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EFFICIENCY OF STABILITY-ORIENTED INSTITUTIONS: THE EUROPEAN CASE♦

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Stability-oriented European institutions correspond to the general prescriptions of the 'new macroeconomics consensus'. This contribution provides an assessment of the pros and cons of these institutions in terms of macro stabilisation and exchange-rate swings drawing on different scenarios. We argue that the institutions which have been associated with the Euro – limits on public deficits and a conservative central bank – have somewhat jeopardized the efficiency of this new exchange-rate regime. Adaptation of institutions is thus needed: either cooperation or coordination may enhance European welfare.

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1 Introduction

The Euro area triggered the launch of an unprecedented economic policy architecture. Contrary to US-style monetary union, Europeans decided they did not need the federal financial clout that would allow them to carry out an effective redistribution policy between Member States on a vast "European" scale. With an upward limit of about 1% of European GDP and torn as it is between the Common Agricultural policy (CAP) and structural Funds, the Community's budget cannot boost either agricultural revival or the realignment of poorer regions. It appears that Europe seems to be better characterised by its shadowing of US theoretical models – which have given rise to the 'new macroeconomics consensus' - than by its shadowing of US institutions: it did grant the European central bank (ECB) independence (*cf*. Kydland and Prescott, 1977; Rogoff, 1985), yet without accountability to the voters; and national fiscal policies were capped, within the Stability and Growth Pact (SGP), so as to prevent their inflationary instinct to jeopardise the ECB's objective of "price stability" (*cf*. Barro and Gordon, 1983).

So far, 'price stability' has been reached but GDP growth has been badly oriented; moreover, the exchange rate of the Euro has been moving in an unfavourable fashion for EU trade, except in countries which have matched its recent appreciation with painful structural reforms, e.g. in Germany.

In this paper, we argue that, at least, part of the dismal GDP evolution since 2001 can be related to EU institutions, namely exchange rate, fiscal and monetary policies. To check for the validity of the argument, we construct an open economy model in which institutions in one part of the world (Europe) are characterised by an independent central bank and constrained fiscal policies. We show that after typical shocks, the reactions of these institutions and their overall economic effects do mimic the current EU situation, described

not only by slow growth but also by exchange-rate volatility and a procyclical behaviour of the Euro. The benchmark macroeconomic model featuring four countries also serves to present an extensive and consistent view on the various interactions between economic policies and the public. At last, two variations are introduced: first, a cooperation framework where US authorities are assumed to adopt European-style institutions; second, a coordination framework where European governments and the ECB are assumed to coordinate their policies. In these two variations, European authorities are always characterised by the same loss functions as in the benchmark; their values can thus be compared with the benchmark's.

The remainder of the paper is organised as follows. Section 2 reviews the recent history of the Euro area, emphasizing Euro's behaviour. Section 3 presents the macroeconomic model. Section 4 is devoted to a counterfactual analysis (European institutions are exported to the USA) and to the variation on coordination. Section 5 concludes.

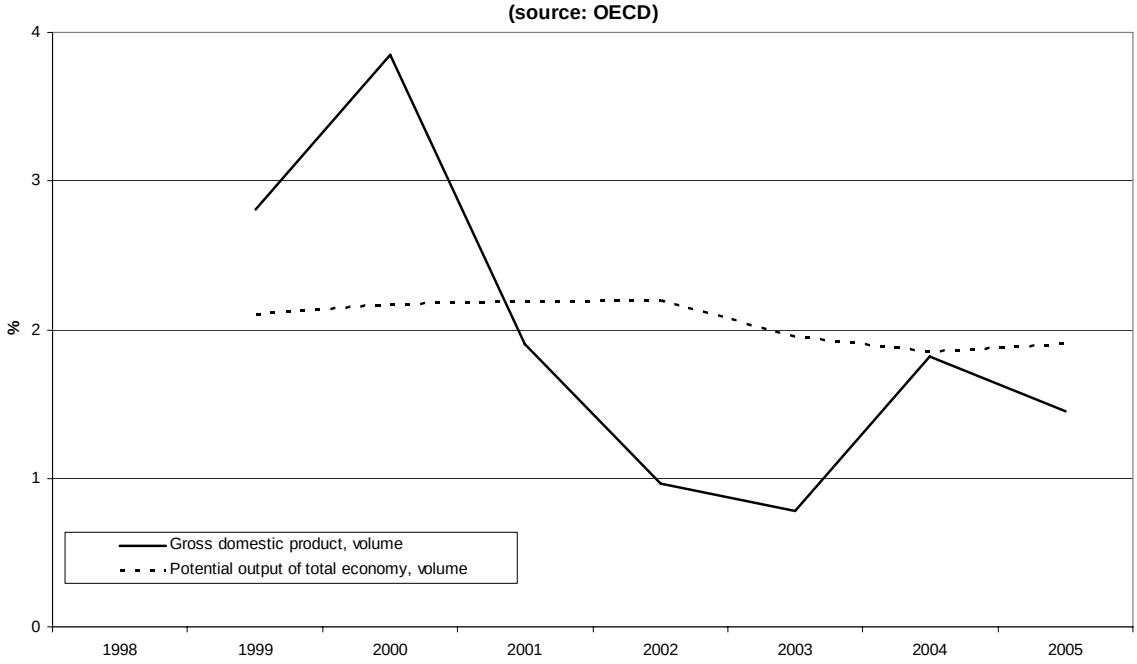
2 Economic performance in the Euro area: a short story

2.1 Slow growth

Euro area economic performance since 1999 has undergone two phases: between 1999 and 2001, the accommodative monetary policy implemented by the ECB helped the European economies to dampen the shocks that had occurred in the emergent economies. Thanks to relatively high economic growth rates, limitations to public deficits embedded in the SGP were still far from met. The Euro area GDP growth rate was superior to potential growth[1] (see figure 1). Since 2001 however and the slowdown of the US economy, the Euro area has entered a long phase of slow growth below potential, except in 2004.

[1] Data for potential output come from the OECD database and therefore stem from the OECD's methodology. Assessing potential output is still a disputable issue which remains beyond the scope of this paper.

Figure 1.
GDP growth rate and potential growth, Euro area
(source: OECD)



2.2 The value and volatility of the Euro

Various reasons can explain such a bad performance (see, e.g. Blanchard, 2004; Fitoussi and Padoa-Schioppa, 2005). We will only quote macroeconomic ones.

The responsibility of European economic policies in this bad performance will be questioned in the following. But of course, the globalisation of economies has become so substantial that one cannot study the Euro area without considering a worldwide perspective; in this respect, the choice of the exchange rate (ER) regime within and outside the Euro area and the European Union is also remarkable. The Euro area is a monetary union which exchange rate is perfectly flexible *vis-à-vis* big currencies like the US Dollar and the Yen, but almost fully-fixed *vis-à-vis* smaller currencies that participate in the Exchange rate mechanism (ERM II). Thanks to the flexibility of the Euro *vis-à-vis* major currencies, the Euro area has long been viewed as a protection *vis-à-vis* external shock: the Euro would be a shield. Thanks to fixed though adjustable pegs within the ERM II, the Euro area has benefited from macroeconomic stability at its borders. As for the monetary union *per se*, it has

permitted a reduction in transaction costs and interest rates within the union.

In this context, the ECB, which is in charge of the monetary policy of the Euro area, was expected to manage the Euro in order to pursue domestic goals, especially to fight inflation, and not to give much attention to the external stability of the currency. Hence, it has long been feared that the Euro would be extremely volatile compared to the post-September 1992 period: the three areas (surrounding respectively the US, Europe and Japan) would undergo large ER fluctuations, and these would increase global uncertainty and be unfavourable to the growth of international trade[2]. The possible volatility of the Euro would hence be a reason why economic growth in the Euro area has been so low since 2001[3].

Table 1 displays standard deviations for monthly variations in exchange rates against the US Dollar. Euro's volatility is shown to be largely superior to the DM's during the convergence process towards the Euro (the so-called post-Maastricht period). The constitution of a vast area – the Euro area –, has thus coincided with an increase in ER volatility which value is similar to that of the Yen's. In the meantime, the volatility of the UK Sterling has substantially decreased. Evidence validates the so-called "size effect": After the creation of the Euro area, many small countries, which were heavily dependent on external factors, have entered a big area which dependence on non-European factors has decreased; this newly established large and relatively closed area does not have to worry as much as in the past about the consequences of its policy choices on the exchange rate because ER fluctuations are less painful. Such is also the case for the United States which are generally attributed a "benign neglect attitude" towars the US Dollar.

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[2] How exchange rate volatility impinges on international trade was originally discussed in IMF (1984) and Krugman (1989).

[3] See Bénassy et al. (1997), Cohen (1997), and Martin (1997) for analyses on the volatility of the yet future euro. Creel and Sterdyniak (2000) provide a theoretical review on this topic.

