Quantitative Finance and Economics

http://www.aimspress.com/journal/QFE

QFE, 5(2): 311–324.
DOI: 10.3934/QFE.2021014
Received: 28 February 2021
Accepted: 11 May 2021
Published: 13 May 2021

Research article

Optimal sequencing to reform the European economic and Monetary Union: a roadmap

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Abstract: In this paper, we examine the political gridlock in reforming the Economic and Monetary Union. We utilize a two–stage game with imperfect information in order to study the optimal sequencing. The main results are: first, optimal sequencing requires for incompliant Member States a default option in stage–two, which in principle is related to the today's fiscal architecture (EMU-I). Second, we show that compliant countries prefer a reform equilibrium today if and only if they have a free choice about the preferred fiscal architecture at the end — either EMU-II with binding European coordination or EMU-I related to Maastricht. Noteworthy, our sequencing approach works for any design of the EMU-II architecture.

Keywords: sequencing; EMU; fiscal governance; Maastricht; reforming

JEL Codes: F45, C72, H77, F59

1. Introduction

The Economic and Monetary Union (EMU) needs further stabilization for the long-run. This conclusion is almost unanimous across political decision-makers and scientists. On 6 December 2017, the European Commission stated in a report on the deepening of the EMU that "the governance of the EMU is still unbalanced in many ways" (Juncker , 2017a). This report followed a previous road-map towards a fiscal union published by the president of the Commission (Juncker , 2017).[1]

Since the Treaty of Maastricht, there have been different visions on the EMU's governance. A well-functioning monetary union requires either fiscal coordination or political integration (Spolaore , 2013). However, after 20 years of EMU, there is no indication towards political integration. Indeed,

[1] The Commission's White Paper discusses proposals focusing on the challenges in the European Union (EU) (Juncker , 2017b).

there is still disagreement in regard to the degree of fiscal governance and particularly the sequencing (Alesina , 2015; Guiso et al. , 2016; Sinn , 2016; Alesina , 2017). Gradualism, path-dependency, and unanimity is a major reason for the present gridlock in Europe (Brunnermeier et al. , 2016; Guiso et al. , 2016; Enderlein and Letta , 2016). In this paper we will study at what economic theory can tell us about the optimal sequencing of a Eurozone reform.

This paper addresses the question by devising a strategic two-period model under imperfect information. A two-stage sequential reform is akin to political ideas of a "two-speed" Europe or a EU with "variable geometry" (Fabbrini , 2015). However, in light of unanimity, the present gridlock within the EMU requires the design of a unique sequencing procedure. To our knowledge, the existing literature is empty about politically feasible sequencing ideas under the unanimity constraint in the EMU. Our novel sequencing mechanism solves the gridlock and is politically feasible to enhance the today's fiscal architecture.

The challenge is as follows: some Member States are concerned about the mixture of fiscal responsibilities, due to undemocratic processes, fiscal profligacy and moral hazard (Beetsma and Bovenberg , 2003). Others fear the adverse effects of overly binding institutional arrangements in a purely rule-based fiscal architecture (Begg , 2017a,b). Thus, "what is needed is an overall vision and clear sequencing (...)" in order to solve the orthogonal concerns (Juncker , 2017a).

When designing politically acceptable reforms, governments typically face a cost-benefit tradeoff. To reform the EMU, one group of scholars propose to enhance the present fiscal architecture without a treaty change (Schmidt et al. , 2016; Sapir and Wolff , 2015; Eyraud et al. , 2017). Others demand a higher degree of fiscal centralization that needs a treaty change (Guiso et al. , 2016; Enderlein and Letta , 2016; Benassy-Quere et al. , 2018). Regardless of the position, the debate demonstrates the need to impose stability-enhancing reforms.

The compelling need of a policy reform is, nevertheless, merely one side of the coin. The other side is the challenge of unanimity and thus the reform sequencing. For the first time in the literature, we examine the issue of reform–sequencing in the Eurozone. We use a dynamic paradigm to analyse the state transition problem of 19 EMU Member States. The Member States are postulated as agenda-setters and face the political constraint of unanimity.

