# A Theory of Social Custom of Which Soft Growth May Be One Consequence. Tales of the European Stability Pact*

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**Abstract**

This paper reviews the arguments in favour and against the "Stability and Growth Pact" signed by the countries of the Euro area. We find the theoretical debate to be inconclusive, as both externality and credibility arguments can be reversed to yield opposite, and equally plausible conclusions. We therefore suggest the view that the stability pact is a social norm, and that adherence to that norm responds in fact to the need to preserve reputation in front of the other members of the European Union. Using this extreme but not implausible hypothesis, we build a simple model similar in spirit to Akerlof's (1980) seminal paper on social norms, and we show that reputational issues may cause the emergence of a stable and inferior equilibrium.

We further show that, when with the enlargement a number of countries anxious to prove their 'soundness' will join the Union, the problems posed by the pact/social norm are likely to increase.

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# 1 Introduction

In this paper we extend to public behaviour the framework introduced by Akerlof's (1980) seminal contribution on social norms.[1] In Akerlof, freely obeyed social norms may result in constraints on private behaviour and in departures from the 'normal' equilibrium. Similarly, we argue that they may also limit the room of manoeuvre of national governments interacting to build an Economic and Monetary Union. The 'public' social norm we focus on here is the Stability and Growth Pact signed by the countries participating in the EMU in 1997.

Whether of public or private origin, a social norm does not generally follow sound economic reasoning, but rather is grounded in other motivations. What matters for its design is a consideration of reputation rather than its direct consequences for any measure of (private or social) welfare. As Akerlof (1980, p. 753) writes, "people want to become rich and famous, and famous not being redundant". There is a major difference with our approach though. Most private social customs have their origin in a notion of fair behaviour, implying that private agents behave in such a way as to refrain from taking full advantage of a (temporary) dominant position (e.g., Hicks, 1974). Thus, norms are a normal outcome of social interaction. Norms constraining public behaviour, however, have their origin in some doctrine, representing the current economic paradigm, regardless of its short term economic consequences. In other words, private-social customs are grounded in rules of fair behaviour, whereas public-social customs are supposed to be consistent with dominant economic doctrine.

Does the Stability and Growth Pact have some features of a social custom constraining governments to build or maintain their reputation? And if this is the case, what are the consequences for the welfare of Europe citizens?

These questions arise because it is difficult to be convinced by the rationale underlying the Pact. Even if the theoretical debate were not inconclusive (as in fact it is, as we argue in section 3), its application would not lead to clear-cut figures about the maximum tolerable deficit : 'Normal' deficits are not independent of the output gap, and it does not need more than a modicum of historical sensitivity to understand that we should not have blind confidence in the figures of potential growth and output gap (Solow, 2002). Furthermore, the provision by which the budgetary position of each country should be in the medium run close to balance or in surplus seems to have even weaker theoretical foundations. It implies the strong consequence that

[1] Hechter and Opp (2001) provide a thorough survey of models of social norms in economics and game theory, as well as in other fields.

public debt as a ratio to GDP should trend asymptotically to zero, a position hard to justify *per se*. Finally, not distinguishing between current and capital expenditures, the Stability Pact may lead to odd evaluations of the stance of fiscal policy. Two countries with the same deficit may be equally reprimanded by the European Commission whatever the origin of the deficit, be it, the building of a high speed train or the increase of public salaries.

Besides the assertion that lower deficits and debts are better, other arguments in favour of the Stability Pact are expressed in terms of externalities and credibility. In a monetary union, the fiscal policy of one country affects the interest rates and level of activity of others countries in the union. We argue, however, that it does not follow that such externalities should lead to a well defined rule constraining the behaviour of national governments, and that it is far from obvious that such a rule should lean toward the restrictive side.

So why have governments accepted restriction on their behavior, when the economic theory behind these restrictions are, in fact, inconclusive? The question is all the more important because national governments in the union have fewer instruments left, having already given up monetary sovereignty, i.e. the manipulation of the exchange rate and the short term rate of interest. A common monetary policy has differentiated effects on the dynamics of public debt: countries 'enjoying' the lowest rate of inflation will suffer from the highest level of real interest rate; it is particularly difficult to understand the rationale of the policy mix which will be imposed by a strict obedience to the Stability Pact.

Consideration of reputation may go a long way to solve this puzzle; and this argument may not be as odd upon closer inspection. First, decisions concerning the Union are the outcome of a bargaining process between the different governments of Europe. Each government may believe that its weight in the negotiations depends on its reputation. Alternatively, one may consider the European Council as a Club were the members obey a social norm because they believe that the others are obeying it. A question then arises: why is reputation founded on a criteria of budget balance, and not on a criteria of low unemployment or high GDP growth? There is no good answer to this question. Probably, similarly to private behaviour, history matters. The transition towards the EMU has been dominated by the so-called Maastricht criteria[2], and among them especially the budget deficit and debt to GDP ratios. We should recall that the restrictions were accepted even by

[2]Among the criteria, only one (inflation) was related to a final objective; the others, exchange rate, long term interest rate, deficit and debt, where aimed at intermediate objectives.

governments which were doctrinally opposed to the design of the criteria. Many countries have had a hard time conforming to them, and when they have succeeded, the only visible benefit was the increased reputation of their governments.

In light of these considerations, the enlargement to take place in 2004 is, of course, a major source of concern. With the increase of heterogeneity, the need of stabilization policies to cushion asymmetric shocks will plausibly increase, and hence the cost of obeying a norm that prevents their full deployment.

We believe that the Stability Pact is not the only instance of a social norm constraining public behaviour in recent European history. In the 1990s, the obedience to the theoretically dubious requirement of maintaining exchange rate parities *vis-à-vis* the German Mark had most of the features of a social norm. It led to a strongly procyclical monetary policy, similar in many respects to the widely studied (Clarke, 1967) British experience of the 1920s. As a result, Europe entered a period of slow growth and mounting unemployment that lasted almost six years.