Table 1. Standard deviations of monthly variations in exchange rates expressed in US$

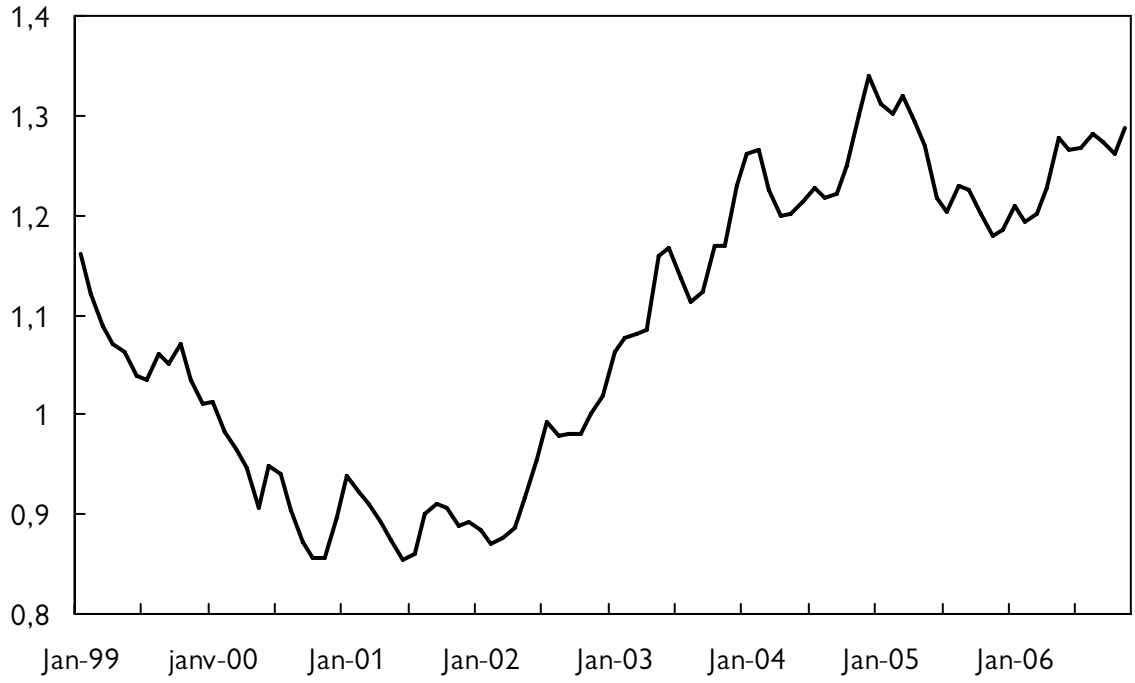
	Germany	Japan	UK	France	Euro area
1974 :8-79 :2	2.08	2.17	2.11	1.93	
1979 :3-83 :2	2.84	3.25	2.61	2.96	
1983 :3-87 :8	2.97	2.82	2.89	2.92	
1987 :9-92 :8	3.00	2.75	3.02	2.86	
1992 :9-98 :12	2.38	3.80	2.77	2.63	
1999:1-06:01		**2.75**	**2.19**		**2.78**

Source: Datastream (monthly data), authors' calculations.

Another phenomenon that may have had strong consequences on the ability of the Euro area to foster growth has been the procyclicality feature of the Euro-US Dollar ER (documented in Fitoussi, 2004, for instance, see also figure 2). From 1990 onwards, the US Dollar-Euro ER has contributed to the stabilisation of the US economy; in the meantime, it has destabilised the European economy. Until the end of 2000, the Euro depreciated against the US Dollar whereas European economic growth was high; and it only stopped appreciating for a relatively long period in the middle of 2005 when economic growth in the Euro area has been meant to resume. During 2006, appreciation coincided with higher growth than expected in Germany, but with lower growth than expected in France and Italy, for instance.

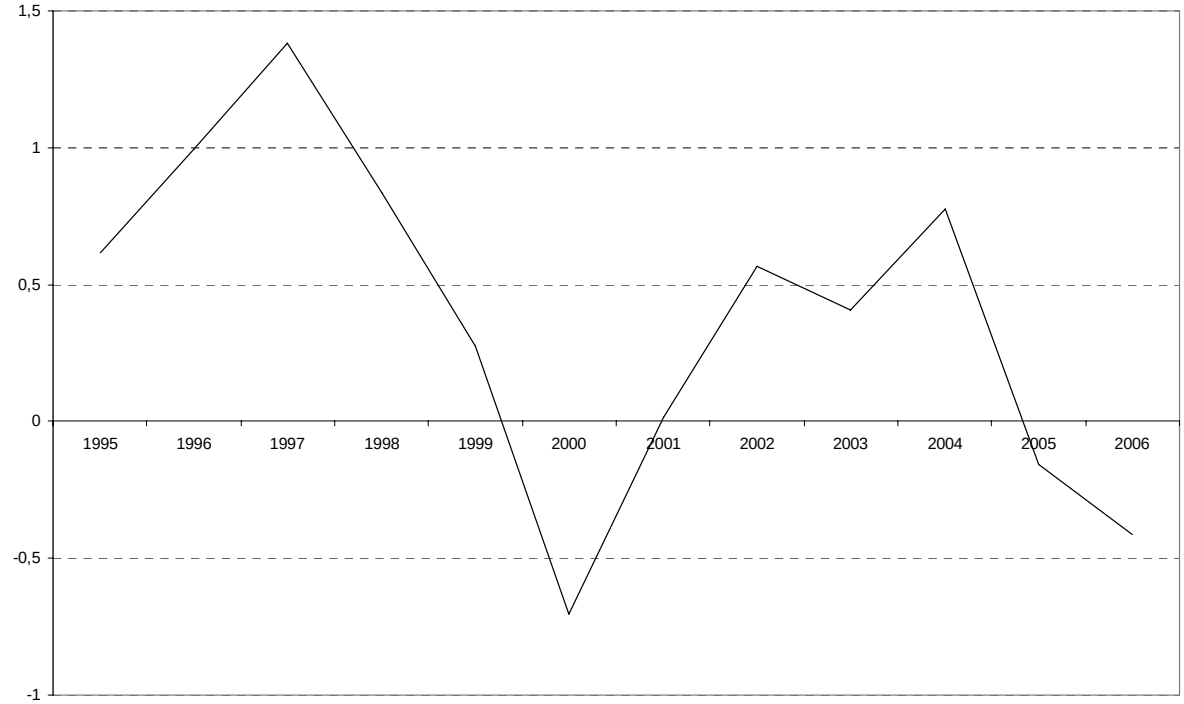
Moreover, following the Euro appreciation and according to the inversed J-curve, current accounts have decreased or have turned negative in a number of Euro area member countries, like Belgium, Finland, France, Italy, Ireland, Portugal and Spain, reinforcing therefore the low growth process. As reported in figure 3, since Euro's appreciation, which started in 2002, Euro area's current account has lost 1 point of GDP, to reach a deficit of almost 0.5 point of GDP in 2006.

Figure 2. US Dollar to Euro exchange rate



Source: Datastream

Figure 3. Current account, as a percentage of GDP, Euro Area



Source: OECD

2.3 Shocks and institutions

These features of the Euro area – slow growth, volatility and procyclicality of the Euro – which are generally addressed independently need on the contrary to be investigated in a common framework incorporating the main institutional features of the US and EU economies[4]. Using a macroeconomic model involving four countries, we will relate these three features with two complementary ones: shocks and institutions.

It has been usual to blame European institutions for the bad Euro area's economic record (see, for instance the recent appraisal of Buiter, 2006 and de Grauwe, 2006a, b); moreover, these institutions are blamed for their involvement in exchange rate volatility and procyclicality *via* inadequate monetary and fiscal policies (see, for instance, Creel and Sterdyniak, 2000). Strikingly, as regards the 'new macroeconomics consensus', European institutions are clearly in accordance with mainstream economics and they should deserve to be labelled 'good institutions'.

Our definition of institutions will be narrow: we mean economic policies and their interactions. The quality of institutions in the European context has often been evoked in the literature: the Maastricht architecture of fiscal and monetary policies in the European monetary union is very typical of the 'new macroeconomics consensus' (see Arestis and Sawyer, 2003; Fitoussi and Padoa-Schioppa, 2005). The 'consensus', summarised very briefly, is made of two important parts: first, it largely denies efficiency to fiscal policy, except in the very short run in so far as automatic stabilisers are concerned; second, monetary policy must resolve the time-inconsistency issue; an independent and 'conservative' (i.e.

[4] Some contributions, like the Sapir report (Sapir et al., 2004), that investigate the bad economic performance of the Euro area, deal at length with institutions' efficiency but do not say much on the exchange rate of the Euro; whereas some contributions, like Altavilla and de Grauwe (2005), that investigate the Euro-Dollar exchange rate, relate its variations partly to GDP differentials but do not deal with institutions.

inflation averse) central bank which ensures price stability is generally considered as a good solution.

In accordance with the 'consensus', member countries of the Euro area follow fiscal rules that depend on the output gap (in the mid-run, member countries should balance their cyclically-adjusted deficit) and on public debt (since the SGP's reform of March 2005, member countries with high debt levels have had to implement further improvements in their public finances in comparison with low-debt countries; before the reform, high-debt countries were under close scrutiny by the European Commission). As for the ECB, although it denies following an inflation targeting strategy, its policy is aimed at price stability, consistently with the 'consensus' prescriptions.

