The Domestic Politics of International Cooperation in the Eurocrisis

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June 13, 2014

Abstract How does the interaction between domestic politics and international negotiations in a highly institutionalized environment affect Eurozone governments' decisions to agree to coordinated financial bailouts? We use a game-theoretic model to analyze the conditions under which EU governments are likely to provide bailouts, delay bailouts, or shift the burden of the bailout to other Eurozone countries. We find that EU governments that stand to receive the greatest benefits from financial rescues of crises face the greatest obstacles to implementing coordinated financial bailouts whenever these actions must take place prior to domestic elections. We establish conditions under which greater preference heterogeneity of Eurozone members can increase cooperation on financial bailouts instead of decreasing it.

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1 Introduction

International organizations increase the likelihood that countries cooperate towards a common goal despite domestic political obstacles. The European Union (EU) is an organization that has induced its members to adjust domestic policies to a great extent. During the European debt crisis, EU members faced serious economic and political pressure to provide financial bailout packages to Greece, Ireland, Spain, and Portugal. However, not only did some Eurozone member states fail to contribute to the first Greek bailout, but Germany's initial refusal to participate allowed the debt crisis to deteriorate drastically, making the subsequent rescue much costlier. The repeated refusals of the German government to agree to this bailout are particularly puzzling because the German government is among the most pro-EU governments in the Union, and should have had strong incentives to prevent a deepening of the Eurozone crisis with its potential negative effects on EU's integration effort in general. Given the clear and present danger that the debt crisis had presented the Eurozone members with, it is puzzling that even in the dense institutional context of the Union international cooperation proved so difficult to achieve and that the main source of that difficulty lay in the country that was (and still is) among the most keen on the Union.

We develop a game-theoretic model to study how the interaction between domestic politics and international negotiations in a highly institutionalized environment affects government decisions to agree to coordinated financial bailout packages. We assume that whereas bailouts are costly to tax payers, voters would support bailouts if the crisis is serious and the bailout prevents its spillover to other countries. We also assume that citizens know whether their government is more predisposed to act in a crisis than the median voter (we call such governments "pro-EU") or not (we call these "nationalist").[1] Even though voters know if their government has incentives to act because of its commitments to the EU, they do not know precisely what the extent of the crisis is. Since the government is better informed about that, voters might suspect that it might act when they do not wish it to. This *domestic conflict* over the desirability of a bailout interacts with an *international conflict* over the distribution of bailout costs among the member governments.

We show that even though voters will generally find it quite difficult to discipline their governments through the electoral mechanism, domestic politics can have decisive influence on bailout negotiations. On one hand, if voters are sufficiently convinced that the crisis is serious and a bailout desirable, they will be unable to prevent pro-EU governments from acting even in a mild crisis. In other words, even though the government is known to have incentives to act in circumstances where its voters would want it to do nothing, the electoral mechanism will fail to restrain it. Such a *hyperactive* equilibrium is a clear instance of a "democratic deficit" in the EU.

On the other hand, if voters are sufficiently convinced that the crisis is mild and a bailout not merited, they will be unable to get pro-EU governments to act even in a serious crisis. In other words, precisely because the government is known to have incentives to act in

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1. It is important to note that these labels merely reflect whether, all else equal, a particular government has stronger incentives to act in a crisis than its median citizen. They are not meant as general characterizations although a nationalist government would by definition be less inclined to support policies that deepen EU integration, and as a result would be less keen on participating in a bailout than a government that is generally more supportive of the EU.

circumstances where its voters would want it to do nothing, it cannot credibly reveal that the circumstances are, in fact, such that the voters would want it to act. As a result, in such a *hypoactive* equilibrium, the electoral mechanism forces pro-EU governments to allow the crisis to deepen, saddling the voters with much higher rescue costs. Ironically, a coalition of governments known to be supportive of the EU will be *less* likely to provide the bailout than a more heterogeneous coalition that also includes some nationalist governments. Thus, the presence of governments that are less well-disposed toward the EU in the coalition could actually improve the prospects for European stabilization and integration.

We also show that pro-EU governments may not only find themselves condemned to in-action by domestic politics, but forced to bear the lion's share of the bailout costs when they do act. In such a *burden-shifting* equilibrium, a pro-EU government cannot commit not to act (even in a mild crisis), and the other members of the coalition could use that to evade the provision of their share of the bailout package. Even in the highly institutional-ized EU context, where the shares are fixed by prior agreement based on the relative sizes of the economies, this burden-shifting can occur when coalition members either refuse to participate outright or cooperate intermittently.

To illustrate the underlying mechanism and some of the theoretical findings, we provide analytic narratives of two episodes from the Eurozone crisis, both involving international negotiations over Greek bailouts and domestic politics in Germany. We show how the parameter configurations in 2010 and 2013 map onto the hypoactive and hyperactive equi-libria, respectively. The first equilibrium rationalizes the otherwise puzzling behavior of the German government when it allowed the debt crisis to deepen for domestic electoral rea-sons, but then agreed to a (much costlier) bailout even though doing so cost it the elections in question. The second equilibrium counters a widespread explanation for a seemingly analogous delay in the provision of the third bailout, when the agreement to act actually helped the government's electoral prospects by decreasing support for the opposition.[2]

The analysis offers several insights about government interactions during the European debt crisis, but also implications for international cooperation more generally. First, the model can illuminate the supply-side dynamics of international financial bailouts. Most of the studies of financial rescues look at bailouts through the International Monetary Fund (IMF) or analyze the political-economic strategies and outcomes in crisis countries.[3] In contrast, we focus on the interaction between governments that provide the bailout. Even though the events of the Eurozone crisis show just how important this aspect of financial rescues can be, the scholarly literature has paid scant attention to it.[4]

Second, even though the electoral mechanism might be too weak for citizens to incen-tivize their government to act in accordance with their wishes — which might suggest an extensive democratic deficit in the EU — it is not the case that governments do not take elections seriously. In fact, the prospect of being punished at the polls might induce oth-

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2. We also present an analytic narrative involving the burden-shifting equilibrium in Appendix C, where we analyze the Slovak government's refusal to participate in the first Greek bailout.

3. Thacker (1999); Dreher (2003); Dreher and Vaubel (2004); Stone (2004, 2008, 2011); Dreher and Jensen (2007); Dreher, Sturm, and Vreeland (2009); Copelovitch (2010b, 2010a); Dreher and Walter (2010); Walter (2013).

4. Bordo and Schwartz (1999); Frankel and Roubini (2001); Lipscy (2003); Broz (2005, 2012); Schneider (2013).

erwise pro-EU governments to fail to cooperate with each other despite serious pressure to do so.

Third, we find that heterogeneity in the composition of the membership of international institutions can have a positive effect on the prospects for international cooperation because the presence of diverse governments can enable credible information transmission to the voters. It is commonly accepted in the IO literature that diversity of preferences among members of an IO makes for "shallower" cooperation.[5] When scholars argue to the contrary, they point to heterogeneity increasing the opportunities for issue linkages and coalition formation.[6] In contrast, we point to reasoning firmly rooted in domestic politics and suggest that in an environment plagued by informational asymmetries credible signaling by governments can be crucial in securing their cooperation on international issues by helping them avoid adverse domestic reactions to such behavior.

2 The Model

Two countries, $i \in \{1, 2\}$, are involved in an economic crisis that potentially requires a financial bailout to stop. The timing of the game is as follows: the governments, G_i, observe the severity of the crisis they are dealing with and simultaneously decide whether to provide a bailout or not. If both act, the rescue package is a *multilateral bailout* and if only one acts, it is an *unilateral bailout*. The median voter in each country observes these public actions and the voters simultaneously decide whether to retain the incumbent. Voting is costless. After the elections, the (possibly new) governments again decide whether to implement a bailout, after which the game ends and payoffs are realized.

2.1 Economic environment

Without a bailout to stop it, a crisis can be either *mild*, in which case it inflicts on country i economic damages worth $\theta_i > 0$, or *serious*, in which case it inflicts damages $w_i \theta_i$ with $w_i > 1$. Citizens and governments are equally sensitive to economic damages. The governments know the type of crisis they are dealing with but the citizens in both countries do not: they believe that it is serious with probability $s \in (0, 1)$ and mild with complementary probability. This prior is common knowledge.[7]

Whereas a mild crisis fizzles out even without a bailout, a serious crisis continues to inflict cumulative damages until a bailout is provided. In other words, If at least one of the governments acts prior to the elections, then the crisis will be resolved regardless of its

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5. Libecap (1989); Kanbur (1991); Moravcsik (1991); Hackett (1992); Kahler (1992); Miles, Redmond, and Schwok (1995); Cornes and Sandler (1996); Miles and Redmond (1996); Schulz and König (2000); Koremenos, Lipson, and Snidal (2001); Tsebelis and Yataganas (2002); König (2007); König and Junge (2009); Hertz and Leuffen (2011); Schneider and Urpelainen (2014). However, see also special issue on "The European Union: wider and deeper?" (Keleman, Menon, and Slapin 2014).

6. Martin (1994) and Golub (2007).

7. The common knowledge prior can be motivated by the fact that in our globalized world information travels quickly, so whatever information is publicly available to the citizens in one democratic country cannot be assumed not to be available to the citizens in another democratic country. A government's private information, on the other hand, is a different matter entirely, as it is quite possible for two governments to share information that neither population is aware of.

type. If neither acts, then the mild crisis will resolve itself after the elections but the serious crisis will deepen. In this case, the post-electoral economic situation will fully reveal the type of crisis: if it continues, it must be serious. As we shall see, since the preferences of governments and voters are aligned in this case, a rescue package will be provided at that point.