The main conclusion of the model we develop in this paper is that governments caring about reputation may not act in the 'economically' welfare maximizing way; the existence of a social norm may hence result in lower level of income for the area as a whole. Furthermore, enlargement might worsen the loss linked to obedience of the norm.

The paper is structured as follows: The next section will describe the provisions of the Stability and Growth Pact. The following one (3 will describe the theoretical arguments underlying the Pact, and argue in favour of their inconclusiveness. Then, sections 4 and 5 will present our model in which obedience to the norm is induced by reputation considerations, and show the effects of enlargement when a norm like the Pact is in place. Section 6 concludes and suggests themes for further research. Finally, an appendix provides the analytical results.

# 2 The Stability and Growth Pact

The institutions of Europe, in their actual configuration, stem from two main sources. The first is the "founding Treaty" signed in Maastricht in 1991, and the second is the Amsterdam Treaty, of 1997, that completes the setup with the *Stability and Growth Pact*[3] signed by the countries participating to the

[3]The full text of the treaties can be found on the Commission's website: http://europa.eu.int/eur-lex/en/treaties/index.html

*European Monetary Union* (EMU).

The Maastricht Treaty does set the objective of the Union in very general terms:

> "The Community shall have as its task, by establishing a common market and an economic and monetary union and by implementing the common policies, (...) to promote throughout the Community a harmonious and balanced development of economic activities, sustainable and non-inflationary growth respecting the environment, a high degree of convergence of economic performance, a high level of employment and of social protection, the raising of the standard of living and quality of life, and economic and social cohesion and solidarity among Member States" (Art. 2)

Yet, after this broad statement the ranking between inflation and growth is established, by stating that the Community should conduct

> "a single monetary policy and exchange rate policy the *primary objective of both of which shall be to maintain price stability* and, without prejudice to this objective, to support the general economic policies in the Community" (Art. 3A, emphasis added)[4].

The Treaty further defines the famous "Maastricht convergence criteria" that countries had to fulfil in order to be enclosed in the single currency area. In particular, it requires a 3% deficit to GDP ratio, and a public debt close to 60%. This latter requirement was overlooked for countries like Italy and Belgium.

The Amsterdam Treaty ("Stability and Growth Pact") contains further provisions regarding fiscal policy, that have the scope of increasing transparency and control on public finances: Each year, member countries have to present a "Stability and Convergence Program", embedding the following information:

- A medium-term objective for the budgetary position of close to balance or in surplus, the adjustment path and the expected path of the general government debt ratio

[4]Notice that the price stability and growth objectives have instead equal dignity in the US FED statute, as designed by the Federal Reserve Act of 1913, the Employment Act of 1946, and the Full Employment and Balanced Growth (Humphrey-Hawkins) Act of 1978.

- The main assumptions about expected economic developments (growth, employment, inflation and other important economic variables)
- A description of budgetary and other economic policy measures being taken and/or proposed to achieve the objectives of the program
- An analysis of how changes in the main economic assumptions would affect the budgetary and debt position

The plans are examined by the European Council, that may subsequently emit 'recommendations', in case the country deviates from the objectives stated in the program. The two treaties further establish, in the ' 'Excessive deficit procedure', what deviations from the 3% budget deficit target are acceptable (strong recessions or exceptional external shocks), and gives the Council the right to sanction the country not respecting the limit[5]. It is important to notice that the sanction is not automatic, but has to be decided by a qualified majority (two thirds) of the council members.

The Stability Pact constrains national fiscal policies to a (not better defined) medium run close-to-balanced budget. Since 1999, each year, most Stability Plans forecasted a balanced budget four years later. In March 2002, in Barcelona, national governments and the Commission have finally agreed for the medium run to be the year 2004[6]; and the following Seville summit (June 2002) has quantified the "close to" statement to be a 0.5% deficit-to-GDP ratio. Late in September 2002, faced with the persistent slowdown in economic growth (especially in France, Germany and Italy), the Commission has extended the 'deadline' to 2006 amid protests by the small and virtuous countries.

# 3 The Theoretical Debate

The main theoretical foundation of the Stability Pact is an externality argument: A state running a budget deficit has to borrow; in a monetary union

[5]http://europa.eu.int/scadplus/leg/en/lvb/l25020.htm. The excessive deficit procedure has been first invoked for Portugal (September 2002) for its 2001 deficit. At the moment (November 2002), a formal procedure has been put in place by the Commission for Germany, and an early warning has been issued to France; both based on forecated 2002 deficits.

[6]"Member States will maintain or respect the medium term budgetary objective of close to balance or in surplus by 2004 at the latest" http://ue.eu.int/pressData/en/ec/69871.pdf, p. 4. All the European Council's conclusions can be found at http://www.europa.eu.int/council/off/conclu/index.htm

this is supposed to raise the common interest rate, and to have restrictive effects both on public expenditure (the area-wide increased interest payments reduce government consumption and investment possibilities), and on private consumption and investment in the other countries. This negative externality would induce national governments to run excessive budget deficits, allowing them to make the other countries pay part of 'the bill'.

The first objection to this argument is purely quantitative, considering that a one percent increase in the national fiscal deficit would imply a one or two tenths of percent increase at an European level. Barely significant, and unlikely to cause a change in the interest rate. More importantly, from a theoretical viewpoint, the externality argument can be reversed: Suppose a budget deficit expansion occurred in one country. If this were unwarranted, it would result in inflationary pressure, and hence in reduced competitivity. On the other hand, if the deficit responded to a slump in production it would sustain demand and hence income and imports. In both cases, demand for the other countries' production would increase, and their deficit (thanks to increased fiscal revenues) would be reduced[7]. Models with either negative or positive fiscal policy spillovers have flourished in the recent literature;[8] but nothing, from a theoretical point of view, may induce to think that the negative externality would be larger in size than the positive one. Indeed simple reasoning leads to believe the contrary: generally, a fiscal expansion in a region does not have negative effects on other regions of the same country. Given the short life of the EMU, we'll have to wait some more time for empirical work to help shed some light on this debate.