Moreover, the importance of shocks that have hit the Euro area since 1999 should not be underestimated when the performance of the Euro area is assessed. The nature of these shocks may have produced policy reactions that have proven counterproductive in the 'consensus' context. For example, if a symmetric unfavourable supply shock occurs the ECB may not be willing to sustain economic growth because it may fear to lose credibility: market participants may expect the ECB to outperform its price stability objective[5].

The various shocks that have occurred in Europe since 1999 are reported in table 2. Their (theoretical) relationships with Euro's volatility are also presented.

[5] Using the same type of shock, Bernanke et al. (1999) argue that official "inflation targeting" - they mean the strategy is transparent – reduces the fear of losing credibility: transparency produces credibility. Sustaining economic growth temporarily after a negative shock would not be interpreted as bad policy. It is worth mentioning here that the ECB does not officially follow an "inflation targeting" strategy and is generally criticised for its low transparency (see, for instance, Buiter, 1999)

Most of the shocks can reasonably be considered as supply shocks, although their determinants have been diverse: political shock in Russia, external financing shock in Asia, geopolitical shocks related to the Middle East, etc. At least, their influence on the Euro area has been mostly driven towards the supply-side of the economy.

A positive external supply shock, like the IT shock, can be supposed to have increased Euro's volatility: lower competitiveness in Europe triggered a restrictive monetary policy and an upswing in the Euro ER; meanwhile, IT diffusion in the EU countries should have decreased volatility, with the originally external shock becoming an internal one. The other negative shocks on the EU (Asian and Russian crises, oil shocks, geopolitical tensions) were all supposed to have increased Euro's volatility.

Table 2.EU shocks and Euro-US Dollar ER volatility

EU shocks	Volatility
Asian and Russian crises (1998-99)	+
IT revolution (2000-02)	+ / –
Oil shock (2000-02)	+
Geopolitical tensions (2002-03)	+
Oil shock (2004-05)	+

N.B.: '+': higher volatility; '-': lower volatility.

Based upon this economic diagnosis – slow growth, volatility and procyclicality of the Euro – and after taking shocks into account, we can now question the relevance of the EU policy mix and its responsibility in the diagnosis.

3 The benchmark model

The illustrative model comes from an earlier work by Creel et al. (2003). The model is a dynamic Mundell-Fleming one extended to four theoretical countries: the United States, Japan, Germany and France. The last two countries are assumed to be in a monetary union and their size is twice smaller than that of the large countries; the United States, Japan and Europe have thus the same size.

The model incorporates different key features: policies are computed as time-consistent solutions to a dynamic optimisation problem, in the vein of Kydland and Prescott (1977); differences in preferences among authorities are introduced in the vein of Hughes Hallett and Weymark (2006); all agents are embedded with rational expectations and nominal rigidities are introduced in the short-run evolution of prices and wages; and the model of exchange rate, current account and balance of payments determination is based on imperfect substitutability in both goods and asset markets, in the vein of Purvis (1978) and Branson (1979)[6] (see also the recent contribution of Blanchard et al., 2005).

3.1 The model[7]

The *real bloc* of the model consists of an aggregate demand and a supply bloc. Aggregate demand (eqn. 1) depends positively on the households' income net of taxes (y-T), public

[6] The model thus hinges extensively on Capoen and Villa (1997). Long term and stability conditions can therefore be found in their paper. Three substantial modifications to their model are worth mentioning. First, two countries with heterogeneous sizes are added. Second, the consumption function is simplified by the assumptions that households neither consume the returns on their financial assets, nor the capital gains on foreign assets net of exchange rate variations. These assumptions have no influence on the results. Last, balanced budget rules are ruled out.

[7] All equations and definitions are given in the appendix. Variables have a subscript for time, a superscript for the country, with $i = F, G, J$ or U representing respectively France, Germany, Japan and the United States. Except for net external assets, all variables are expressed as deviations from the baseline.

spending (g), the trade balance (b), and negatively on the real interest rate (r). It also depends on a wealth effect[8].

The household's income does not include the interests perceived on the assets (public debt (d) and net foreign assets (ϕ)), which are spared out and contribute to the accumulation of wealth. They have an indirect impact on the aggregate demand though through the wealth effect. Households are assumed to have a planned level of wealth W_0; and their consumption-savings trade-off makes their effective wealth (the sum of public debt and net foreign assets) tends toward this planned level. Eqn. (1) shows that wealth and consumption decisions are closely linked, in accordance with Purvis (1978).

$$y_t^i = c(y_t^i - T_t^i) - \sigma r_t^i + g_t^i + b_t^i + \mu(\phi_{t-1}^i + d_{t-1}^i - W_0) \qquad (1)$$

The model contains portfolio *and* wealth effects. Portfolio effects are due to the existence of risk aversion on foreign currency denominated assets (see Branson, 1979). Wealth effects in the consumption function is introduced as a consequence of these portfolio effects, in order to be consistent with Purvis (1978) extension of Brainard and Tobin (1968) model: "The existence of adjustment costs (*here, due to risk aversion*) means that there is no portfolio balance problem per se (in the sense of allocation of a given level of wealth), but rather a (longer run) problem of determining an optimal path for each asset and for the level of consumption. Thus a natural extension of the Brainard-Tobin model is to treat saving and portfolio decisions in an integrated fashion." (Purvis, p. 403,)[9].

The trade balance of country i (eqn. 2) depends on the cyclical gap with countries j (where $j \neq i$) and on the respective real ER between country i and countries j:

[8] Barrell and Sefton (1997) also introduce a wealth effect, but with a weak form of Ricardian equivalence, since public debt has a negative effect on aggregate demand. We disregard this 'equivalence' here.

[9] Text in italics added by the authors.

$$b_t^i = \sum_{j \neq i} [n^{ij}(y_t^j - y_t^i) + n^{ij}\delta_x x_t^{ij}] \quad (2)$$

where n^{ij} is the degree of openness between country i and country j, x^{ij} the real ER between country i and country j, and δ a positive parameter which satisfies the Marshall-Lerner-Robinson condition.

The supply bloc is made of a wage-price loop: prices follow an expectations-augmented Phillips curve. Desired production prices (p^d) depend on wages, on the output, and on financial costs, approximated by the real interest rate (eqn. 3). An interest rate growth increases prices *ceteris paribus* because firms pass the financing costs on prices and substitute work to capital, which puts wages under pressure. Production prices (p) depend on past prices and current desired prices (eqn. 4). The desired wage (w^d) depends on consumer prices (q) and on the output (eqn. 5). Wages (w) depends on past wages and on current desired wages (eqn. 6). Consumer prices depend on current production prices and foreign prices (eqn. 7).

$$p_t^{id} = w_t^i + v_1 y_t^i + \theta r_t^i \quad (3)$$

$$p_t^i = l_1 p_{t-1}^i + (1 - l_1) p_t^{id} \quad (4)$$

$$w_t^{id} = \lambda q_t^i + v_2 y_t^i + w_{0t}^i \quad (5)$$

$$w_t^i = l_2 w_{t-1}^i + (1 - l_2) w_t^{id} \quad (6)$$

$$q_t^i = p_t^i + \sum_{j \neq i} n^{ij} x_t^{ij} \quad (7)$$

Inflation expectations are considered backward-looking, consistently with Fuhrer (1997) and Mankiw (2001). This assumption is not as strong as it may appear since the outcomes of the model are the same as when price expectations are forward-looking. This is due to the fact that wages are only partially indexed on prices in the short and medium term, and that prices and wages adjust slowly, consistently with the assumption of nominal rigidities (see Capoen

and Villa, 1997, pp. 19-20).

The *financial bloc* includes the real interest rate, equal to the nominal interest rate minus expected inflation; an equation of public debt accumulation, which depends on the interest burden and the public primary deficit (eqn. 8); and equations for the gross demands of net foreign assets by private agents in country i (with $i = F, G, J$ or U). These demands depend on the expected variation in the nominal exchange rate and on the interest rate gap between country i and countries j (where $j \neq i$) (see eqns. A1a to A1d in the appendix). Expectations regarding the future nominal exchange rates are forward-looking[10]. The net asset position of country i is the sum of net external assets between households in country i and households in country j (where $j \neq i$). The net asset position depends on the domestic valuation of foreign-currency denominated foreign assets (the terms in x in eqn. 9)[11].

$$d_t^i = d_{t-1}^i + r_{t-1}^i(\tilde{d}/100) + r_0(d_{t-1}^i - \tilde{d}) + g_t^i - T_t^i \tag{8}$$

$$\phi_t^{ij} = F_t^{ij} - F_t^{ji} = \phi_{t-1}^{ij} + 2(x_t^{ij} - x_{t-1}^{ij})F_0 + (r_{t-1}^j - r_{t-1}^i + y_t^j - y_{t-1}^j - y_t^i + y_{t-1}^i)F_0 + r_0\phi_{t-1}^{ij} + b_t^{ij} \tag{9}$$

$$\phi_t^i = \sum_{j \neq i} \phi_t^{ij} \tag{10}$$

where $\tilde{d}$ stands for the government public debt target, F^{ij} for assets of country j owned by agents of country i denominated in country i currency, in real terms, and ϕ^{ij} for net external assets of country i towards country j.