The total financial cost of a bailout is $C > 0$. If the governments provide it together it is shared according to the fixed rule under which each country pays $\alpha_i \in (0, 1)$ of the total cost, with $\sum \alpha_i = 1$.[8] If G_i acts on its own, the country bears the costs of the entire bailout, $\alpha_i = 1$. Whereas the citizens of country i pay bailout costs in full, $\alpha_i C$, its government could either be as sensitive to these costs as they are or less so. Letting $t_i \in \{1, \delta\}$ denote the type of G_i so that the government pays $t_i \alpha_i C$ when it participates in a bailout, we call a government *nationalist* when $t_i = 1$ and *pro-EU* when $t_i = \delta \in (0, 1)$. The government's type is common knowledge.

When it comes to the crisis and the bailout, the different sensitivity to the financial cost of the bailout policy is the sole source of preference divergence between the government and its citizens, and it is the source of the *domestic distributional conflict* whose effects we are going to examine. We now make this difference more precise.

ASSUMPTION 1. Citizens in each country want the governments to intervene if, and only if, the crisis is severe even when there is an agreement to share the fiscal costs of a bailout package: $\theta_i < \alpha_i C < C < w_i \theta_i$.

This assumption also implies that irrespective of the government's type, both the government and its citizens prefer to have an international cost-sharing agreement in place if that government is going to implement a bailout. If they expect the other government to implement the policy, then they have an incentive to shift the entire burden to the other country and reap only the benefits. This raises the specter of free-riding and creates an *international distributional conflict* between the two governments, each of whom would like the other to implement for the bailout alone.

2.2 Political environment

Governments value being in power, which we represent by adding 1 to their payoffs if they are reelected and 0 if they are not. Citizens value that their government behaves according to their preferences. Since they are not informed about the nature of the crisis, they can only use the observable behavior of the governments to make inferences about the desirability of that behavior. In particular, they can form posterior beliefs about the type of crisis, and then ask whether their government's action was appropriate or not. They can then reward or punish the incumbent depending on this inferred behavior. They use this retrospective estimate to form expectations about possible future behavior, and then prospectively compare these with expectations about what an untested alternative government will do if they elect it instead. In other words, citizens use retrospection to engage in prospective voting.[9]

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8. The fixed sharing rule is consistent with the EU framework, where contributions are usually pegged by formula to the relative sizes of the member economies.

9. Under our assumptions, the post-electoral behavior of pro-EU and nationalist governments will be the same because everyone — citizens and all types of governments alike — wish to act in a serious crisis, and no

There are four contingencies in which citizens of the two countries can find themselves when they vote (recall that since they have a common prior and any new information that might be revealed from the governmental actions is symmetric, the posteriors would have to be the same; this is why we only need specify four states of the world).[10] Let s_{11} be the citizens' common belief that the crisis is severe when they observe an agreement for a multilateral bailout; let s_{10} be the analogous belief when they observe a unilateral bailout by G_1; let s_{01} be the analogous belief when they observe a unilateral bailout by G_2; and let s_{00} be the analogous belief when they observe that the governments agree not to take any action.

If there is a multilateral agreement, then the actions of both governments would have been appropriate from the citizens' perspective if the crisis was severe. Citizens credit their governments in proportion with their belief that the crisis was, in fact, severe. Since s_{11} represents this belief, it is the value of that credit if they reelect them. If there is a unilateral action by G_1, then this action would have been appropriate if the crisis was severe; otherwise, G_2's lack of action would have been appropriate. Citizens in country 1 credit G_1 with s_{10} if they reelect that government, whereas citizens in country 2 "credit" G_2 with $1 - s_{10}$ if they reelect that government. Analogously, if there is unilateral action by G_2, then citizens credit G_1 with $1 - s_{01}$, and G_2 with s_{01}. Finally, if there is no action, then citizens in each country credit their government with $1 - s_{00}$, their belief that the crisis was mild, and so the lack of action was appropriate.

When citizens apportion credit (and blame), they compare their posterior beliefs to what they expect to get from the alternative government they could select, $e_i \in (0, 1)$. This baseline expectation captures how contested the elections in country i are expected to be. Very low values represent cases where the incumbent is favored to win the elections whereas very high values represent cases where the incumbent is compromised and unlikely to win. Intermediate values represent competitive elections where neither has a clear advantage. As we shall see, many interesting interactions occur when both governments are threatened at the polls:

DEFINITION 1. Governments are *jointly vulnerable* if, and only if, $e_1 + e_2 \geq 1$.

Occasionally, we shall refer to G_i as *vulnerable* whenever e_i is high or, alternatively, whenever $1 - e_i$ is low.

2.3 Payoffs

Payoffs are realized at the end of the game, and are as follows.

MULTILATERAL BAILOUT. The crisis is resolved regardless of type, no economic costs are incurred, the fiscal costs are shared, and no further action is taken after the elections. The citizens in i obtain a payoff of $s_{11} - \alpha_i C$ if they keep the incumbent and $e_i - \alpha_i C$ if

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action will be necessary if the crisis has been resolved. Thus, the type of the candidate government is irrelevant for the electoral decision.

10. Empirically, Keyser and Peress (2013) show that voters often punish incumbent governments when the economy only in their country contracts but are much less likely to do so when many economies contract. This suggests that voters pay attention to international context and that their assessments of economic performance are consistent across countries.

they replace it. The government in country i gets $1 - t_i \alpha_i C$ if it is reelected, and $-t_i \alpha_i C$ if not.

UNILATERAL BAILOUT BY G_1. The crisis is resolved regardless of type, no economic costs are incurred, the fiscal costs are borne entirely by country 1, and no further action is taken after the elections. The citizens in 1 get a payoff of $s_{10} - C$ if they keep the incumbent and $e_i - C$ if they replace it, whereas the citizens in 2 get a payoff of $1 - s_{10}$ if they keep the incumbent and e_i if they replace it. The government in country 1 gets $1 - t_1 C$ if it is reelected, and $-t_1 C$ if it is not. The government in country 2 gets 1 if reelected, and 0 if it is not.

UNILATERAL BAILOUT BY G_2. The crisis is resolved regardless of type, no economic costs are incurred, the fiscal costs are borne entirely by country 2, and no further action is taken after the elections. The citizens in 1 get a payoff of $1 - s_{01}$ if they keep the incumbent and e_i if they replace it, whereas the citizens in 2 get a payoff of $s_{01} - C$ if they keep the incumbent and $e_i - C$ if they replace it. The government in country 1 gets 1 if it is reelected, and 0 if it is not. The government in country 2 gets $1 - t_2 C$ if reelected, and $-t_2 C$ if it is not.

NO ACTION. If the crisis is mild, it is resolved, θ_i economic costs are incurred, and no fiscal costs are incurred. The citizens in i obtain a payoff of $1 - s_{00} - \theta_i$. The government obtains $1 - \theta_i$ if reelected and $-\theta_i$ if it is not.

If the crisis is serious, it deepens, and $w_i \theta_i$ economic costs are incurred. Since the severity is now revealed and citizens always want such crises acted upon, we assume that whatever governments are in place an agreement on multilateral bailout will be reached, and the costs of such program will be distributed according to the existing fixed rule. The citizens in country i get a payoff of $1 - s_{00} - w_i \theta_i - \alpha_i C$. The government in country i gets a payoff of $1 - w_i \theta_i - t_i \alpha_i C$ if reelected and $-w_i \theta_i - \alpha_i C$ otherwise.[11]

2.4 Preference constraints

We can now define the preferences of the governments more precisely so that elections become meaningful in the model. Consider first the preferences of a nationalist government when the other is expected to act to solve the crisis. We wish to assume that even nationalist governments are not so extreme in their preferences that they would refuse to cooperate in a cost-sharing multilateral bailout irrespective of electoral consequences. In particular, if they expect to stay in office after a multilateral bailout but lose office if they do nothing while the other government acts, even a nationalist government would prefer to cooperate in a multilateral bailout.

ASSUMPTION 2. A nationalist government strictly prefers to cooperate in a multilateral bailout if doing so ensures its reelection and if it expects to lose office after a unilateral bailout by the other government: $\alpha_i C < 1$.

Note that (A1) and (A2) together imply that $\theta_i < 1$ as well.

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11. If reelected, the government will have to implement the bailout once it is revealed that the crisis is severe. If replaced, the government only incurs the economic costs from the delay in acting on the crisis but since it is out of office, it pays the same fiscal costs as the regular citizens.

Turning now to pro-EU governments, we wish to assume that they a more interventionist than nationalist ones but that they still have electoral concerns. Thus, we assume that they prefer to act unilaterally even in a mild crisis provided that doing so does not affect their electoral prospects. (By (A1), a nationalist government strictly prefers to allow the mild crisis to continue rather than to intervene unilaterally.) However, they would not do so if acting unilaterally would cost them the elections while allowing the crisis to continue would ensure their stay in office.

ASSUMPTION 3. All else equal, a pro-EU government strictly prefers to intervene unilaterally in a mild crisis rather than to allow it to continue, but strictly prefers to allow it to continue if doing so ensures its reelection and if acting unilaterally results in its removal from office: $\delta C < \theta_i < 1 + \delta C$.

Without loss of generality, we shall restrict attention to three possible government configurations: both pro-EU, both nationalist, and G_1 nationalist with G_2 pro-EU.

