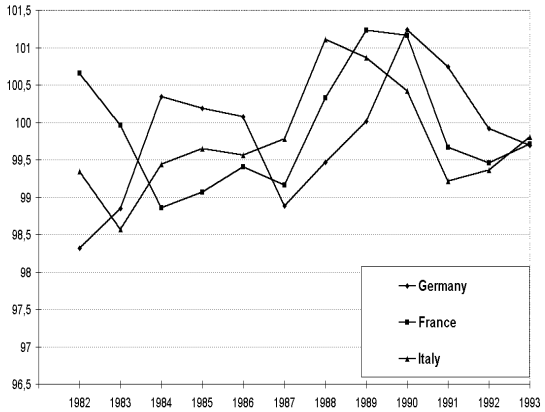
Real GDP (growth rates, %): baseline



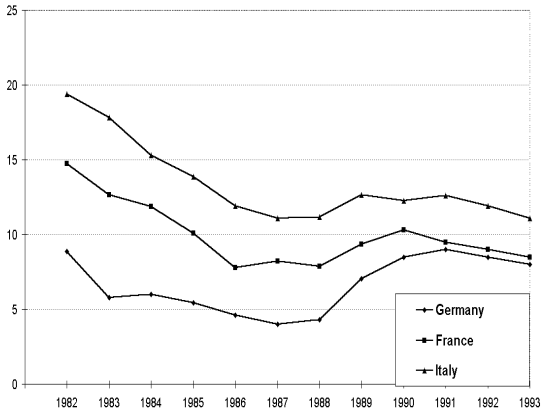
Inflation Rates (%): baseline



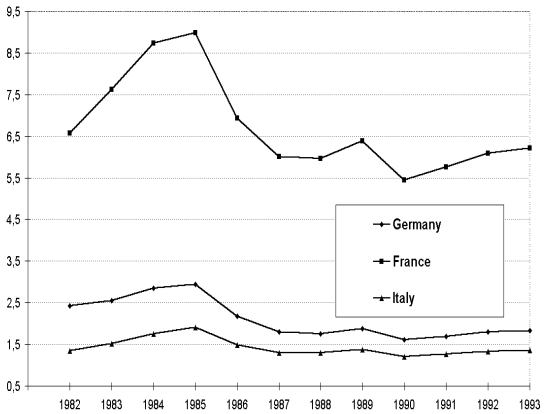
Capacity Utilization (%): baseline



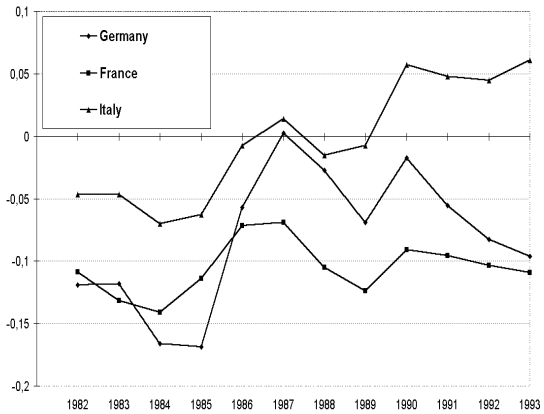
Nominal Interest Rates (short term; %): baseline