In accordance with Branson (1979), it has been assumed in eqns. (9) and (10) that assets

[10] In fact, with backward-looking price expectations and forward-looking exchange rate expectations, there exists an asymmetry of information between households (workers) and financial markets: the first are less informed than the latter. Another explanation for introducing this gap could be that workers are linked by staggered and protracted contracts (at time t, there are always workers with 'old' contracts still in due course, so that expectations of workers at the aggregate level are a mix of backward and forward behaviours, the now so called "hybrid Phillips curve") whereas agents on financial markets can insure themselves against news and noises and, therefore, have forward-looking behaviours.

denominated in domestic and foreign currencies are not perfect substitutes: because of an exchange rate risk, households only want to hold a limited share of their wealth in foreign currency; this share depends on the expected forward-looking return differential. The latter includes the expected variation in the nominal exchange rate. The same specification has been used recently by Blanchard et al. (2005) and applied to the US current account deficit and its sustainability. Using their words, the mechanisms at work are the following: first, under imperfect substitutability, the initial depreciation in response to a trade deficit is more limited than with perfect substitutability, and by implication, the deficit is larger and longer lasting. Second, an increase in the foreign demand for, say, Euro area assets leads to an initial appreciation of the Euro and a trade (or current account) deficit.

The exchange rate regimes have been chosen as follows. France and Germany form a monetary union (the Euro area): by definition, they share the same central bank (the ECB), and the same nominal interest rate. The three central banks are independent from the governments and do not abide by the rules of a fixed exchange rate regime: the Dollar, the Yen and the Euro therefore fluctuate freely against one another.

3.2 Policy functions

Economic policy decisions are taken in a dynamic intertemporal framework within a forward-looking expectations framework. Economic policies are time-consistent, as advocated by the new consensus since the seminal paper of Kydland and Prescott (1977).

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[11] For a theoretical justification, see Bénassy and Sterdyniak (1992).

Economic policies are conducted following the minimization of loss functions which include the policymakers' targets and instruments[12]. Each policymaker has basically four main targets: stabilizing the output at its potential level; stabilizing the price level; meeting the external constraint so that fluctuations in the exchange rate are stabilised[13]; and satisfying the intertemporal budget constraint of the government because public debt accumulation reduces the economic policies future rooms for manoeuvre.

In addition, policymakers control one instrument and tend to minimize its expensive use. On the one hand, fiscal policy can be costly because of implementation delay, and because it may be irreversible; on the other hand, monetary policy affects future growth through its impact on investment so that using the interest rate can be costly.

Hence, governments use public spending in order to minimize the following intertemporal loss function:

$$L_g(0) = \frac{1}{2}\sum_{t=0}^{\infty}\rho^t\left\{\alpha_g y_t^2 + \beta_g q_t^2 + \gamma_g \phi_t^2 + \delta_g (d_t - \tilde{d})^2 + \varepsilon_g g_t^2 + \eta_g i_t^2\right\} \qquad (11)$$

while central banks choose the interest rate so as to minimize their intertemporal loss function[14]:

$$L_b(0) = \frac{1}{2}\sum_{t=0}^{\infty}\rho^t\left\{\alpha_b y_t^2 + \beta_b q_t^2 + \gamma_b \phi_t^2 + \delta_b (d_t - \tilde{d})^2 + \varepsilon_b g_t^2 + \eta_b i_t^2\right\} \qquad (12)$$

where y and q are in log, ϕ, d, and g are in percentage of GDP, and i (the nominal interest rate) is in percentage. ρ is the discount factor, assumed to be constant, and $\tilde{d}$ is the government *ex ante* planned public debt target. ρ is set equal to 0.95.

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[12] The structures of these loss functions are quite usual (see, for instance, Beetsma and Bovenberg, 1998, 2005, Hughes Hallett, 1998, Hughes Hallett and Ma, 1996).

[13] This target can be interpreted as reflecting an indicator of national savings (Masson and Melitz, 1991).

[14] The ECB's loss function includes average targets for France and Germany.

With quadratic loss functions and the model set linearly in deviation from the baseline, Nash equilibria have the property that policy instruments are linear functions of the states of the model. Economic policies are computed as in Oudiz and Sachs (1985): policymakers follow time-consistent economic policy rules in a rational expectations framework ('closed loops'). We will deal with non-cooperative equilibria set as Nash equilibria and with Nash-bargaining solutions, i.e. cooperative equilibria. Nash-bargaining solutions are computed as the maximisation of the product of the differences between losses at Nash equilibrium and the cooperative equilibrium for each player.

The weights for the different targets in the loss functions of monetary and fiscal policymakers, different one from the other, are also different from one country to the other (see table 3): therefore, we have differences in national preferences for output stabilisation, price stability, exchange rate stability and public balance, in a vein close to Hughes Hallett and Weymark (2006), but we also have differences in international preferences. This assumption will be partly relaxed in section 4.

In the benchmark model, the typical following preferences have been assumed. In the US, the Fed has been supposed to balance production and inflation targets so that the nominal interest rate responds with equal weight to production and inflation deviations from their respective targets; the *real* interest rate increases with inflation deviations. The US government places more weight on production target than on inflation target. Both authorities share a benign-neglect view as regards the stability of the US Dollar ER *vis-à-vis* the Euro and the Yen (γ are set equal to zero). Last, weights attributed to public finances' targets (public spending and debt) are relatively low.

Table 3: Loss functions' parameters – **Benchmark**

		α	β	γ	δ	ε	η
USA	**Gov.**	0.5	0.25	0.0	0.5	0.5	0.5
	CB	0.5	1.5	0.0	0.25	0.25	0.5
Europe	**Gov.**	0.5	0.5	4.0	1.0	1.0	0.5
	CB	0.5	2.25	1.0	0.5	0.5	0.5
Japan	**Gov.**	0.5	0.25	4.0	0.5	0.5	0.5
	CB	0.5	1.5	1.0	0.25	0.25	0.5

In the case of Euro area, governments and the ECB are more "conservative" than US authorities. By conservative, we mean that European authorities have a higher aversion *vis-à-vis* inflation, relatively to the production target, than in the US. Globally, the European weight on inflation target has been increased by 50% in comparison with the US case. Moreover, European authorities are assumed not to share the "benign-neglect" attitude of US authorities. Last, weights attributed to public spending and debt targets are higher than in the US, testifying for the existence of the Stability and Growth Pact (SGP). It is well-known that the SGP limits public deficits (hence public spending – in our model, lump-sum taxes are supposed to be fixed) and public debts' deviations from their respective targets.

The preferences of Japan (or Asian economies) have been assumed to be the same as those of the US, except regarding the exchange rate target for which Europe's preferences have been adopted.

3.3 Methodology

The analysis will draw on different scenarios that will analyse the advantages and drawbacks of European institutions in terms of stabilisation and in terms of exchange-rate swings and counter/procyclicality. Although the adoption of the Euro was meant to help member countries to dampen external and internal shocks, institutions which have been associated with the Euro – a conservative central bank and fiscal targets – may have

jeopardised the efficiency of this new ER regime.

In order to mimic the Euro area situation, we have checked for the types of shocks that either produce large swings in the Euro-US Dollar ER or hamper the stabilisation capacities in the Euro area. This preliminary step has therefore identified the shocks which were more detrimental to EU loss functions (the issue of stability/optimality of economic policies) or to exchange rate variations (the issue of volatility).

Consistently with the European experience (see table 2 and comments), an external supply shock (a supply shock on the USA) has the largest consequences on the variations of the Euro-US Dollar ER. As for loss functions, they are at their top after a demand shock on EU countries (see table 4). In the following, we will hence focus on a supply shock in the USA and on a demand shock in France.

4 Do institutions matter?

4.1 Responses to the shocks in the benchmark case

Responses to a *negative demand shock* in France are reported in figure 4. The shock can be considered as a negative one on consumption or investment. This shock occurred after the weekly working time reduction in 1997 (the 35-hour week legislation). Originally a supply shock, it has rapidly transmitted in higher uncertainty which induced slower aggregate demand[15].

[15] Launched in 1998 and 2000, the working week reduction reform was meant to increase employment and productivity. Firms negotiated more flexibility in the working time (it has been calculated on a yearly rather than a weekly basis ever since) and a wage frost. Finally, employment has not increased as much as expected and the wage frost associated with a still high unemployment rate has largely hindered consumption growth; investment growth has also decreased afterwards.