2.5 Equilibrium refinements

The solution concept is weak perfect Bayesian equilibrium, which only requires that strategies are sequentially rational given beliefs and that beliefs are consistent with the strategies and derived by Bayes rule whenever possible. These requirements do not put any meaningful restrictions on admissible beliefs after events that are not supposed to occur when equilibrium strategies are followed, which essentially permits any subsequent behavior to be rationalized. Since expectations about actions after zero-probability events can be crucial in supporting equilibrium behavior, we would like to ensure that these beliefs are at least plausible. To this end, we shall require that the assessment satisfies something analogous to the Intuitive Criterion (Cho and Kreps 1987):

DEFINITION 2. An equilibrium is *intuitive* if (a) there exists no deviation that can profit only the deviating player only when the crisis is of a particular type given that the citizens infer that the crisis is of that type, and (b) for any deviation that can unilaterally induce an outcome with positive probability only when the crisis is of a particular type, the citizens infer that the crisis is of that type.

To understand the first requirement, consider what assessments it would eliminate. Suppose we found an equilibrium where governments get reelected for not acting regardless of the nature of the crisis because citizens treat any unilateral bailout as evidence that the crisis is mild, and so remove any government that acts unilaterally. Since unilateral bailouts occur off the path of play, they are zero-probability events and Bayes rule cannot evaluate whether the citizens' beliefs make sense. But what if it was the case that if (a) G_1 acted unilaterally and citizens instead inferred that the crisis is serious and so retained G_1, and (b) G_1 could only profit from such inference when the crisis is, in fact, serious? (This would be the case with a nationalist government.) It makes sense that in this case citizens should conclude that the crisis is serious upon observing a unilateral bailout by G_1: given the equilibrium strategies of not acting, this outcome can only be induced by G_1, and the revised citizen beliefs can only profit G_1 if the crisis is serious. The original beliefs should be considered implausible, and so the equilibrium fails to be intuitive.

To understand the second requirement, imagine first a scenario in which G_1 always acts and G_2 never does irrespective of the nature of the crisis. The outcome s_{01} is off-the-path, and neither player can induce it unilaterally. In this case, the second requirement has no bite. Consider now the same strategies except that G_1 mixes when the crisis is mild. Now, s_{01} can be induced unilaterally with positive probability only by G_2 by deviating to acting when the crisis is mild. The second requirement then imposes the inference $s_{01} = 0$. Finally, suppose that G_1 also mixes when the crisis is serious. Now s_{01} can be induced unilaterally by G_2 regardless of the nature of the crisis, and as a result the second requirement has no bite.

Weak perfect Bayesian equilibria are merely a subset of Nash equilibria, and as such define rationality in strictly individualist manner: the equilibrium requirements eliminate strategy profiles vulnerable to unilateral deviations. Although this definition of rationality might be appropriate when it comes to the citizens in the two countries who cannot be expected to coordinate in order to deviate together, it is less persuasive when it comes to the two governments. Since governments can meet in private, they could conceivably conspire to hide information from their citizens. In the model, citizens only have the actions they can observe to go on when making inferences. But what if governments collude to take advantage of this? We shall require that the equilibrium be immune to such collusion:

DEFINITION 3. An equilibrium is *collusion-proof* if there exists no group deviation by the governments such that (a) the payoffs from the deviation Pareto-dominate the equilibrium payoffs, and (b) no government can benefit from deviating from the collusive agreement.

To understand this collective definition of rationality, suppose we found an equilibrium where citizens retain both pro-EU governments after a multilateral bailout or after inaction, and remove them after a unilateral bailout. Given these actions, neither pro-EU government will be tempted by a unilateral bailout in a mild crisis, which is the only possible individual deviation in that case. But what if the two governments colluded to deviate together? If they do so, their observable behavior will produce a multilateral bailout, in which case both will be reelected as well. But then the payoffs from the group deviation Pareto-dominate the equilibrium payoffs: $1 - \delta\alpha_i C > 1 - \theta_i \Leftrightarrow \delta\alpha_i C < \theta_i$, which obtains because $\delta\alpha_i C < \delta C < \theta_i$, where the second inequality holds by (A3). Moreover, the collusive agreement itself is credible because neither government has an incentive to deviate from that: doing so would result in a unilateral bailout by the other government, in which case both governments will be removed from office. Thus, pro-EU governments have a strict credible incentive to deviate as a group, so the equilibrium would not be collusion-proof.

3 The Citizen-preferred Equilibrium

Let σ_i be the probability with which G_i acts when the crisis is serious, and μ_i be the probability with which G_i acts when the crisis is mild. Let $p_i(s_{a_1 a_2})$ be the probability of retaining G_i when the game has reached information set $s_{a_1 a_2}$, where $a_i \in \{0, 1\}$ denoting whether G_i has acted or not.

The payoff structure of the model allows us to reduce electoral expectations to direct comparisons of retrospective beliefs and candidate prospects. Lemma A in Appendix A shows that the equilibrium probability of reelection is a simple function of these beliefs.

We now exhibit an equilibrium in which governments agree to a multilateral bailout only when the crisis is serious and do nothing if it is mild. This is the behavior citizens want, so we shall call this the *citizen-preferred equilibrium* (CPE). We shall go through part of the proof of this equilibrium here because it highlights all the issues caused by the two types of conflict we embedded in the model and because they arise in all other equilibria as well.

PROPOSITION 1. *The following constitute the essentially unique* citizen-preferred equilibrium:[12]

- *Each government acts when the crisis is serious and does not act when the crisis is mild;*

- *When citizens in each country observe a multilateral bailout, they infer that the crisis is serious and retain both governments. When they observe inaction, they infer that the crisis is mild and retain both governments as well.*

- *When citizens in each country observe a unilateral bailout,*

    - *if the dyad is nationalist, citizens infer that the crisis is serious, retain the government that acts and remove the one that does not;*

    - *if the dyad is pro-EU or mixed, citizens remain uncertain about the nature of the crisis with some $s_{10} \in [1 - e_2, e_1]$ and some $s_{01} \in [1 - e_1, e_2]$, and remove both governments.*

This equilibrium can always be supported in a nationalist dyad, but can be supported in pro-EU or mixed dyads only when governments are jointly vulnerable electorally. It is intuitive in all dyads but collusion-proof only in nationalist and mixed dyads. □

The proof in Appendix A establishes the claims for nationalist and mixed dyads. Here, we shall walk through the result for a pro-EU dyad. Even though pro-EU governments have stronger incentives to act than nationalist ones, the international distributional conflict among them will prevent them from engaging in a multilateral bailout without some additional electoral incentives. We shall use the strongest electoral threat for failing to act when the other does, $p_1(s_{01}) = p_2(s_{10}) = 0$, even though somewhat weaker threats can work as well. As we shall see shortly, citizens cannot safely infer that the crisis is serious when they observe a unilateral bailout. This means that they would need to remove the incumbent that fails to act despite being uncertain about the extent of the crisis. They would do so here as long as $s_{01} \geq 1 - e_1$ and $s_{10} \geq 1 - e_2$, or when G_2 is vulnerable electorally.

Pro-EU governments must also be prevented from being too pro-active. Since neither government is supposed to act when the crisis is mild, each knows that inaction means that the crisis will continue if it does not act. Since they get reelected for doing nothing in this case, (A3) implies that if they were to also get reelected for acting unilaterally, they would strictly prefer to act. This can be seen easily be rewriting the mild crisis condition for G_1 from (1) as $1 + \delta C \geq p_1(s_{10}) + \theta_1$ and noting that it must fail if $p_1(s_{10})$ is too high because $\delta C < \theta_1$. The strongest disincentive is provided by a threat to remove any government that

12. Because of the latitude in specifying off-the-path beliefs, there is a continuum of equilibria of this type, but they are all substantively the same and they induce the same probability distribution over outcomes.

acts unilaterally with certainty: $p_1(s_{10}) = p_2(s_{01}) = 0$. This strategy will be optimal as long as $s_{10} \leq e_1$ and $s_{01} \leq e_2$; that is, G_1 must be vulnerable electorally as well.

Although it sounds straightforward, the requirement that a government that acts unilaterally is removed can be tricky to satisfy simultaneously with the requirement that a government that does not act when the other does is removed as well. This is because when they observe an (unexpected) unilateral bailout, citizens do not know which government did what it was not supposed to do and so cannot infer what the nature of the crisis might be. For example, a unilateral bailout by G_1 can happen either because the crisis is serious but G_2 failed to cooperate, or because the crisis is mild but G_1 acted anyway. If they knew which government deviated, citizens could tailor their punishment accordingly. In the first instance, citizens would infer that the crisis is serious and punish G_2. In the second instance, they would infer that the crisis is mild and punish G_1. To provide appropriate disincentives to pro-EU governments, citizens must remove both of them after a unilateral bailout. But in our example, G_1 is removed under the presumption that the crisis is mild whereas G_2 is removed under the presumption that the crisis is serious. Thus, the citizens in country 1 must believe that the crisis is serious with sufficiently high probability simultaneously with the citizens in country 2 who must believe that it is mild with sufficiently high probability. Since their posterior beliefs about the crisis are the same, citizens in both countries must remain at least somewhat uncertain about the nature of the crisis. Putting the two belief requirements together establishes the necessary degrees of uncertainty: $s_{01} \in [1 - e_1, e_2]$ and $s_{10} \in [1 - e_2, e_1]$. Clearly, no such beliefs can exist unless governments are jointly vulnerable.

