

# Structural Reforms and Self-defeating Expectations

Luigi Bonatti\* and Andrea Fracasso\*\*

August 2014

## ABSTRACT

This work addresses the implications of agents' expectations about structural reforms in a context characterized by institutional inertia due to the policy-makers' *status quo* bias. By means of a stylized small-open economy model encompassing policy-induced barriers to entry in the non-tradable sector, the paper shows that expectations about reforms affect economic performances and alter the incentives for the authorities to implement structural reforms. Moreover, the model shows that it is possible to envisage circumstances under which no set of expectations has the potential for self-fulfillment, thereby creating self-defeating expectations traps. This intuition is used for a tentative interpretation of the observed lack of economic convergence within the Eurozone.

*Key words:* Structural reforms; Status quo bias; Self-defeating expectations; Eurozone crisis.

*JEL Classification:* E02, E61, F41

---

✉Luigi Bonatti, Department of Economics and Management & School of International Studies – University of Trento; luigi.bonatti@unitn.it

Andrea Fracasso, Department of Economics and Management & School of International Studies – University of Trento; andrea.fracasso@unitn.it

## 1. INTRODUCTION

The recent sovereign debt crisis in the Eurozone ignited an intense debate about the role played by financial investors' expectations, both in the period before the introduction of the euro and when the sovereign risk premia of some Eurozone countries (the so-called periphery) surged because of the concerns for a possible break-up of the Economic and Monetary Union (EMU).<sup>1</sup> Some scholars, such as Fernandez-Villaverde et al. (2013) and Reis (2013), have convincingly pointed out that economic convergence was not affected just by the expectations in the financial markets: the adoption of the euro boosted widespread confidence in the periphery countries, allowed both their governments and private sectors to borrow at relatively low interest rates, and fostered investment in activities with limited productivity growth. Such benign a context, in turn, lowered the incentives of the authorities to implement structural reforms. As a result, while the "Maastricht variables" converged over time and employment scores improved, productivity and unit labor costs dynamics in the periphery failed to conform to those of the core countries and various structural weaknesses remained overlooked.

This euro-related narrative, on which we shall briefly come back in a dedicated section, raises some general questions regarding the impact that expectations regarding structural reforms may have on the inter-temporal and inter-sectoral allocation of resources. In particular, it suggests that there might be situations in which expectations are "self-defeating" in that agents, by acting on the basis of certain expectations, create the conditions for their falsification. Our model shows that under these circumstances it might be even impossible to have a rational expectations equilibrium as no set of expectations has the potential for their fulfillment. We call these

---

<sup>1</sup> Several observers have questioned whether, as effectively put by Giavazzi and Spaventa (2010), the markets had been too complacent before the crisis or have displayed unwarranted pessimism during the crisis. Nominal interest rate convergence in the late 90s, the argument goes, was excessively fast and homogenous in the Eurozone, probably because of the optimistic expectations about the positive impact of the euro on the laggard countries. On the contrary, after a period in which the worldwide expansion of credit contributed to preserve low long-term interest rates, sovereign risk premia in the periphery increased by an extent that is hardly reconcilable with the observed changes in the fundamentals and that most likely reflects very pessimistic expectations. For empirical evidence on the Eurozone sovereign risk premia, see among others Aizenman et al. (2013), De Grauwe and Ji (2012, 2013), Di Cesare et al (2012).

circumstances “self-defeating expectations traps”, whereby agents have no obvious criterion for forming their expectations about the future and face a high degree of indeterminacy.

It is important to notice that structural reforms consist neither in incremental policy changes at the margin, nor in systematic responses of the policymakers to exogenous shocks; rather, they amount to major shifts in policy from the *status quo* as they are regime switches that alter once and for all (unless they are purposefully reversed) the structure of the economy. Also because of their importance and impact, political authorities tend to exhibit a *status quo* bias with respect to structural reforms: a rich literature accounts for such inertia, which is shown to stem from a number of possible reasons ranging from pressure groups to multiple concerns, from divided governmental coalitions to fear of the costs of policy reversals, from problems in compensating losers to lack of commitment devices, and the like.

Self-defeating expectations in our model arise for reasons that do have to do neither with *ad hoc* agents’ cognitive biases and meta-preferences (about which we remain agnostic)<sup>2</sup> nor with learning failures<sup>3</sup> nor with changes in ideologies and ideas (Rodrik 2014). Uncertainty about political reforms has to do with the regime-switching nature of such policy changes, with the policymakers’ *status quo* bias, and with governments’ commitment problems.

In this work we start by developing a stylized macroeconomic model that aims at providing a formal representation of the self-defeating expectations mechanism. Subsequently, our main findings are shown to carry over to more sophisticated versions of the model which explore realistic extensions of the basic set up. In all versions of the model we posit the *status quo* bias and we explore whether and under what conditions self-defeating expectations traps may emerge.

---

<sup>2</sup> On cognitive biases, expressive behaviours and policy, see Caplan (2002, 2007), Besley (2006) and Jennings (2011). Notice that we do not introduce concepts such as ‘rational ignorance’ (Downs 1957), preference falsification (which might give raise to a status quo bias and collective conservatism, as in Kuran 1987) and individual misconceptions (Romer 2003). For an attempt to use this behavioural approach to interpret the Euro crisis, see Willet and Srisorn (2013).

<sup>3</sup> Strictly speaking, structural reforms cannot be repeated over and over and rational agents cannot reformulate their beliefs about unobserved state variables. For a review of political economy models with learning, see among others, Tommasi and Velasco (1996). Meseguer (2006) and Freytag and Renaud (2007) focus on governments’ learning about the effectiveness of market-oriented reforms.

This work contributes to the literature exploring the impact of expectations regarding future reforms on economic outcomes. Currently, structural reforms are at the very heart of, at least, three lively debates, about how to boost growth in the developed economies hit by the crisis, how to ensure a smoothing functioning of the EMU, and how to accomplish a successful transition in emerging economies. We believe that our intuition about the existence of possible self-defeating expectations may inform all these debates, but we shall not venture into a detailed discussion of each one of them. Rather, developing further the observations that open this section, we shall offer some tentative considerations on the interplay between structural reforms, agents' optimistic expectations and the lack of convergence in the Eurozone.

The remainder of the paper proceeds as follows. Section 2 contains a discussion of the relevant literature regarding structural reforms and expectations. The building blocks of the basic model are presented in section 3, while the implications of alternative expectations concerning the future regulatory regimes of the sector producing (internationally) non-tradable goods are discussed in section 4. Section 5 is dedicated to some extensions of the basic model. Section 6 offer a tentative application of this framework to inform the interpretation of the observed development in the EMU. Section 7 concludes. The mathematical derivations are contained in the Appendix.

## **2. STRUCTURAL REFORMS AND EXPECTATIONS**

It is widely held that financial developments are affected by market sentiment, hence subject to exuberance, panic, and the like. Yet optimism and pessimism may affect a wider range of economic decisions, such as inter-temporal investment patterns and the sectoral allocation of investment.<sup>4</sup> This is particularly the case when agents have to form expectations about the ability and the willingness of the authorities to undertake profound economic reforms directed to increase

---

<sup>4</sup> Haaparanta and Pirttila (2007) discuss how governments with present-biased preferences may strategically disclose information to impact on private sector investment. Here, we exclude strategic interactions and, as we shall explain, posit the existence of a *status quo* bias. Our approach is close to Chang (2001), who analyses the impact of expectations on investment when the government has a commitment problem and tries to build credibility.

long-term productivity and address structural weaknesses. As mentioned in the Introduction, such situations occur in all the circumstances entailing profound economic transformation, such as economic transitions, currency regime switches, economic integration, post-conflict reconstruction, and the like.<sup>5</sup>

The first question to address is why so much uncertainty surrounds radical reforms and why agents strive to identify the mechanisms informing the decision of the political authorities. In a nutshell, we maintain that even reforms delivering aggregate benefits cannot be assumed to be costless, institutionally neutral, Pareto improving and uncontended. As the realization of profound reforms (i.e., reforms resembling more to policy regime switches than to marginal changes) depends on discretionary decisions by the authorities, focusing on their long-term aggregate impact does not make justice of all the considerations and the trade-offs the authorities face.

The first aspect to consider is that the process of designing, approving and implementing structural reforms takes time and is subject to economic and non-economic constraints, which typically make very difficult to predict whether and to what extent reforms will be realized. Reforms are “to be consistent with governments objectives outside the field of economic efficiency” and “reform processes have often met political quandaries” (Hoj et al. 2006, p. 88). Accordingly, individuals have to make an educated guess regarding the exact political motives of the authorities, who pursue a vast array of goals besides social welfare maximization and who face constraints associated with several (often even conflicting) concerns. For instance, incumbent authorities make decisions about reforms with a view to preserving social stability, respecting the electoral mandate (Tompson 2009), maintaining the political support of the parties in a ruling coalition (Dur and Swank 1998, Perotti and Kontopoulos 2002), appeasing powerful domestic lobbies (Olson 1965, Drazen 2000, Grossman and Helpman 2001), preventing prospective policy reversals associated with possible reform failure (Aizenman and Yi 1998), and implementing

---

<sup>5</sup> Besides monetary integration processes and growth-enhancing policies, the political economy of reforms is key in the debates about economic transition (Roland 2002, Fidrmuc 2000, 2003) and economic development (Rodrik 1996, 2005, Jain et al. 2014).

complex compensating transfers across heterogeneous citizens (Classen 2002).<sup>6</sup> Moreover, policy-makers face pressure from or need to coordinate with foreign peers (Grier and Sutter 2007), meet the resistance of bureaucrats and strive to frame public multi-issue debate in a consistent way.

Uncertainty is increased also by a second aspect, namely that short-lived governments care not only for the long-run effects of structural reforms, but also for the transitory path to their full implementation. Governments, individual policymakers, and the political parties supporting the ruling coalition tend to have different time horizons and reforms have a differentiated impact over time: such a combination makes the timing for implementing structural reforms dependent on the contingent macroeconomic and political environments (Alesina and Drazen 1991, Cacciatore et al. 2012, Classen 2002, Drazen 1996, Laffont and Qian 1999, Orphanides 1996, Stein and Streb 2004).

These complications associated with the realization and the implementation of structural reforms affect the ultimate choices of ruling governments and coalitions. The observation that policy-making departs from the conventional assumption that the authorities maximize a (continuous) social welfare function is common wisdom and lies at the core of the field of political economy (see Drazen 2000 and Persson and Tabellini 2000 for an overview). In particular, several works in this strand of literature have shown that, even when reforms are expected to produce aggregate benefits in the long-run, governments exhibit some institutional inertia and tend to preserve the *status quo*.

Indeed, the literature on the political economy of reforms and on the persistence of the *status quo* is extremely vast (see OECD 2010 for a partial overview). Alesina and Drazen (1991), for instance, argue that lack of reforms may stem from the ‘war of attrition’ between different groups with conflicting distributional objectives.<sup>7</sup> Reforms may also be hindered by the

---

<sup>6</sup> See Riberio and Beetsma (2008), Buti et al. (2009) and Anderson et al. (2013) on the conflicting goals of adopting structural reforms and undertaking fiscal consolidation.

<sup>7</sup> Martinelli and Escorza (2007) show that asymmetric costs of delay may mitigate the attrition war and shorten the *status quo*. Recent experiments, such as Paetzel et al. (2014), suggest that social preferences mitigate both losers’ anti-reform bias and winners’ support. Mitigation, however, does not imply the disappearance of any war of attrition.

uncertainty about their aggregate effect and their impact on heterogeneous individuals (Fernandez and Rodrik 1991, Laban and Sturzenegger 1994, Cason and Mui 2005, Rubinchik and Wang 2008, Valderrama 2009), as well as by the authorities' inability to credibly promise compensation to the losers from the enactment of the reforms (Jain and Mukand 2003). Bourguignon (2011) shows that the *status quo* bias of each heterogeneous individual (Samuelson and Zeckhauser 1988) in the society affects the impact of the reforms on welfare: this, as well as reference-dependent preferences (Tversky and Kahneman 1991; Bateman et al. 1997), hinders the authorities' evaluation of the welfare-related consequences of the reforms and it favors inertia. It has also been shown that a *status quo* bias is particularly likely to emerge when inaction has invisible opportunity costs whereas reforms are associated with visible upfront costs (Tompson 2009). Delaying reforms may be convenient also for governments facing serious commitment problems, as the authorities need to build reputation before undertaking radical policy shifts (Chang 2001). Sometimes it is the institutional set up that leads to political inertia: Eterovic (2011) shows that the institutions making citizens unable to properly reward politicians tend to produce a *status quo* bias, while Spolaore (2004) provide evidence that different government systems affect the frequency of reform and adjustment.<sup>8</sup> Furthermore, it is possible that well established socio-economic models are characterized by institutional and international complementarities (Acemoglu et al. 2008, Bassanini and Duval 2009, Acemoglu et al. 2012) which make difficult for the authorities to adopt individual reforms in isolation. Often, an external shock is necessary to put the reform process in motion: Abiad and Mody (2005) find evidence that (financial) reforms are conditioned by the occurrence of economic and political shocks (either as windows of opportunity or as extremely stressful events, as also argued in Drazen and Grilli 1993 and Rodrik 1996), although Galasso (2014) claims that the impact of crises on reforms depends on the ideology and the political partisanship of the ruling government.