Nominal Exchange Rates (to US-$): baseline

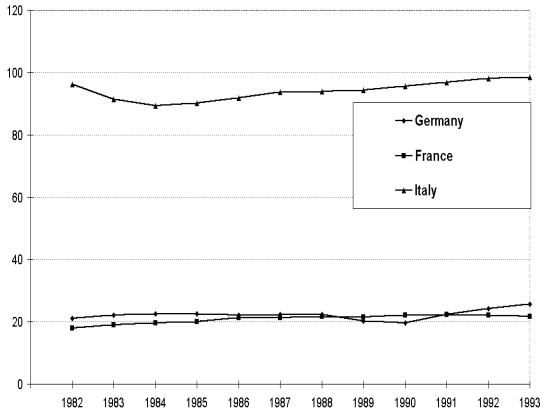


Real Effective Exchange Rates (index): baseline

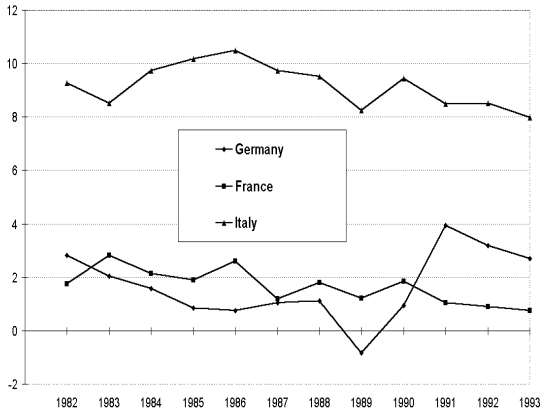


The Baseline – page 2

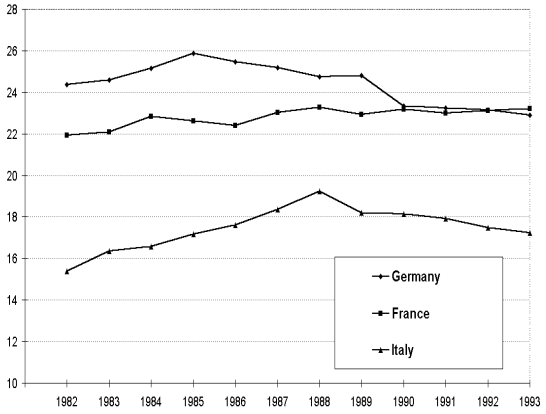
Debt (% of GDP): baseline



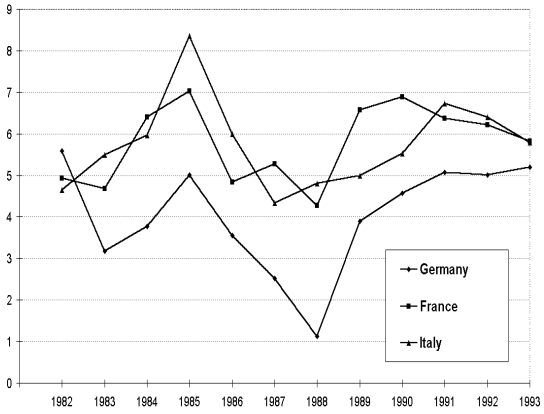
Budget Deficit (% of GDP): baseline



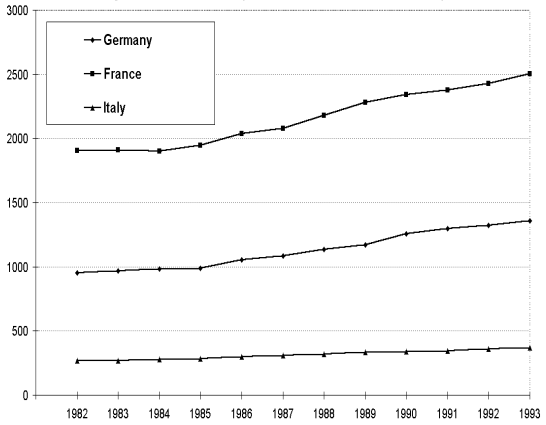
Average Tax Rates (%): baseline



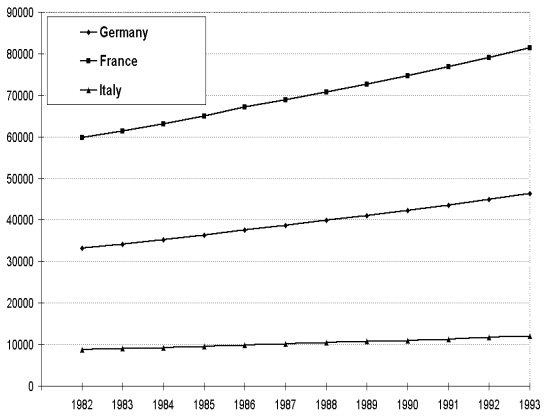
Real Interest Rates (short term; %): baseline



Real Disposable Income (bil. DM, FF; tril. Lira; 1980): baseline

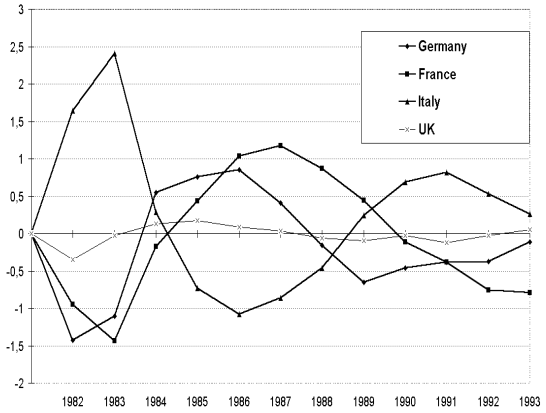


Real Wealth (bil. DM, FF; tril. Lira; 1980): baseline

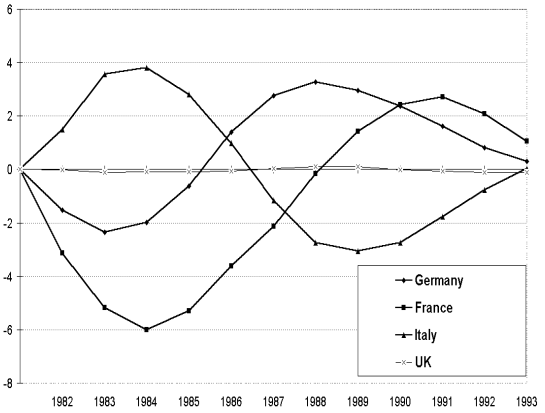


B CP Scenario (Monetary Union Only)