To understand the necessity of joint vulnerability, consider the citizens problem of simultaneously having to think that the crisis could be mild and that it could be serious. They can act appropriately only when there is sufficient unresolved uncertainty. How uncertain they must be to have the required incentive to remove the incumbent depends, of course, on how serious the other candidate for office is. The more attractive that candidate (the more vulnerable the incumbent), the more certain citizens can be that the incumbent did the right thing and yet be willing to remove it. Thus the electoral vulnerability of the incumbent enlarges the region of uncertainty that can sustain the citizen strategy, making it possible to maintain the citizen-preferred equilibrium. Conversely when the domestic alternative is unpalatable, citizens would need to be quite certain of wrong-doing before they remove the incumbent. But the more certain they are of the wrong-doing of one of the governments, the more certain they have to be of the right-doing of the other, which decreases the incentive to punish the other government. Thus, lower electoral vulnerability of the incumbent makes it harder (or impossible) to sustain the citizen-preferred equilibrium.

Are beliefs that make the two governments jointly vulnerable also intuitive? As before, the second requirement has no bite, so we only analyze the first. Consider an unexpected unilateral bailout by, say, G_1. This outcome can be induced either by G_1 deviating in a mild crisis or G_2 deviating in a serious one. Observe now that in either case, the deviating government can only profit if citizens infer that the other one is responsible for the deviation. That is, when G_1 acts in a mild crisis, it can only profit from doing so if it gets reelected after its unilateral bailout, which requires that voters infer that the crisis is serious (and so G_2 has deviated). Conversely, when G_2 fails to act in a serious crisis, it can only profit from

doing so if it gets reelected with sufficiently high probability after G_1's unilateral bailout, which can only happen if the voters infer that the crisis is mild (and so G_1 has deviated). Not surprisingly, these requirements cannot be satisfied because whenever a government induces a deviation it can only profit if citizens infer that it has not done so. For example, for G_1's deviation to be profitable, $s_{10} > e_1$ is required so that it gets reelected. But since the beliefs make the governments jointly vulnerable, this implies that $s_{10} > 1 - e_2$, so G_2 has to be removed. But then G_2 has no incentive to deviate in a serious crisis, which means that the only plausible inference after a unilateral bailout by G_1 is that the crisis is mild, which cannot make the deviation profitable. A similar argument establishes the case for G_2's deviation, so the equilibrium is intuitive in a pro-EU dyad.

Finally, we need to ask whether the equilibrium is vulnerable to collusion. The obvious possible candidate is an agreement to deviate jointly to a multilateral bailout when the crisis is serious. Since going so would result in reelection of both governments, the payoffs from the group deviation Pareto-dominate the equilibrium payoffs: $1 - \delta \alpha_i C > 1 - \theta_i$, which obtains by (A3). Moreover, since deviating from the collusive agreement results in the removal of both governments, the agreement is credible: $1 - \delta \alpha_i C > 0$, which obtains by (A3) as well. The equilibrium is not collusion-proof.

Thus, if the dyad is pro-EU, the equilibrium exists only if the governments are jointly vulnerable and while it is intuitive, it is not collusion-proof.

We conclude that Proposition 1 establishes somewhat dim prospects for disciplining governments through electoral sanctions. Pro-EU governments cannot be prevented from colluding to provide bailouts even in mild crises. Governments with heterogeneous preferences can be induced to act in accordance with citizen preferences but only if they are jointly vulnerable electorally. It is only nationalist governments that can be relied upon to do what the citizens want them to irrespective of the electoral vulnerability and despite the possibility for collusive agreements.

4 Analysis: Three Generic Possibilities

This game has many equilibria where governments do not behave the way voters want them to. It turns out, however, that, generally speaking, these can take one of four forms, and two of these are similar enough to be grouped together. Roughly, the equilibrium could involve (i) governments providing bilateral bailouts regardless of the nature of the crisis; (ii) governments failing to act regardless of the nature of the crisis; one government always acting regardless of the nature of the crisis, and the other government either (iii) never acting, or (iv) acting only some of the time.

4.1 Bailouts even in mild crises

We first investigate the possibility that governments do too much; namely, that they act not only when the crisis is serious — as their citizens wish them to — but also when the crisis is mild. The central result here is that electoral incentives could drive even nationalist governments to such hyperactive engagement but that the more electorally vulnerable the incumbent gets, the smaller the chances of such policy failure are.

LEMMA 1. *If both governments act when the crisis is serious, then in any equilibrium either (1) neither government acts when the crisis is mild or (2) both do, in which case $s \geq \bar{s} = \max(e_1, e_2)$ is required.* □

This lemma implies that we should restrict our attention to two types of equilibria when both governments act in a serious crisis. We have already seen the one where they do not act when the crisis is mild — the citizen-preferred equilibrium from Proposition 1. The other involves policy failure because governments always act regardless of the nature of the crisis.

PROPOSITION 2. *The following assessments constitute a* hyperactive equilibrium *only if $s \geq \bar{s}$:*

- *Each government acts regardless of the nature of the crisis.*

- *The citizens in each country reelect the incumbent when they observe a multilateral bailout. When they observe any other outcome, they infer that the crisis is serious, reelect any government that acts, and replace any government that does not.*

This equilibrium is collusion-proof and intuitive. □

Not surprisingly, when citizens are quite certain that the crisis is serious, they are going to reward action and punish inaction even if they are still unsure about the precise nature of the crisis. Pro-EU governments obviously benefit from this because they get to have their cake (the bailout) and eat it too (get reelected) even though they are, in fact, acting against the wishes of the citizens when the crisis is mild. The electoral threat forces even nationalist governments to fall in line and participate in bailouts that neither they nor, ironically, their citizens actually want.

Citizens are, of course, quite aware that they might be precipitating the very behavior they are trying to prevent and they are only willing to do so if they believe that the probability of such a mistake is low. This is why a necessary condition for this equilibrium is for them to think that it is very likely that the crisis is serious and requires action (s is high enough). With such a belief they are willing to reelect their government even though there is a chance that it has acted contrary to their wishes. When the incumbent is more vulnerable electorally, their tolerance for such a mistake becomes lower (because the replacement they can elect is more attractive), which pushes the required initial beliefs further up. In other words, electoral vulnerability shrinks the range of priors that can support this equilibrium and reduce the chances of policy failure.

4.2 No bailouts even in serious crises

We now investigate the possibility that governments do too little; namely, that they fail to act not only when the crisis is mild — as their citizens want them to — but also when the crisis is serious. This is a particularly egregious type of policy failure because it saddles the citizens with a deepening crisis that they will eventually have to pay to resolve. The central result for inactivity here parallels the case of hyperactivity: electoral concerns could keep even pro-EU governments from acting when the crisis is serious but the more vulnerable

the incumbent, the less likely such policy failure becomes. As before, looming elections are a double-edged sword: their presence alters the incentives of the governments, but their particular circumstances can alleviate some of the perversity of these incentives.

LEMMA 2. *If both governments do not act when the crisis is mild, then in any equilibrium either (1) they both act when the crisis is serious or (2) neither does, in which case*

$$s \le \underline{s} = \min(1 - e_1, 1 - e_2) \quad and \quad w_i \le \frac{1 + t_i(1 - \alpha_i)C}{\theta_i} \equiv \overline{w}_i.$$

are required. □

This lemma implies that we should restrict attention to two types of equilibria when both governments do not act in a mild crisis. We have already seen the one where they act when the crisis is serious — the citizen-preferred equilibrium from Proposition 1. The other involves massive policy failure because the governments do not act even in a serious crisis.

PROPOSITION 3. *The following assessments constitute a* hypoactive equilibrium *only if* $s \le \underline{s}$ *and* $w_i \le \overline{w}_i$:

- *Each government does not act regardless of the nature of the crisis.*

- *The citizens in each country reelect the incumbent when they observe inaction. When they observe any other outcome, they infer that the crisis is mild, reelect any government that does not act, and replace any government that does.*

The equilibrium is collusion-proof, but it is intuitive only for pro-EU dyads. □

This result should be jarring for it states that while pro-EU dyads can experience this type of policy failure, dyads where at least one of the governments is nationalist cannot. To put it differently, it is only when both governments are pro-EU — and thus very interested in providing a bailout regardless of the nature of the crisis — that a serious crisis might remain unattended with both governments remaining passive for electoral reasons. Ironically, this sort of massive policy failure that will saddle the hapless voters with the costs of a rescue from a wider and deeper crisis cannot occur when at least one of the governments is nationalist.

How do we explain this puzzling behavior? The answer lies in the underlying incentives of pro-EU and nationalist governments. As long as it is rewarded for inaction, a nationalist government does not have an incentive to act when the crisis is mild even if doing so would also result in reelection. When voters observe such a government acting unexpectedly, they can safely infer that the crisis is serious, in which case they can also reelect it for doing the right thing, which, in turn, rationalizes its unexpected deviation. Unlike the nationalist government, a pro-EU government cannot credibly signal that the crisis is serious in this way. If it expects to be rewarded for deviating, it will have incentive to do so even if the crisis is mild, which means that when voters observe such a government acting unexpectedly, they cannot safely infer that the crisis is serious, so they will not reelect the government. This, in turn, prevents the pro-EU government from acting even in a serious crisis. In other words, since the pro-EU government cannot credibly signal what it knows, the citizens cannot be

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induced to remove the electoral threat that is preventing the government from acting. Pro-EU governments are prisoners of voter expectations: because they are known to want to do too much, they are condemned to do too little.