---

<sup>8</sup> Similarly, Woo (2003) finds that the effects of social polarization on fiscal policymaking can change depending on the political and institutional structures in place.

Our work builds on the tenet that governments exhibit reluctance to implement structural reforms without specifying the exact reason of such inertia. As we aim at developing a stylized macroeconomic model through which providing a formal representation of the self-defeating expectations mechanism, it is not important to choose one among the various rationalizations of the *status quo* bias mentioned above. Accordingly, for the sake of parsimony, we shall posit that reforms are adopted only if failing to do so would lead to such a deterioration of most people's standard of living that social and political stability is at risk. In such a framework, private agents' expectations regarding the implementation of structural reforms may be self-defeating. Indeed, if private agents tend to be relatively optimistic (pessimistic) about the possibility that the authorities will adopt these reforms, they tend to invest more (less), thus improving (worsening) the economic situation and making less (more) likely that it will materialize the scenario in which the authorities will be led to implement the reforms. Under these circumstances, it may be even the case that a self-defeating expectations trap emerges and no set of expectations with the potential to be self-fulfilling exists.

### **3. THE MODEL**

#### **3.1 A stylized set up with regulatory imperfections and *status quo* bias**

In this work we adopt a tractable model with limited competition in the product market of the nontradable sectors (e.g., services) and with government 'reluctance' to implement structural reforms. Barriers to entry and competition are still present in several countries and, according to the OECD, have a particularly negative impact on those economies lagging behind in productivity and GDP growth. As shown by Alesina et al. (2005), regulation affects the performance of the regulated sector and, in particular, it limits investment whereas large regulatory reforms, especially those directed to entry liberalization, boost capital accumulation. Focusing on the regional liberalization process of large retail trade in Italy, Schivardi and Viviano (2011) provide evidence that entry barriers reduce investment and keeps incumbents' profits relatively high.



More recently, Chari (2011) shows that aggregate productivity gains may emerge from the removal of certain entry and size restrictions.. Several other studies provide evidence that unambiguously suggests that entry barriers impact negatively on several aspects of the economy.<sup>9</sup>

If this is common knowledge, why do entry restrictions persist in so many countries? Why, despite a deregulation trend across the board (Duval and Elmeskov 2006), numerous countries continue to exhibit high levels of protection? Djankov (2009) offers an effective overview of the three main theoretical reasons to impose burdensome entry requirements (e.g., market failure theory, capture theory, tollbooth theory), even when such restrictions are sub-optimal from a social welfare point of view.<sup>10</sup> In most cases, political economy reasons, such as those mentioned in section 2, lie behind the persistence of inefficient regulation.

As entry barriers are relevant examples of policy-induced frictions whose removal would lead to non-negligible aggregate gains but is prevented from the authorities' *status quo* bias, they perfectly exemplify the kind of structural reforms we intend to investigate in this work.

We recall that the simple set-up we developed is meant to offer a stylized and realistic analysis to capture the essence of a situation characterized by self-defeating expectations about structural reforms. To keep the model tractable, we do not address the relationship between market structure and rent-seeking activities (Brou and Ruta 2013) and we exclusively focus on the direct effect of nontradable product market regulation on the regulated market. Thus, we neglect the indirect effect of service regulation on the downstream tradable sectors (Barone and Cingano 2011) as well as the within-industry reallocation of resources (Bartelsman et al. 2013): doing so would strengthen our results, yet it would also add unnecessary complexity. Clearly, similar arguments and various extensions could be developed for other anticompetitive restrictions and

---

<sup>9</sup> Klapper et al. (2006) find that entry barriers have a positive impact on firms' size and Barseghyan (2008) shows that productivity is lower in the sectors where entry costs are higher. The interaction of natural entry barriers and entry restrictions creates distortions to a country's industrial organization (Fisman and Sarria-Allende 2004). Fernandes et al. (2013) find that firm entry deregulation increases returns to education.

<sup>10</sup> OECD Regulation Impact Indicators, calculated in accordance with the method developed by Coway and Nicoletti (2006), are often used to measure the barriers to entry in professional and retail services.

for any policy-related market imperfection (e.g. poor financial regulation and monitoring) that make the allocation of resources suboptimal and reforms desirable (Arnold et al. 2010).<sup>11</sup>

We would like to point out that we do not intend to discuss the merit of the concerns inspiring the anticompetitive regulatory provisions in the nontradable sector; rather, we emphasize the efficiency costs of the regulatory provisions and posit a *status quo* bias of the authorities. This shortcut should not suggest that we consider all anticompetitive regulations as unjustified on any economic and social terms. We do not intend to exclude that certain distortions may be due to agreeable public policy goals (e.g., tackling certain market imperfections), as suggested by Arrunada (2007). We focus on all those cases in which policy-induced distortions are, or eventually become, inappropriate as they negatively affect aggregate economic performance and do not help to address any public interest concerns. It is worth noticing that the high regulatory heterogeneity observed across the advanced countries can hardly be reconciled with widespread concerns for agreeable public policy goals: it rather suggests that country-specific political tensions may be the key determinants of regulatory reforms and lack thereof.<sup>12</sup>

The Governor of the Bank of Italy, addressing the Banks' shareholders on May the 31st 2013, described the dismal situation of the Italian economy as follows: "The lag we have accumulated is accentuated by a redundant regulatory framework, by complex and costly administrative obligations that must be radically reduced [...] Immediate, visible progress in removing these serious obstacles can stimulate productive investment."

### **3.2 The basic model**

---

<sup>11</sup> The range of policy and institutional factors that may limit experimentation and efficient resource allocation is indeed vast. One could think, for instance, of measures that limit the adoption of new technologies as in Krueger (1974) and Krusell and Rios-Rull (1996).

<sup>12</sup> The fact that most services continued to be offered mainly by national suppliers in the EU after the 2006 Bolkestein Directive on services provides evidence of tensions between national regulatory frameworks and international competition (Mola and Bertola 2010). This is in line with the findings of Borchert et al. (2013) who show that although explicit discrimination against foreign providers is low, the allocation of new licenses is opaque and highly discretionary: a variety of restrictions on entry, ownership, and operations continue to affect the international trade in services. According to Fernandez Corugedo and Perez Ruis (2014), around 800 activities are regarded as regulated professions in several EU countries.

We model a small-open economy belonging to a currency area (the nominal exchange rate of this economy is irreversibly fixed to one).<sup>13</sup> Two market goods are produced in this economy: an internationally tradable good and an internationally non-tradable good. Hence, in this economy there are firms specialized in the production of tradable goods and firms specialized in the production of non-tradable goods. The tradable good is used as capital in the production of both goods and is also consumed, while the non-tradable good can be only consumed.<sup>14</sup> The international price of the tradable good is exogenously given and firms can freely enter this market. On the contrary, firms' entry into the non-tradable market is regulated and a firm needs a license issued by the government to operate. This regulatory framework is inherited from the past and, despite its sub-optimality in terms of aggregate welfare (as suggested by the evidence discussed in the previous section), the government is willing to reform it only if it causes serious economic hardship to a relevant portion of the population (more on this below). In line with the discussion in section 2, the authorities exhibit a *status quo* bias regarding the reform of firms' entry in the non-tradable sector.

The economy is populated by households that supply labor, buy consumer goods, accumulate productive assets (physical capital) to be rent to domestic firms, borrow from abroad (or lend abroad) at the exogenously given world interest rate and possess the licenses issued by the government for operating in the non-tradable sector. Both the workforce and the capital stock are mobile across sectors but not across countries. Wages are determined competitively but there is a reservation wage (given by the value of non-market activities) below which market wages cannot fall. Rental rates of capital are determined competitively. Also the prices at which households can cede the use of their licenses to firms that intend to operate in the non-tradable sector are determined competitively.

---

<sup>13</sup> Forni et al. (2010) show that structural reforms in one country of the Eurozone have negligible macroeconomic spillovers to the rest of the area. This justifies the adoption of a small-open economy framework in this work.

<sup>14</sup> As argued by Turnovsky (1997), there is no agreed conclusion on the share of tradables in total investment. For some evidence on the issue, see Bems (2008). The extreme assumption that investment consists only of tradable goods is adopted here with two objectives in mind: first, to simplify the set-up, and second, to create a clearer channel of tradable-induced learning (see Rodrik 2008).

Time is discrete: we have the present (time 0) and the future (time 1). In period 0, only a limited number of firms are allowed to operate in the non-tradable sector (the government restricts the issuance of licenses), while in period 1 the government can maintain this regulatory regime or reform it by granting licenses to everyone is willing to pay a fixed fee (i.e. the reform consists in the “liberalization” of the non-tradable sector). Because of the *status quo* bias (potentially associated with any of the reasons illustrated in section 2), a regulatory regime change is implemented in period 1 only if, in the absence of such a change, the utility of the representative household would fall below a certain minimum threshold.

There is no source of random disturbances here. At time 0, agents’ expectations can be either optimistic (in the sense that they are consistent with the assumption that the government will liberalize in the future the entry into the non-tradable sector) or pessimistic (in the sense that they are consistent with the assumption that the government will keep the initial entry restrictions in the non-tradable sector).

### 3.2.1 Firms producing the (internationally) tradable good

In each period  $t$  ( $t=0,1$ ), there is a continuum (whose measure is normalized to be one) of identical firms producing the tradable good  $Y_{Tt}$  according to the following technology:

$$Y_{Tt} = A_{Tt} K_{Tt}^{1-\alpha} L_{Tt}^{\alpha}, 0 < \alpha < 1, \quad (1)$$

where  $K_{Tt}$ ,  $L_{Tt}$ , and  $A_{Tt}$  are, respectively, the capital stock, the labor input and the state of technology (total factor productivity) of the representative firm producing  $Y_{Tt}$ . Total factor productivity is a positive function of the capital installed in the tradable sector:  $A_{Tt} = K_{Tt}^{\alpha}$ . Consistently with this formal set-up, one can interpret technological progress as labor augmenting. This assumption combines the idea that learning-by-doing works in the tradable sector through each firm’s capital investment and the idea that knowledge and productivity gains spill over instantly across all firms of this sector (see Barro and Sala-i-Martin, 1995). Therefore, in accordance with Frankel (1962), it is supposed that although  $A_{Tt}$  is endogenous to the

economy, each firm takes it as given, since a single firm's decisions have only a negligible impact on the aggregate stock of capital of the tradable sector.<sup>15</sup>

The profits of the representative firm producing tradables,  $\pi_{Tt}$ , are given by

$$\pi_{Tt} = Y_{Tt} - W_t L_{Tt} - R_t K_{Tt}, \quad t=0,1, \quad (2)$$

where  $W_t$  is the wage and  $R_t$  is the capital rental rate in period  $t$ . Notice that the price of the tradable good—which is treated as the numéraire of the system—is exogenously given and normalized to be one.

### 3.2.2 Firms producing the (internationally) non-tradable good

In each period  $t$  ( $t=0,1$ ), there is a continuum of measure  $N_t$  of identical firms producing the non-tradable good  $Y_{Nt}$ . This good is not storable and must be immediately consumed. Each firm produces the good according to the following technology:

$$Y_{Nt} = K_{Nt}^\gamma L_{Nt}^\beta, \quad 0 < \gamma < 1, 0 < \beta < 1, \gamma + \beta < 1, \quad (3)$$

where  $K_{Nt}$  and  $L_{Nt}$  are, respectively, the capital stock and the labor input employed by the representative firm producing the non-tradable good. Assuming that the non-tradable sector roughly coincides with the technologically stagnant sector of the economy, we rule out the possibility that also in this sector productivity improvements can take place as a result of the positive externalities generated by each single firm's activity.

The net profit (cash flow)  $\pi_{Nt}$  of the representative firm producing non-tradable goods is given by:

$$\pi_{Nt} = P_{Nt} Y_{Nt} - W_t L_{Nt} - R_t K_{Nt} - Q_t, \quad t=0,1, \quad (4)$$

where  $P_{Nt}$  and  $Q_t$  are, respectively, the price of the non-tradable good and the price for the use of the license required to operate in the non-tradable sector at time  $t$ .