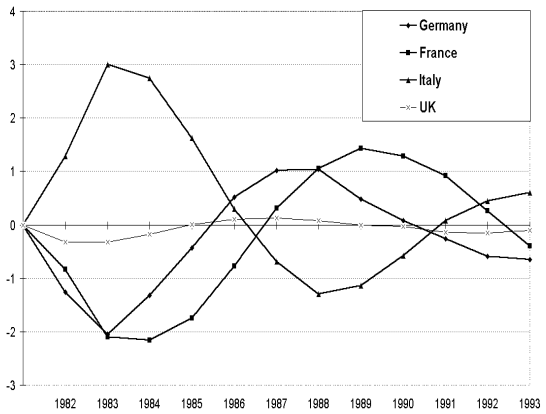
Real GDP (growth rates, %): dev. of sim. values from baseline



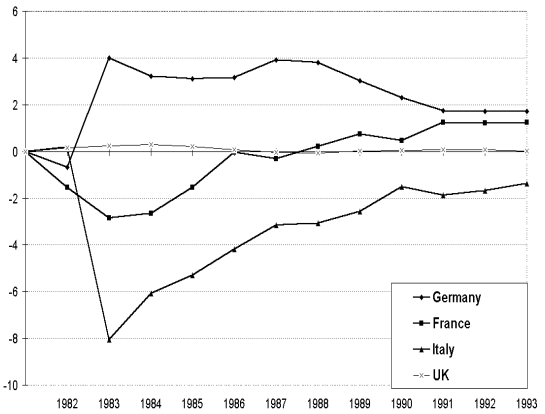
Inflation Rates (%): deviation of simulated values from baseline



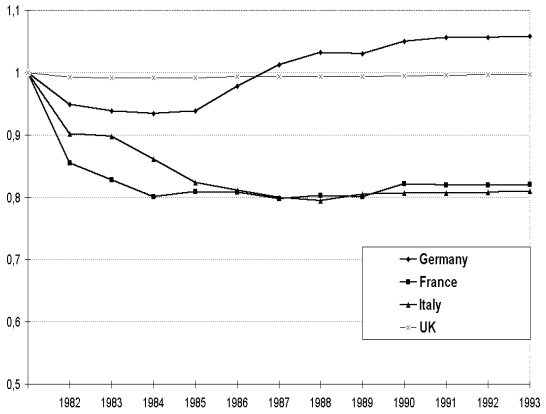
Capacity Utilization (%): dev. of simulated values from baseline



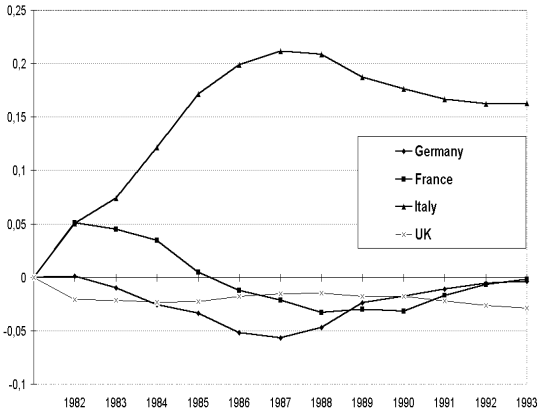
Nominal Interest Rates (short term; %): dev. of sim. v. from b.



Nominal Exchange Rates (to US-$): ratio of sim. v. to baseline

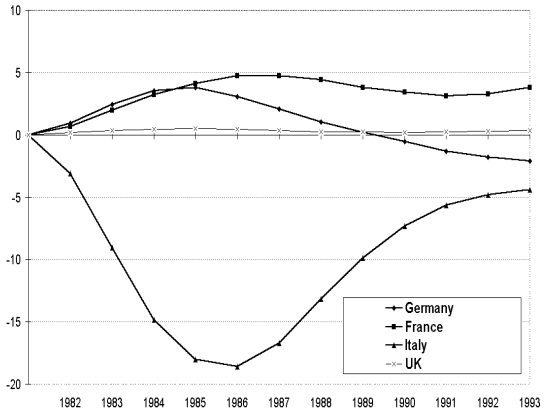


Real Effective Exchange Rates (index): dev. of sim. v. from b.