A second argument in favour of the Stability Pact is credibility: Excessive deficits may end up in insolvency, forcing the Central Bank to intervene (against its own statute) to bail out the country involved; otherwise, banks owning the debt would see their financial soundness hampered, and face the risk of depositors' runs. The moral hazard aspect of excessive deficits could

[7]The conventional wisdom usually contrasts the trade effect (typical of the Mundell-Fleming model) with opposite effects through exchange and interest rates, that may even offset the positive influence of imports (Fitoussi and Phelps, 1988). But these arguments do not apply to a monetary union, with irrevocably fixed exchange rates and common interest rates.

[8]Examples of papers with negative spillovers are Andersen and Sorensen (1995), Jensen (1996), and Catenaro and Tirelli (2000). Some of these papers rely on the adverse effect of interest rate increases, as described in the text, while others focus on negative terms of trade effects. The classic book by Mundell (1968) assumed positive demand spillovers, that also appeared in recent papers as the ones by Dixon and Santorini (1997), and Beetsma Debrun and Klaassen (2001). Levine and Brociner (1994) have a model in which all these externalities play a role, and argue that the negative ones probably dominate the positive ones.

hence undermine the Central Bank credibility in its commitment to fight inflation. Furthermore, as the costs of an ECB bailout would be sustained by all EMU citizens, this would encourage irresponsible behaviour of governments. A constraint on deficits can avoid this risk.

This argument may be dismissed on several grounds. The first is the scarce plausibility of a debt crisis in the present context. Since 1945, even in far more turbulent times, European countries never seriously risked default on their debt. Eichengreen and Wyplosz (1998) further notice that contrary to Mexico and East Asia during the crises of the 1990s, the European banking system exposure, and the term structure of public debts seem more solid, so that the bailout risk is not particularly relevant. And at any rate, they argue that such a risk would be better dealt with by improving public debt management and bank regulation.

As for credibility, it is far from obvious that it would be enhanced. The Pact was designed assuming that governments would accumulate surpluses in good times to allow the operation of automatic stabilizers in bad times[9]. This ideal scenario though, did not take into account at least two complications: The first, correctly predicted by Eichengreen and Wyplosz (1998), is that this symmetry would only be attained after a long transition; during this transition, still happening, governments are being forced to restrictive fiscal policies irrespective of the business cycle phase. To make things worse, the Pact was signed at the end of a long phase of convergence to the Maastricht criteria, that involved procyclical fiscal policies during at least the years 1995-97. This in turn provoked, in the attempt to restore 'normal' levels of taxation and expenditure, expansionary policies when growth later resumed in Europe. For all these reasons the Euro area economy has experienced, especially since the end of the US expansion of the 1990s, an explosive combination of depressed growth and (procyclical) restrictive fiscal policy induced by the convergence to Maastricht first, and by the Stability Pact after. Mainly because of high interest charges , the three largest countries, Germany France and Italy do not have room for the automatic stabilizers to play, so that fiscal policy is ineffective even facing transitory shocks. This situation being simply unbearable, it is already resulting in "creative accounting" experiments, and in increasing pressure to revise or soften the Pact. Even worse, the impossibility to use the fiscal instrument is inducing governments and economists to put pressure on the ECB for a more expansionary monetary stance, undermining the support for the fight against inflation. These phenomena seem far

[9]Nevertheless, "the problem, with the Pact as presently framed is that it is all stick and no carrot; rewarding good fiscal behaviour in booms rather than, or in addition to, punishing bad behaviour in slumps, would certainly make better sense" (Bean, 1998, p.106).

more threatening, for the credibility of the European institutional system as a whole, than the bailout risk.

Another popular argument in favour of the Pact builds on the literature that flourished in the 1990s on the Non-Keynesian effects of budget deficit reductions (Giavazzi and Pagano, 1990, 1996; Alesina and Perotti, 1997; Perotti, 1999). Broadly speaking, the argument goes as follows: If the budget deficit reduction is credible and significant, it may trigger the expectation of a permanently lower share of government spending in GDP. The consequent upwards revision of permanent income, will cause private consumption and investment increases, and hence be expansionary. This will in turn reinforce the initial debt consolidation. Again, the argument is not convincing. First, the literature cited above finds that empirically this effect has had more chances to overcome the standard Keynesian deflationary effect when public finances are in distress, and when fiscal consolidation is seen as credible and based on expenditure reduction rather than tax increases. Now, the situation of European countries' public finances hardly qualifies as unsustainable or explosive. The argument might serve as a basis for a Maastricht-type limit, but certainly not for a balanced budget as required by the Stability Pact. Furthermore, as we said earlier, especially in periods of low growth the Pact will have the perverse effect to induce governments to find loopholes and shortcuts to meet the requirements, actions that will hardly have a positive effect on private expectations. Finally, we may notice that the arguments in favour of expansionary effects of fiscal contractions suggest its *una tantum* nature. Advocating these effects to justify a long term rule does not seem appropriate[10].

Finally a popular argument in favour of the Pact maintains that excessive budget deficits are inherently unfair because they shift to future generations the burden of current expenditure. This interegenerational fairness argument is important and legitimate. We believe nevertheless that it should be appropriately developed, by fully considering costs and benefits of current deficit for future generations. Nobody would deny that besides investment, many current expenditures actually benefit future generation (think for instance of well functioning educational and health systems). A serious analysis of the intergenerational effects of public deficits should take those benefits into account as well, and the fact that they are hard to measure is no excuse for excluding them, and considering the costs alone.

On a completely different key, Eichengreen and Wyplosz (1998) argue that assuming that governments have a political capital to spend in unpopular

[10]We thank Robert Solow for suggesting this argument.

measures, the Pact forced them to spend this capital on fiscal consolidation, rather than on more needed measures like labour market or pension reforms.