The major findings are: first, the present situation is characterized by a Prisoner's Dilemma (PD) due to unanimity and the one-way proposals of an "ever closer union". Second, the main theoretical insight concerns a new sequencing mechanism with a free choice element and a default option. Indeed, we propose and analyse two fiscal options: a fiscal architecture related to Maastricht (EMU-I) and a newly enhanced fiscal architecture (EMU-II). While EMU-I follows the rule-based Maastricht framework, EMU-II includes further fiscal elements. Note, in order to avoid normative statements, we do not set out the fiscal elements under EMU-II. Yet, the EMU-II architecture can be broader such as automatic rule enforcement with incentives and punishment schemes or even steps towards a fiscal capacity in-line with the present treaty (Alesina et al. , 1995, 2005; Andreozzi and Tamborini , 2019).

Member States compliant with the newly pre-defined conditions under EMU-II[II] obtain a free choice between both architectures: EMU-I or EMU-II.[III] Note, compliant countries opting to the EMU-I architecture keep all fiscal responsibilities at the domestic level but do not get support in case of

[II] The fiscal rules of the Stability and Growth Pact, thresholds for non-performing loans (NPL) below the average of three countries with the lowest NPL-ratio, etc.

[III] Member states in line with all fiscal criteria, might opt out in order to have a strict no-bailout regime according to Article 125 TFEU.

endogenous policy failures or asymmetric shocks. For incompliant countries the Maastricht architecture is a kind of default option (status quo). Certainly, the EMU-II architecture has distinct entrance criteria. If incompliant Member States want to join the EMU-II, they must either oblige to the entrance criteria later or follow stronger conditionalities; e.g. paying a surcharge to joined mechanisms.[IV] Similarly to the convergence period under Maastricht in the 1990s, we define a transition period (phase-in) of about 10 years until the two architectures come into force.

Third, under those boundary conditions, we uncover an effective sequencing mechanism that is sufficient to achieve unanimous agreement to reform the Eurozone. In fact, our sequencing proposal contains intrinsic incentives to impose reforms in order to enhance the competitiveness as well as obtaining a stabilization of the EMU. Indeed, we demonstrate Pareto efficiency of our sequencing proposal.

As a matter of fact, countries select either the EMU-I or EMU-II architecture according to the preferences. The sequencing mechanism unleashes incentives to enforce domestic policy reforms with the aim of receiving a free choice before the transition period ends. Noteworthy, this article does not argue for any normative direction of a future fiscal architecture. We merely focus on the challenge of sequencing, which is a game-theoretic issue. Indeed, we do not discuss the governance challenges of a political union versus a decentralized rule-based architecture (Herzog and Hengstermann , 2013).[V]

Henceforth some readers may argue that a single monetary union cannot have two different fiscal arrangements simultaneously. But in view of the optimum currency area theory and the literature on fiscal federalism, it is well-established that fiscal governance bears no relation to a monetary union (Mundell , 1961; McKinnon , 1963; Fleming , 1971; Oates , 1999). Additionally the Lisbon Treaty in the EMU prohibits the central bank to discriminate public authorities. This notion reveals that the type of fiscal governance is irrelevant as long as the architecture is free of moral hazard (Beetsma and Bovenberg , 1999, 2000, 2003).

In consequence, this roadmap prescribes a feasible sequencing without omitting sufficient flexibility in the design of the EMU-II architecture. In principle, the proposal creates a stable sequencing for "A EMU of Pioneers". As a byproduct, our sequencing approach solves the unanimity constraint and guarantees an immediate execution.

The paper is structured as follows. The literature review is in section 2. Section 3 contains the model. We study the strategic interaction as well as equilibria. In section 4, we explore the optimal effort under the sequencing procedure. Section 5 concludes the paper.

2. Literature review

This paper is related to at least three areas in economic literature. First, the literature of the optimum currency area theory. This literature provides early ideas regarding economic imbalances in a currency union. Mundell (1961) suggested free markets, particularly labour mobility to mitigate imbalances. On the contrary, McKinnon (1963) and Kenen (1969) proposed centralized fiscal mechanisms. The present proposal of the Commission follows the centralized approach by suggesting a European monetary fund, a fiscal capacity or a European Minister of Finance (Juncker et al. , 2015; Juncker , 2017a). There is

[IV] For instance, incompliant Member States have to surrender their sovereignty in the field of public deficit/debt surveillance and must implement a state insolvency mechanism.