Table 4. Effects of different shocks[(1)] in the benchmark case

		Mid-run (5 years)	***Long-run*** (40 years)
Demand shock in France	L_{gov}[(2)]	6.26	0.00
	L_{BCE}	1.51	0.00
	1$=…€	-0.14	-0.35
Supply shock in France	L_{gov}	1.23	0.00
	L_{BCE}	0.60	0.00
	1$=…€	0.05	0.18
Demand shock in the USA	L_{gov}	0.14	0.00
	L_{BCE}	0.05	0.00
	1$=…€	0.28	0.54
Supply shock in the USA	L_{gov}	0.11	0.00
	L_{BCE}	0.06	0.00
	1$=…€	-0.55	0.90
Demand shock in Japan	L_{gov}	0.08	0.00
	L_{BCE}	0.03	0.00
	1$=…€	-0.11	-0.16
Supply shock in Japan	L_{gov}	0.06	0.00
	L_{BCE}	0.04	0.00
	1$=…€	0.07	0.10

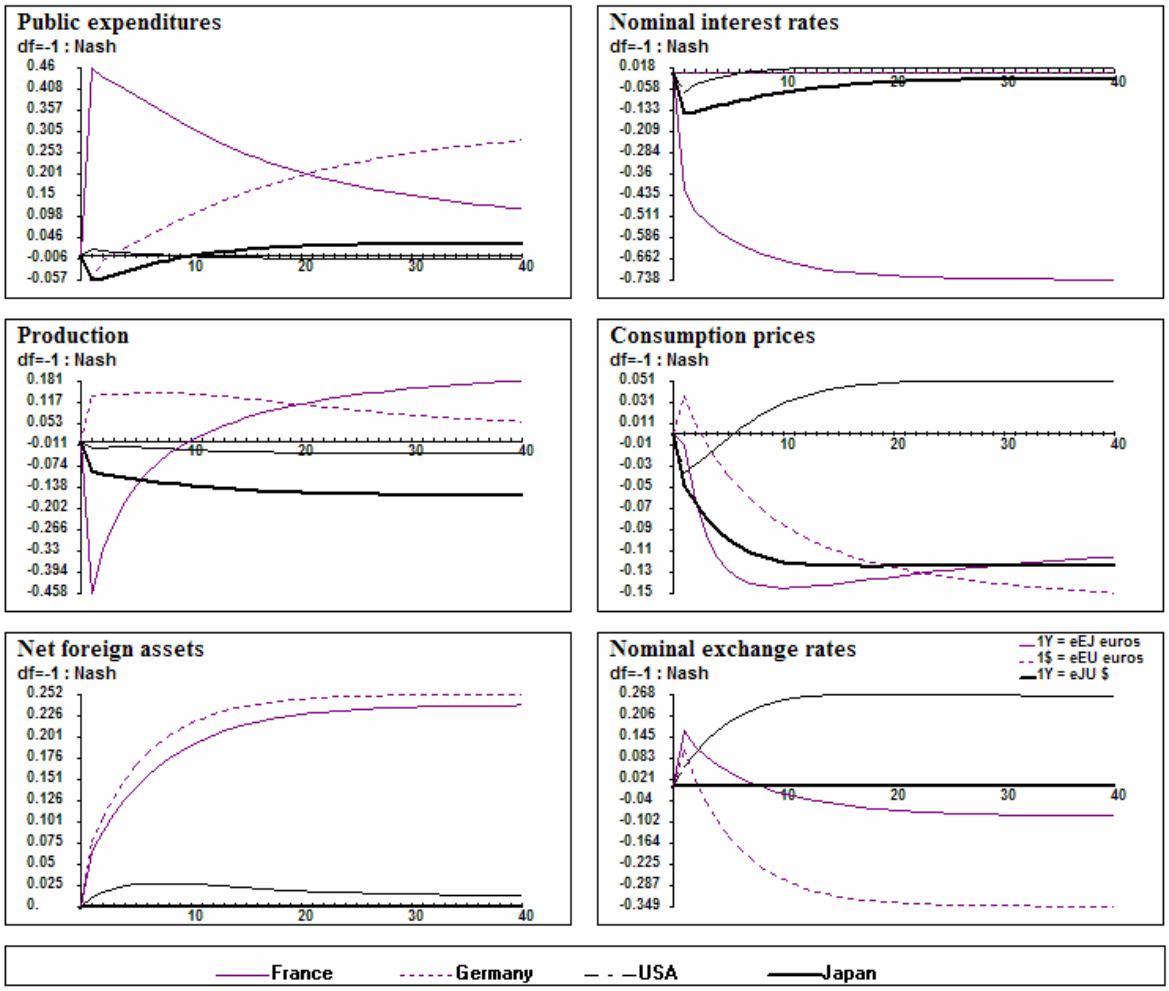
(1): All shocks are negative ones. The absolute value of the size of the shocks in the USA and Japan is half that occurring in France.
(2): only the loss value of the French government is reported in this table.

With our model, in France, the shock immediately induces a sharp reduction in output, up to almost 0.5% one year after the shock. Consumer prices are almost immediately below their initial steady-state level. The French government and the ECB therefore implement expansionary policies: public expenditures are increased[16] and the nominal interest rate is reduced. These policies provoke a depreciation of the Euro (*vis-à-vis* the US Dollar and the Japanese Yen) in the short-run. In the mid-run and the long run, the initial improvement in European countries' trade balance, the interest rates' differentials (nominal interest rates decrease less in the USA and Japan than in the Euro area) and the differentials in growth

[16] The working week reduction reform in France included an expansionary fiscal policy through lower

performance make European net foreign assets sharply increase. The Euro is thus expected to appreciate. Within our forward-looking framework, the Euro thus rapidly appreciates. Noteworthy, Euro's appreciation is preceding growth resumption: in the mid-run, the Euro is procyclical.

Figure 4. Demand shock in France – benchmark



Thanks to the reduction in the European interest rate, German output increases; this rise is long-lasting despite the appreciation of the Euro because German public expenditures are

social contributions.

increased: the lower interest burden gives higher fiscal leeway. Now thanks to the appreciation of the Euro, German prices are permanently below their initial steady-state value. The procyclicality of the Euro ER is thus favourable to price stability; in a globalised world, low prices are meant to enhance market shares; this is partly for this reason that Germany has greatly improved its trade balance since 2002[17].

The model, in its reactions to this first shock, quite consistently mimics the recent history of the Euro area: slow growth in some countries has contributed to increasing public deficits (some of them above the 3% of GDP limit of the SGP), and to reducing nominal interest rates (at the mid of 2001 and the beginning of 2003); in the meantime, the Euro started appreciating in the mid of 2002 and has shown a procyclical behaviour. Still meanwhile, deflation trends have been evoked in the case of Germany.

It is also noteworthy that European institutions are able to cope with this type of shock: the original negative demand shock in France ends up with a positive impact on production in the long run in France and Germany. Notwithstanding this property, it must be reminded that values for the French government and the ECB loss functions are high, in comparison with other shocks (see table 4); in other words, the stabilisation properties are low in this context. The relatively large resort to policy instruments after this shock can thus be interpreted as a preliminary proof of their low overall efficiency.

Let us now turn to the situation in the USA after the shock in France. The US trade balance deteriorates immediately after the shock, as French and Japanese outputs are below their steady-state and the US Dollar has been appreciating: US output therefore decreases slightly below its initial steady state in the short run.

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[17] Germany also benefits from high-quality competitiveness, from a strong specialisation in chemical, mechanical and car industries for which demand is high in emerging economies, and from world demand.

The reaction of US authorities is immediate: the nominal interest rate is decreased and public spending increased. Both policies coupled with the depreciation of the US Dollar then produce inflation and policy stances are reversed.

Here again, the benchmark model seems consistent with the highly reactive actions of the Fed and the US government. As regards the reversal in the policy stances, it has actually happened at the end of the Greenspan's era as far as monetary policy was concerned; the reversal in the fiscal stance has been postponed, at least partly for electoral reasons and also because of the financial costs of the "war on terrorism".

In comparison with their European counterparts, the Fed and the US government do not need large variations in their policy instruments to dampen the consequences of the French shock.

Responses to a *negative supply shock* in the USA are reported in figure 5. This shock illustrates the oil shocks that have hurt the European economies, more than the (positive) IT shock that has diffused over European countries.

The shock induces a sharp rise in US prices and a sharp decline in US output. Slower growth and higher prices in the US deteriorate the US trade balance, meaning that price effects have been stronger than volume effects; conversely, Japan and the Euro area benefit from an output increase due to an improvement in their competitiveness *vis-à-vis* the US, and they thus increase their net foreign assets positions *vis-à-vis* this country.