To summarize our argument so far, the theoretical foundations of the Stability Pact are not as solid as the proponents of a zero deficit rule claim. There is no consensus in the theoretical literature, and if a tendency has to be found, it is towards a critical attitude, with attacks coming from the right as well as from the left. In fact, it is our opinion that the major element behind the observance of the Pact by European countries is at present their fear of a public reprimand by the other members of the "club". In a situation in which most countries suffer from low growth, and lack of policy instruments, the observance of strict and often procyclical fiscal discipline can only be explained by the fear of reputational effects.

In the next section we present a simple model derived from Akerlof (1980), in which we show that an inefficient equilibrium caused by a social norm can be sustained, if deviation from the norm causes a loss of reputation.

# 4 The Model

This section introduces a static, very stylized model of public choice and reputation. In general terms, the government's objective function has two arguments, welfare of the population, and reputation among its peers. This general setting may be applied to various problems; in this paper we assume that the welfare measure is the output gap[11], whereas reputation stems from obeying the Stability Pact, and giving up income stabilization. Consistently with our discussion of the previous section, we assume that positive and negative externalities linked to budget deficits wash out, so that they do not play a role in the model. Our formalization rules out any deficit bias, as governments do not try to push output above its natural level; this has the important implication that no conflict with the Central Bank arises, and we can avoid modeling monetary policy.

Suppose we have an economic union of unit mass. Each country belonging to the union (indexed by $i$) is very broadly described by an aggregate demand relationship, and by a stochastic process describing private demand:

$$\begin{aligned} y_i &= c_i + g_i \\ c_i &= \bar{y} + \varepsilon_i \end{aligned} \tag{1}$$

[11] By targeting the output gap, on one side the government reduces variability of income, therefore reducing uncertainty for its citizens; on the other, it sustains employment and per capita income, both linked to individual welfare.

In words, total income in country $i$ is simply the sum of private ($c_i$) and public ($g_i$) expenditure, that for sake of simplicity can be viewed as deficit spending. The natural or potential level of income ($\bar{y}$) is given by the deterministic part of private consumption, and it is assumed to be equal across countries. We assume that the shock has a uniform distribution with zero mean: $\varepsilon_i \sim U(-a, a)$.[12]

The government objective is to set $g_i$ in order to minimize deviations from natural income (the output gap). We assume that it knows the gap, and that it can immediately act in response to it. In this sense we can think of $g_i$ as modelling the effect of automatic stabilizers, rather than sluggish discretionary policy (see Solow 2002). Furthermore, assume that a social norm is in place, call it 'Stability Pact'. This norm stems from a political process, and has no clear economic justification; it considers values of $g_i$ different from zero as 'bad'. Each government knows that, by breaking the norm, it will gain the undesired reputation of a 'naughty boy'. The objective function is a loss minimization

$$\min_{g_i} \mathfrak{L}_i = \alpha \left(y_i - \bar{y}\right)^2 + d_i R_i \tag{2}$$

Notice that this function rules out any deficit bias. $R_i$ is the loss linked to a bad reputation, and $d_i$ is a dummy variable taking value of 1 if the social norm is broken and 0 if it is not.

The norm has another arbitrary (and theoretically ungrounded) characteristic, namely that positive values of $g_i$ are seen as worse than negative ones. Furthermore assume that the loss of reputation is proportional to the fraction of governments that believe in the code, $\mu$, and that it does not depend on the magnitude of $g_i$.

$$\begin{cases} R_i = \beta_+^2 \mu & \text{if } g_i < 0 \\ \\ R_i = \beta_-^2 \mu & \text{if } g_i > 0 \end{cases} \tag{3}$$

where $0 < \beta_+ < \beta_-$ models the lower weight given by the social norm to positive deviations with respect to negative ones

The government faces a two step problem: (a) decide whether to break the code and stabilize ($g_i \neq 0 \Rightarrow d_i = 1$); and (b) if the code is broken, what level of $g_i$ to choose. The problem can be tackled backwards, remembering that if the code is broken the reputation loss is not linked to the size of

[12]For this particular distribution, $f(\varepsilon) = 1/2a$, $F(\varepsilon) = (\varepsilon + a)/2a$, and $Var(\varepsilon) = a^2/3$. Notice that this assumption about the shocks rules out correlation between income in the countries.

stabilization. Substituting equations (1) within equation (2), we obtain

$$\min_{g_i} \alpha (g_i + \varepsilon_i)^2 + d_i R_i \tag{4}$$

whose solution is

$$g_i = -\varepsilon_i \Rightarrow y_i = \bar{y} \tag{5}$$

If the government does let automatic stabilizers play, it succeeds in compensating private consumption deviations, and income is always at its natural level. This implies that regarding the choice of whether to stabilize, the loss in the two cases ($S/F$, stabilize/follow the norm) will be

$$\begin{cases} \mathfrak{L}_i^S = R_i = \beta_j^2 \mu \qquad j = +, - \\ \\ \mathfrak{L}_i^F = \alpha \varepsilon_i^2 \end{cases} \tag{6}$$

The norm will be followed only if $\mathfrak{L}_i^F < \mathfrak{L}_i^S$, i.e. if

$$|\varepsilon_i| \leq \bar{\varepsilon}_j = \beta_j \sqrt{\frac{\mu}{\alpha}} \qquad j = +, - \tag{7}$$

So, the higher the reputation loss (high $\beta_j$), and the lower the weight given to the output gap (low $\alpha$), the higher the threshold $\bar{\varepsilon}_j$, i.e. the deviation the government will allow without stabilizing. Notice that the asymmetry in reputation loss ($\beta_+ < \beta_-$) results in a higher threshold for negative shocks ($\bar{\varepsilon}_+ < \bar{\varepsilon}_-$); in other words, the rule will be more easily broken if shocks are positive.