[V] The EU-Commission paraphrases: *"This not only relates to the design of the overall approach, but also to the sequencing of the various steps to be taken in the short, medium and long-term. But this is not about a single, take-it-or-leave-it reform. It is rather a set of actions to consider collectively and take forward."*(Juncker , 2017a).

also a literature about the detriments of centralization such as free riding and moral hazard in a currency union (Alesina et al. , 1995; Herzog and Hengstermann , 2013; Herzog and Ferencz , 2019). Beetsma and Bovenberg (2000, 2003) and Beetsma and Uhlig (1999) show that binding fiscal rules are essential to mitigate fiscal profligacy.[VI] These issues are corroborated by a rigorous analysis of the failures of historical monetary unions (Bordo and Lonung , 1999).

The second field of literature studies the types of fiscal governance in a monetary union (Fabbrini , 2015). Already Delors (1977, 1989) emphasized the need of fiscal coordination in a monetary union. Recently Blanchard et al. (2017), Brunnermeier et al. (2017), Messori and Micossi (2018) and Benassy-Quere et al. (2018) propose new European risk-sharing mechanisms, such as European Safe Bonds (ESBies) or a fiscal capacity at the union level. In addition, Werning (2017) provides a theoretical model on the benefits of a fiscal union and this is similar to Kim and Kim (2017). Even so, there exist evidence on the ineffectiveness of fiscal transfers in a monetary union (Kehoe and Patorino , 2017; Martinez-Garcia , 2017; Bandeira , 2018). They demonstrate that a fiscal union is unnecessary and costly, unless there is a political union.[VII]

Third, related to our paper, there is a literature centered around the modelling of economic reforms (Alesina et al. , 1995, 2005; Herzog , 2016b; Andreozzi and Tamborini , 2019; Zhang , 2019). We borrow some ideas particularly from Laffont and Tirole (1990) and Dewatripont and Roland (1992). They show the feasibility of dynamic reforms under an unanimity and majority voting constraint. Similarly, they use a dynamic adverse selection model with an agenda-setter proposed by Romer and Rosenthal (1972). The idea of repeated proposals, which we utilize in our two-stage game, was first analysed by McKelvey (1976) and later generalized by Rosenthal (1989). To our knowledge, there is no literature that is studying the optimal sequencing of a Eurozone reform.

3. The model

In this paper, we present a strategic two-period model. We concentrate on the case of reforming and sequencing under the unanimity constraint. Given the need of unanimity across Member States, without loss of generality, we can model the present situation by simply studying two Member States with orthogonal preferences.

At time t (today), countries simultaneously choose between action Reform (R) or NO-Reform (NO-R) (Table 1). The notion of Reform (R) is defined as follows: on the one hand, steps to enhance the competitiveness in-line with the rules and demands of the EU-Commission today. On the other hand, the willingness to make the EMU resilient to future shocks. Naturally action NO-R increases the likelihood of an uncontrolled break up. Moreover, we assume the following rules:

(a) At time t, Member States are agenda-setters and choose a strategy of either (R, NO-R). Yet, they agree already today on an institutional setting consisting of the two options at the end. Note, at time t, the concrete notion and entrance criteria of the EMU-II architecture is open.

(b) In $t + 1$, during the transition period, Member States design the new elements of the EMU-II

[VI] Similar Herzog and Choi (2017).

[VII] Kehoe and Patorino (2017) demonstrate that a complete fiscal union is only optimal when countries are either unable or unwilling to pursue desirable policies. They show a fiscal authority is unnecessary if its only goal is to provide cross–country insurance. Martinez-Garcia (2017) find that fiscal integration leads to indeterminacy of monetary policy in a currency union.

architecture.[VIII] The EMU-I framework is the default setting and closely related to the original rule-based Maastricht architecture.[IX]

(c) At time T, Member States enter either the EMU-I or EMU-II architecture. Note, as it was in Maastricht, one year before at time $T-1$, the EU-Commission assesses the compliance of the Member States with the new entrance criteria for the EMU-II architecture. The so-called compliant countries obtain a free choice between both fiscal architectures. Incompliant Member States enter EMU-I as the default option.[X]

Next, assume two countries with orthogonal preferences denoted by large, L, and small, S, respectively. We address two questions. First, do we obtain a Nash equilibrium of reforming at time t under unanimity? Second, is reforming preferable to all Member States given the action space at time T?[XI]

Table 1. Country's payoff matrix at time t.

		Player S	
		R	$NO-R$
Player L	R	$(\Psi+\zeta_L, \Psi+\zeta_S)$	(C, H)
	$NO-R$	(H, C)	$(B-\zeta_L, B-\zeta_S)$

Table 1 denotes the payoffs. The payoff hierarchy is defined as $H > \Psi > B > C$ and the parameter ζ_L is only privately known by the large respectively ζ_S by the small country. Next, we explain the payoffs in detail.