---

<sup>15</sup> This amounts to say that technological progress is endogenous to the economy, although it is an unintended by-products of firms' capital investment rather than the result of purposive R&D efforts.

### 3.2.3 Households

There is a continuum (whose measure is normalized to be one) of households who live for two periods. In each  $t$  ( $t=0,1$ ), the representative household produces the services  $C_t$  that it consumes by combining the tradable and the non-tradable goods according to

$$C_t = \min(\eta C_{Nt}, C_{Tt}), \quad \eta > 0, \quad (5)$$

where  $C_{Nt}$  and  $C_{Tt}$  are, respectively, the amount of non-tradable good and the amount of tradable good used by the representative household to produce consumer services in  $t$ .

In each  $t$  ( $t=0,1$ ), the representative household determines its labor supply  $L_t$  according to the following rule:

$$L_t = \begin{cases} H & \text{if } W_t \geq \underline{W} \\ 0 & \text{otherwise,} \end{cases} \quad (6)$$

where  $H$  is the representative household's total time endowment in every period and  $\underline{W}$  stays for the value of non-market activities (and acts as a reservation wage).

The lifetime utility of the representative household is given by

$$U = u_0 + \theta u_1, \quad 0 < \theta < 1, \quad (7)$$

where  $u_t = \frac{C_t^{1-\xi}}{1-\xi}$ ,  $0 < \xi < 1$  ( $t=0,1$ ), is the household's period utility function,  $\theta$  is a time-preference parameter and  $\xi$  is the coefficient of relative risk aversion.

The representative household's period budget constraint is:

$$K_{t+1} + D_t(1+r) + P_{Nt}C_{Nt} + C_{Tt} \leq R_t K_t + D_{t+1} + N_t \pi_{Nt} + \pi_{Tt} + T_t + (N_t L_{Nt} + L_{Tt}) W_t + N_t(Q_t - F),$$

$$K_0 = \bar{K}, \quad D_0 = 0 \quad \text{and} \quad N_0 = \bar{N} \quad \text{given,} \quad D_2 \leq 0, \quad t=0,1, \quad (8)$$

where  $K_t$  are the productive assets held by the representative household in  $t$ ,  $D_t$  are the net foreign liabilities accumulated during period  $t-1$  by the representative household and carried over into period  $t$  with interest  $r$  (the exogenously given world interest rate),  $F$  is the fixed fee paid to the government by the representative household for each license that it holds in period  $t$ , and  $T_t$  are the net transfers that the representative household receives by the government in  $t$ . Notice that in

each period the representative household can sell the right to use the licenses for operating in the non-tradable sector to the firms at a market price of  $Q_t$  per unit, and that it is entitled to receive the net profits earned by the firms as dividend payments (it is assumed that each household owns an equal share of all existing firms). Moreover, in (8) it is assumed for simplicity that capital fully depreciates every period, and that at time 0 households have zero net foreign liabilities.

### 3.2.4 Government

The government's period budget constraint is:

$$T_t = FN_t, \quad t=0,1. \quad (9)$$

At the beginning of period 0, the government restricts the entry into the non-tradable sector by issuing  $N_0 = \bar{N}$  licenses required for operating in that sector at time 0. In the following period, the government may preserve the arrangement of the previous period, so that the households can keep  $N_1 = \bar{N}$  licenses paying a fixed fee  $F$  per unit to the government, or it can liberalize the entry into the non-tradable sector by granting licenses to everyone willing to pay a fixed fee  $F$  per unit.<sup>16</sup>

At the beginning of period 1, the government decides to liberalize if and only if

$$u_1 \Big|_{N_1 = \bar{N}} < \underline{u} \quad \text{and} \quad u_1 \Big|_{N_1 > \bar{N}} \geq \underline{u}, \quad \underline{u} > 0, \quad (10)$$

where  $u_1 \Big|_{N_1 = \bar{N}}$  is the utility level that the representative household can get in period 1 if the

entry into the non-tradable sector is not liberalized,  $\underline{u}$  is the minimum utility level that is deemed

---

<sup>16</sup> Notice that in this institutional framework the households can directly appropriate the rent created by the government through the issuance of a limited number of licenses for operating in the non-tradable sector. The same equilibrium configuration would emerge in an institutional framework where the government sells the licenses directly to the firms and redistributes the rents to the households through the fiscal transfers. In this alternative framework, at the beginning of period 0,  $\bar{N}$  licenses are sold at auction to the firms by the government, thus determining a market price of  $Q_0$  per unit. Then, the government redistributes the revenues to the households ( $T_0 = Q_0 \bar{N}$ ). At the beginning of period 1, the government may again sell  $\bar{N}$  licenses at auction to the firms and redistribute its revenues  $Q_1 \bar{N}$  to the households, or alternatively it can sell a license to any firm willing to pay a fixed price  $F$  for it, thus selling  $N_1$  licenses and redistributing its revenues  $FN_1$  to the households.

socially (and politically) acceptable in this economy, and  $u_1 \Big|_{N_1 > \bar{N}}$  is the utility level that the representative household can get in period 1 if the entry into the non-tradable sector is liberalized.

#### 4. EQUILIBRIUM, EXPECTATIONS AND RATIONALITY

##### 4.1 Equilibrium conditions

Markets for labor and for the non-tradable good are purely domestic. Equilibrium in the labor market implies

$$W_t > \underline{W}, t=0,1 \quad (11a)$$

and

$$N_t L_{Nt} + L_{Tt} = H, t=0,1, \quad (12a)$$

or, alternatively,<sup>17</sup>

$$W_t = \underline{W}, t=0,1 \quad (11b)$$

and

$$N_t L_{Nt} + L_{Tt} < H, t=0,1. \quad (12b)$$

Equilibrium in the market for the non-tradable good requires:

$$N_t Y_{Nt} = N_t K_{Nt}^\gamma L_{Nt}^\beta = C_{Nt}, t=0,1. \quad (13)$$

The market for the tradable good is internationally integrated. Equilibrium in this market requires:

$$Y_{Tt} = C_{Tt} + K_{t+1} + TA_t, t=0,1, \quad (14)$$

where  $TA_t$  is the trade account (net exports) in period  $t$ .

Equilibrium in the market for productive assets entails

$$K_t = N_t K_{Nt} + K_{Tt}, t=0,1, K_0 = \bar{K} \text{ given.} \quad (15)$$

---

<sup>17</sup> The corner solution entails  $W_t = \underline{W}$  and  $N_t L_{Nt} + L_{Tt} = H, t=0,1$ .



The representative firms equalize the value of the marginal productivity of capital to the rental rate of capital and the value of the marginal productivity of labor to the wage:

$$(1 - \alpha)L_{Tt}^{\alpha} = R_t = \gamma P_{Nt} K_{Nt}^{\gamma-1} L_{Nt}^{\beta}, \quad t = 0, 1, \quad (16)$$

$$\alpha K_{Tt} L_{Tt}^{\alpha-1} = W_t = \beta P_{Nt} K_{Nt}^{\gamma} L_{Nt}^{\beta-1}, \quad t = 0, 1. \quad (17)$$

By solving for the output that the representative firm operating in the non-tradable sector produces in equilibrium (see the Appendix), one can obtain from the market-clearing condition (13) that

$$C_{Nt} = N_t Y_{Nt} = \frac{N_t}{W_t^{\beta} R_t^{\gamma}} \left[ \frac{(\beta + \gamma) Q_t}{(1 - \beta - \gamma) \Psi} \right]^{\beta + \gamma}, \quad t = 0, 1, \quad (18)$$

where  $\Psi \equiv \left( \frac{\beta}{\gamma} \right)^{\frac{\gamma}{\beta + \gamma}} + \left( \frac{\gamma}{\beta} \right)^{\frac{\beta}{\beta + \gamma}}$ .

The equilibrium price of the non-tradable good is given by (see the Appendix):

$$P_{Nt} = \frac{W_t^{\beta} R_t^{\gamma} Q_t^{1 - \beta - \gamma}}{(1 - \beta - \gamma)} \left[ \frac{(1 - \beta - \gamma) \Psi}{(\beta + \gamma)} \right]^{\beta + \gamma}, \quad t = 0, 1. \quad (19)$$

Solving the optimization problem of the representative household, one obtains that in equilibrium:

$$K_2 = D_2 = 0, \quad (20)$$

$$C_{Tt} = \eta C_{Nt}, \quad t = 0, 1, \quad (21)$$

$$\frac{C_{T0}^{-\xi}}{(\eta + P_{N0})} = \frac{\theta R_1 C_{T1}^{-\xi}}{(\eta + P_{N1})}, \quad (22)$$

$$\frac{C_{T0}^{-\xi}}{(\eta + P_{N0})} = \frac{\theta(1+r) C_{T1}^{-\xi}}{(\eta + P_{N1})}. \quad (23)$$

Notice that (22)-(23) entails  $R_1 = 1 + r$ . Moreover, by using (1), (2), (4), (9), (13) and (20), one can derive from the households' budget constraint (8) that in equilibrium

$$K_{T0} L_{T0}^{\alpha} + \frac{K_{T1} L_{T1}^{\alpha}}{1+r} = C_{T0} + K_1 + \frac{C_{T1}}{1+r}. \quad (24)$$

#### 4.2 Number of firms and price of licenses in the non-tradable sector

If in period  $t$  the government restricts the issuance of licenses required to operate in the non-tradable sector, the price that firms are willing to pay for using a license increases up to the point where their profits go to zero. Hence, one has:

$$N_t = \bar{N}, \quad t=0,1, \quad (25a)$$

thus obtaining from (18)

$$Q_t = \frac{(1-\beta-\gamma)\Psi}{(\beta+\gamma)} \left( \frac{W_t^\beta R_t^\gamma C_{Nt}}{\bar{N}} \right)^{\frac{1}{\beta+\gamma}} > F, \quad t=0,1. \quad (26a)$$

In contrast, if in period 1 the government grants licenses to everyone willing to pay a unit price  $F$ , the number of firms that intend to operate in the non-tradable sector increases up to the point where their profits go to zero. Hence, one has

$$Q_1 = F, \quad (25b)$$

Thus, from (18) one can obtain

$$N_1 = W_1^\beta R_1^\gamma C_{N1} \left[ \frac{(1-\beta-\gamma)\Psi}{(\beta+\gamma)F} \right]^{\beta+\gamma} > \bar{N}. \quad (26b)$$

#### 4.3 Pessimistic expectations

If at time 0 the households expect that the government will restrict the issuance of licenses required to operate in the non-tradable sector also in period 1 (and thus believe that  $N_0^* = N_1^* = \bar{N}$ ), one can use (11)-(24) and (25a)-(26a) to solve for what the households consume, work, invest and borrow in the present (i.e., for  $C_{T0}^*$ ,  $C_{N0}^*$ ,  $L_0^*$ ,  $K_1^*$ ,  $D_1^*$ ) and for what they plan to consume and to work in the future (i.e., for  $C_{T1}^*$ ,  $C_{N1}^*$ ,  $L_1^*$ ). Together, one can solve for the associated  $Q_0^*$ ,  $W_0^*$ ,  $R_0^*$ ,  $P_{N0}^*$ ,  $K_{T0}^*$ ,  $K_{N0}^*$ ,  $L_{T0}^*$ ,  $L_{N0}^*$ ,  $Y_{T0}^*$ ,  $Y_{N0}^*$ ,  $Q_1^*$ ,  $W_1^*$ ,  $R_1^*$ ,  $P_{N1}^*$ ,  $K_{T1}^*$ ,  $K_{N1}^*$ ,  $L_{T1}^*$ ,  $L_{N1}^*$ ,  $Y_{T1}^*$ ,  $Y_{N1}^*$ .

Two possible cases can occur.

Suppose that when the future arrives the authorities maintain the restriction on the issuance of licenses for producing non-tradables. In this case, the households' pessimistic expectations are fulfilled and the agents actualize at time 1 the optimal plan made in the previous period, thus consume  $C_{T1}^*$  units of tradable good and  $C_{N1}^*$  units of non-tradable good, and supply  $L_1^*$  units of labor. Their associated utility is  $u_1^*$ . All the other variables in period 1 take the values predicted at time 0 ( $Q_1^*, W_1^*, R_1^*, P_{N1}^*, K_{T1}^*, K_{N1}^*, L_{T1}^*, L_{N1}^*, Y_{T1}^*, Y_{N1}^*$ ).