**Short term equilibrium**

In the short term the fraction of believers of the norm $\mu$ is given. Remember that the shock has a uniform distribution. This means that the fraction of governments following the norm, i.e. those for which the shock is low enough, is

$$x = \frac{\beta_+ + \beta_-}{2a} \sqrt{\frac{\mu}{\alpha}} \tag{8}$$

**Long term equilibria**

In the long run, the number of believers in the norm changes according to their number with respect to the followers.

$$\dot{\mu} = \varphi(x - \mu) \quad \varphi > 0 \tag{9}$$

where $\varphi$ is a positive multiplicative constant. So, if more governments believe in the norm, than follow it, the number of believers will decrease; and

if the opposite holds, the number will increase. The following proposition characterizes the long run, or steady state equilibrium ($\dot{\mu} = 0$):

**Proposition 1** *Suppose* $\beta_j > 0$, $(j = +, -)$; *then*
*(a) Two equilibria may exist, one in which nobody follows the rule, and one in which a positive fraction* $0 < \mu^{**} \leq 1$ *of governments follows the rule:*

$$\begin{aligned} \mu^{*} &= 0 \\ \mu^{**} &= \min\left(1, \frac{\left(\beta_{-} + \beta_{+}\right)^{2}}{4a^{2}\alpha}\right) \end{aligned} \tag{10}$$

*(b) The equilibrium* $\mu^{*}$ *is unstable, whereas the equilibrium* $\mu^{**}$ *is globally stable*

***Proof.*** *See Appendix* ■

One of the two equilibria ($\mu^{*}$) corresponds to the equilibrium without reputation (nobody believes in the norm, nobody follows it and nobody is sanctioned for that). The other instead has a positive fraction of governments following the rule and hence not stabilizing[13]. $\mu$ is inversely related to $\alpha$ and $a$: Both a higher weight given to stabilization, and a more unstable macroeconomic environment, make the rule less sustainable. In particular the role of the latter parameter may be worth investigation in further research. Notice that if the sanctions are weak enough ($0 < \left(\beta_{-} + \beta_{+}\right)^{2} < 4a^{2}\alpha \Rightarrow \mu^{**} < 1$) there is coexistence, in steady state, of governments stabilizing and governments following the rule.

Substituting back in equation 7, we obtain the following long term value for the threshold:

$$\bar{\varepsilon}_j = \beta_j \frac{\beta_{-} + \beta_{+}}{2a\alpha} \qquad j = +, - \tag{11}$$

The next paragraph will analyze the properties of the two equilibria with or without the social norm.

**Aggregate income and welfare**

In the first equilibrium, $\mu^{*} = 0$ we have the same (optimal) level of income. Every government stabilizes, and aggregate income is $Y^{*} = \bar{y}$ (the Union has unit mass). Accordingly, aggregate loss $\mathfrak{L}^{*} = 0$, as the value of $R_i$ is equal

[13]Having only one stable equilibrium, with positive $\mu$, we don't deal, with the emergence of the rule, nor with its robustness with respect to parameter changes ($\mu^{**}$ is the only stable equilibrium). We are only concerned by the welfare effects of the norm.

to zero for every $i$. The equilibrium with a positive fraction of governments following the rule will on the other hand be characterized by lower aggregate income and higher aggregate loss. The following proposition states the result:

**Proposition 2** *Suppose* $\beta_+ < \beta_-$. *Then*
*(a) The* $\mu^{**}$ *equilibrium, with a positive number of followers of the norm, is characterized by a lower level of production:*

$$Y^* = \bar{y} > Y^{**} = \bar{y} - \frac{\left(\beta_+ + \beta_-\right)^2}{16a^3\alpha^2}\left(\beta_-^2 - \beta_+^2\right)$$

*(b) The equilibrium with positive* $\mu$ *is inferior:* $\mathfrak{L}^* = 0 < \mathfrak{L}^{**}$. *This holds for any positive value of at least one* $\beta_j$ $(j = -, +)$.

**Proof.** See appendix ■

In this section we proved in the general case that the emergence of a social norm whose violation involves a reputational loss may yield two equilibria, one in which the norm is neglected, and the other in which it is followed by a positive fraction of agents. We further showed that the latter equilibrium is globally stable, and that it involves a lower aggregate welfare. Further assuming that negative deviations are sanctioned more than positive ones, we were able to show that average income is lower in the equilibrium with the norm. Before tackling, in the next section, the issue of enlargement, we'll make some simplifying assumptions aimed at keeping the algebra of the model tractable. We'll assume that there is no penalty for positive deviations from the rule (only deficits and positive $g$ add to bad reputation): $\beta_+ = \bar{\varepsilon}_+ = 0$, $\beta_- = \beta > 0$. Furthermore, we'll normalize the shock to $a = \frac{1}{2}$, and the weight to $\alpha = 1$. As a consequence,

$$\mu^{**} = \min\left(\frac{1}{2}, \beta^2\right) \qquad \mathfrak{L}^{**} = \beta^4\left(\frac{1}{2} - \frac{2\beta^2}{3}\right)$$

$$\bar{\varepsilon}_- = \bar{\varepsilon} = \beta^2 \qquad Y^{**} = \bar{y} - \frac{\beta^4}{2}$$

where $\bar{\varepsilon}$, $Y^{**}$, $\mathfrak{L}^{**}$ are all calculated in the case $\beta^2 < \frac{1}{2}$.[14] Notice that as the countries subject to positive shocks are not sanctioned, they will not follow the norm, and consequently $\mu$ (and $\bar{\varepsilon}$) will never be larger than $\frac{1}{2}$ (corresponding to the case in which no country hit by a negative shock stabilizes). Furthermore, from now on we'll focus on the only stable equilibrium, namely the (inefficient) one with $\mu = \mu^{**}$.