Payoff H denotes moral hazard, meaning the benefits if a single country does not follow the fiscal and economic rules. This includes moral hazard incentives of deficit-spending in a monetary union without bearing direct costs alone (Beetsma and Bovenberg , 2003). On the contrary, the payoff C represents the cost of reforming in a single Member State. The payoff Ψ captures the benefits of a mutual reform. In this case both Member States benefit equally from the reform externalities. Finally, payoff B denotes the break up risk if both countries choose no-reform. First, let us simplify the game by assuming $\zeta_L = \zeta_S = 0$.

Proposition 1. *At time t, the game characterizes a Prisoners Dilemma with a Nash equilibrium of (NO-Reform, NO-Reform) and the payoff of (B,B).*

Proof. Indeed, if $\zeta_L = \zeta_S = 0$, we immediately obtain a Nash equilibrium of (NO-Reform, NO-Reform) in Table 1. No Member State is willing to reform. In fact, this depicts the EMU's political gridlock □.

In order to solve the Prisoner's Dilemma in Proposition 1, we need to incentivize both Member States.[XII] Note, this must hold for both countries with orthogonal preferences due to unanimity. Otherwise, we do not obtain a reform equilibrium at time t.

[VIII] This could include a completion of the banking union, a fiscal capacity, a state insolvency mechanism, etc.

[IX] However, in EMU-I one can enhance the no-bailout rule with a credible threat such as an escape- or exit-clause (Herzog and Ferencz , 2019).

[X] Yet, our proposal has a single exception for incompliant Member States: There exist an option to enter the EMU-II after the transition period, if incompliant candidates surrender a higher degree of sovereignty to Europe and pay an extra premium to the joined rescue schemes.

[XI] The extensive form of the game structure is in Appendix C.

[XII] What is a feasible incentive in order to make the reform equilibrium with payoff (Ψ, Ψ) a Nash equilibrium?

Next, we assume $\zeta_i \neq 0$, which designs both payoffs sufficiently positive so as to obtain a Nash equilibrium (Reform, Reform) with payoffs $(\Psi + \zeta_L, \Psi + \zeta_S)$. If the payoff $\Psi + \zeta_i > H$ and $C > B - \zeta_i$ hold, we obtain a unique Nash equilibrium of (Reform, Reform). Notable, $\zeta_i \neq 0$ is not necessarily a monetary incentive. In our sequencing game, the incentive is defined by a free choice for compliant countries and a default option for incompliant countries. Thus, nobody is worse-off and the future is Pareto superior.

At stage–two or time T, countries choose between two architectures: either EMU-I or EMU-II but if and only if they comply to the entrance criteria. The payoff matrix at T is given in Table 2.

Table 2. Country's payoff matrix at time T.

		Player S	
		EMU-I	EMU-II
Player L	EMU-I	(ϵ, ϵ)	$(0, -G)$
	EMU-II	$(-g, 0)$	(P, P)

The payoffs denote the following situation. If the countries choose unanimously the strategy EMU-I the payoff is almost zero as it reflects the status quo of today, except for a small $\epsilon > 0$. This slight enhancement is denoting the total conviction of compliant Member States to keep fiscal sovereignty at home and the reform-effort, yet insufficient, of incompliant Member States in order to obtain a free choice. Thus, the ϵ captures the commitment to a rule-based approach and a small stabilization effect. If the countries select the strategy EMU-II they obtain the payoff (P, P). The payoff hierarchy is assumed to be $P > \epsilon$.[XIII] This follows from historical research on the one hand. Indeed, Bordo and Lonung (1999) find that historical monetary unions are more stable with some fiscal coordination. On the other hand, the past 20 years of EMU's governance demonstrate the necessity to enhance the weak enforcement. As long as both Member States agree and the new elements are compatible with the Lisbon Treaty, the EMU-II architecture could be designed somewhat beyond the present fiscal architecture, including binding independent or automatic enforcement mechanisms.