In contrast, suppose that when the future arrives the authorities liberalize firms' entry into the non-tradables sector. In this case, the households' pessimistic expectations are not fulfilled and the agents revise in period 1 the optimal plan made in the previous period on the basis of the pessimistic expectations. One can obtain the values  $C_{T1}^{**}, C_{N1}^{**}, L_1^{**}, u_1^{**}, Q_1^{**}, N_1^{**}, W_1^{**}, R_1^{**}, P_{N1}^{**}, K_{T1}^{**}, K_{N1}^{**}, L_{T1}^{**}, L_{N1}^{**}, Y_{T1}^{**}, Y_{N1}^{**}$  which the endogenous variables take in  $t=1$  when the pessimistic expectations are not fulfilled and agents revise their plans, by using (11)-(21) (where  $K_1 = K_1^*$  is given), (25b)-(26b) and the budget constraint (8), which in period  $t=1$  entails

$$K_{T1}L_{T1}^\alpha = C_{T1} + (1+r)D_1, \quad D_1 = D_1^* \text{ given.} \quad (27)$$

Typically,  $u_1^{**} > u_1^*$  (see the Appendix for a numerical example): by removing in  $t=1$  the distortion caused by the restriction on the number of firms that may enter the non-tradable sector, the well-being of the representative household at time 1 improves with respect to the case of no liberalization. However, by checking (10) (and noticing that—when households have pessimistic expectations—  $u_1 \Big|_{N_1 > \bar{N}} = u_1^{**}$  and  $u_1 \Big|_{N_1 = \bar{N}} = u_1^*$ ), one can easily verify that  $u_1^{**} > u_1^*$  is a necessary but not a sufficient condition for inducing the government to liberalize the entry into the non-tradable sector at time 1. Indeed, for the authorities to overcome the institutional inertia and trigger a change in the regulatory regime, one needs that both  $u_1^* < \underline{u}$  and  $u_1^{**} \geq \underline{u}$  hold true.

It follows that, when households' expectations are pessimistic, a necessary and sufficient condition for the liberalization of the non-tradable sector in period 1 is:

$$u_1^{**} \geq \underline{u} > u_1^* . \quad (28)$$

Clearly, if (28) holds, it is irrational for economic agents to have pessimistic expectations at time 0 with regard to the possibility of a future liberalization of the regulatory regime governing the non-tradable sector.

#### 4.4 Optimistic expectations

If at time 0 the households expect that in period 1 the government will stop restricting the issuance of licenses required to operate in the non-tradable sector (and thus believe that  $N_0^\circ = \bar{N} < N_1^\circ$ ), one can use (11)-(24) and (25b)-(26b) to solve for what the households consume, work, invest and borrow in the present (i.e., for  $C_{T0}^\circ, C_{N0}^\circ, L_0^\circ, K_1^\circ, D_1^\circ$ ) and for what they plan to consume and to work in the future (i.e., for  $C_{T1}^\circ, C_{N1}^\circ, L_1^\circ$ ). Together, one can solve for the associated  $Q_0^\circ, W_0^\circ, R_0^\circ, P_{N0}^\circ, K_{T0}^\circ, K_{N0}^\circ, L_{T0}^\circ, L_{N0}^\circ, Y_{T0}^\circ, Y_{N0}^\circ, N_1^\circ, Q_1^\circ, W_1^\circ, R_1^\circ, P_{N1}^\circ, K_{T1}^\circ, K_{N1}^\circ, L_{T1}^\circ, L_{N1}^\circ, Y_{T1}^\circ, Y_{N1}^\circ$ .

Again, two possible cases can occur.

Suppose that when the future arrives the authorities stop restricting the number of firms allowed to produce non-tradables. In this case, the households' optimistic expectations are fulfilled and the agents actualize at time 1 the optimal plan made in the previous period, thus consuming  $C_{T1}^\circ$  units of tradable good and  $C_{N1}^\circ$  units of non-tradable good, and supplying  $L_1^\circ$  units of labor. Their associated utility is  $u_1^\circ$ . All the other variables take in period 1 the values predicted at time 0 ( $N_1^\circ, Q_1^\circ, W_1^\circ, R_1^\circ, P_{N1}^\circ, K_{T1}^\circ, K_{N1}^\circ, L_{T1}^\circ, L_{N1}^\circ, Y_{T1}^\circ, Y_{N1}^\circ$ ).

In contrast, suppose that when the future arrives the authorities do not liberalize the entry into the non-tradable sector and continue to restrict the issuance of licenses required to produce non-tradables ( $N_1^\circ = \bar{N}$ ). In this case, the households' optimistic expectations are not fulfilled

and the agents revise in period 1 the optimal plan made in the previous period on the basis of these expectations. One can obtain the values  $C_{T1}^{\circ\circ}$ ,  $C_{N1}^{\circ\circ}$ ,  $L_1^{\circ\circ}$ ,  $u_1^{\circ\circ}$ ,  $Q_1^{\circ\circ}$ ,  $N_1^{\circ\circ}$ ,  $W_1^{\circ\circ}$ ,  $R_1^{\circ\circ}$ ,  $P_{N1}^{\circ\circ}$ ,  $K_{T1}^{\circ\circ}$ ,  $K_{N1}^{\circ\circ}$ ,  $L_{T1}^{\circ\circ}$ ,  $L_{N1}^{\circ\circ}$ ,  $Y_{T1}^{\circ\circ}$ ,  $Y_{N1}^{\circ\circ}$  which the endogenous variables take in  $t=1$  when the optimistic expectations of the households are not fulfilled and agents revise their plans, by using (11)-(21) (where  $K_1 = K_1^{\circ}$  is given), (25a)-(26a) and the budget constraint (8), which in period  $t=1$  entails

$$K_{T1}L_{T1}^{\alpha} = C_{T1} + (1+r)D_1, \quad D_1 = D_1^{\circ} \text{ given.} \quad (29)$$

Typically,  $u_1^{\circ} > u_1^{\circ\circ}$  (see in the Appendix for a numerical example): again, by removing at time 1 the distortion caused by the restriction to the number of firms that can enter the non-tradable sector, the well-being of the representative household improves. However,  $u_1^{\circ} > u_1^{\circ\circ}$  is a necessary but not sufficient condition for the government to change the *status quo* and liberalize the entry into the non-tradable sector. Indeed, for the authorities to overcome the institutional inertia and trigger a change in the regulatory regime, one needs both  $u_1^{\circ} \geq \underline{u}$  and  $u_1^{\circ\circ} < \underline{u}$ , since—when households have optimistic expectations— $u_1|_{N_1 > \bar{N}} = u_1^{\circ}$  and  $u_1|_{N_1 = \bar{N}} = u_1^{\circ\circ}$ .

A sufficient condition for the government not to liberalize the non-tradable sector in period 1, thus keeping the number of firms operating in this sector restricted to  $\bar{N}$  when the households hold optimistic expectations, is given by:

$$u_1^{\circ\circ} \geq \underline{u}. \quad (30)$$

If condition (30) holds, it is irrational for economic agents to have optimistic expectations at time 0 with regard to the possibility of a future liberalization of the regulatory regime governing the non-tradable sector.

#### 4.5 Self-defeating expectations

Before proceeding, we propose two definitions.

**Definition 1:** We say that a set of expectations is *self-defeating* if acting on the basis of these expectations creates the condition for their falsification.

In the model presented here, pessimistic (optimistic) expectations about the possibility of a future regulatory reform are self-defeating if (28) (if (30)) holds: acting on the basis of pessimistic (optimistic) expectations, economic agents invest less (more) than otherwise, thereby reducing (increasing) households' future well-being and generating more (less) pressure on the authorities to implement the reform.

Consistently with Definition 1, not all sets of wrong expectations are self-defeating: we may have expectations whose fulfillment (or disappointment) does not depend on the conduct that they activate.

**Definition 2:** A *self-defeating expectations trap* is a situation where all possible sets of expectations are *self-defeating* because no set of expectations has the potential for self-fulfillment.

It is straightforward that, whenever both (28) and (30) hold, no rational expectations equilibrium can exist and the economy is in a self-defeating expectations trap. What conditions have to be satisfied in the present model for ruling out the existence of a rational expectations equilibrium? One can easily verify that  $u_1^{\circ\circ} > u_1^*$  is a necessary condition for the truth of both (28) and (30). Hence,  $u_1^{\circ\circ} > u_1^*$  is a necessary condition for the existence of a self-defeating expectations trap.

It is worth pointing out that the condition  $u_1^{\circ\circ} > u_1^*$  is very likely to hold: economic agents tend to invest more in productive assets when they expect that reforms augmenting the efficiency of the economy will be implemented ( $K_1^{\circ} > K_1^*$ ) and households' well-being is higher the larger the investment in productive assets in the past. Hence, even if the reforms will be never implemented, households' well-being is higher if economic agents were optimistic about their implementation ( $u_1^{\circ\circ} > u_1^*$ ). Thus, there is a real possibility that both (28) and (30) hold (see the numerical example in the Appendix).

## 5. THREE REALISTIC EXTENSIONS OF THE MODEL

To show that the previous results carry over to more complex and realistic environments, we develop and discuss three extensions of the basic model.

### 5.1 Probability of a regulatory change

One could argue that the previous discussion applies to the special case in which the representative household attaches probability one (pessimistic expectations), or alternatively probability zero (optimistic expectations), to the possibility that the *status quo* will prevail and a regulatory change will not be implemented in the future. We can generalize our results considering the case in which the representative household attaches probability  $q$ , with  $0 \leq q \leq 1$ , to the possibility that the number of firms operating in the non-tradable sector will remain restricted to  $\bar{N}$  in period 1. In this case, at time 0 the representative household maximizes its expected lifetime utility  $U^e = u_0 + \theta \left[ q u_1 \Big|_{N_1 = \bar{N}} + (1-q) u_1 \Big|_{N_1 > \bar{N}} \right]$ , and the economy is still governed by (11)-(21) and (24)-(26), while (22)-(23) must be rewritten as

$$\frac{C_{T0}^{\xi}}{(\eta + P_{N0})} = \theta \left[ q \frac{R_1 C_{T1}^{\xi}}{(\eta + P_{N1})} \Big|_{N_1 = \bar{N}} + (1-q) \frac{R_1 C_{T1}^{\xi}}{(\eta + P_{N1})} \Big|_{N_1 > \bar{N}} \right], \quad (22a)$$

$$\frac{C_{T0}^{\xi}}{(\eta + P_{N0})} = \theta(1+r) \left[ q \frac{C_{T1}^{\xi}}{(\eta + P_{N1})} \Big|_{N_1 = \bar{N}} + (1-q) \frac{C_{T1}^{\xi}}{(\eta + P_{N1})} \Big|_{N_1 > \bar{N}} \right]. \quad (23a)$$

By solving the model, one can check that the agents tend to invest more in productive assets if they attach a higher probability to the possibility that reforms augmenting the efficiency

of the economy will be implemented:  $\frac{\partial K_1^{\#}}{\partial q} < 0$  and  $K_1^{\circ} \geq K_1^{\#} \geq K_1^*$ , where “#” denotes the value of

a variable when the households assign probability  $q$  to the absence of any liberalization in the

non-tradable sector. Hence, one has  $\frac{\partial u_1^{\#}}{\partial q} \Big|_{N_1 = \bar{N}} < 0$  and  $u_1^{\circ} \geq u_1^{\#} \Big|_{N_1 = \bar{N}} \geq u_1^*$ : even if the liberalization

will never be implemented, households' future well-being is higher if economic agents did attach a higher probability to the implementation of the reform.

If both (28) and (30) hold, the fact that  $\frac{\partial u_1^\#}{\partial q}\Big|_{N_1=\bar{N}} < 0$  implies that there exists a unique value of  $q < 1$ , say  $\bar{q}$ , such that  $u_1^\#|_{N_1=\bar{N}} = \underline{u}$  if the agents attach probability  $\bar{q}$  to the absence of any liberalization. In this case, one has that for  $q > \bar{q}$  (i.e., if the households are relatively pessimistic about the possibility that the authorities will liberalize firms' entry into the non-tradable sector), the authorities will implement the liberalization (since  $u_1^\#|_{N_1=\bar{N}} < \underline{u}$ ). On the contrary, if the households are relatively optimistic (i.e., if  $q \leq \bar{q}$ ), the authorities will not undertake the reform. In other words, if both (28) and (30) hold, a self-defeating expectations trap emerges even if the households attach probability  $q$  to the possibility that the number of firms operating in the non-tradable sector will remain restricted to  $\bar{N}$  in period 1.