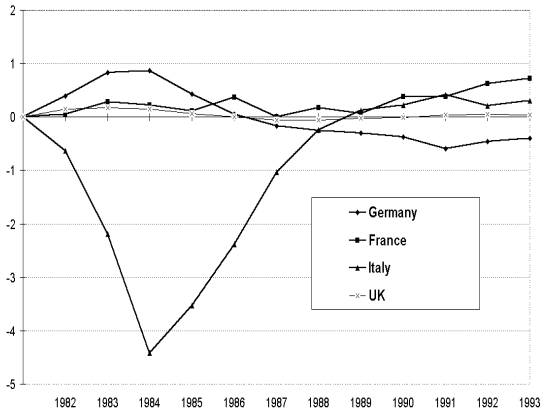


CP Scenario – page 2

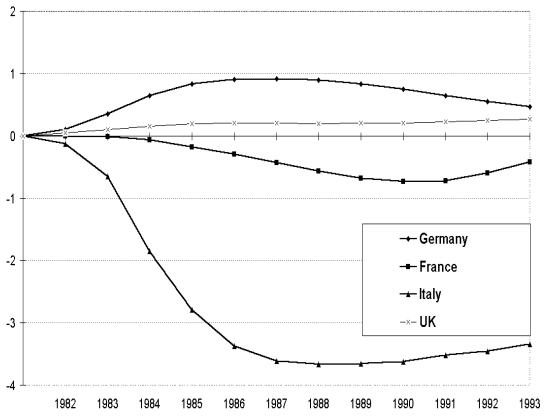
Debt (% of GDP): deviation of simulated values from baseline



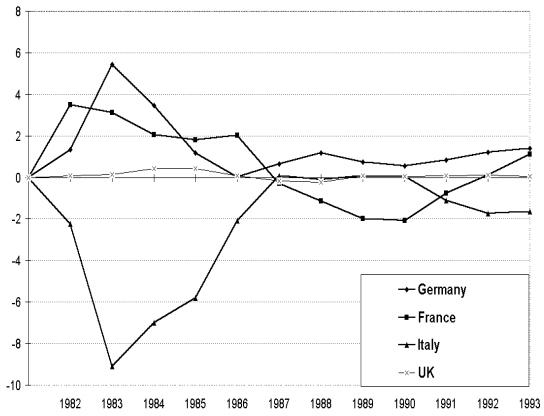
Budget Deficit (% of GDP): dev. of simulated values from baseline



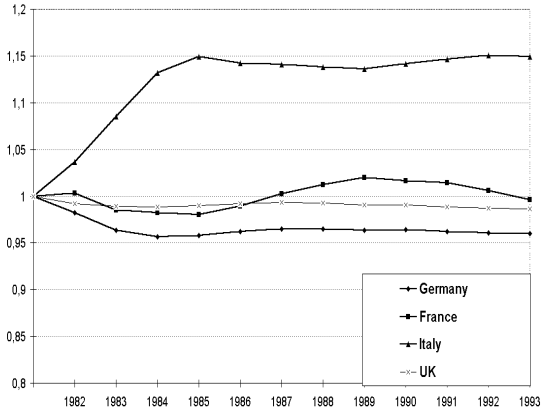
Average Tax Rates (%): dev. of simulated values from baseline



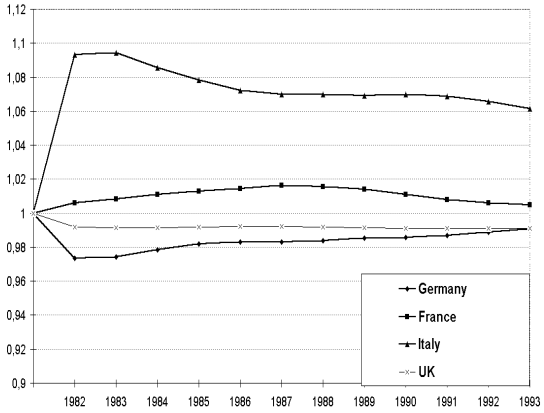
Real Interest Rates (short term; %): dev. of sim. v. from baseline