Proposition 2. *At time T, the game characterizes a separation Nash equilibrium of either (EMU-I, EMU-I) with payoff (ϵ, ϵ) or (EMU-II, EMU-II) with payoff (P, P).*

The proof of Proposition 2 follows from Table 2. If a country L chooses the strategy EMU-II and a country S prefers the strategy EMU-I, then country L expects limited solidarity (payoff $-g$). Thus, country L is worse-off and country S is not affected. The same happens vice versa, nonetheless, the small country is comparatively worse-off ($G > g$). Consequently, at time T, there exists a separation Nash equilibrium of either EMU-I with payoff (ϵ, ϵ) or EMU-II with payoff (P, P) □.

Note, given that both countries are not worse-off in stage-two, and the compliant Member State obtains a free-choice at T, it follows that both countries unanimously agree to choose the strategy reform at time t. Of course, in stage-two, the incompliant Member State is allocated automatically to EMU-I. Yet, under additional constraints, incompliant States can join the EMU-II architecture. However due

[XIII] The past Euro-Crisis and Corona-Crisis clearly show that the payoff hierarchy follows the political realties in Europe: (a) no Member State (even Greece) was willing to exit the EMU. (b) There was always unanimity about further rules and integration such as the fiscal compact, European Semester, ESM, and joined borrowing, etc. The past decisions during the Eurozone crises corroborate the greater benefits of new European institutions, modelled by payoff P, in comparison to the previous status quo (modelled by ϵ).

to a higher default probability, they must surrender a higher degree of sovereignty and pay an extra premium to the joined mechanisms than compliant Member States.

As a result, even the incompliant countries agree to reform at time t: Why? First of all, during the transition period, both including the incompliant countries design the new fiscal architectures and both have sufficient time to become compliant with the new entrance criteria of EMU-II. Moreover, the benefit of free choice will spur compliance of today's incompliant countries. Furthermore, in case of incompliance at time T, the country and fiscal architecture of EMU-I is not worse-off in comparison to today. As a matter of fact, incompliant Member States stay in a more stable rule-based fiscal architecture of EMU-I due to transition-reforms inherent in our sequencing model.[XIV] Our proposal even conceives an access of incompliant countries to the EMU-II architecture. There are two different paths: either obliging to the entrance criteria afterwards or sticking to stronger conditionalities, such as approving a state insolvency mechanism or paying an surcharge to new fiscal (insurance) facilities.[XV] In summary: the compliant countries benefit and the incompliant countries are not worse-off. On that extend, we obtain a Pareto improvement for both Member States with orthogonal preferences today.

Next, we assume imperfect information across countries. We suppose a uniform probability distribution on the domain $[0, x]$. Thus, the density function is of $f(x) = \frac{1}{x}$ and the respective probabilities are of $\tilde{p}(NO - R) = \frac{\alpha}{x}$ and of $\tilde{p}(R) = 1 - \frac{\alpha}{x} =: p$. The parameter α denotes the critical value of the large country to play NO-Reform, and p is the critical value of the small country respectively. Further, we assume $\zeta_L \neq \zeta_S \neq 0$ in the payoff matrix in Table 1. The values ζ_L and ζ_S perturb the payoffs. The Nash equilibrium (Reform,Reform) with payoffs $(\Psi + \zeta_L/\Psi + \zeta_S)$ is obtained under the following condition:

Proposition 3. *If uncertainty is low about the country specific private information, we obtain the Nash equilibrium (Reform,Reform) with payoff* $(\Psi + \zeta_L/\Psi + \zeta_S)$ *for* $\zeta_L > \alpha = 0$ *and* $\zeta_S > p = 0$.

Proposition 4. *The sequencing structure guarantees the Nash equilibrium of reforming under the unanimity constraint at time t.*

Proof. Country's L expected payoff from playing Reform over No-Rerform is

$$\left[1 - \frac{p}{x}\right](\Psi + \zeta_L) + \left[\frac{p}{x}\right]C \geq \left[1 - \frac{p}{x}\right]H + \left[\frac{p}{x}\right](B - \zeta_L).$$

Rearranging to ζ_L yields

$$\zeta_L \geq \left[\frac{x}{p}\right]\left(B - C + \left[1 - \frac{p}{x}\right](\Psi - H)\right) = \alpha. \tag{1}$$

Analogously, for country S, the expected payoff from playing Reform over NO-Reform and finally rearranging to ζ_S is:

$$\left[1 - \frac{\alpha}{x}\right](\Psi + \zeta_S) + \left[\frac{\alpha}{x}\right]C \geq \left[1 - \frac{\alpha}{x}\right]H + \left[\frac{\alpha}{x}\right](B - \zeta_S)$$

[XIV] If an incompliant or compliant Member State wish to exit the EMU, they can do so.