## 5.2 Distributive conflict

In the previous section, we invoked a somehow unspecified institutional inertia as the reason why the authorities are reluctant to change a regulatory framework that is clearly Pareto inferior. The existence of a distributive conflict across heterogeneous agents is one of the possible explanations of this inertia (see section 2 for a discussion), but in the basic model we could not capture the redistributive implications of the liberalization of the non-tradable sector because of the simplifying assumption of a unique representative household. Here, we abandon such setup by recognizing that there may be diverging interests among households concerning the removal of restrictions to the number of firms that can operate in the non-tradable sector.

Hence, we assume that at time 0 the population consists of two groups: a fraction  $\lambda$  ( $0 < \lambda < 1$ ) of the households is endowed with the licenses for operating in the non-tradable sector (the "rentiers"), while the remaining fraction  $1-\lambda$  is not (the "non rentiers"). Assuming that all the rest



remains the same as in the basic model, the two groups of households differ solely because of their budget constraint, since the rent due to the possession of the licenses is only part of the rentiers' income:

$$\begin{aligned} K_{t+1}^s + D_t^s(1+r) + P_{Nt} C_{Nt}^s + C_{Tt}^s \leq R_t K_t^s + D_{t+1}^s + \lambda(N_t \pi_{Nt} + \pi_{Tt}) + \lambda T_t + \lambda(N_t L_{Nt} + L_{Tt}) W_t + \\ + N_t(Q_t - F), \quad K_0^s = \bar{K}^s, D_0^s = 0 \text{ and } N_0 = \bar{N} \text{ given, } D_2^s \leq 0, t=0,1, \end{aligned} \quad (8a)$$

$$\begin{aligned} K_{t+1}^n + D_t^n(1+r) + P_{Nt} C_{Nt}^n + C_{Tt}^n \leq R_t K_t^n + D_{t+1}^n + (1-\lambda)(N_t \pi_{Nt} + \pi_{Tt}) + (1-\lambda) T_t + \\ \lambda(N_t L_{Nt} + L_{Tt}) W_t, \quad K_0^n = \bar{K}^n, D_0^n = 0 \text{ and } N_0 = \bar{N} \text{ given, } D_2^n \leq 0, t=0,1, \end{aligned} \quad (8b)$$

where the superscript ‘‘s’’ (‘‘n’’) denotes the value of a variable controlled by the rentiers (non rentiers). Notice also that total capital stock  $K_t$ , net foreign debt  $D_t$ , consumption of tradables  $C_{Tt}$  and consumption of non-tradables  $C_{Nt}$  are now given by  $K_t = \lambda K_t^s + (1-\lambda) K_t^n$ ,  $D_t = \lambda D_t^s + (1-\lambda) D_t^n$ ,  $C_{Tt} = \lambda C_{Tt}^s + (1-\lambda) C_{Tt}^n$  and  $C_{Nt} = \lambda C_{Nt}^s + (1-\lambda) C_{Nt}^n$ ,  $t=0,1$ .

It is straightforward to notice that the rentiers do not like the removal of the restriction to the number of firms operating in the non-tradable sector, since this reform will eliminate the rent that they enjoy as holders of the licenses. The government is realistically assumed to preserve the regulatory regime favoring the rentiers (possibly as a result of some rent-seeking activities by the latter): if and only if the utility of the non rentiers falls below that minimum level which is deemed socially acceptable, the government will accept to lift the barrier to entry into the non-tradable sector. More formally, at the beginning of period 1, the government decides to liberalize if and only if

$$u_1^n \Big|_{N_1 = \bar{N}} < \underline{u} \quad \text{and} \quad u_1^n \Big|_{N_1 > \bar{N}} \geq \underline{u}. \quad (10a)$$

As in the previous section, a necessary and sufficient condition for liberalizing the non-tradable sector in period 1 when the households expected at time 0 that the government will not liberalize it is:

$$u_1^{n**} \geq \underline{u} > u_1^{n*}, \quad (28a)$$

where  $u_1^{n**}$  is the utility level that the non rentiers can achieve in period 1 if the households erroneously believed that the government would not liberalize the entry into the non-tradable sector, and  $u_1^{n*}$  is the utility level that the non rentiers can achieve in period 1 if the households correctly believed that the government would not liberalize.

As in the previous section, a sufficient condition for the authorities not to liberalize the entry in the non-tradable sector in period 1 (keeping the number of operating firms restricted to  $\bar{N}$ ) when the households believed at time 0 that liberalization would instead occur, is given by:

$$u_1^{n^{\circ\circ}} \geq \underline{u}, \quad (30a)$$

where  $u_1^{n^{\circ\circ}}$  is the utility level that the non rentiers can achieve in period 1 if the households erroneously believed that the government would liberalize the entry into the non-tradable sector.

Again, there is a realistic possibility that both (28a) and (30a) hold, thus realizing a self-defeating expectations trap in a framework of heterogeneous agents with distributive conflicts.

### 5.3 Possibility of default

In section 4, we implicitly ruled out the possibility that the households can default on their foreign debt, namely we assumed that  $K_{T1}L_{T1}^\alpha \geq C_{T1} + D_1(1+r)$  must necessarily hold. Here, we relax this assumption by admitting that the households will honor their entire debt service if and only if this will not prevent them from reaching in period 1 the minimum acceptable level of consumption  $\underline{C}$ ,

where  $\underline{C}$  is such that  $\underline{u} = \frac{\underline{C}^{1-\xi}}{1-\xi}$ .

This possibility of partial or total repudiation of the debt on the part of the households can be simply modeled by reformulating  $u_1$  as

$$u_1 = \begin{cases} \frac{C_1^{1-\xi}}{1-\xi} - \zeta Z_1 & \text{if } C_1 \geq \underline{C}, \\ -\zeta Z_1 & \text{otherwise, } \frac{\zeta}{\eta} \geq \underline{C}^{-\xi}, \end{cases} \quad (31)$$

where  $Z_1, 0 \leq Z_1 \leq D_1(1+\hat{r})$ , is the amount of the outstanding debt service repudiated by the households,  $\zeta$  is a parameter measuring the households' sensitivity to the reputational loss due to the repudiation of  $Z_1$ , and  $\hat{r}$  (with  $\hat{r} \geq r$ ) is the interest rate at which the representative household can go into debt. It derives from (31) that in period 1 the representative household sets

$$Z_1 = \begin{cases} 0 & \text{if } D_1(1+\hat{r}) \leq K_{T1}L_{T1}^\alpha - \frac{\underline{C}}{\eta}, \\ \frac{\underline{C}}{\eta} + D_1(1+\hat{r}) - K_{T1}L_{T1}^\alpha & \text{otherwise,} \end{cases} \quad (32)$$

where it is assumed that  $K_{T1}L_{T1}^\alpha - \frac{\underline{C}}{\eta} \geq 0$  (the households, by repudiating entirely their

outstanding debt service, can at least reach the minimum acceptable level of consumption) and

$\frac{\underline{C}^{1-\xi}}{1-\xi} - \zeta \left[ \frac{\underline{C}}{\eta} + D_1(1+\hat{r}) - K_{T1}L_{T1}^\alpha \right] > 0$  (if the households cannot reach  $\underline{C}$  by honoring entirely

their debt service, they are strictly better off by repudiating that amount of debt service which is

necessary to reach  $\underline{C}$  than by paying off entirely  $D_1(1+\hat{r})$ ). Together with  $\frac{\zeta}{\eta} \geq \underline{C}^{-\xi}$ , this implies

that whenever their debt service is excessive (i.e., whenever  $D_1(1+\hat{r}) > K_{T1}L_{T1}^\alpha - \frac{\underline{C}}{\eta}$ ), it is

optimal for the households to repudiate exactly that amount of debt service which is necessary to

reach  $\underline{C}$ .

International investors are aware of the possibility that their credits will not be entirely repaid. Hence, the interest rate at which they are willing to lend to the domestic households ( $\hat{r}$ ) may be higher than the world (risk-free) interest rate:

$$\hat{r} = r + \frac{Z_1}{D_1}. \quad (33)$$

In a self-defeating expectations trap, that is when both conditions (28) and (30) hold, the possibility for the households to default on their debt is particularly relevant for the case in which the households' pessimistic expectations about reform implementation in period 1 will be

validated. When the households' pessimistic expectations are validated and agents do not have the possibility to default, one has that  $C_1^* < \underline{C}$  (see the previous section). Instead, when the households' pessimistic expectations are validated and agents have the possibility of repudiating (partially or entirely) the debt, agents would choose to default whenever it is convenient for them to go excessively into debt in period 0 in the anticipation that they will not repay (partially or entirely) it. More formally, the households will honor entirely their debt service if, in the situation in which at time 1 no debt repudiation will occur and they will consume exactly  $\underline{C}$ , the marginal increase in utility brought about by the increment in consumption at time 0 obtainable by one additional unit of debt is lower than the future discounted disutility of repudiating that unit of debt (and the interest payment on it), i.e., if and only if

$$(C_0^*)^{-\xi} \Big|_{\substack{Z_1=0 \\ C_1=\underline{C}}} \leq \frac{\theta(1+r)\zeta}{\eta}.^{18} \quad (34)$$

Condition (34) is necessary for avoiding a default on the households' debt when the households' expectations are pessimistic and the authorities do not liberalize the firms' entry into the non-tradable sector. It is straightforward that (34) holds when the cost of default is relatively large and the households do not discount the future too heavily: under these circumstances, if the households' pessimistic expectations will be validated by the government, they will not default in  $t=1$  and their utility will be  $u_1^* = \underline{u}$ . Hence, condition (28) does not hold and there is no self-defeating expectations trap: recalling (10), it is rational to expect that the households' pessimistic expectations will be validated.

In contrast, if (34) does not hold, the households' pessimistic expectations cannot be validated, since—in the absence of the liberalization of the non-tradable sector—the households would default on their debt and their utility in period 1 would be  $u_1^* = \frac{\underline{C}^{1-\xi}}{1-\xi} - \zeta Z_1^* < \underline{u}$ , where

---

<sup>18</sup> Notice that  $C_0^*$  can be obtained by solving (11)-(21), (23)-(24), (25a)-(26a) and  $C_1 = \underline{C}$  in the case in which the households have pessimistic expectations, and by solving (11)-(21), (23)-(24), (25b)-(26b) and  $C_1 = \underline{C}$  in the case in which they have optimistic expectations.

$Z_1^* > 0$ . Being aware that—without the removal of the barriers limiting firms' entry into the non-tradable sector—households' utility in period 1 would fall below  $\underline{u}$ , the government is induced in this period to liberalize the non-tradable sector. In other words, if the cost of default is relatively small and the households discount the future heavily, they tend to augment their consumption in period 0 by increasing excessively their debt, thus going into default and reducing their well-being in period 1 in the absence of a regulatory reform on the part of the government. This will lead the government to implement this reform, thus falsifying the households' pessimistic expectations: again, a self-defeating expectations trap is at work.

## **6. SELF-DEFEATING EXPECTATIONS AND THE LACK OF ECONOMIC CONVERGENCE IN THE EUROZONE**

In the attempt to account for the recent debt crisis in the Eurozone, several observers claimed that financial markets in the 1990s had been too complacent with the historically weakest countries joining the EMU and that market investors were excessively pessimistic during the crisis. This, the argument goes, reflects the well-known phenomenon of self-fulfilling expectations and multiple equilibria in financial markets (see, among others, Corsetti et al. 2013, 2014, De Grauwe and Ji 2013, Gros 2012).<sup>19</sup>

Although positive sentiment in financial markets is a key determinant of the nominal convergence achieved in Europe in the 1990s, it cannot explain alone the lack of structural reforms in several countries in the following decade, the scant signs of economic convergence across countries, and the emergence of large macroeconomic imbalances in the Eurozone. As structural reforms are essential to ensure the real economic convergence of heterogeneous countries sharing the same currency, we would argue that more need be said about the relationship between agents' expectations about reforms and economic performances.

---

<sup>19</sup> Among the several previous works on self-fulfilling prophecies and multiple equilibria, see for instance, Calvo (1988), Farmer (1993), Obstfeld (1986).