Real Disposable Income: ratio of simulated values to baseline

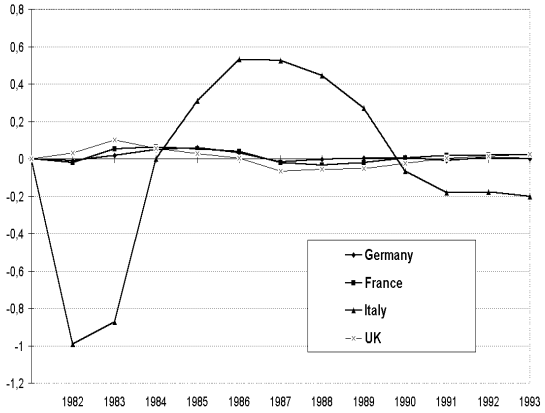


Real Wealth: ratio of simulated values to baseline

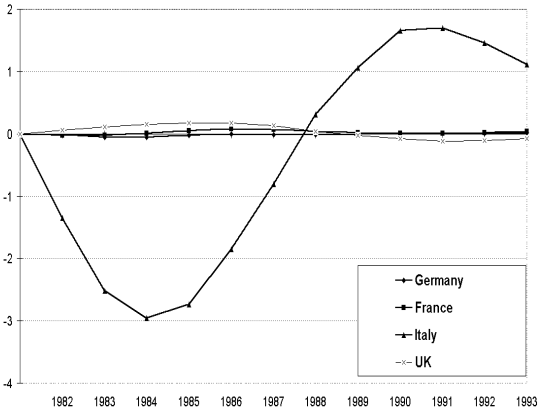


C Lax Fiscal-Baseline (Fiscal Policy Only)

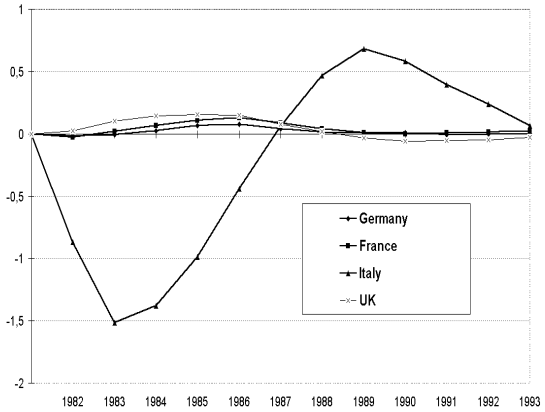
Real GDP (growth rates, %): dev. of sim. values from baseline



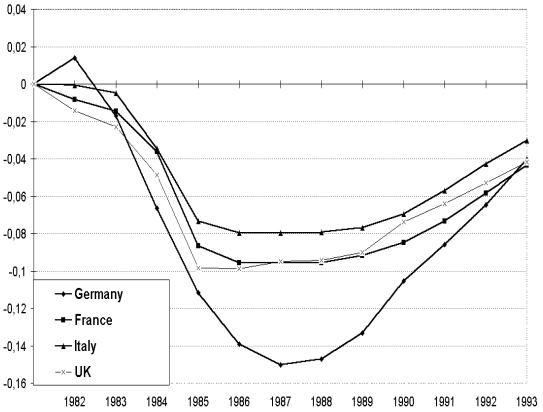
Inflation Rates (%): deviation of simulated values from baseline



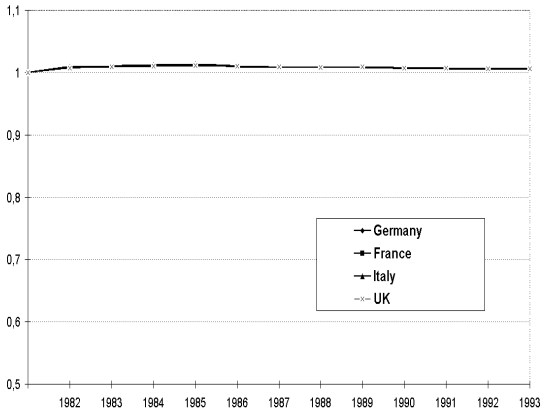
Capacity Utilization (%): dev. of simulated values from baseline



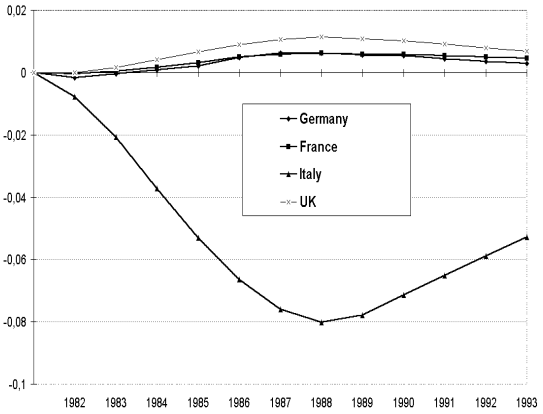
Nominal Interest Rates (short term; %): dev. of sim. v. from b.



Nominal Exchange Rates (to US-$): ratio of sim. v. to baseline

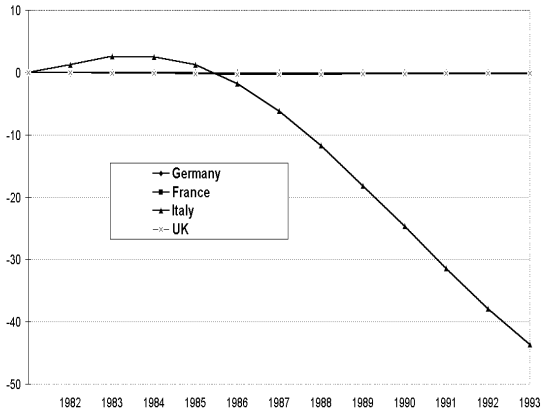


Real Effective Exchange Rates (index): dev. of sim. v. from b.