Let us now consider the two necessary conditions for this equilibrium. First, and analogous to the case of hyperactivity, hypoactivity is the consequence of electoral rewards and expected punishments. Citizens must be willing to reelect the incumbent for doing nothing even though there is a positive probability that this might be a mistake and they know it. This probability must be sufficiently low (i.e., the citizens must be relatively sure that the crisis is mild). The more vulnerable the incumbent governments — the lower $\underline{s}$ — the more certain citizens have to be before they dole out a reward for inaction.

Second, observe that this equilibrium requires that the economic costs of a serious crisis not be too severe. Even though inactivity is rewarded and a unilateral bailout is punished, a pro-EU government would still act when the crisis is serious if the economic costs of the crisis are too high. Since it does not fully internalize the financial costs of the bailout, such a government will find that the overall losses from doing nothing are so high that they outweigh the electoral costs from preventing the worsening of the crisis. If a pro-EU government is confronted with a very costly crisis, then the hypoactive equilibrium will fall apart: this government will act unilaterally knowing full well that doing so is going to cost it the elections while refraining from action will keep it in power.

Finally, it is worth asking why this equilibrium is not susceptible to pro-EU governments colluding to provide a bailout even when they know that the crisis is serious. It is not really the threat to punish them both if they engage in a multilateral bailout that is preventing collusion. (The proof of Proposition 3 shows that even when $p_i(s_{00}) = 0$ there exist intermediate costs of a serious crisis that would make the collusive agreement profitable.) It is the lack of incentives to abide by the collusive agreement that is destroying its viability. In this equilibrium voters always reward the inaction of their own government regardless of what the other government does. This means that if governments agree to act in a serious crisis, each of them can do better by breaking their promise and doing nothing: whoever does this will both get reelected and saddle its erstwhile co-conspirator with the full cost of a bailout. The collusive agreement cannot be sustained, and pro-EU governments will end up doing nothing.

4.3 Burden-Shifting

We now consider the possibility that one government acts while the other either acts some of the time or never does. We shall establish the equilibrium for the case when only one of the governments acts in a serious crisis. The characterization of the equilibrium when the other government sometimes joins it in a bilateral bailout is involved and we relegate it to Appendix B (it adds nothing of substantive importance for the cases we are going to discuss).

Consider, then, a situation in which one of the governments does not act when the crisis is serious. Lemma E tells us that when this happens, the other government must either fail to act as well — which we have already analyzed in Proposition 3 — or must act with certainty, which is the case we now turn to. The following lemma establishes, roughly, that if one of the governments carries the entire bailout burden in a serious crisis, then it must

also carry the entire bailout burden in a mild crisis. Moreover, it shows that such complete shifting of the burden to one of the governments is only possible when that government is pro-EU.

LEMMA 3. *If $\sigma_i = 1$ and $\sigma_{-i} = 0$, any intuitive and collusion-proof equilibrium requires that $\mu_i = 1$ and $\mu_{-i} = 0$, and it can exist only if G_i is pro-EU, and if $w_i \leq \overline{w}_i$ whenever $s < e_i$.* □

This immediately suggests, perhaps not surprisingly, that pro-EU governments can be saddled with the entire burden of a bailout irrespective of the crisis type. The following proposition establishes the expectations that are required for such an equilibrium.

PROPOSITION 4. *The following assessments constitute a generically unique collusion-proof burden-shifting equilibrium* only when G_i is pro-EU: G_i acts regardless of the nature of the crisis, G_{-i} never does, and

- $s < \min(e_i, 1 - e_{-i})$: *on the path, only G_i is removed; off the path, G_i is removed when neither acts;*

- $e_i < s < 1 - e_{-i}$ *(no joint vulnerability): on the path, both governments are retained;*

- $1 - e_{-i} < s < e_i$ *(joint vulnerability): on the path, both governments are removed; off the path, G_i is removed when neither acts and G_{-i} is removed whenever it acts;*

- $s > \max(e_i, 1 - e_{-i})$: *on the path, only G_i is retained; off the path, G_{-i} is removed after a bilateral bailout, and at least one of the governments is removed after a unilateral bailout by G_{-i}.*

The equilibrium is intuitive when $s > e_i$, and intuitive when $s < e_i$ only if $w_i \leq \overline{w}_i$. □

Proposition 4 shows that the bailout burden can be shifted entirely on one of the governments, but only if it is pro-EU. The important implication is that a nationalist government cannot be induced to carry a disproportionate share of the bailout regardless of what type the other government is; not even in a serious crisis.

In the following sections, we use the two of forms the equilibrium can take (i.e. the hyperactive and hypoactive equilibrium) to provide an analytic narrative of two key episodes from the Eurozone financial crisis. Because of space constraints, we focus on these two equilibria. Appendix C presents an additional analytical narrative of the burden-shifting equilibrium.

5 Merkel's *Volte-face*, Spring 2010

The problems with Greece began in earnest shortly after the snap elections, which brought to power a new Socialist government in 2009. The prime minister George Papandreou revealed that the previous governments had seriously mismanaged the economy saddling the country with a crushing debt of 129.7% of GDP and a massive deficit of 12.7% of GDP (later revised to 15.6%, up from the 3.7% originally claimed). The debt was more than

twice the size Eurozone members were allowed to incur, and the budget deficit was more than four times the agreed limits.

The markets reacted immediately. Rating agencies began downgrading the Greek debt, and by the early spring of 2010, the government was being shut out of the international financial markets. Papandreou implemented a series of austerity measures, but these provoked civil unrest without stemming the economic slide. It began to look like Greece would not be able to manage by itself. Rumors about a potential agreement on a bailout for Greece spread through the Eurozone despite the clear "no bailout clause" in Article 125 of the EU Treaties.[13] Any impetus for a concerted international action, however, foundered on Germany's stiff, if unexpected, opposition. Starting with the February 11 EU special summit and continuing to late April, the German chancellor, Angel Merkel, insisted that the Greeks must solve their own problems. In a characteristic statement, she denied the possibility of a default:

> [T]here is no looming insolvency. (...) I don't believe that Greece has acute financial needs from the European Community and that's what the Greek prime minister keeps telling me.[14]

Amid mounting evidence of a deepening crisis that was threatening to spread to the Eurozone and despite the chorus of governments clamoring for immediate action with Greeks themselves asking for assistance, Merkel not only persisted in her opposition to a bailout for Greece, but even hinted that countries in continuing violation of the Stability and Growth Pact (read: Greece) could be expelled from the Eurozone.[15] It was only after the sudden downgrading of Greek bonds to junk status on April 27 that Merkel agreed to act but only if the meeting was set for May 10. The downgrading of Spanish debt on the following day forced an earlier decision: the Eurozone members and the IMF reached a €110 billion bailout agreement on May 2.[16]

How are we to understand the behavior of the German government? Merkel's actions are particularly puzzling because she had been, and continued to be, strongly pro-EU and because from such a perspective it must have been clear by March that the crisis was likely to be very serious and that Germany would be the linchpin for any concerted action to resolve it. The delay not only made the crisis appreciably worse, but drastically increased the funds that had to be committed to its resolution. If her delay was motivated by domestic political considerations, why did she reverse course when she did, and why did she fail to persuade voters that this had been the right decision? In other words, how can we explain the behavior that, in the words of former foreign minister Joschka Fischer, made such a "complete mess" of the crisis that he could "not think of a situation since 1949 that [had] been handled so badly"?[17]

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13. *The Guardian*. February 10, 2010. "The euro's darkest hour. European leaders gather in Brussels amid rumors that struggling Greece will be bailed out."

14. *The Guardian*, March 21, 2014. "Angela Merkel: EU summit should not discuss bailout for Greece."

15. *Reuters*. April 30, 2010. "Greece bailout will prevent spillover: EU's Barroso."

16. *BBC News*. May 2, 2010. "Huge Greece bail-out deal agreed." The Eurozone members would provide €80 at 5% interest, and the IMF the remaining €30 billion at 3%.

17. *The Independent*. May 23, 2010. "Euro crisis is melting support for 'Iron' Merkel."

5.1 Selection of the Hypoactive Equilibrium

The first step in applying the model is to select among its several equilibria on the basis of the parameters necessary for their existence. From the vantage point of the German government, the situation between January 11 (when Eurostat officially questioned the Greek debt and deficit figures) and April 27 (when S&P downgraded Greek and Portuguese bonds) is consistent with parameter values that map onto the hypoactive equilibrium. Recall that this equilibrium requires (1) a pro-EU dyad, (2) citizens believing that the crisis does not require a bailout, and (3) costs of a serious crisis not being excessive.

First, both the CDU and Angela Merkel were regarded as pro-EU. In fact, in party manifestos and expert evaluations, German governments tend to come out as more pro-EU than other EU governments in general Warntjen, Hix, and Crombez (2008). Merkel in particular had earned the nickname "Mrs. Europe" for her exceptional handling of the previously gridlocked negotiations for the 2007–13 financial framework (Schneider 2013, 2014). She was able to persuade the UK to accept a reduction of its budget rebate, and was considered vital to the success of EU negotiations on a number of issues. With respect to their attitudes toward the EU, German governments hew very closely to the Euro-friendly elite opinion, but even among the general populace, attitudes toward the EU are quite positive. Finally, given the express concerns of the other Eurozone members and their ready willingness to participate in a common bailout early on, we can regard them as pro-EU.