As a matter of fact, the early debate on the desirability of the European monetary union did explicitly touch upon the relationship between monetary unification, incentives to undertake structural reforms, and real economic convergence. Particular attention was attributed to the indirect effects of the prospective monetary union on the real economy through the EMU-related incentives for the authorities to operate structural reforms (Bean 1998a, 1998b, and Bentolila and Saint-Paul 2000). On the one hand, it was argued, governments may recognize that participating in a monetary union requires greater real convergence (in a sort of TINA—There Is No Alternative—argument), as well as more market-based adjustments to asymmetric shocks, and this might promote broad and deep reforms. On the other hand, the existence of a monetary union may deprive national governments of some macroeconomic tools to temper the negative short-term effects of reforms, thereby making the latter less likely.<sup>20</sup> Despite its relevance, the interest on the TINA argument gradually faded, probably due to the improvements in the budgetary conditions of most EU countries, the global reduction in the levels and volatility of inflation (the so-called great moderation), the successful changeover operations in 2002, and the buoyant financial markets in the 2000s.<sup>21</sup>

As pointed out by Fernandez-Villaverde et al. (2013) and Reis (2013), the adoption of the euro boosted confidence in the periphery countries, facilitated cheap borrowing and investment in activities with limited productivity growth. Because of this seemingly positive context, many governments did not find the right incentives to address the structural weaknesses and limited progress was made in terms of real economic convergence. Before the eruption of the debt crisis,

---

<sup>20</sup> Empirical evidence on the issue is mixed and inconclusive (Belke et al. 2005, Duval and Elmeskov 2006, Vamvakidis 2009, Alesina et al. 2011, Cacciatore et al. 2012, Bouis et al. 2012). Contingent economic circumstances and country-specific social preferences led to very different outcomes in diverse countries: the TINA argument appears to have worked in some countries but not in others.

<sup>21</sup> The early debate on the costs and benefits of establishing a monetary union among heterogeneous countries overlooked the impact of agents' expectations on investment and on the structure of the economy. Agents' expectations, instead, did play a role in the Walters' critique to the establishment of fixed exchange rates in the European Community. Sir Alan Walters, a counselor of Ms. Thatcher in the 1980s, warned about risk that the presence of nominal interest rate convergence and persistent inflation differentials (leading to diverging real interest rates) could bring about asymmetric transmission of monetary policy and a cyclical de-coupling of the high inflation countries in the union. Walters pointed out that financial market expectations about the nature of the exchange rate regime switch could be inconsistent with the expectations in the labour markets. Along similar lines, Miller and Sutherland (1991) develop a macroeconomic model that allows for a gradual convergence of initially inconsistent expectations.

many euro-area countries exhibit relatively low productivity levels and growth rates, which can be associated with various barriers to competition and innovation, as well as with pervasive resource misallocation.<sup>22,23</sup> Vamvakidis (2009) analyses the reasons for the deceleration of reforms after the introduction of the euro and find that the reform dynamics was negatively affected by “good-times complacency”.

Focusing on Portugal, Blanchard (2007) timely observed: “Combined with expectations that participation in the euro would lead to faster convergence and thus faster growth for Portugal, the result was an increase in both consumption and investment. Household saving dropped, investment increased”. This is in line with Baer et al. (2013) who illustrate the disappointment of the optimistic expectations about (and the perceived opportunities from) Portugal’s participation in the EMU.

Paradoxically, the widespread optimistic belief that—thanks to the euro—real convergence would have occurred between the core and the periphery countries proved to be self-defeating. This is in line with the idea of self-defeating expectations, thereby the belief that real convergence would have occurred between the core and the periphery of the Eurozone created the conditions

---

<sup>22</sup> Coudert et al. (2013) assess real exchange rate misalignments within the Eurozone and find relatively large and persistent ones in the periphery; Ruscher and Wolff (2009) show that non-tradables play an important role in determining intra-euro area price competitiveness; Estrada et al (2013) find that limited convergence within the Euro area, in part due to factors others than the EMU. Bénassy-Quéré and Coulibaly (2014) investigate the contribution of market regulations to the dynamics of the real exchange rates in the EU and find that the relative evolutions of product market regulations play a significant role through their impacts on the relative price of nontradable good. D’Auria et al. (2009) model the impact of structural reforms across the EMU, whereas Forni et al. (2010), Lusinyan and Muir (2013) and Annichiarico et al. (2013) analyze the impact of liberalizing protected service sectors in Italy, that is the OECD country with the highest mark-ups in non-manufacturing industries and whose recent economic performance has not been affected by housing and credit bubbles. Bassanetti et al (2013), in turn, discuss the reasons why the reform process in Italy reached a virtual standstill after the late 1990s. Also Eggertsson et al. (2013) analyse the short- and long-run effects of structural reforms in Europe; they argue that, despite unambiguous long-term gains, reforms may worsen the conditions of the reforming countries if undertaken during the recent crisis (when monetary policy is constrained by the zero lower bound and reforms may be perceived as reversible)

<sup>23</sup> The elimination of nominal exchange rate risk and the ECB anti-inflationary credibility allowed the periphery to borrow at low interest rates, thereby creating incentives to postpone further painful fiscal consolidations (Greece, Italy) and structural reforms (Greece, Italy, Portugal, Spain), and boosting aggregate demand and production thanks to the high indebtedness of the household and financial (private) sectors (Ireland, Spain).

for a real divergence, mirrored in the large current account imbalances emerged in the last decade (Bonatti and Fracasso 2013).

Although our stylized set-up does not provide a framework to analyze the mechanisms through which macroeconomic imbalances grew large in the Eurozone, it does offer a rationalization of the possible interaction between the lack of structural reforms and widespread optimistic expectations. As similar considerations have been offered by influential commentators without the adoption of any formal model, our set up provides at least a basis to represent the self-defeating expectations situation occurred in the Eurozone in the 1990s and early 2000s.

If real economic convergence in the Eurozone represents a case of self-defeating expectations about structural reforms, a number of questions arise: why did economic agents miscalculate the reform stance of their governments? Could they have done better if endowed with better information about the *status quo* bias of the authorities? Could have the EU authorities helped in this process by providing information and incentives rather than focusing on the Maastricht convergence criteria? Are international arrangements and numerical rules, such as those contained in the recently reformed Stability and Growth Pact, effective in reducing the likelihood of self-defeating expectations? Could domestic commitment devices, such as the establishment of independent committees of technicians, be of help?

If our tentative interpretation of the Eurozone problems in achieving real convergence is correct, one could wonder whether Europeans would have been more rational had they been pessimistic. This is possible but not certain. Had most economic agents be pessimistic about governments' reform stance, the authorities could have eventually implemented the needed structural reforms. In such a case, the EU citizens would have found themselves in a self-defeating expectations trap, where no expectations could eventually be fulfilled. Unfortunately, this is a purely counterfactual scenario as most agents were optimistic and reforms limited.

## **7. CLOSING REMARKS**



This work addresses the underexplored implications of agents' expectations about structural reforms in a context characterized by institutional inertia, whereby the authorities do not implement reforms unless social welfare falls below a critical (politically and socially sustainable) level. By means of a stylized small open economy with tradable and non-tradable sectors and encompassing policy-induced barriers to entry in the non-tradable sector, this work shows that optimistic (pessimistic) expectations about reforms may boost (weaken) the economic performance of the economy and thus reduce (increase) the incentives for the authorities to implement the reform. In addition, the model reveals that there might be circumstances in which no set of expectations has the potential for self-fulfillment, leaving agents to face a high degree of indeterminacy. By identifying the potential emergence of self-defeating expectations traps, the model reveals a new kind of problem that may possibly afflict radical structural reforms, that is the risk of not having a rational expectations equilibrium and no obvious criterion for the agents to form their expectations.

Notwithstanding the stylized nature of the analytical set-up, the focus on the interplay between structural reforms and agents' expectations allows to shed some light on the recent Eurozone problems. To start, the model suggests that, if the authorities exhibit a *status quo* bias against reforms, expectations about the realization of the reforms may be self-defeating and the disciplining effects of the monetary union may fail to materialize. This seems to be consistent with what observed in a number of Eurozone periphery countries. Thus, while the literature on the European sovereign debt crisis explained the turmoil in terms of self-fulfilling prophecies and multiple equilibria in the sovereign debt markets, our work suggests that the limited real economic convergence occurred in the 1990s and early 2000s may represent a case of self-defeating expectations about structural reforms.

## REFERENCES

Abiad, A., and A. Mody (2005). "Financial Reform: What Shakes It? What Shapes It?" *American Economic Review*, 95(1), 66-88.

Acemoglu, D., Robinson, J.A., and T. Verdier (2012). “Can’t We All Be More Like Scandinavians? Asymmetric Growth and Institutions in an Interdependent World.” CEPR Discussion Paper 9113.

Acemoglu, D., S. Johnson, P. Querubin and J.A. Robinson, (2008). “When Does Policy Reform Work? The Case of Central Bank Independence”, *Brookings Papers on Economic Activity*, 39(1 (Spring)), 351-429.

Aizenman, J., Hutchison, M., and Y. Jinjark (2013). “What is the risk of European sovereign debt defaults? Fiscal space, CDS spreads and market pricing of risk” *Journal of International Money and Finance*, 34(C), 37-59.

Aizenman, J., and S.-S. Yi (1998). “Regret Theory and Policy Reform” *Journal of Policy Reform*, 2; 269-280.

Alesina, A., Ardagna, S., and V. Galasso (2011). “The Euro and Structural Reforms” *Review of Economics and Institutions*, vol. 2(1).

Alesina, A., Ardagna, S., Nicoletti G., and F. Schiantarelli (2005) “Regulation and investment” *Journal of the European Economic Association*, 3(4), 791-825.

Alesina, A. and A. Drazen (1991). “Why Are Stabilizations Delayed?” *American Economic Review*, 81(5), 1170-88.

Anderson, D., Hunt B., and S. Snudden (2013). “Fiscal Consolidation in the Euro Area: How Much Can Structural Reforms Ease the Pain?” IMF Working papers 13/211

Annicchiarico, B., Di Dio, F., Felici, F. (2013). “Structural Reforms and the Potential Effects on the Italian Economy”, *Journal of Policy Modeling*, 35(1), 88-109.

Arnold, J., Nicoletti, G., and S. Scarpetta (2010). “Much Ado About something? Regulation, Resource Allocation and Firm-level Productivity in a Panel of Countries.” Paper presented at the Ifo/CESifo and OECD Conference on Regulation, 29-20 January 2010, Munich.

Arrunada, B. (2007). “Pitfalls to avoid when measuring institutions: Is Doing Business damaging business?”, *Journal of Comparative Economics*, 35(4), 729-747.

Baer, W., Dias, D., and J.B. Duarte (2013). “The economy of Portugal and the European Union: From high growth prospects to the debt crisis” *The Quarterly Review of Economics and Finance*, 53(4), 345-352.

Barone, G., and F. Cingano (2011). “Service Regulation and Growth: Evidence from OECD Countries” *Economic Journal*, 121(555), 931-957.

Barro, R. J., and X. Sala-i-Martin, (1995). *Economic Growth*. New York: McGraw-Hill.

Barseghyan, L. (2008). “Entry costs and cross-country differences in productivity and output”, *Journal of Economic Growth*, 13(2), 145-167.

Bartelsman, E., Haltiwanger, J., and S. Scarpetta (2013). “Cross-Country Differences in Productivity: The Role of Allocation and Selection” *American Economic Review*, 103(1), 305-34.

- Bassanini, A. and R. Duval, (2009). “Unemployment, institutions, and reform complementarities: re-assessing the aggregate evidence for OECD countries”, *Oxford Review of Economic Policy* 25(1): 40-59.
- Bateman, I., Munro, A. , Rhodes, B., Starner, C., and R. Sugden (1997). “A Test of the Theory of Reference-Dependent Preferences” *Quarterly Journal of Economics*, 62, 479-505.
- Bassanetti, A., M. Bugamelli, S. Momigliano, R. Sabbatini and F. Zollino (2014). “The policy response to macroeconomic and fiscal imbalances in Italy in the last fifteen years.” *Questioni di Economia e Finanza (Occasional Papers)* No 211, Bank of Italy
- Bean, C. (1998a). “Monetary Policy under EMU” *Oxford Review of Economic Policy*, 14, 41-53.
- Bean, C. (1998b). “The Interaction of Aggregate Demand Policies and Labor Market Reform” *Swedish Economic Policy Review*, 5, 353-382.
- Belke, A., Herz, B., and L. Vogel (2005). “Structural Reforms and the Exchange Rate Regime: A Panel Analysis for the World versus OECD Countries” *IZA Discussion Papers* 1798.
- Bems, R. (2008). “Aggregate Investment Expenditures on Tradable and Nontradable Goods.” *Review of Economic Dynamics*, 11, 852-883.
- Bénassy-Quéré A. and D. Coulibaly, 2014, “The impact of market regulations on intra-European real exchange rates”, *Review of World Economics*, 150(3), 529-556.
- Bentolila, S. and G. Saint-Paul (2000). “Will EMU Increase Eurosclerosis?” *CEPR Discussion Papers* 2423.
- Bernoth, K., von Hagen, J., and L. Schuknecht (2012). “Sovereign risk premiums in the European government bond market” *Journal of International Money and Finance*, 31(5), 975-995.
- Bertola, G., and L. Mola (2010). “Services Provision and Temporary Mobility: Freedoms and Regulation in the EU” *World Economy*, 33(4), 633-653.
- Besley, T. (2006), *Principled Agents: The Political Economy of Good Government*, Oxford University Press, Oxford.
- Blanchard, O., 2007, “Adjustment within the euro. The difficult case of Portugal”, *Portuguese Economic Journal*, 6(1), 1-21.
- Bonatti, L. and A. Fracasso (2013). “The German model and the European crisis” *Journal of Common Market Studies*, 51(6), 1023-39.
- Borchert, I., Gootiiz, B., and A. Mattoo (2013). “Policy Barriers to International Trade in Services: Evidence from a New Database” *World Bank Economic Review*, forthcoming
- Bouis, R., Causa, O., Demmou, L., Duval, R. and A. Zdzienicka (2012), “The Short-Term Effects of Structural Reforms: An Empirical Analysis”, *OECD Economics Department Working Papers* , No. 949.
- Bourguignon, F. (2011). “Status Quo In The Welfare Analysis Of Tax Reforms” *Review of Income and Wealth*, 57(4), 603-621.