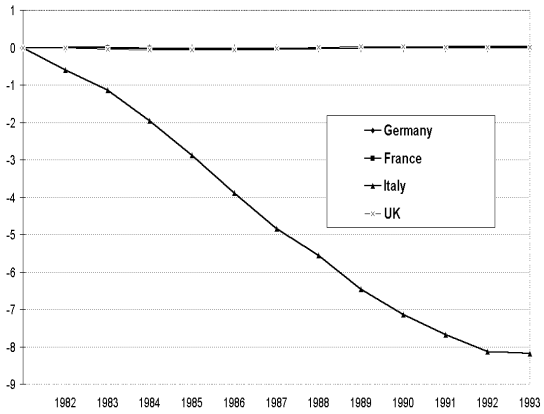


Lax Fiscal-Baseline – page 2

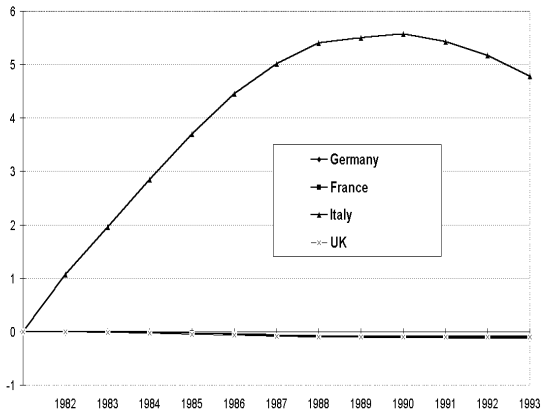
Debt (% of GDP): deviation of simulated values from baseline



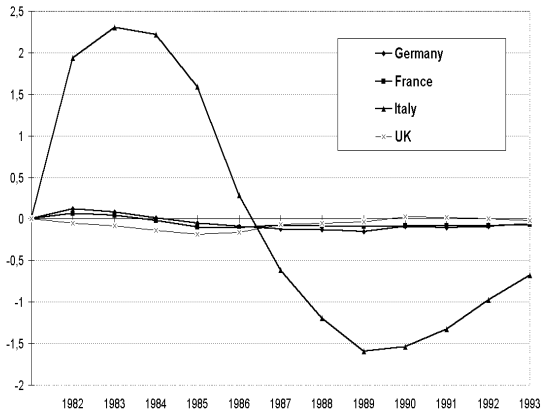
Budget Deficit (% of GDP): dev. of simulated values from baseline



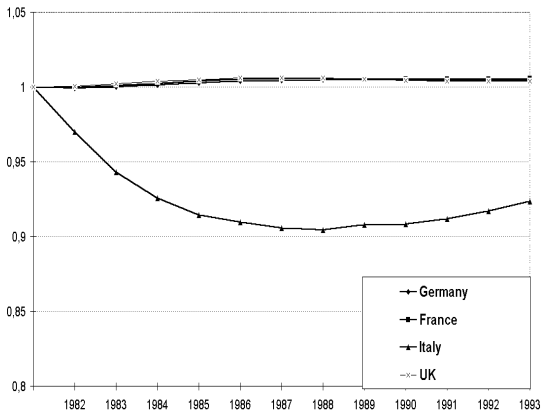
Average Tax Rates (%): dev. of simulated values from baseline



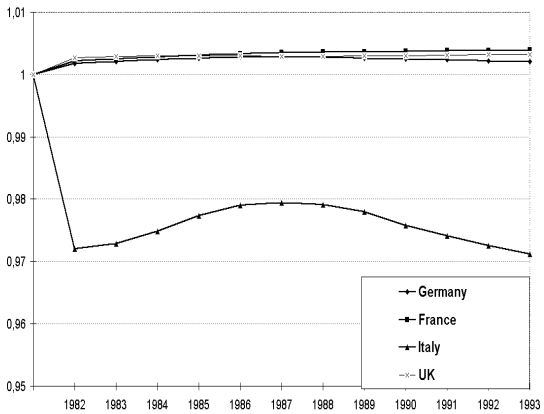
Real Interest Rates (short term; %): dev. of sim. v. from baseline