[XV] Or in an extreme case of incompliance countries have to exit the EMU at time T. This setup is inline with President's Draghi view. He characterized the future of the EMU by strong institutions rather than rules during the EU-Parliament hearing on Monday 29 May 2017. Admittedly, a rescue of the euro area is not a monetary objective especially if it is the fault of Member States. All states, no matter of the fiscal architecture and no matter whether they are part of a rule-based union, have to bear all consequences of flawed domestic public policy: either by exiting a union if they are in the EMU-I architecture (no-bailout) or by paying higher contributions to a rescue fund (e.g. fiscal capacity) in the EMU-II setup.

$$\zeta_S \geq \left[\frac{\alpha}{x}\right]\left(B - C + \left[1 - \frac{\alpha}{x}\right](\Psi - H)\right) = p.$$

In symmetry, $\alpha = p$, we obtain from equation (1) a quadratic equation:

$$\alpha^2 + (\Psi - H) * \alpha + \xi * x = 0,$$

where $\xi := (C - B) - (\Psi - H) < 0$, according to the definition of the payoffs. The solution is $\alpha_{1,2} = \frac{-(\Psi-H)\pm\sqrt{(\Psi-H)^2-4\xi x}}{2}$. Under the assumption of low uncertainty ($x \to 0$), the solution simplifies to $\alpha_{1,2} = \frac{-(\Psi-H)\pm(\Psi-H)}{2}$ or $\alpha_1 = \Psi - H$ and $\alpha_2 = 0$. Since $H > \Psi$, the parameter α_1 is negative and therefore no solution. Consequentially, the critical point is $\alpha_2 = 0$. Hence, we obtain $\alpha = p = 0$. Q.E.D.

The proof of Proposition 3 supports the proof of Proposition 4. Indeed, we have demonstrated that all countries choose the reform strategy at time t if the country's specific incentives ζ_L and ζ_S are greater than the critical value of zero. Given our default option in our sequencing mechanism, we first create low variance/risks. Hence, both ζ_L and ζ_S are positive because they are drawn from a uniform distribution with zero variance. The worst payoff at time T is of $(\epsilon, \epsilon) > 0$ which is still positive for both even with orthogonal preferences about EMU-I and EMU-II. This guarantees a reforming equilibrium under unanimity with payoff $(\Psi + \zeta_L/\Psi + \zeta_S)$ at time t Q.E.D.

Our sequencing approach successfully tackles the political gridlock of reforming the EMU under an unanimity constraint.

4. Optimal sequencing

In this section, we study a two–stage game with imperfect information in order to determine the effort towards optimal sequencing. We indicate countries by $i = 1, ..., n$. Countries produce stability by $y_i = f(e_i) + \epsilon_i$, where $e_i \geq 0$ represents the reform effort and ϵ_i is a noise term with mean zero and variance σ (Lazear and Rosen , 1981). The probability density function is given by $p(\epsilon) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{\epsilon^2}{2\sigma^2}}$. The reform effort parameter, e_i, is given at time t but unobservable afterwards. Only output y_i is observable by all countries. Hence, the reform effort is neither measurable nor observable. The welfare, W_i, is defined by

$$W(e_i) = G(e_i) - g(e_i), \tag{2}$$

where the governmental contribution to welfare is measured by a reform function $G(e_i)$. The function $g(e_i)$ represents disutility due to reforms. The disutility is a convex function with properties $g'(e_i) > 0$ and $g''(e_i) > 0$. Without loss of generality, we assume that there are two groups of countries. Ergo, we obtain two exogenous reform functions: $G_i^{High} > G_j^{Low}$. We unravel what the optimal reform effort, e_i, at time t is in order to increase the welfare at T?

Proposition 5. *The optimality of e^* is obtained if and only if the marginal disutility from a policy reform equals the marginal profit. In mathematical terms:*

$$\frac{G^i - G^j}{2\sigma\sqrt{\pi}} = g'(e^*).$$

Proof. All details of the proof are in Appendix A.

Proposition 5 demonstrates that a greater output variance, due to economic heterogeneity, reduces the marginal profit of a policy reform. Yet, the genuine incentive of a free choice and default option at time T in our sequencing model, guarantees flexibility for compliant Member States and certainty for incompliant Member States. Thus, a Nash equilibrium is feasible at t.

Proposition 6. *Countries maximize the welfare at time t if and only if* $e^* = g(e^*) + W^D$ *and* $g'(e^*) = 1$.