- Brou, D., and M. Ruta (2013). “Rent-seeking, market structure, and growth” *Scandinavian Journal of Economics* 115(3), 878-901.
- Buti, M., Werner R. and A. Turrini, (2009). “Is Lisbon Far from Maastricht? Trade-offs and Complementarities between Fiscal Discipline and Structural Reforms”, *CESifo Economic Studies*, 55(1), 165-196.
- Cacciatore, M., Duval R., and G. Fiori (2012), “Short-Term Gain or Pain? A DSGE Model-Based Analysis of the Short-Term Effects of Structural Reforms in Labour and Product Markets”, OECD Economics Department Working Papers, No. 948
- Calvo, G.A., (1988) “Servicing the Public Debt: The Role of Expectations” *American Economic Review*, 78(4) 647-661.
- Caplan, B. (2007) *The Myth of the Rational Voter: Why Democracies Choose Bad Policies*. Princeton University Press, Princeton NJ
- Caplan, B., (2002) “Systematically biased beliefs about economics: robust evidence of judgemental anomalies from the survey of Americans and economists on the economy” *The Economic Journal*, 112, 433–458.
- Cason, T. N., and V.-L. Mui, (2005). “Uncertainty and resistance to reform in laboratory participation games” *European Journal of Political Economy*, 21(3), 708-737.
- Chang, R. (2001) “Commitment, coordination failures, and delayed reforms”, *Journal of Monetary Economics*, 47(1), 123–144.
- Chari, A.V. (2011) “Identifying the Aggregate Productivity Effects of Entry and Size Restrictions: An Empirical Analysis of License Reform in India” *American Economic Journal: Economic Policy*, Vol. 3, Issue 2.
- Claussen, C.A., (2002). “On the Dynamic Consistency of Reform and Compensation Schemes” *Journal of Economic Policy Reform*, 5(3), 133-144.
- Conway, P., and G. Nicoletti (2006). “Product Market Regulation in the Non-Manufacturing Sectors of OECD Countries: Measurement and Highlights,” OECD Economics Department Working Papers 530.
- Corsetti, G., Kuester K., Meier A. and G. Müller, (2014), “Sovereign risk and belief-driven fluctuations in the euro area”, *Journal of Monetary Economics*, forthcoming
- Corsetti, G., Kuester,K., Meier,A., and G. Müller, (2013). “Sovereign risk, fiscal policy, and macroeconomic stability”. *Economic Journal*, 123, F99–F132.
- Coudert, V., Couharde, C., and V. Mignon, (2013). “On Currency Misalignments within the Euro Area” *Review of International Economics*, 21(1), 35–48.
- D’Auria, F., Pagano, A., Ratto, M., & Varga, J. (2009). “A comparison of structural reform scenarios across the EU member States: Simulation-based analysis using the QUEST model with endogenous growth”, *European Economy – Economic Paper* no. 392.
- De Grauwe, P., and Y. Ji (2012). “Mispricing of Sovereign Risk and Macroeconomic Stability in the Eurozone” *Journal of Common Market Studies* 50, 866-880.

- De Grauwe, P., and Y. Ji (2013). “Self-fulfilling crises in the Eurozone: an empirical test” *Journal of International Money and Finance*, 34(C), 15–36.
- Dewatripont, M., and G. Roland (1992a). “Economic Reform and Dynamic Political Constraints” *Review of Economic Studies*, 59, 703–30.
- Dewatripont, M., and G. Roland (1992b). “The Virtues of Legitimacy and Gradualism in the Transition to a Market Economy” *Economic Journal*, 102, 291-300.
- Djankov, S. (2009). “The Regulation of Entry: A Survey” *World Bank Research Observer*, 24(2), 183-203.
- Downs, A. (1957) *An Economic Theory of Democracy*. Harper and Row, New York
- Drazen, A. (2000.) *Political Economy in Macroeconomics*. Princeton: Princeton University Press.
- Drazen, A. (1996) “The Political Economy of Delayed Reform.” *Journal of Policy Reform*, 1(1), 25–46.
- Drazen, A., and V. Grilli, (1993). “The Benefit of Crises for Economic Reforms”, *American Economic Review*, 83(3), 598-607.
- Dur, R.A.J. and O.H. Swank, (1998). “The role of governmental agreements in breaking political deadlock”, *European Journal of Political Economy*, 14(3), 561-572.
- Duval, R., and J. Elmeskov (2006) “The effects of EMU on structural reforms in labour and product markets,” Working Paper Series 596, European Central Bank.
- Eggertsson G., Ferrero A., and A. Raffo, (2013) “Can Structural Reforms help Europe?” *Journal of Monetary Economics*, forthcoming
- Estrada, A., Galí J. and D. Lopez-Salido. (2013) “Patterns of convergence and divergence in the euro area”. *IMF Economic Review*, 61(4), 601-630.
- Eterovic, D. S. (2011). “Institutional Bias towards the Status Quo” *Journal of Institutional and Theoretical Economics* 167(3), 489-514.
- Farmer, R.A.E. (1993), *The Macroeconomics of Self-fulfilling Prophecies*, Cambridge Mass., MIT Press.
- Fernandes, A.P., Ferreira P. and L.A. Winters (2013), “Firm Entry Deregulation, Competition and Returns to Education”, *European Economic Review*, forthcoming
- Fernandez, R. and D. Rodrik (1991). “Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty” *American Economic Review*, 81(5), 1146-55.
- Fernández Corugedo, E. and E. Pérez Ruiz, (2014). “The EU Services Directive: Gains from Further Liberalization”, IMF Working paper 14/113
- Fernández-Villaverde, J., Garicano, L., and T. Santos (2013). “Political Credit Cycles: The Case of the Eurozone.” *Journal of Economic Perspectives*, 27(3): 145-66.

- Fidrmuc, J., (2003). “Economic reform, democracy and growth during post-communist transition” *European Journal of Political Economy*, 19(3), 583-604.
- Fidrmuc, J., (2000). “Political support for reforms: Economics of voting in transition countries”, *European Economic Review*, 44(8), 1491-1513.
- Fisman, R. and V. Sarria-Allende, (2004) “Regulation of Entry and the Distortion of Industrial Organization” NBER Working Paper No. 10929.
- Forni, L., Gerali, A., and M. Pisani (2010). “Macroeconomic Effects Of Greater Competition In The Service Sector: The Case Of Italy” *Macroeconomic Dynamics*, 14(05), 677-708.
- Frankel, M. (1962). “The Production Function in Allocation and Growth: A Synthesis” *American Economic Review*, 52, 995-1022.
- Freytag, A., and S. Renaud, (2007). “From short-term to long-term orientation—political economy of the policy reform process”, *Journal of Evolutionary Economics*, 17(4), 433-449.
- Galasso, V. (2014). “The role of political partisanship during economic crises”, *Public Choice*, 158(1), 143-165.
- Ghironi, F., Iscan T.B., and A. Rebucci (2008). “Net Foreign Asset Positions and Consumption Dynamics in the International Economy” *Journal of International Money and Finance*, 27(8), 1337-1359.
- Giavazzi, F., and L. Spaventa (2010). “Why the current account may matter in a monetary union: Lessons from the financial crisis in the Euro area.” CEPR Discussion Papers 8008.
- Gros, D., (2012) “A simple model of multiple equilibria and sovereign default” CEPS Working Documents
- Grier, K, and D. Sutter, (2007). “External influences on economic reform: Reform as a regional public good” *European Journal of Political Economy*, 23(3), 660-673.
- Grossman, G., and E. Helpman (2001). *Special Interest Politics*. Cambridge MA and London UK: MIT Press.
- Hoj, J., Galasso, V., Nicoletti, G., and D. Thai-Thanh (2006). “The Political Economy of Structural Reform” OECD Economics Department, Working Paper 501.
- Jain, S., and S.W. Mukand (2003). “Redistributive Promises and the Adoption of Economic Reform” *American Economic Review*, 93(1): 256-264.
- Jain, S., Majumdar, S., and S.W. Mukand, (2014) “Walk the Line: Conflict, State Capacity and the Political Dynamics of Reform”, CESifo Working Paper Series No. 4648.
- Jennings, C., (2011). “The good, the bad and the populist: A model of political agency with emotional voters”, *European Journal of Political Economy*, 27(4), 611-624.
- Katsimi, M. and T. Moutos (2010). “EMU and the Greek Crisis: The Political Economy Perspective” *European Journal of Political Economy*, 26: 568-576.

- Klapper, L., Laeven L., and R. Rajan (2006). "Entry Regulation as a Barrier to Entrepreneurship", *Journal of Financial Economics* 82 (3), 591-629
- Krueger, A. O. (1974). "The political economy of the rent-seeking society" *American Economic Review* 64, 752-769
- Krusell, P. and J.-V. Rios-Rull (1996). "Vested Interests in a Positive Theory of Stagnation and Growth" *Review of Economic Studies*, 63(2) 301-29.
- Kuran, T., (1987). "Preference falsification, policy continuity, and collective conservatism" *Economic Journal*, 97, 642–665.
- Laffont, J.-J. and Y. Qian, (1999). "The dynamics of reform and development in China: A political economy perspective", *European Economic Review*, 43(4-6), 1105-1114.
- Laban, R. and F. Sturzenegger, (1994) "Distributional conflict, financial adaptation and delayed stabilization". *Economics and Politics*, 6(3), 257–276.
- Lusinyan, L., and D. Muir (2013). "Assessing the Macroeconomic Impact of Structural Reforms The Case of Italy," IMF Working Papers 13/22.
- Martinelli, C. and R. Escorza, (2007). "When are stabilizations delayed? Alesina-Drazen revisited", *European Economic Review*, 51(5), 1223-1245.
- Mayes, D., and M. Virén, (2009) "Changes in behaviour under EMU", *Economic Modelling*, 26(4), 751-759.
- Mendoza, E.G., Quadrini, V., and J.-V. Rios-Rull (2009). "Financial Integration, Financial Deepness and Global Imbalances." *Journal of Political Economy*, 117(3), 371-416
- Meseguer, C., (2006). "Learning and economic policy choices", *European Journal of Political Economy*, 22(1), 156-178.
- Miller, M. and A. Sutherland (1991). "The 'Walters critique' of the EMS—A case of inconsistent expectations?" *Manchester School*, LIX (S1), 23—37.
- Moutos, T. and L. Pechlivanos, (2013). "The Democratization of Rent Seeking in Greece." CESifo Working Paper 4331.
- Obstfeld, M. (2012). "Financial Flows, Financial Crises, and Global Imbalances." *Journal of International Money and Finance*, 31(3), 469-480.
- OECD (2010). *Making Reform Happen Lessons from OECD Countries: Lessons from OECD Countries*. Paris: OECD Publishing.
- Obstfeld, M.. (1986) "Rational and Self-Fulfilling Balance-of-Payments Crises" *American Economic Review*, 76(1), 72-81
- Olson, M. (1971). *The Logic of Collective Action: Public Goods and the Theory of Groups* (Revised edition ed.). Harvard University Press.