US authorities then face a trade-off: should they use their policy instruments to foster growth or to curb inflation? In fact, in the presence of imperfect substitutability between domestic and foreign assets and the corresponding presence of a home bias, the rise in US net

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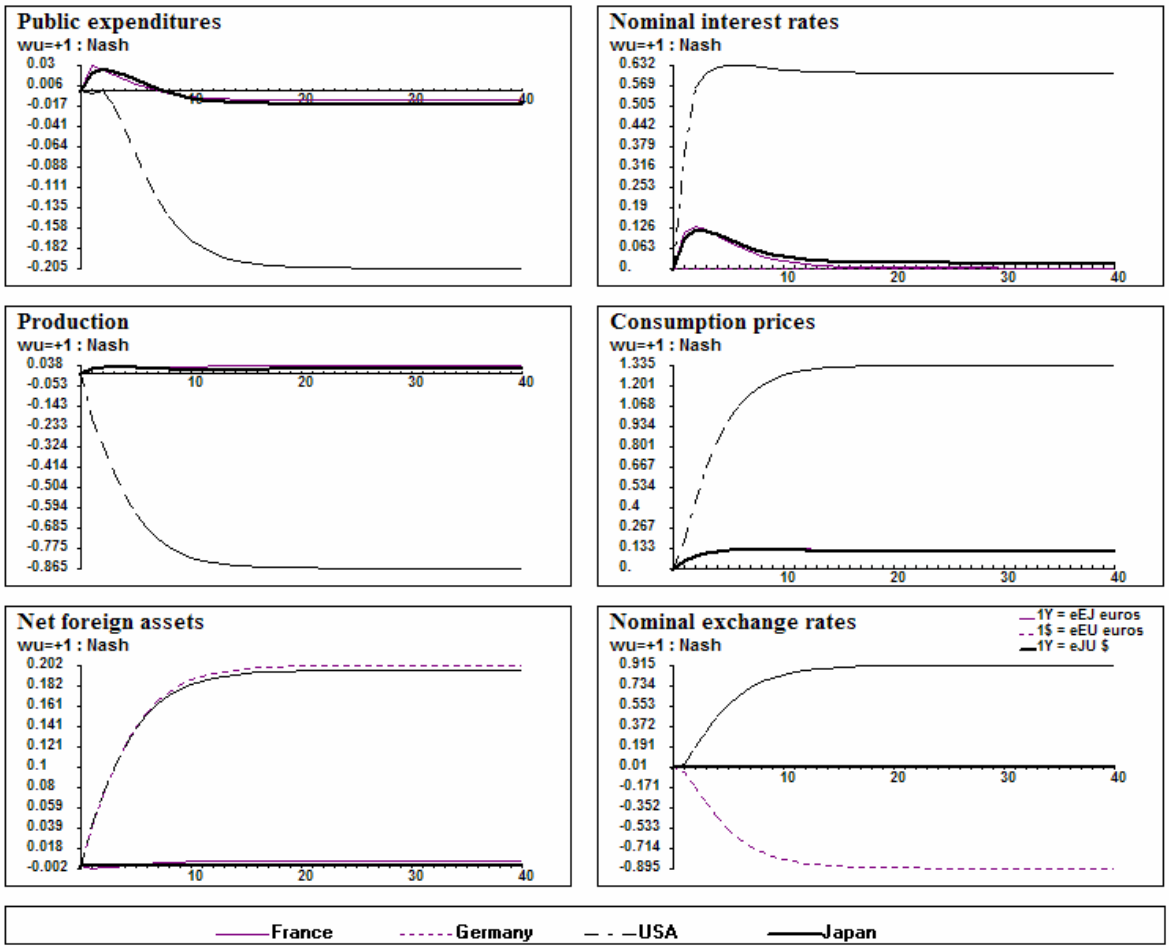
Gaulier et al. (2005) have shown that the last determinant was clearly more intense for Germany than for France.

foreign indebtedness is associated with a lower ER. US authorities can therefore take profit of the expected depreciation of the US Dollar that will stabilise output in the long-run to dampen economic fluctuations in the short run with a restrictive monetary policy. US authorities can thus both follow restrictive policies: interest rates are actually increased and public spending decreased. Note that the reaction of the US monetary authority *vis-à-vis* inflation has to be tough enough to ensure price stability: in so far as it is not the case, the nominal interest rate would need to be raised and net foreign indebtedness would still increase; stabilising net foreign indebtedness therefore requires interest rate stability and the latter requires in turn price stability.

Figure 5. Supply shock in the USA – benchmark



The swings of the Euro-US Dollar exchange rate are substantial: a half-percentage point increase in US labour costs would provoke almost a one-percentage point depreciation of the US Dollar. This is quite strong and is consistent with the Euro-US Dollar ER volatility which was briefly documented in section 2.

The large variations in the Euro-US Dollar ER are strikingly contra-cyclical in the US economy (the Dollar depreciates when economic growth is lowered) and they largely stem from the expectations of the financial markets; in the meantime, fiscal and monetary policies are designed to curb inflation and attain price stability.

Reliance on the exchange rate to dampen economic fluctuations is also fundamental when one compares the outcomes of a *symmetric supply shock* in the Euro area and of a supply shock in the US of the same size[18]. After these two shocks, it appears that fiscal stances are similar for the countries hit by the shock, but monetary policy in the USA is more restrictive than what that of the ECB would be. However, prices increase by more and output declines by less in the USA than in France and Germany. The only possible reason for these different outcomes on the monetary stance, prices and output can be found in the variations of the US Dollar ER: whereas the US dollar depreciates by 2% in the long run after a shock in the USA, the Euro depreciates by a mere 0.4% after a symmetric shock in the Euro area. The less active behaviour by the European monetary authority in comparison with its US counterpart seems to jeopardise the ability of the Euro to dampen economic fluctuations. As such, two institutions seem to matter substantially: monetary and exchange rate policies.

[18] Figures and tables are available upon request.

Changing institutions: the cooperation case

So far, European institutions like exchange rate, monetary and fiscal policies have been showed to be less efficient than in other parts of the world, although fiscal and monetary policies have been characterised consistently with the 'new macroeconomics consensus'. One reason to be put forward to explain this outcome may be the following: the efficiency of these institutions depends on whether other countries adopt the same type of institutions. For instance, after a worldwide negative supply shock like an oil shock or a geopolitical shock, different types of institutions on both sides of the Atlantic –conservative in the Euro area, pragmatic in the US– leave a heavy burden on the ECB which has to curb inflation. Now if institutions are the same across the Atlantic – the USA and Europe cooperate[19] –, the burden would be better shared, worldwide economic stabilisation would improve and the economic record of European institutions would also.

Before achieving such a conclusion, one needs to check that a better cooperation on the chosen institutions would be actually beneficial to the Euro area but one also has to check that such a choice would be beneficial to non-European countries. If it were the case, the conclusion would be simple: Europeans should promote their institutions rather than blame them.

Before studying the outcomes of the shocks when US and European authorities share the same preferences, it has to be recalled that fiscal and monetary policies in our model are computed like time-consistent solutions on an infinite horizon. Modifying only slightly the parameters in the loss functions is not expected to substantially change the reactions of the different authorities as well as their outcomes on output, prices, etc. The model is meant to be

[19] We follow the taxonomy of Horne and Masson (1988) in defining coordination as the joint setting of economic policies, whereas cooperation can be defined as an agreement on the "rules of the game", here an

illustrative and it is also highly normative. Normative models help to gain consistency in the analysis of the numerous macroeconomic mechanisms at work, so that the directions of change between the benchmark and variant cases are economically consistent, although their size may be different in the "real world".

In the cooperation case, the USA are supposed to adopt European institutions: parameters in the US authorities' loss functions are thus the same as European authorities'. Some of the results are reported in table 5 below. Related figures are numbered 6 and 7.

After a *negative demand shock* in France, in this setting, the loss values of the French government and the ECB are reduced, meaning that they are better off than in the previous situation in which only Euro area countries had conservative institutions. On the contrary, the non-hit European country, Germany, sees its situation worsen.

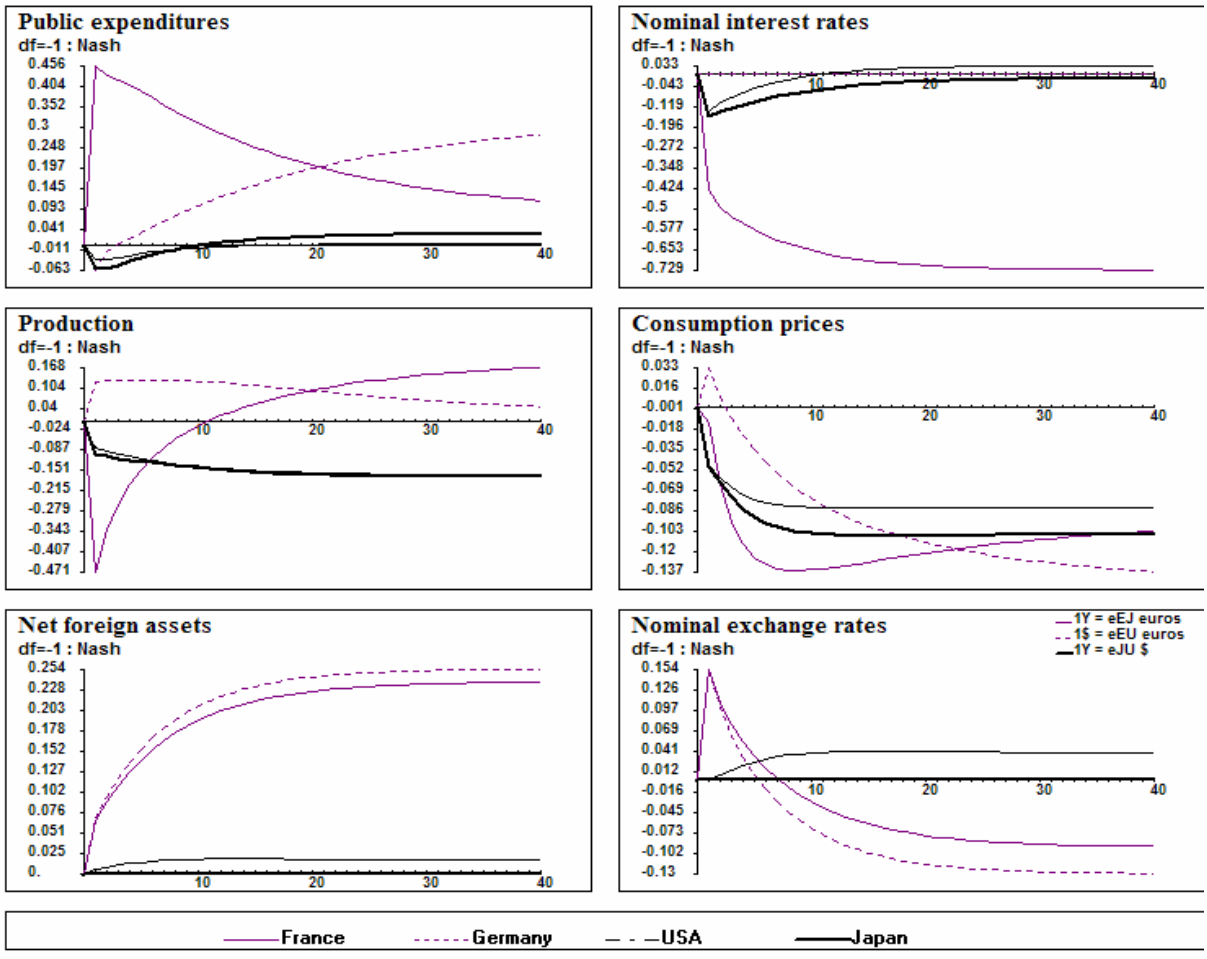
Table 5. Comparisons between the benchmark and cooperation cases