Second, German voters did not believe that the Greek crisis was serious enough to affect their own well-being. Two-third of Germans opposed the Greek bailout, particularly in light of domestic austerity measures that were necessary to meet fiscal consolidation targets in Germany.In Nordrhein-Westfalen (NRW), which had become one of the most indebted states in Germany, public opposition to the Greek bailout lingered at even 90 percent.[18] The negative public opinion was further fueled by the German media, which portrayed the Greeks as tax dodging individuals who pursued early retirement. Germans who had long accepted stagnant wages and shrinking pensions in order to make the German economy more competitive globally were very reluctant to provide taxpayer money to bail out the Greek economy which was rampant with corruption, and overpaid civil servants.[19] Most Germans also did not see the Greek crisis as a very important problem for Germany during this time. They were much more concerned about unemployment, and about equally concerned about education and retirement, compared to the financial crisis (Forschungsgruppe Wahlen: Politbarometer). By the end of 2009, only 14% of Germans believed that the economic situation in the EU would worsen over the next twelve months (30% expected that the national economy would get worse over the next twelve months). In both cases, this was a significant decrease from surveys in the spring of 2009 (data from Eurobarometers 71 & 72).

Third, the costs of continuing a serious crisis were not excessive. By March, the other Eurozone members and the IMF had essentially reached a consensus that the crisis was serious, but within their initial bailout agreement from April 11 they estimated that only about €45 billion in loans would be sufficient to rescue Greece. The €15 billion IMF share

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18. *The Observer"*. May 9. 2009. "Disgruntled Germans go to polls with Merkel's coalition under threat."

19. *New York Times*. May 4, 2010. "Merkel tries to sell Germans to Greece bailout."; *The Guardian*. April 29, 2010. "Merkel's dilemma: Germans rage at picking up bill for 'pampered' Greeks."

was comparable to its loans to Brazil 1999 and Mexico in 1994, and the overall package was akin to the bailout for Argentina in 2001. The expected economic costs were also not expected to be grievous — the Greeks did not even request the activation of the emergency loans under this agreement until April 23, and the credit ratings on government bonds in Greece itself but also in Portugal, Ireland, Italy, and Spain (the other PIIGS countries where the crisis was most likely to spill into) remained at investment-grade levels until April 27–8.

Thus, with Eurozone governments pro-EU in general, but the German government known to be such in particular, with German voters believing that the Greek crisis did not concern them, and with the expectation that even a serious crisis would be contained and its costs unlikely to be excessive, we should expect the hypoactive equilibrium to obtain.

5.2 Inaction even in a Serious Crisis

In the hypoactive equilibrium, the governments take no action even when the crisis is serious. One possible explanation for Merkel's stubborn refusal to act until May is that she simply did not believe that the crisis was serious enough. There is no equilibrium where this can happen — the citizen-preferred one cannot be sustained in pro-EU dyads — and the evidence makes it difficult to believe that she could have been so singularly deluded when other governments, the EU commission, and the IMF were all broadly in agreement that the Greeks would need a bailout. European leaders urged Merkel not to prolong the bailout to Greece, but to act in solidarity with other members of the Eurozone. Italian Foreign Minister, Franco Frattini, pointedly stated that there was a "moral duty to intervene as soon as possible," and Spanish Foreign Minister, Miguel Angel Moratinos, argued that the austerity measures that had already been implemented in Greece should be met with trust and solidarity by the Eurozone members.[20]

A more plausible interpretation is that Merkel was convinced that the crisis was serious, and getting worse, but that there was still plenty of time to act. The April 11 agreement to set up the €45 billion fund for emergency loans should the Greeks request help points to such an interpretation.[21]

The reason for inaction in this equilibrium is fear of electoral punishment should the government engage in a bailout. When voters think that the crisis is not serious, they are inclined to reward the incumbent if it fails to act despite the positive probability that this might allow a serious crisis to fester: the risk is sufficiently small to justify accepting it. By the same token, however, voters are inclined to view any positive action as inappropriate and remove the incumbent for engaging in it. Merkel's CDU faced regional elections against a strong opponent in the country's most populous state, Nordrhein-Westfalen, on May 9, 2010. These elections were very important to Merkel's governing coalition because a defeat for the CDU in NRW would lead to loss of control in the *Bundesrat*, which would produce a divided government. This, in turn, would jeopardize the her government's plans for a radical overhaul of the tax and health systems, and an extension of the nuclear power program. These plans were opposed by the Social Democratic Party (SPD), which was the major

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20. *Agence France Presse*. March 22, 2010. "EU ups pressure on Merkel to aid Greece"; *Agence France Presse*. March 22, 2010. "EU ups pressure on Merkel to aid Greece."

21. Even after the rescue package loans were activated on April 23, the German foreign minister insisted that these were not a "blank cheque" for Greece.

opposition party in NRW at that point.[22] Public opinion polls in NRW indicated a close race between the SPD and the CDU, with a small advantage for the governing CDU, but opinion poll experts predicted that the bailout debate could have a strong impact on voters' choice.[23]

Given the economic indicators in Greece and other Southern European countries, Merkel might have wanted to act earlier had it not been for the elections in NRW.[24] Instead, she talked tough on Greek debt in an attempt to reassure German voters that their own beliefs about the crisis were correct and she agreed with them. Foreigners thought that Merkel's refusal to act was a transparent political ploy and that she was merely "hoping to stave off a bailout decision that many believe is inevitable until after voters in NRW go to the polls."[25] The leader of the Eurogroup, Jean-Claude Juncker, accused the German government of

> being excessively hesitant when it comes to Europe (...) Taking a domestic political look at European issues first, instead of looking at domestic issues with a European eye, definitely worries me.[26]

German voters, however, begged to differ. In line with the equilibrium predictions, Merkel's tough talk on Greece brought her political gains domestically. Figure 1(a) shows that initial rumors of a bailout at the end of 2009 led to declining support for Merkel. However, after her staunch opposition to the Greek bailout, support increased and stabilized in March and April of 2010. Figure 1(b) reveals the same, even slightly stronger, pattern in support for the CDU. This period also saw a stabilization in the share of voters that believed that the CDU government had competently handled the economy (Figure 1(c)).

Whatever Merkel happens to have believed about the seriousness of the Greek crisis, her opposition to a bailout was in tune with the wishes of the German voters and this was reflected in the opinion polls. If one agrees with our interpretation of the evidence that suggests that Merkel must have thought the crisis was serious, the conclusion is that the charges of politically-motivated temporizing were on target. She was prepared to allow the situation to deteriorate until after the elections in NRW gave her the freedom to join the other Eurozone members in the inevitable bailout. Her attempt to postpone the bailout discussion to May 10 (one day after the elections) even after the drastic worsening of the crisis with the April 27 downgrade of Greek bonds to junk status strongly suggests that her delay was politically motivated.

The hypoactive equilibrium can rationalize Merkel's opposition to a bailout despite her knowledge that the crisis was serious. However, according to the equilibrium, she should have waited until after the elections to act. We are thus left with a puzzle: if Merkel's strategy was motivated by her expectation that acting would result in an electoral punishment, then why did she agree to a bailout on May 2, barely a week before the NRW elections? Related to this, if her hand was forced by the seriousness of the crisis, why was she unable to persuade the voters that such action was necessary? In other words, if Merkel was act-

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22. *The Times*. May 8, 2010. "Greece it like a rat's tail. It will come round to hit us'.'
23. RP Online, May 2010, "Griechenland entscheided die Wahl."
24. *New York Times*. April 28, 2010. "Merkel Tested as Escalating Greek Crisis Hurts Europe."
25. Ibid.
26. *Agence France Presse.* April 15, 2010. "Euro chief Juncker hits out at 'hesitant' Germany."

(a) Support for Merkel
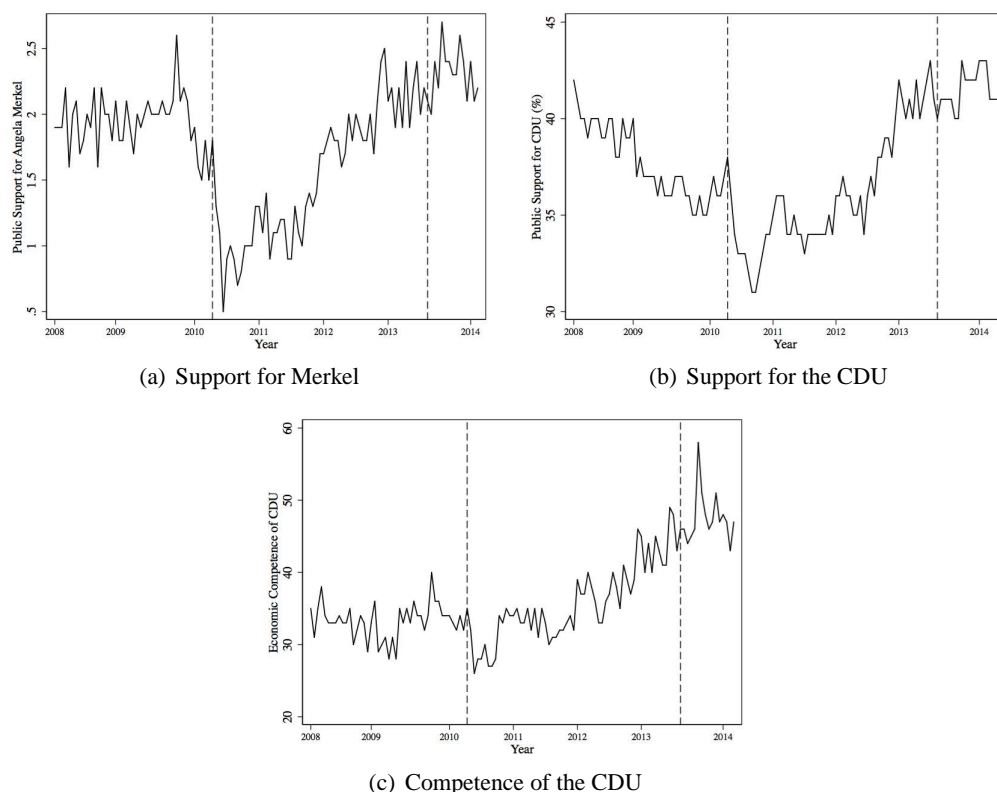
(b) Support for the CDU

(c) Competence of the CDU

Figure 1: Public opinion in Germany during the Eurozone crisis. Dashed line indicates the timing of the agreement on Greek bailout. *Source:* Forschungsgruppe Wahlen: Politbarometer.

ing according to the optimal strategy in the hypoactive equilibrium, why did she suddenly deviate to a bailout inducing, in effect, an out-of-equilibrium outcome?