- Orphanides, A. (1996). "The timing of stabilizations" *Journal of Economic Dynamics and Control*, 20, 257–280.
- Paetzl, F., Sausgruber R., and S. Traub, (2014). "Social preferences and voting on reform: An experimental study", *European Economic Review*, 70, 36-55.
- Perotti, R., and Y. Kontopoulos (2002). "Fragmented Fiscal Policy." *Journal of Public Economics* 86(2): 191-222.
- Persson, T, and G. Tabellini (2000). *Political Economics: Explaining Economic Policy*. Cambridge, MA: MIT Press.
- Ruscher E .& G.B. Wolff, (2009)."External rebalancing is not just an exporters' story: real exchange rates, the non-tradable sector and the euro" *Economic Papers* 375, ECFIN
- Reis, R. (2013). "The Portuguese Slump-Crash and the Euro Crisis." Paper presented at the Brookings Panel on Economic Activity, Brookings Institution, 21–22 March.
- Ribeiro, M.P. and R. Beetsma (2008). "The political economy of structural reforms under a deficit restriction", *Journal of Macroeconomics*, 30(1), 179-198.
- Rodrik, D. (2014). "When Ideas Trump Interests: Preferences, Worldviews, and Policy Innovations". *Journal of Economic Perspectives*, 28(1): 189-208.
- Rodrik, D. (2008). "The Real Exchange Rate and Economic Growth." *Brookings Papers on Economic Activity*, 2.
- Rodrik, D. (2005). "Growth Strategies" in: Philippe Aghion & Steven Durlauf (ed.), *Handbook of Economic Growth*, vol. 1, ch. 14, 967-1014 Elsevier.
- Rodrik, D. (1996). "Understanding Economic Policy Reform" *Journal of Economic Literature*, XXXIV, March, 9-41.
- Roland, G. (2002). "The Political Economy of Transition." *Journal of Economic Perspectives*, 16(1): 29-50.
- Romer, D. (2003). "Misconceptions and Political Outcomes", *Economic Journal*, 113(484), 1-20.
- Rubinchik, A. and R. Wang, (2008). "A note on redistributive fairness and economic reform", *Journal of Development Economics*, 86(2), 447-452.
- Samuelson, W. and R. Zeckhauser (1988). "Status quo bias in decision making." *Journal of Risk and Uncertainty*, 1, 7-59.
- Schivardi F. and E. Viviano, (2011). "Entry Barriers in Retail Trade", *Economic Journal*, 121(551), 145-170.
- Spolaore, E. (2004) "Adjustments in different government systems." *Economics and Politics*, 16(2), 117–146.
- Stein, E. and J.M. Streb, (2004) "Elections and the timing of devaluations." *Journal of International Economics*, 63(1), 119–145.



Tompson, W. (2009). "The political economy of reform. Lessons from pensions, product markets and labour markets in ten OECD countries." Paris: OECD Publishing.

Tommasi, M., and A. Velasco, (1996). "Where are we in the political economy of reform?" *Journal of Economic Policy Reform*, 1(2), 187-238.

Turnovsky, S. J. (1997). *International Macroeconomic Dynamics*. Cambridge, MA: MIT Press.

Tversky, A., and D. Kahneman (1991). "Loss Aversion in Riskless Choice: A Reference-Dependent Model" *Quarterly Journal of Economics*, 106(4), 1039-61.

Valderrama, L. (2009). "Political Risk Aversion." IMF working paper 09/194.

Vamvakidis, A., (2009). "Is there a reform fatigue in the euro area?" *Economic Modelling*, 26(4), 767-777.

Willett, T.D., and N. Srisorn, (2013), "The Political Economy of the Euro Crisis: Cognitive Biases, Faulty Mental Models, and Time Inconsistency", *Journal of Economics and Business*, forthcoming

Woo, J., (2003). "Economic, political, and institutional determinants of public deficits", *Journal of Public Economics*, 87(3-4), 387-426.

## APPENDIX

### 1) Derivation of the equilibrium output of the representative firm operating in the non-tradable sector and of the equilibrium price of its output

We find the cost-minimizing demand functions for  $L_{Nt}$  and  $K_{Nt}$  by solving

$$\min_{L_{Nt}, K_{Nt}} W_t L_{Nt} + R_t K_{Nt} + Q_t \quad \text{subject to } L_{Nt}^\beta K_{Nt}^\gamma \geq Y_{Nt}. \quad (\text{A.1})$$

From the solution to (A1), one can derive the cost function of the representative firm producing the non-tradable good:

$$C(W_t, R_t, Q_t, Y_{Nt}) = \begin{cases} \Psi(Y_{Nt} W_t^\beta R_t^\gamma)^{\frac{1}{\beta+\gamma}} + Q_t & \text{if } Y_{Nt} > 0 \\ 0 & \text{otherwise, } \Psi \equiv \left(\frac{\beta}{\gamma}\right)^{\frac{\gamma}{\beta+\gamma}} + \left(\frac{\gamma}{\beta}\right)^{\frac{\beta}{\beta+\gamma}}. \end{cases} \quad (\text{A.2})$$

By solving

$$\max_{Y_{Nt}} P_{Nt} Y_{Nt} - C(W_t, R_t, Q_t, Y_{Nt}). \quad (\text{A.3})$$

one can find the supply function of the representative firm producing the non-tradable good:

$$Y_{Nt} = \begin{cases} \left\{ \frac{P_{Nt} (\beta + \gamma) (W_t^\beta R_t^\gamma)^{\frac{-1}{\beta+\gamma}}}{\Psi} \right\}^{\frac{\beta+\gamma}{1-\beta-\gamma}} & \text{if } P_{Nt} \geq \text{Min } AC(W_t, R_t, Q_t, Y_{Nt}) \\ 0 & \text{otherwise.} \end{cases} \quad (\text{A.4})$$

Notice that  $AC(W_t, R_t, Q_t, Y_{Nt})$  is the average cost function of the representative firm operating in the non-tradable sector:

$$AC(W_t, R_t, Q_t, Y_{Nt}) = \begin{cases} \Psi(Y_{Nt}^{1-\beta-\gamma} W_t^\beta R_t^\gamma)^{\frac{1}{\beta+\gamma}} + \frac{Q_t}{Y_{Nt}} & \text{if } Y_{Nt} > 0 \\ 0 & \text{otherwise.} \end{cases} \quad (\text{A.5})$$

Knowing that in equilibrium the representative firm produces the quantity which minimizes its average cost, one can solve

$$\min_{Y_{Nt}} AC(W_t, R_t, Q_t, Y_{Nt}), \quad (\text{A.6})$$

thus obtaining the equilibrium output of the representative firm producing the non-tradable good:

$$Y_{Nt} = W_t^{-\beta} R_t^{-\gamma} \left[ \frac{(\beta + \gamma) Q_t}{(1 - \beta - \gamma) \Psi} \right]^{\beta + \gamma}. \quad (\text{A.7})$$

Moreover, knowing that in equilibrium the price of the non-tradable good equalizes the minimum of the average cost function, one can use (A.7) to substitute for  $Y_{Nt}$  in (A.5), thus obtaining (19).

## 2) Numerical example

Let us assume that  $\alpha=0.7$ ;  $\beta=0.6$ ;  $\gamma=0.2$ ;  $\eta=0.3615336$ ;  $\theta=0.7986$ ;  $\xi=0.8636241$ ;  $r=0.0898415$ ;  $F=8.3777348$ ;  $H=42.314599$ ;  $\bar{K} = 49.0208565$ ;  $\bar{N} = 4$ ;  $\underline{u} = 9.786$ , and  $\underline{W} = 3.1350538$ .

### 2.1 Pessimistic expectations

Taking the parameter values and initial conditions given above, one can solve for the case in which agents' expectations are pessimistic, thus obtaining:  $C_{T0}^* = 8.574346$ ;  $C_{N0}^* = 23.716595$ ;  $L_0^* = H$ ;  $W_0^* = 3.616183$ ;  $R_0^* = 1.084547$ ;  $N_0^* = \bar{N}$ ;  $Q_0^* = 10.861741$ ;  $P_{N0}^* = 9.159613$ ;  $K_{T0}^* = 8.960856$ ;  $K_{N0}^* = 10.015$ ;  $L_{T0}^* = 6.270824$ ;  $L_{N0}^* = 9.010944$ ;  $Y_{T0}^* = 32.39491$ ;  $Y_{N0}^* = 5.929149$ ;  $K_1^* = 42.16378$ ;  $D_1^* = 18.343216$ ;  $C_{T1}^* = 8.28969$ ;  $C_{T1}^{**} = 8.497391$ ;  $C_{N1}^* = 22.929234$ ;  $C_{N1}^{**} = 23.503738$ ;  $N_1^* = \bar{N}$ ;  $N_1^{**} = 4.489750$ ;  $Q_1^* = 9.36689$ ;  $Q_1^{**} = F$ ;  $L_1^* = H = L_1^{**}$ ;  $W_1^* = \underline{W}$ ;  $W_1^{**} = 3.138048$ ;  $R_1^* = 1+r$ ;  $R_1^{**} = 1.094759$ ;  $P_{N1}^* = 8.17026$ ;  $P_{N1}^{**} = 8.001695$ ;  $K_{T1}^* = 7.7848581$ ;  $K_{T1}^{**} = 7.807343$ ;  $K_{N1}^* = 8.59473$ ;  $K_{N1}^{**} = 7.652585$ ;  $L_{T1}^* = 6.3145995$ ;  $L_{T1}^{**} = 6.3553444$ ;  $L_{N1}^* = 8.96338$ ;  $L_{N1}^{**} = 8.0091889$ ;  $Y_{T1}^* = 28.28087$ ;  $Y_{T1}^{**} = 28.490536$ ;  $Y_{N1}^* = 5.732308$ ;  $Y_{N1}^{**} = 5.2349767$ ;  $u_1^* = 9.78428$ ;  $u_1^{**} = 9.8173558$ . It is worth to notice that condition (28) is satisfied ( $u_1^{**} = 9.8173558 \geq \underline{u} = 9.784406 > u_1^* = 9.78428$ ).

### 2.2 Optimistic expectations

Taking again the parameter values and initial conditions given above, one can solve for the case in which agents' expectations are optimistic, thus obtaining:  $C_{T0}^\circ = 8.5655285$ ;  $C_{N0}^\circ = 23.692206$ ;  $L_0^\circ = H$ ;  $W_0^\circ = 3.6328049$ ;  $R_0^\circ = 1.0898415$ ;  $N_0^\circ = \bar{N}$ ;  $Q_0^\circ = 10.898415$ ;  $P_{N0}^\circ = 9.2$ ;  $K_{T0}^\circ = 9.0208565$ ;  $K_{N0}^\circ = 10$ ;  $L_{T0}^\circ = 6.3145994$ ;  $L_{N0}^\circ = 9$ ;  $Y_{T0}^\circ = 32.771011$ ;  $Y_{N0}^\circ = 5.9230515$ ;  $K_1^\circ = 42.39325$ ;  $D_1^\circ = 18.187768$ ;  $C_{T1}^\circ = 8.5185921$ ;  $C_{T1}^{\circ\circ} = 8.3187641$ ;  $C_{N1}^\circ = 23.56238$ ;  $C_{N1}^{\circ\circ} = 23.009657$ ;  $N_1^\circ = 4.5$ ;  $N_1^{\circ\circ} = \bar{N}$ ;  $Q_1^\circ = F$ ;  $Q_1^{\circ\circ} = 9.3997928$ ;  $L_1^\circ = H = L_1^{\circ\circ}$ ;  $W_1^\circ = 3.1416507$ ;

$W_1^{\circ\circ} = \underline{W}$  ;  $R_1^{\circ} = 1+r$  ;  $R_1^{\circ\circ} = 1.0860535$  ;  $P_{N1}^{\circ} = 8$  ;  $P_{N1}^{\circ\circ} = 8.1703028$  ;  $K_{T1}^{\circ} = 7.8012393$  ;  
 $K_{T1}^{\circ\circ} = 7.77325$  ;  $K_{N1}^{\circ} = 7.6871134$  ;  $K_{N1}^{\circ\circ} = 8.655$  ;  $L_{T1}^{\circ} = 6.3145994$  ;  $L_{T1}^{\circ\circ} = 6.2832683$  ;  $L_{N1}^{\circ} = 8$  ;  
 $L_{N1}^{\circ\circ} = 8.9948630$  ;  $Y_{T1}^{\circ} = 28.34038$  ;  $Y_{T1}^{\circ\circ} = 28.1405485$  ;  $Y_{N1}^{\circ} = 5.2360845$  ;  $Y_{N1}^{\circ\circ} = 5.7524142$  ;  
 $u_1^{\circ} = 9.8206926$  ;  $u_1^{\circ\circ} = 9.7889524$  . It is worth to notice that condition (30) is satisfied  
( $u_1^{\circ\circ} = 9.7889524 \geq \underline{u} = 9.784406$ ).

Since both conditions (28) and (30) are satisfied, this numerical example is consistent with the existence of a self-defeating expectations trap: given the parameter values and initial conditions specified above, no rational-expectations equilibrium can exist.