[14] If $\mu^{**} = \frac{1}{2}$, then $\bar{\varepsilon} = a = \frac{1}{2}$, $\mathfrak{L}^{**} = \frac{1}{12}$.

# 5 Enlarging the Club: New Members and Reputation

In this section we explore the behaviour of our model in the case of an enlargement of the Union. To do so, we introduce heterogeneity in a very peculiar way: We assume that for exogenous reasons (for example past history) not all countries suffer from the same reputational loss in case they break the code. To keep things simple, they are divided in two groups, (b)ad and (g)ood, of mass $\nu$ and $1-\nu$ respectively. We further assume that countries belonging to the two groups face the same shocks, have the same average income, and the same weight for output stabilization. The only difference is that reputation loss is larger for 'bad' countries ($\beta_g < \beta_b$). For each group we can compute the threshold and the fraction of followers (see eqs. 7 and 8, remembering that here $a = 1/2$, $\alpha = 1$) :

$$\begin{aligned} \bar{\varepsilon}_k &= \beta_k \sqrt{\mu} \qquad k = b, g \\ x_k &= \beta_k \sqrt{\mu} \end{aligned} \tag{12}$$

The total number of followers is then

$$x = \nu x_b + (1-\nu) x_g = (\nu \beta_b + (1-\nu)\beta_g)\sqrt{\mu} \tag{13}$$

The steady state equation and its nonzero solution (eqs. 9 and 10)

$$\begin{aligned} (\nu \beta_b + (1-\nu)\beta_g)\sqrt{\mu} - \mu = 0 \\ \mu = (\nu \beta_b + (1-\nu)\beta_g)^2 \equiv \beta^2 \end{aligned} \tag{14}$$

Accordingly, the values for the thresholds are

$$\bar{\varepsilon}_k = \beta_k \beta = \beta_k (\nu \beta_b + (1-\nu)\beta_g) \tag{15}$$

where $\beta_g < \beta_b \Rightarrow \bar{\varepsilon}_g < \bar{\varepsilon}_b$. Average income for the area can be written as

$$y^{**} = \underbrace{\int_{\bar{y}-\frac{1}{2}}^{\bar{y}-\bar{\varepsilon}_b} \bar{y}\ dy}_{A} + \underbrace{\int_{\bar{y}}^{\bar{y}+\frac{1}{2}} \bar{y}\ dy}_{B} + \underbrace{\int_{\bar{y}-\bar{\varepsilon}_g}^{\bar{y}} y\ dy}_{C} + \underbrace{\int_{\bar{y}-\bar{\varepsilon}_b}^{\bar{y}-\bar{\varepsilon}_g} (\nu y + (1-\nu)\bar{y})\ dy}_{D} \tag{16}$$

whith the integrals $A$ and $B$ collecting the countries that do stabilize, either because they are hit a positive shock, or because (the absolute value of) the

negative shock is above all the thresholds. $C$ represents countries whose shock is so small that they do not stabilize whatever their group is. Finally, integral $D$ represents the interval of countries for which the behaviour depend on the group. If they are 'bad' ($\nu$ of them), they do not stabilize, whereas if they are 'good', they will find it convenient to stabilize. Equation 16 yields

$$y^{**} = \bar{y} - \frac{1}{2}(\nu\bar{\varepsilon}_b^2 + (1-\nu)\bar{\varepsilon}_g^2) \tag{17}$$

that is the equivalent of equation (23).

Notice that, as less countries will stabilize, average income in the 'b' group will be lower than in the 'g' group:

$$y_b^{**} = \bar{y} - \frac{1}{2}\varepsilon_b^2 < \bar{y} - \frac{1}{2}\varepsilon_g^2 = y_g^{**} \tag{18}$$

Hence, even assuming that the natural level of income is the same, the mere existence of the norm might generate income inequality.

Newly admitted members are usually closely scrutinized to verify whether they abide to the rules. The ten countries that should join the European Union starting 2004 will be no exception, and though not formally, their public finances will most probably be subject to stricter controls from the old member states. Even more plausibly, the newcomers themselves will do whatever in their possibilities to show the other participants of the club that they deserve to be part of it. In terms of our model, this means that the ratio of governments for which deviations from the norm imply a higher reputation loss will increase. The following proposition relates average income, and its variability, with the ratio of bad governments on the total:

**Proposition 3** *Assume that* $0 < \beta_g < \beta_b$. *Then, as the ratio of 'bad' governments* $\nu$ *increases:*
*(a) Average income for the area as a whole decreases.*
*(b) Income variability for the area as a whole increases.*

**Proof.** See appendix ■

The model gives thus an insight on the possible effects of enlargement in presence of a constraining rule on stabilization policies. If the intuitive assumption that entrants will have to be more rigorous than the old members of the Union proves correct, then the norm will become more binding, with the effect of increasing income variability, and reducing average income and welfare of the area. We believe that such a risk should be taken into account when discussing the future institutional setup of the EMU, and especially

when coming to the issue of 'deepening vs. enlarging' the Union. Notice furthermore that this result is derived in the most unfavorable case, given that besides reputation countries are all alike; the negative effects of the norm would be even more evident if we had allowed for heterogeneity.

# 6 Conclusion: Enlargement and the Pact

This paper developed the consequences of a strong but plausible premise, namely that the Stability and Growth Pact has uncertain theoretical justifications, and that its *raison d'être* is mainly a reputational issue. In this sense it may be considered a social norm of the type analyzed in the seminal paper by Akerlof (1980). The model we presented in the previous sections was willingly kept abstract and simple, in particular assuming that the system, as described by equations 1, was static; and more importantly that positive and negative externalities washed out. At the price of more cumbersome algebra, we could express the model in terms of growth rates, keeping the main conclusions unaltered:

a. In spite of its lack of economic justification, the norm generates a stable equilibrium with lower growth and welfare. Furthermore, the higher the weight attached to reputational loss, the lower the growth rate.

b. Further making the realistic assumption that in case they broke the Pact, new members would suffer a higher loss in reputation than the others, we showed that the enlargement would further decrease the area wide average growth rate, and increase income dispersion.