5.3 Triggering an Out-of-Equilibrium Outcome

To understand the abrupt *volte-face* of May 2 — when the Eurozone and the IMF agreed to the €110 billion bailout — we need to recall that one of the necessary conditions for this equilibrium is that the expected costs of a serious crisis that is allowed to deepen are not excessive. When this condition is not met, then the government will have an incentive to deviate in a serious crisis and agree to a bailout even if doing so would cost it the elections (i.e., the equilibrium would not exist). We argue that S&P's unexpected downgrading of the Greek (and Portuguese) debt on April 27 and the downgrading of the Spanish debt on the following day, with their devastating implications for the Eurozone, were catalytic. They revealed not only that the costs of the crisis would be significantly worse than expected but that the situation was deteriorating much more rapidly than anticipated. The events of April 27–8 accelerated the crisis and made further delay tantamount to permitting the Eurozone go to ruin; i.e., to violating the "no excessive costs" condition of the equilibrium.

By the end of April, the economic and financial situation in Greece had worsened so

much that experts no longer thought that the bailout package – even if were to come – would suffice to stem the crisis. Greece's debt had reached almost €300 billion, and its borrowing costs were about 4% higher than they had been in February 2010.[27] With such prohibitive borrowing costs, it was unlikely that Greece would be able to service the €8.2 billion that were about to mature on May 19.[28] With the country headed toward almost certain default and financial markets in turmoil, experts predicted that a restructuring of Greek sovereign debt was unavoidable.[29] The yields on two-year Greek government bonds had increased to over 13%: it was now safer to lend money to Iraq or Venezuela than to Greece.[30] In this heated atmosphere, S&P's downgrade of Greek government debt to junk ($BB+$ for long-term and B for short-term bonds) and Portugal's to low investment grade ($A-$, closing on the territory previously occupied by the Greek bonds) unleashed a veritable panic.[31]

The borrowing costs for Ireland and Portugal climbed as experts became increasingly convinced that a Greek default would trigger an avalanche of defaults in the other PIIGS countries.[32] The Portuguese ten-year government bonds was now 2.2% above the German benchmark and the Lisbon stock market shrank by 5.36%.[33] S&P downgraded the Spanish long-term debt to AA on the 28th, and an Italian bond issue failed to garner expected support.[34]

The crisis also threatened to engulf the entire Eurozone, not just its weakest members. Sales of the euro accelerated, leading the common currency to plunge to its lowest value against the dollar in over a year and, since the yuan was tracking the dollar, against the Chinese currency as well.[35] European stock markets plummeted as investors voiced fears over the crisis and the risk of contagion.[36] *The Sunday Herald* succinctly summarized the panic that the crisis will likely go global:

> Greece's economic problems are on the point of triggering an economic avalanche that will engulf other eurozone countries with high borrowing levels (Spain, Portugal, Italy and Ireland), roll relentlessly on through the eurozone and its trading partners (notably Britain) and push the struggling global economy into the second dip of the recession triggered by the collapse of Lehman Brothers in 2008.[37]

27. *The Guardian*. April 27, 2010. "Markets tremble while Merkel plays for time over Greek rescue deal."; *The Sunday Times*. May 2, 2010. "The fall of Greece may topple us all."

28. *Agence France Presse*. April 25, 2010. "Pressure mounts for swift Greek bailout."

29. *The Guardian*. April 9, 2010. "EU can't afford to let Greece fail"; *BBC News*. April 27, 2010. "The bitter taste of a Greek bail-out."

30. *BBC*. April 27, 2010. "The bitter taste of a Greek bail-out."

31. *New York Times*. May 4, 2010. "Germany approves bailout for Greece."; *Agence France Presse*. April 27, 2010. "Desperate Greece presses EU for quick debt rescue."

32. *BBC News*. May 2, 2010. "Huge Greece bail-out deal agreed."; *The Guardian*. May 8, 2010. "Debt crisis: EU leaders announce €70bn plan to protect euro."; *Agence France Presse*. April 25, 2010. "Pressure mounts for swift Greek bailout."

33. *Agence France Presse*. April 26, 2010. "Greece warns speculators as it races for bailout."

34. *Agence France Presse*. April 27, 2010. "Desperate Greece presses EU for quick debt rescue."

35. *Reuters*. April 30, 2010. "Greece bailout will block spillover – EU's Barroso."

36. *Agence France Presse*. April 27, 2010. "Desperate Greece presses EU for quick debt rescue."

37. *The Sunday Herald*. April 30, 2010. "Debt crisis in Greece is a warning to us all."

The extent of this panic can be seen in the April 28 statement by EC President Barroso, in which he not only reassured markets that "Greece's needs will be met in time" without any debt restructuring, but also fired a broadside at the immediate culprit that had triggered the panic when he reminded everyone that the Commission had "already taken action to put in place a regulatory framework on credit-rating agencies."[38]

As this official annoyance at S&P's actions shows, the downgrade had not been anticipated by policy-makers, which explains why we should not expect it to occur as part of an equilibrium.[39] Moreover, the fallout from these downgrades was immediate and severe. Not only did the expected costs of the bailout package nearly triple to €110 billion, but the potential costs of letting it fester had become incalculable.[40] With Germany's contribution to a bailout also up threefold to €25 billion, Merkel confronted a painful choice. She could stay the hardline course, delaying the now-inevitable bailout until after May 9th, convincing German taxpayers that she had their preferences at heart, and helping the CDU win the regional elections in NRW. The cost would be continued and unpredictable market volatility, rising borrowing costs spreading to the Eurozone and possibly triggering debt crises in the PIIGS, a potential collapse of the euro, with whatever global consequences that might have. Or, she could bite the bullet and bring Germany into a bailout agreement. Doing so would at least give the Eurozone members a fighting chance to stabilize the crisis. The cost would be the displeasure of German taxpayers that would likely manifest itself through CDU losses in the crucial NRW elections. To her credit, Merkel sacrificed her and her party's domestic position for the sake of Eurozone and international stability.

The hypoactive equilibrium cannot be supported when the cost of a continuing serious crisis is very high: in these cases the government would deviate from inaction in order to stop the crisis even if doing so would certainly cause it to lose the elections while doing nothing would have ensured reelection. The unexpected downgrade caused the expected costs to escalate too much and too fast, making precisely such a deviation preferable to the hardline equilibrium strategy. In other words, by May 1st, the equilibrium fell apart.

5.4 The Counter-factual Becomes Fact

The unexpected events of late April provide us with an interesting glimpse into the workings of our explanatory mechanism. By forcing Merkel "off the path of play", they made observable what normally would have been a counter-factual: the elections following a deviation. While we do have evidence that Merkel had reasons to worry about CDU's position in NRW and that the vote was likely to be affected by her actions on the Greek bailout, we would not have had the evidence provided by actual elections in the wake of an unexpected *volte-face* to a bailout agreement.

In the hypoactive equilibrium, deviations from holding the line lead to electoral defeat as citizens punish the incumbent for what they consider an inappropriate bailout. After the bailout agreement became public on May 2, support for the CDU government in NRW declined from 39% to 37%, pointing to an electoral defeat for the governing coalition. In early 2010, the coalition had consistently polled three points ahead of the opposition, and

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38. *European Commission Press Release*. April 28, 2010. "Statement by President Barroso on Greece."

39. *New York Times*. April 28, 2010. "Merkel tested as escalating Greek crisis hurts Euro."

40. *New York Times*. April 30, 2010. "Greece said to be close to deal on rescue plan."

now it was trailing by two. Discontent was so deep that when Merkel appeared at a rally near Wuppertal, the police had to step in to contain protests that were about to turn into a riot.[41] The elections proved an unmitigated disaster for the CDU, which lost by 10 percentage points, making this its worst electoral defeat in NRW ever. As a result, the government was replaced with a coalition of SPD and Greens, first as a minority government, and then (after additional gains), as majority in 2012. Moreover, after the SPD won the post of Minister-President in NRW in July, Merkel lost the majority in the *Bundesrat* as well.[42] This made it very difficult to pursue the domestic agenda intended by Merkel and her CDU, and even though they still could push some legislation with compromises after long negotiations, by early 2013 the Greens and the Left had acquired 36 of the 69 votes, enough to block or renegotiate any government bill without exception.[43] Thus, the political ramification of the NRW loss were not merely temporary setbacks; they proved as costly and persistent as the gloomy forecasts had predicted. As Figure 1 shows, support for Merkel would not recover to the (uncharacteristically low) levels of the immediate pre-crisis months for two years, and support for the CDU would take even longer.