Proof. All details of the proof are in Appendix B.

Proposition 6 demonstrates that the design of the EMU-II architecture is feasible if and only if the reform effort, e_i, is greater than the disutility of reforming plus the status quo welfare, W^D.

The policy implication of this model is appealing. We obtain a natural selection of Member States, according to the fiscal preferences. In addition, all Member States have a strong incentive to impose welfare enhancing reforms, during the period of transition, in order to obtain an additional degree of freedom in the choice-set at time T.

Nonetheless, there is little doubt that fiscal integration is no silver bullet. Yet, both fiscal architectures (EMU-I or EMU-II) would stabilizes the Eurozone in comparison to today given the orthogonal preferences and economic realities. Our proposed sequencing mechanism eliminates the flawed responsibilities in the present rule-based architecture. Indeed, on the one hand, we unleash new incentives towards binding rule-enforcement in EMU-I and new pioneering mechanisms under the EMU-II architecture. On the other hand, our sequencing approach contains incentives for Member States preferring a higher degree of national sovereignty and allocates by free choice or default those countries to the EMU-I architecture. Hence, both Member States retain fiscal flexibility and sovereignty if they wish doing so. Importantly, both fiscal architectures are feasible and compatible under the today's treaty and do not require long-lasting treaty changes.

The EMU-II architecture[XVI] works if additional preconditions are annexed to it. Otherwise there is a risk of growing moral hazard across Eurozone Member States. Thus, countries must satisfy certain thresholds of risk reduction at home during the transition period before entering the EMU-II architecture. Admittedly, the phase-in of the newly designed conditions require time and consequently a transition period.

5. Conclusions

The European Economic and Monetary Union remains incomplete until today. This paper puts forward a novel sequencing approach solving the political gridlock under the unanimity constraint. The sequencing is modelled by a two–stage game under imperfect information. Member States compliant with the pre-defined entrance criteria to EMU-II obtain a free choice at time T. Those countries choose their preferred fiscal architecture. Incompliant Member States are not worse-off because the default option is an enhanced Maastricht architecture. Under additional conditions, such as the partial loss of fiscal sovereignty, one could even allow incompliant countries to enter the new EMU-II architecture. The final architecture is always a Pareto improving Nash equilibrium.

We propose an architecture of EMU-II that is feasible and admissible with minor institutional changes and without a Treaty change. Bolder risk-sharing mechanisms such as a European unemployment scheme, a

[XVI] The EMU-II architecture constrains also sovereignty, particularly for incompliant countries. Further steps, for instance a European budget or a European Minister of Finance would constrain fiscal sovereignty even more and forever. If eager countries are willing to do so, there is the need of a democratic and political union at first. This would require a fundamental treaty change aligned with constitutional changes in Member States.

fiscal capacity or a European safe asset are possible inside of EMU-II, however, require unanimous agreement to surrender fiscal sovereignty to Europe and thus a treaty change (Herzog , 2020a,b). In so far, our roadmap works for all possibilities, however, we follow a milder approach that is realistic in particular considering the political path-dependency over 70 years of European integration.

Furthermore, we do not make any normative judgement about the optimal governance in the EMU. As a matter of fact, this is rather reliant on political preferences. For the first time, our roadmap creates a feasible sequencing approach, whilst considering both EMU's realities and needs.

Acknowledgement

The author thanks participants in seminars at which earlier versions and ideas of this paper were discussed. In addition, I thank all members and participants in particular Christian Calliess, Matthias Herdegen, Ferdinand Wollenschläger, Sven Simon, Wim Kösters, Lothar Funk, Jürgen Matthes, Georg Jarzembowski, Fabrice Lenglart, Sebastian Plociennik, Adriaan Schout, Mathias Schäfer and Olaf Wientzek of the "Reflection Group on the Future of the Euro Area" at the Konrad-Adenauer Foundation. All provided insight and expertise that greatly enhanced my research, although they may not agree with all of the interpretations/conclusions of this paper. I would also like to thank my research assistants Julia Lehmer, Darius Griebenow, Adrián Elsässer Briones for editing and commenting preliminary versions of this paper. Finally, I thank the anonymous reviewers for all comments and insights. All remaining errors are my own responsibility.

I gratefully acknowledge support from the Reutlingen Research Institute (RRI).

Conflict of interest

The author declares no conflicts of interest in this paper.

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