A few extensions might add to the insights of model. Some would intuitively strengthen our results, for example if the model was complicated in order to keep track of long term variations in potential income. If we consider that, especially in periods of fast technological change, potential output is plausibly affected (via investment) by protracted periods of low growth, the dynamics would probably result in even stronger long run negative effects of a social norm depressing output in the short run. Another extension that would highlight the negative effects of the Pact is the consideration of common (instead of independent) shocks. If business cycles are synchronized, then the number of countries breaking the code would be higher in recession times (something we are observing nowadays). The effect of this extension on the norm itself (could it be that if a common shock is severe enough the norm simply breaks down?) would be particularly interesting to study. On the other hand, the explicit consideration of negative externalities

of budget deficits would soften our conclusion; showing how do externalities interact with the reputational issue tackled in this paper would certainly be interesting.

Another topic for future research is the introduction of size effects, that may affect both the sanctioning scheme, and the influence of deficits on reputation.

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# Appendix: Proof of Propositions

**Proof. Proposition 1**

**(a)**

Equation (9), together with the steady state condition $\dot{\mu} = 0$ implies $x^F = \mu$, i.e. (using eq. 8)

$$\mu = \frac{\beta_+ + \beta_-}{2a}\sqrt{\frac{\mu}{\alpha}} \tag{19}$$

the two solutions are given in equation (10), and repeated here for convenience:

$$\begin{aligned} \mu^* &= 0 \\ \mu^{**} &= \min\left(1, \frac{\left(\beta_- + \beta_+\right)^2}{4a^2\alpha}\right) \end{aligned}$$

where the formulation for $\mu^{**}$ stems from the fact that $\mu \in [0, 1]$.

**(b)**

For notational convenience, define $K = \frac{\beta_+ + \beta_-}{2a\sqrt{\alpha}}$, implying that $\mu^{**} = K^2$. In order to study stability, we substitute (8) inside (9), to obtain the following:

$$\dot{\mu} = F(\mu) = \varphi(K\sqrt{\mu} - \mu) \tag{20}$$

Notice that $F(0) = F(\mu^{**}) = 0$. Furthermore, notice that

$$\lim_{\mu \to 0} F'(\mu) = \lim_{\mu \to 0} \frac{1}{2\sqrt{\mu}} - 1 > 0$$

so that the $\mu^* = 0$ equilibrium in unstable. Global stability of $\mu^{**}$ requires $F(\mu) > 0 \ \forall \mu < \mu^{**} = K^2$, and $F(\mu) < 0 \ \forall \mu > \mu^{**} = K^2$, exactly what we have (remember that $\varphi > 0$):

$$\begin{aligned} K\sqrt{\mu} - \mu &> 0 \Longleftrightarrow \mu < K^2 = \mu^{**} \\ K\sqrt{\mu} - \mu &< 0 \Longleftrightarrow \mu > K^2 = \mu^{**} \end{aligned} \tag{21}$$

so that $\mu^{**}$ is globally stable. ■

**Proof. Proposition 2**

**(a)**

If $\varepsilon_i \sim U(-a,a)$,it follows that $y_i = \bar{y} + \varepsilon_i \sim U(\bar{y}-a, \bar{y}+a)$. Aggregate (and average) income of the area, wen $\mu = \mu^{**}$, can then be written as

$$Y^{**} = \frac{1}{2a}\left( \underbrace{\int_{\bar{y}-a}^{\bar{y}-\bar{\varepsilon}_-} \bar{y} dy}_{A} + \underbrace{\int_{\bar{y}+\bar{\varepsilon}_+}^{\bar{y}+a} \bar{y} dy}_{B} + \underbrace{\int_{\bar{y}-\bar{\varepsilon}_-}^{\bar{y}+\bar{\varepsilon}_+} y dy}_{C} \right) \tag{22}$$

where $A$ and $B$ denote the "extreme" countries, whose shock is large, and who consequently stabilize ($y_i = \bar{y}$); whereas $C$ is the income of countries which do not stabilize, and consequently produce $y_i = \bar{y} + \varepsilon_i$. Changing from $y_i$ to $\varepsilon_i$, and collecting the $\bar{y}$ term, equation 22 can be rewritten as

$$\begin{aligned} Y^{**} &= \frac{1}{2a}\left( \bar{y} \int_{-a}^{a} d\varepsilon + \int_{-\bar{\varepsilon}_-}^{\bar{\varepsilon}_+} \varepsilon \, d\varepsilon \right) = \\ &= \bar{y} + \frac{1}{4a}(\bar{\varepsilon}_+^2 - \bar{\varepsilon}_-^2) \\ &= \bar{y} + \frac{\left(\beta_+ + \beta_-\right)^2}{16a^3\alpha^2}\left(\beta_+^2 - \beta_-^2\right) < N\bar{y} \end{aligned} \tag{23}$$

being $\beta_+ < \beta_-$ by assumption

**(b)**

Governments stabilizing will face a reputation loss of $\beta_j^2 \mu$, with $j$ being different according to the sign of the shock. Countries following the rule will suffer a loss of $\alpha\varepsilon_i^2$. Aggregate loss can be written as

$$\begin{aligned} \mathfrak{L}^{**} &= \frac{1}{2a}\left( \int_{-a}^{-\bar{\varepsilon}_-} \mu^{**}\beta_-^2 \, d\varepsilon + \int_{\bar{\varepsilon}_+}^{a} \mu^{**}\beta_+^2 \, d\varepsilon + \int_{-\bar{\varepsilon}_-}^{\bar{\varepsilon}_+} \alpha\varepsilon^2 \, d\varepsilon \right) \\ &= \frac{\mu^{**}}{2a}\left((a-\bar{\varepsilon}_-)\beta_-^2 + (a-\bar{\varepsilon}_+)\beta_+^2\right) + \frac{\alpha}{6a}(\bar{\varepsilon}_+^3 + \bar{\varepsilon}_-^3) \end{aligned} \tag{24}$$

whose terms are all positive. As a consequence,

$$\mathfrak{L}^{**} > \mathfrak{L}^{*} = 0$$

■

**Proof. Proposition 3**
First of all notice that

$$\beta_b > \beta_g \Rightarrow \bar{\varepsilon}_b > \bar{\varepsilon}_g$$

i.e. that the threshold value is different for countries belonging to the two groups