	Demand shock in France				***Supply shock in the USA***			
	Benchmark		Cooperation		Benchmark		Cooperation	
	1 yr.	5 yrs.	1 yr.	5 yrs.	1 yr.	5 yrs.	1 yr.	5 yrs.
(values expressed in deviations from steady-state)								
French gvt. loss value	9.00	6.25	8.85	6.16	0.16	0.11	0.16	0.11
German gvt. loss value	1.75	1.39	1.79	1.42	0.16	0.11	0.16	0.11
ECB loss value	2.19	1.51	2.17	1.50	0.09	0.06	0.11	0.07
Prices in France	-0.01	-0.13	-0.01	-0.13	0.05	0.12	0.05	0.15
Output in France	-0.46	-0.14	-0.47	-0.15	0.02	0.03	0.01	0.00
Public debt in France	0.60	1.79	0.60	1.77	0.02	0.24	0.03	0.24
Public spending in France	0.46	0.39	0.46	0.39	0.03	0.01	0.03	0.00
ECB interest rate	-0.42	-0.59	-0.43	-0.58	0.11	0.08	0.12	0.10
1$=…€	0.10	-0.14	0.15	0.01	-0.03	-0.55	0.17	-0.10

agreement on the characteristics of the institutions (see also Currie et al., 1989).

The main reason for these outcomes is linked to the Euro-US Dollar ER: first, the Euro depreciates more than in the benchmark case, provoking more inflation in the non-hit European country; second, depreciation is a lasting phenomenon; third, the absolute value of the Euro's appreciation in the long run is lower than in the benchmark case (compare figure 6 with figure 4). The conclusion is straightforward: If the US authorities cared more about the US Dollar ER stability, the procyclicality of the Euro would be substantially reduced. At least one reason for the Euro's procyclicality can be attributed to the US preferences of not caring enough about the stability of the US Dollar.

Figure 6. Demand shock in France – Cooperation

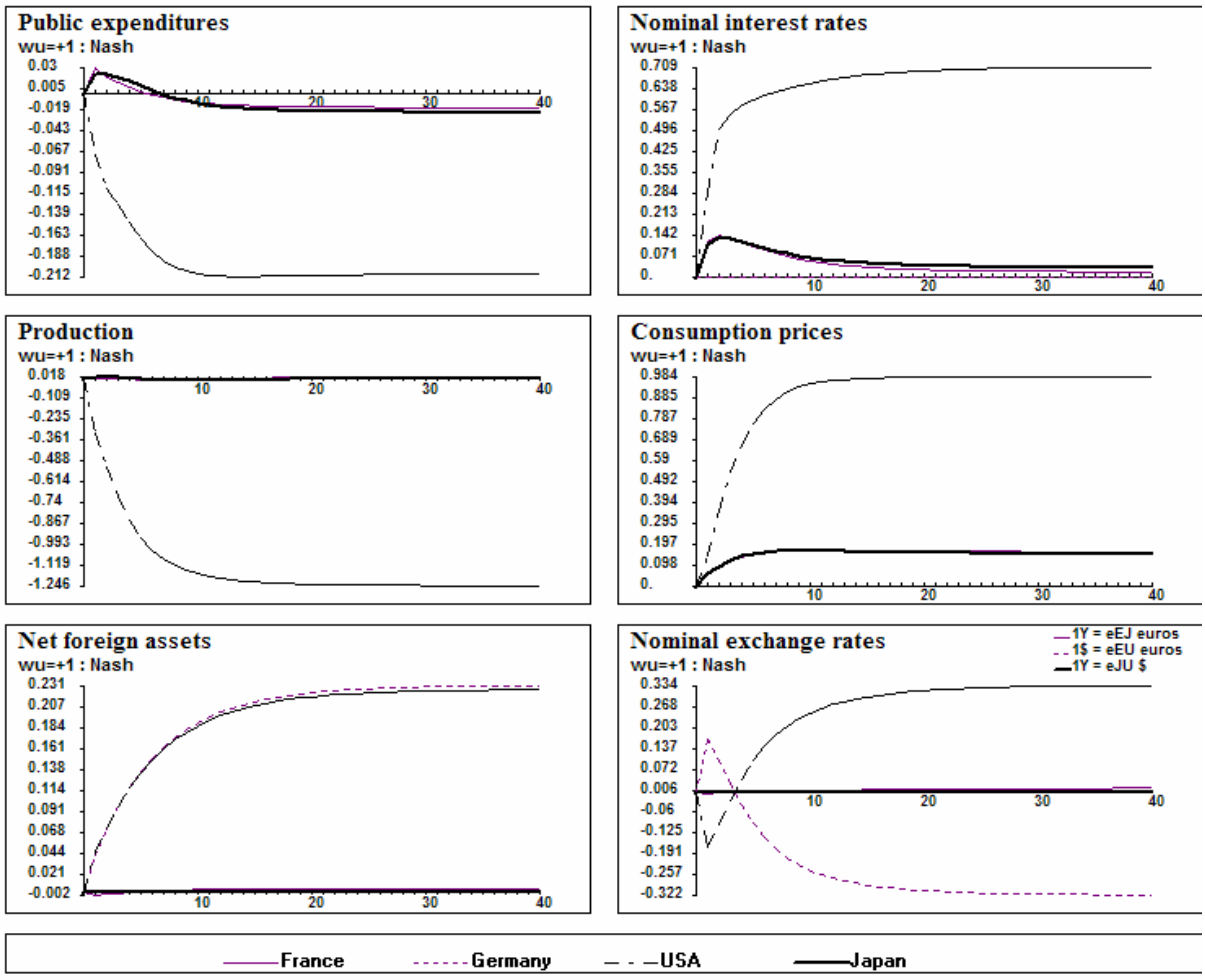


With more conservative preferences than in the benchmark case, the US government and the Fed implement more restrictive policies respectively in the short run (public spending is

decreased) and the long run (the interest rate is raised). Consequently, in the USA, output, prices and public debt are decreasing more than in the benchmark case. Slower growth in the USA reduces the growth of European net external assets *vis-à-vis* the USA; the latter reduction thus explains the lower appreciation of the Euro in the long run.

The adoption of European-style institutions in the USA sharply reduces ER swings in the mid- and long-run, after *a negative supply shock* in the USA. It is noteworthy that cooperation is detrimental to the ECB since the Euro's depreciation that occurs in this case quite rapidly increases European prices.

Figure 7. Supply shock in the USA – Cooperation



As for the USA, with conservative preferences, the ability of the government and the central bank to curb inflation and dampen economic fluctuations at the same time is reduced: after a more restrictive fiscal policy than in the benchmark case (public debt was permanently increased, whereas in the cooperation case, it is decreasing in the long run), US output declines substantially. After this type of shock, which always creates a trade-off between the output and inflation objectives, it appears that the trade-off turns in favour of inflation, consistently with the assumption that US authorities are more conservative than they were in the benchmark case. The reduction in ER swings is thus here contradictory with economic stabilisation in the USA.

4.2 European coordination

The suboptimal situation of the ECB after US authorities have adopted European-style institutions can be improved if US authorities do not modify their original preferences. Moreover, in this case, if the three European authorities coordinate their policies (in a Nash-bargaining fashion) they reach an optimal outcome after a supply shock in the USA (table 6).