Real Disposable Income: ratio of simulated values to baseline

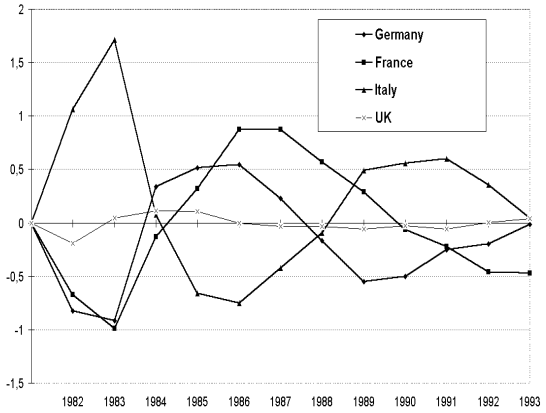


Real Wealth: ratio of simulated values to baseline

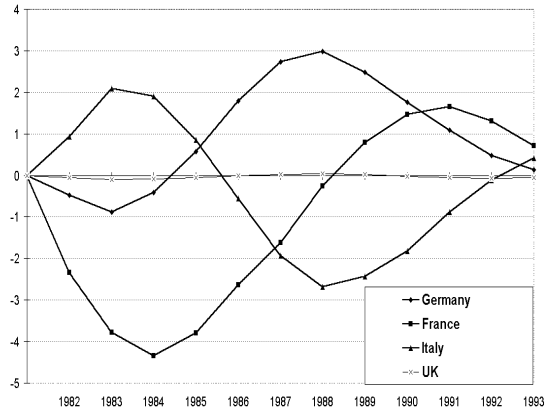


D Lax Fiscal-CP Scenario (Monetary U. & Fiscal P.)

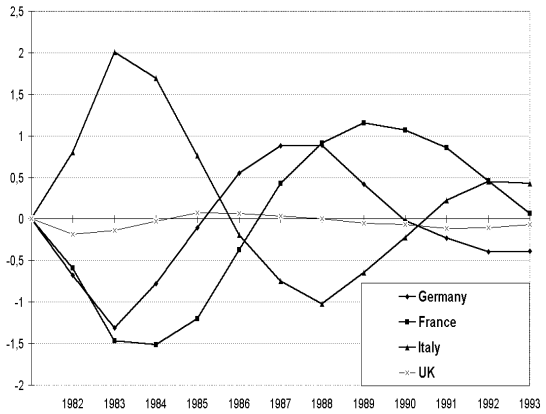
Real GDP (growth rates, %): dev. of sim. values from baseline



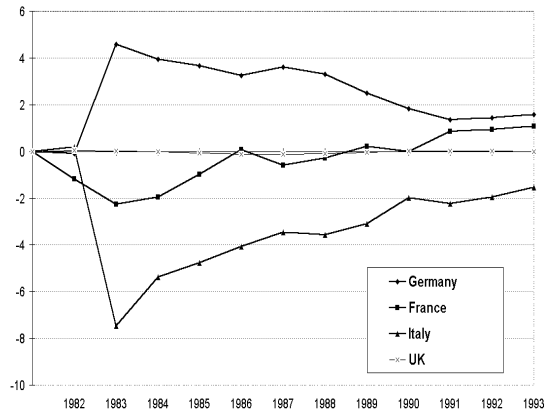
Inflation Rates (%): deviation of simulated values from baseline



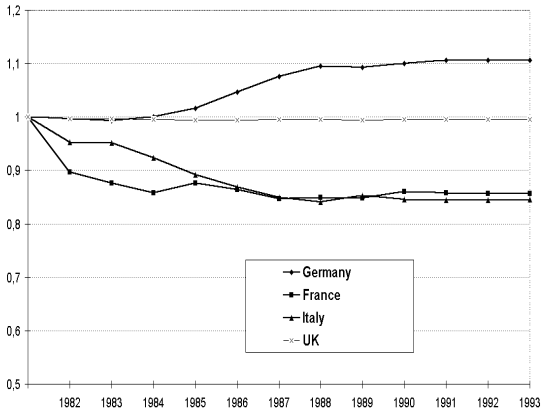
Capacity Utilization (%): dev. of simulated values from baseline



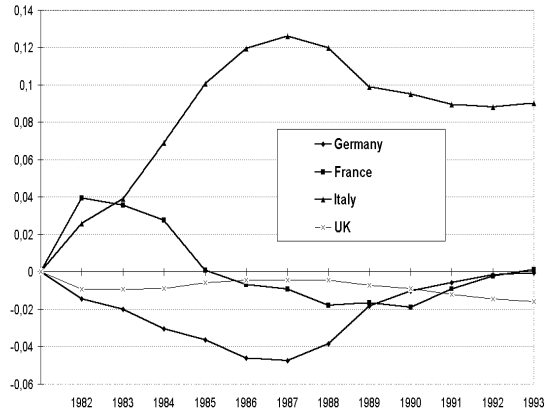
Nominal Interest Rates (short term; %): dev. of sim. v. from b.



Nominal Exchange Rates (to US-$): ratio of sim. v. to baseline



Real Effective Exchange Rates (index): dev. of sim. v. from b.