**(a)**
Recall that average income is (from equation 17)

$$y^{**} = \bar{y} - \frac{1}{2}(\nu\bar{\varepsilon}_b^2 + (1-\nu)\bar{\varepsilon}_g^2) \tag{25}$$

whose derivative is

$$\frac{\partial y^{**}}{\partial \nu} = -\frac{1}{2}\left[\bar{\varepsilon}_b^2 - \bar{\varepsilon}_g^2 + 2\nu_b\left(\bar{\varepsilon}_b\frac{\partial\bar{\varepsilon}_b}{\partial\nu} - \bar{\varepsilon}_g\frac{\partial\bar{\varepsilon}_g}{\partial\nu}\right)\right] < 0$$

$\frac{\partial\bar{\varepsilon}_b}{\partial\nu} = \frac{\partial\bar{\varepsilon}_b}{\partial\beta}\frac{\partial\beta}{\partial\nu} = \frac{\beta_b}{\alpha}(\beta_b - \beta_g) > \frac{\partial\bar{\varepsilon}_g}{\partial\nu} = \frac{\beta_g}{\alpha}(\beta_b - \beta_g)$ by the assumption $\beta_b - \beta_g > 0$ that guarantees that the term within square brackets is positive.

**(b)**
The variance of income can be written, similarly to the mean, as

$$\begin{aligned} V(y) &= \int_{\bar{y}-\frac{1}{2}}^{\bar{y}-\bar{\varepsilon}_b}(\bar{y}-y^{**})^2dy + \int_{\bar{y}}^{\bar{y}+\frac{1}{2}}(\bar{y}-y^{**})^2dy + \int_{\bar{y}-\bar{\varepsilon}_g}^{\bar{y}}(y-y^{**})^2dy + \\ &+ \int_{\bar{y}-\bar{\varepsilon}_b}^{\bar{y}-\bar{\varepsilon}_g}\left(\nu y + (1-\nu)\bar{y} - y^{**}\right)^2 dy \end{aligned} \tag{26}$$

Tedious algebra, and substitution of $y^{**}$ with the value from equation (17), yields

$$\begin{aligned} V(y) &= \nu^2\bar{\varepsilon}_b^3(\frac{1}{3} - \frac{1}{4}\bar{\varepsilon}_b) + (1-\nu)^2\bar{\varepsilon}_g^3(\frac{1}{3} - \frac{1}{4}\bar{\varepsilon}_g) + 2\nu(1-\nu)\bar{\varepsilon}_g^2(\frac{1}{3}\bar{\varepsilon}_g - \frac{1}{4}\bar{\varepsilon}_b^2) \\ &= \nu^2V(y_b) + (1-\nu)^2V(y_g) + 2\nu(1-\nu)[E(y_by_g) - E(y_b)E(y_g)] \end{aligned} \tag{27}$$

We want to show that

$$\frac{dV(y)}{d\nu} = \frac{\partial V(y)}{\partial\nu} + \frac{\partial V(y)}{\partial\bar{\varepsilon}_b}\frac{\partial\bar{\varepsilon}_b}{\partial\nu} + \frac{\partial V(y)}{\partial\bar{\varepsilon}_g}\frac{\partial\bar{\varepsilon}_g}{\partial\nu} > 0 \tag{28}$$

i.e. that an increase in the proportion of bad countries brings about increased variability area-wide. Analytically this derivative is impossible to sign, so that we used a numerical procedure[15]. We made 1000 random draws of the parameters $\beta_b \in (0,1)$, $\beta_g < \beta_b$, $\nu \in (0,1)$, controlling that they were compatible with values of $\bar{\varepsilon}_b \leq 1/2$. We then computed $\frac{dV(y)}{d\nu}$, and were able to show that it is always greater than 0, as the proposition states. Figure 1 shows the result (only 500 points are shown to enhance clarity). ■

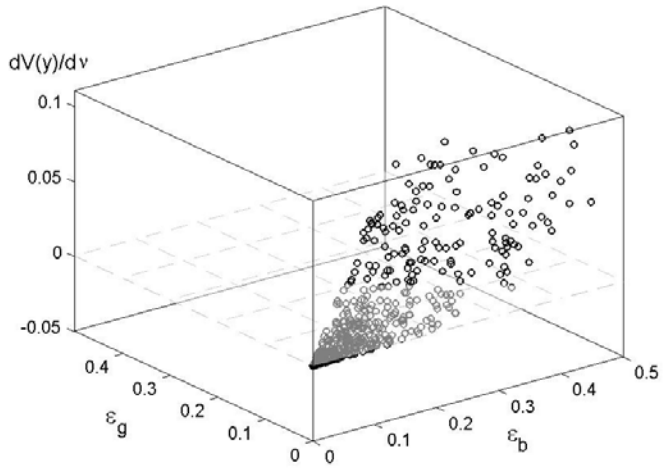


Figure 1: Values of $\frac{dV(y)}{d\nu}$ for different values of $\bar{\varepsilon}_g$ and $\bar{\varepsilon}_b$. Each circle represents a random draw of $\beta_b \in (0,1)$, $\beta_g(0,\beta_b)$, and $\nu \in (0,1)$.

[15]The matlab code is available at http://www.columbia.edu/~fs87/europe.html