Table 6. Comparisons between the benchmark case and European coordination

	Supply shock in the USA			
	Benchmark		Coordination	
	1 yr.	5 yrs.	1 yr.	5 yrs.
(values expressed in deviations from steady-state)				
French gvt. loss value	0.16	0.11	0.11	0.07
German gvt. loss value	0.16	0.11	0.11	0.07
ECB loss value	0.09	0.06	0.04	0.02
Prices in France	0.05	0.12	0.04	0.07
Output in France	0.02	0.03	-0.03	-0.03
Public debt in France	0.02	0.24	-0.01	0.00
Public spending in France	0.03	0.01	-0.02	0.00
ECB interest rate	0.11	0.08	0.04	0.04
1$=…€	-0.03	-0.55	-0.07	-0.67

The optimality of the coordination between fiscal and monetary policies in the Euro area comes from the lower swings in policy instruments, except the ER. When the three authorities internalize their respective reactions, they can lessen the scope of policy instruments' variations: the nominal short-run European interest rate, public expenditures and public debts in France and Germany are almost stable, the bulk of stabilisation resting on ER swings. The steep appreciation of the Euro *vis-à-vis* the US Dollar and its appreciation *vis-à-vis* the Yen (it was depreciating in the benchmark case) are detrimental to the French and German GDPs, though only mildly, but they are beneficial to price variations in the short-run and, more importantly, in the long run. Hence, within a coordinated policy framework, ER variations and macroeconomic stability go together.

5 Conclusion

In this paper, we have argued that shocks and institutions were responsible for Euro area's low economic performance, as well as for two related components: procyclicality and relatively high volatility of the Euro-US Dollar ER. Using a normative and simulated macroeconomic model, we have been able to mimic the Euro area's situation since the beginning of the new millennial and, therefore, we have given credit to our argumentation. We have finally changed the benchmark model in the following respect: to investigate the responsibility of Euro area institutions, which we labelled "conservative", as they are primarily involved in price stability, we have studied the consequences of exporting them in the USA. Results which have emerged have been manifold.

First, the less active behaviour by the European monetary authority in comparison with its US counterpart jeopardises the ability of the Euro ER to dampen economic fluctuations. On the opposite, a "benign neglect" attitude towards the ER may help to dampen shocks. Second, had the USA more conservative institutions and no "benign neglect" attitude towards

the ER of their currency, Euro's procyclicality would be substantially reduced. One recent feature of the Euro area would certainly disappear and Euro area member countries would not undergo the unfavourable trends of the Euro ER. Third, in the case of a European asymmetric demand shock, the adoption of conservative institutions by the USA would be detrimental to the Euro area member countries which were not hit by the shock. Fourth, after an external supply shock, the adoption of conservative institutions by the USA is detrimental to the ECB: Euro's depreciation is detrimental to the price stability objective. Two conservative central banks that do not coordinate may produce negative outcomes for one of them. Last, US authorities, which trade off between price stability and output has a lower slope than in Euro area, are generally better off if European institutions are conservative: economic stabilisation in the USA is improved with lower variations in economic policy's instruments. Clearly, the USA benefit from Euro area member countries having relatively conservative institutions whereas they (the USA) have not.

The last conclusion has strong implications in terms of the type of institutions that should be advocated. Whereas the 'new macroeconomics consensus' emphasises the efficiency of central bank's independence coupled with a conservative central banker and fiscal rules that limit the power of nuisance *vis-à-vis* the central bank's prevailing objective – price stability –, we have shown that this policy framework had more favourable effects on countries which do not adopt this framework than on countries that do. Coordination between fiscal and monetary policies in the Euro area was shown to be Pareto-optimal. Reforms on the economic governance of the Euro area are thus needed.

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7 Appendix

7.1 The model

F stands for France, G for Germany, J for Japan, U for the United States and E for the EMU; $i, j = F, G, J, U$.

7.2 Equations

$$y_t^i = cR_t^i - \sigma r_t^i + g_t^i + b_t^i + \mu(\phi_{t-1}^i + d_{t-1}^i - W_0)$$

$$R_t^i = y_t^i - T_t^i$$

$$T_t^i = T_{t-1}^i$$

$$b_t^i = \sum_{j \neq i} [n^{ij}(y_t^j - y_t^i) + n^{ij}\delta_x x_t^{ij}]$$

$$p_t^{id} = w_t^i + v_1 y_t^i + \theta r_t^i$$

$$p_t^i = l_1 p_{t-1}^i + (1 - l_1) p_t^{id}$$

$$w_t^{id} = \lambda q_t^i + v_2 y_t^i + w_{0t}^i$$

$$w_t^i = l_2 w_{t-1}^i + (1 - l_2) w_t^{id}$$

$$q_t^i = p_t^i + \sum_{j \neq i} n^{ij} x_t^{ij}$$

$$d_t^i = d_{t-1}^i + r_{t-1}^i(\tilde{d}/100) + r_0(d_{t-1}^i - \tilde{d}) + g_t^i - T_t^i$$

$$r_t^i = i_t^E - \pi_{t+1}^{ia} \quad \text{for } i = F, G$$

$$r_t^i = i_t^i - \pi_{t+1}^{ia} \quad \text{for } i = J, U$$

$$\pi_{t+1}^{ia} = p_t^i - p_{t-1}^i$$

$$x_t^{FG} = p_t^G - p_t^F$$

$$x_t^{ij} = p_t^j - p_t^i + e_t^{Eja} \quad \text{for } i = F, G \quad \text{and } j = J, U$$

$$x_t^{UJ} = p_t^J - p_t^U + e_t^{UJa}$$

$$e_{t+1}^{Eja} = e_t^{Ej} + (i_t^j - i_t^E) + k(\phi_t^{Fj} + \phi_t^{Gj}) \quad \text{for } j = J, U$$

$$e_{t+1}^{UJa} = e_t^{UJ} + (i_t^U - i_t^J) + k\phi_t^{UJ}$$

$$F_t^{ij} = F_0 + \frac{1}{6k}(e_{t+1}^{ija} - e_t^{ij} + i_t^j - i_t^E) \quad \text{for } i = F, G \quad \text{and } j = J, U \qquad \text{(A1a)}$$

$$F_t^{ji} = F_0 - \frac{1}{6k}(e_{t+1}^{ija} - e_t^{ij} + i_t^j - i_t^E) \quad \text{for } i = F, G \quad \text{and } j = J, U \qquad \text{(A1b)}$$

$$F_t^{UJ} = F_0 + \frac{1}{6k}(e_{t+1}^{UJa} - e_t^{UJ} + i_t^J - i_t^U) \qquad \text{(A1c)}$$

$$F_t^{JU} = F_0 - \frac{1}{6k}(e_{t+1}^{UJa} - e_t^{UJ} + i_t^J - i_t^U) \qquad \text{(A1d)}$$

$$\phi_t^{ij} = \phi_{t-1}^{ij} + 2(x_t^{ij} - x_{t-1}^{ij})F_0 + (r_{t-1}^j - r_{t-1}^i + y_t^j - y_{t-1}^j - y_t^i + y_{t-1}^i)F_0 + r_0\phi_{t-1}^{ij} + b_t^{ij}$$

$$\phi_t^{ij} = F_t^{ij} - F_t^{ji}$$

$$\phi_t^i = \sum_{j \neq i} \phi_t^{ij}$$

$$W_t^i = d_t^i + \phi_t^i$$

$$\tilde{W}_t^i = W_0 + ar_t^i$$

7.3 Parameters' values and baseline calibrations for the variables

$c = 0{,}6$; $\sigma = 0{,}4$; $\mu = 0{,}1$; $\lambda = 0{,}5$; $\theta = 0{,}1$; $\rho = 0{,}95$; $k = 1$; $l_1 = 0{,}5$; $l_2 = 0{,}5$; $v_1 = 0{,}15$; $v_2 = 0{,}2$; $\delta_x = 1{,}2$; $\tilde{d} = 30\,\%$; $d_0 = 30\,\%$; $W_0 = 0{,}03$; $\phi_0 = 0$; $r_0 = 0{,}025$; $F_0 = 0{,}05$;

$$n^{FG} = n^{GF} = n^{FU} = n^{GU} = n^{FK} = n^{GK} = n^{UK} = n^{KU} = 0{,}1;\ n^{KF} = n^{KG} = n^{UF} = n^{UG} = 0{,}05.$$

7.4 Definitions of the variables

(N.B.: except for F variables, all the variables are expressed as deviations from the initial steady state level.)

y , output (Log)

p^d , desired production price (Log)

p , current production price (Log)

w^d , desired wages (Log)

w , current wages (Log)

q , consumer price (Log)

b^{ij} , trade balance of country towards country j denominated in money i (% of GDP)

e^{ij} , nominal exchange rate (Log, a monetary unit of country j is worth e^{ij} monetary units of country i)

x , real exchange rate (Log)

F^{ij} , assets of country j owned by agents of country i denominated in country i currency, in real terms (% of GDP)

ϕ^{ij} , net external assets of country i towards country j (% of GDP)

i , nominal interest rate (%)

r , real interest rate (%)

T , taxes (% of GDP)

d , public debt (% of GDP)

π^a , anticipated inflation rate of production price (Log)

g , public spending (% of GDP)

R , consumers' revenue (Log)

$\tilde{d}$, government public debt target (% of GDP)

$\tilde{W}$, desired consumers' wealth (% of GDP).