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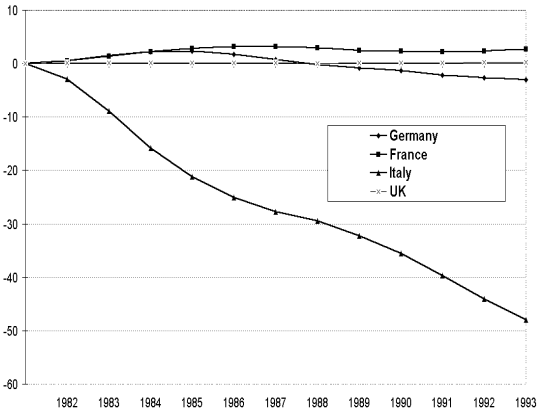
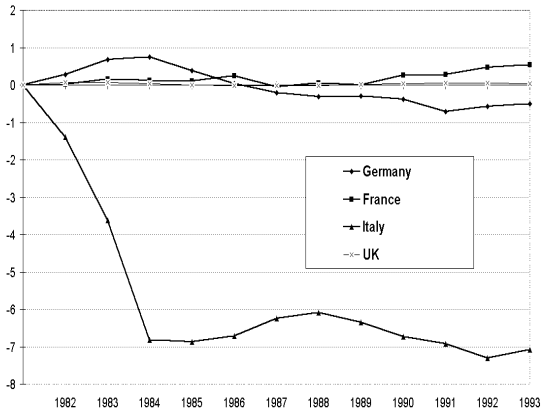
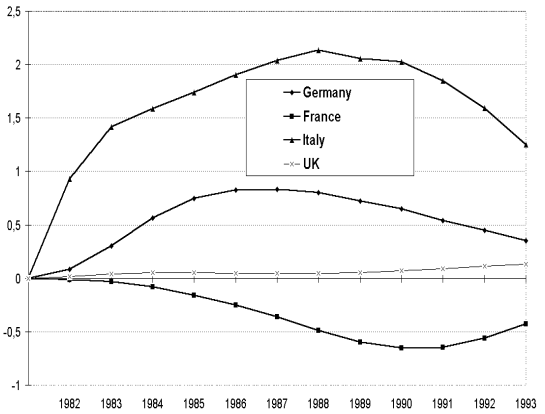
Debt (% of GDP): deviation of simulated values from baseline



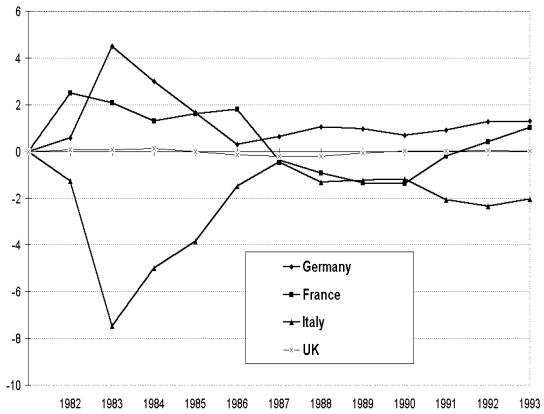
Budget Deficit (% of GDP): dev. of simulated values from baseline



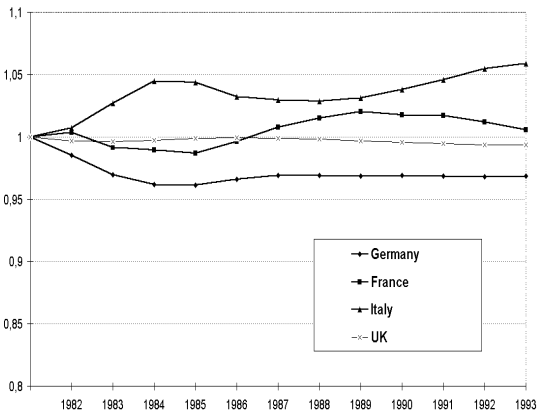
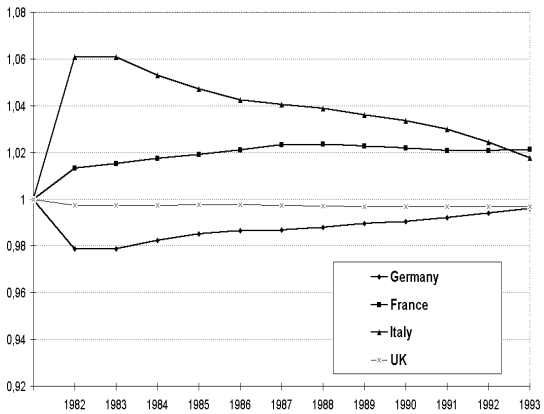
Average Tax Rates (%): dev. of simulated values from baseline



Real Interest Rates (short term; %): dev. of sim. v. from baseline



Real Disposable Income: ratio of simulated values to baseline



Real Wealth: ratio of simulated values to baseline