One might be tempted to argue that the German voters punished the CDU for Merkel's dithering; that she was inconsistent — first opposing the bailout, but then flip-flopping — and that her Machiavellian tactics had worsened the crisis, saddling Germany with three times the costs. For example, Jürgen Rütters, the Premier Minister of NRW, blamed the national government for its handling of the financial crisis.[44] Senior figures in the CDU openly said that they had lost confidence in Merkel's ability to lead and called on her to quit.[45] This, however, was not how the Germans voting in NRW interpreted it. The evidence shows that they had remained unconvinced about the seriousness of the crisis. Since they did not consider a Greek bailout necessary, the *volte-face* of the ruling coalition formalized in the May 7 *Bundestag* vote, which approved Germany's €22.4 billion share, was seen as wasting taxpayer money on foreigners when it was needed at home. As Ingrid Lange, a shop assistant from NRW, put it in a statement that describes the general interpretation,

> First the state had to rescue the banks and now they have to rescue Greece when our own economy is suffering. It's hard to make a decent living even with a job. The government should spend our taxes where they're needed.

5.5 The Inability to Signal Credibly

The electoral outcome, however, raises another question that the equilibrium reasoning helps answer. When Merkel's hand was forced at the end of April, why could she not persuade the German voters that the Greek crisis was serious enough to warrant immediate action? The hypoactive equilibrium is intuitive only in pro-EU dyads. Although the equilibrium does exist when one or both of the governments are nationalist, such a government

41. *The Sunday Times*. May 9, 2010. "Merkel faces voter revolt over bailout."

42. N-tv, May 2010, "Quittung für die Bundesregierung. Rüttgers brutal zurückgestutzt."; *Agence France Presse.*. May 9, 2010. "Merkel loses state poll, upper house majority."

43. *Deutsche Welle*. February 28, 2013. "Opposition to set up new hurdles for Merkel."

44. *The Times.* May 10, 2010. "Poll blow for Merkel amid anger over Greek bailout."

45. *Daily Telegraph*. May 11, 2010. "Calls for Merkel to quit over Greek bailout."; *The Times*. May 12, 2010. "Wounded Merkel's star fades amid acrimony and intrigue."

can credibly reveal the type of crisis and break out of the straightjacket that voters are supposed to impose. Since governments are compelled not to act even in a serious crisis by the threat of removal if they do, citizens must infer that the crisis is likely mild whenever they observe someone acting. A nationalist government that expects to be reelected for inaction has no incentive whatsoever to act in a mild crisis even when doing so would keep it in office. Thus, when voters observe such a government suddenly (and unexpectedly) springing into action, they can only reasonably infer that the crisis must be serious. Since the voters must then reelect the government for acting, a nationalist government cannot be compelled to do nothing in a serious crisis. Unfortunately, since pro-EU governments do have a strong incentive to act even in a mild crisis if doing so would get them reelected, citizens cannot reasonably make the inferences necessary to reward them for acting unexpectedly. In other words, the equilibrium works because a pro-EU government cannot persuade the citizens that its actions are warranted by the seriousness of the crisis. Thus, the equilibrium predicts that if the German government attempted to convince voters that its sudden *volte-face* was required because the crisis was serious, we should expect that effort to fail.

Merkel, in fact, tried very hard to persuade German voters that the bailout was absolutely necessary to ensure the stability of the single European currency and therefore of the German economy.[46] After the Greek bailout became the most important topic in the electoral campaign in NRW,.[47] Merkel went on a veritable media blitz with news conferences and interviews on the day the Eurozone members approved the bailout package. Merkel made 15 personal appearances in NRW alone and spent the week before the election giving numerous interviews on TV.[48] She argued not only that helping the Greeks was essential to secure the German economy but that the bailout was unlikely to cost the taxpayers much. She went so far as to claim that Germany might actually make money on the bailout.[49] Jürgen Rütter put up a brave face by trying to sound confident that voters would realize that the Greek bailout was in their own best interest and would not punish the government for agreeing to it.[50] In the event, however, we would not have expected the German voters to buy the abrupt change of course, especially after having listened to Merkel repeatedly deny the seriousness of the crisis for months prior to that. And so they did not.

5.6   What was the alternative?

At the beginning of this section, we cited Joschka Fischer, who delivered the blunt and unflattering verdict that Merkel had made a "complete mess" of the crisis. It is worth asking, however, what the alternative could have been. Since delaying after the credit downgrades

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46. *New York Times*. May 4, 2010. "Germany Approves Assistance for Greece."; *Deutsche Presse Agentur*. April 26, 2010. "Merkel faces voter backlash over Greece."

47. *Der Spiegel*. May 8, 2010. "Rüttgers kämpft gegen Griechenland-Effekt."; *RP Online*. May 8, 2010. "Griechenland entscheidet die Wahl."

48. *Agence France Presse*. May 9, 2010. "German voters poised to punish Merkel party over Greece."

49. *Agence France Presse*. May 2, 2010. "Germany warns Greece to deliver on cuts."; *New York Times*. May 4, 2010. "Merkel tries to sell Germans to Greece bailout.

50. *Bild*. May 5, 2010. "Verhagelt Ihnen Griechenland die Wahl, Herr Rütters?" This bravado probably would not have worked anyway since Premier Minister's own credibility was already in tatters over the "Rent-a-Rütters" scandal and the allegations that his staff had been trafficking in private conversations with him for donations of €6,000. *Agence France Presse*. May 8, 2010. "Merkel party fears voter lashing over Greece aid."

seems to have been out of the question, the only plausible road not taken must have been acting sooner. With the priors of German voters strongly fixed against the seriousness of the crisis, this would have resulted in an electoral punishment at least as bad as the one that actually happened. In fact, without Merkel holding the line in the face of serious criticism by other Eurozone members, the slide in public opinion polls would have continued. It is also arguable that had Merkel jumped on the bailout bandwagon early on, it would have been even more difficult for voters to believe that the action had been warranted. The delay deepened the crisis so much that even the massive bailout proved insufficient to stabilize the Eurozone. Ironically, by allowing the consequences to reveal themselves, Merkel probably made it possible for Germany to participate fully in the subsequent two bailouts. Thus, the unfortunate downgrades and the panic they caused triggered the drastic reversal that made a mockery of the otherwise solid strategy Merkel had been playing. To her credit, however, when it became clear that further inaction would cause grave harm to the German economy, Merkel abandoned the electorally-motivated strategy to do the right thing despite knowing full well that the voters would not see it that way.

6 Merkel's "Electoral Delay", Summer 2013

The first bailout did not solve the financial crisis. A second bailout was provided to Greece in July 2011, and after some up and downs, rumors about a third bailout surfaced in 2013. In August, barely a month before the federal elections, finance minister Wolfgang Schäuble announced that a third package for Greece might be in the offing.[51] Why had the German government not been more forthcoming about a third bailout earlier in 2013? Why had it been silent until the German Central Bank's statement forced its hand?[52] And why did it then agree to the bailout before the elections?

Some observers – the political opposition in particular – explained that this was merely a repeat of the failed 2010 strategy; that Merkel was delaying the bailout decision until after the elections. Gerhard Schröder, former chancellor and member of the SPD, claimed at rallies that Merkel had lied to the electorate earlier when she had claimed that she had not expected any more aid for Greece:[53] "You cannot win the trust of the population if you conceal and disguise the truth. You can only win the trust of the population if you speak out clearly, and truthful." Peer Steinbrück, front-runner for the SPD opposition party, warned Merkel not to present the German population with the bill after the election: "It is time that Mrs. Merkel speaks the truth about the costs of the Greek bailout."[54]

Some media outlets also perceived differences in sensitivity to German domestic politics in the other Eurozone members and the European Commission. Whereas in 2010 these other actors had made it impossible to conceal the bailout debate even temporarily — in fact,

51. *Der Spiegel*. August 20, 2013. "Schäble hält neues Griechenland-Programm für nötig."; *Agence France Presse*. August 20, 2013. "Germany's Schäble says Greece will need more aid."; *The Times*. August 21, 2013. "The Greek cat's out of the bag."

52. *Der Spiegel*. August 11, 2013. "Schuldenkrise in Europa: Bundesbank recent 2014 mit neuem Hilfspaket für Griechen."

53. *Der Spiegel*. August 20, 2013. "Schröder macht Griechenland zum Wahlkampfthema."; *The Times*. August 14, 2013. "Merkel accused of lying over Greek bailout."

54. *Der Spiegel*. August 20, 2013. "Schröder wetter gegen "Lügen" bei der Griechen-Rettung."

they had even publicly tried to shame Merkel for delaying the bailout until after the NRW elections — they were now suspiciously quiescent even after the need for further action on Greece and Portugal had become fairly obvious in July. "Conspiracy of silence" theories alleged that the other EU members had learnt not to force the German government into action before important elections, and were now collaborating with it in delaying bailout discussions until after the federal elections in September.[55]

This sort of reasoning seems to suggest that the hypoactive equilibrium is in play again. However, the parameter configuration in 2013 does not map onto the requirements for this equilibrium because (i) German voters were quite confident that the crisis was very serious, and (ii) the opposition was quite weak.

Ironically, it might haven been the first bailout debacle and the subsequent inability to end the crisis that had shifted the beliefs of the German voters. By 2013, the German public was firm in its conviction that the crisis was indeed extremely serious for the country. Public opinion polls conducted by *Forschungsgruppe Wahlen* revealed that the Eurocrisis was seen as the second most important problem in Germany, just behind domestic unemployment and ahead of the economic situation, education, and retirement benefits.

Strong economic growth and very low unemployment had contributed to the high support for the incumbent government. The boost came just as the electoral campaign began: GDP grew by 0.7% in the second quarter of 2013, following a stagnant first quarter and contraction in the last quarter of 2012. German growth helped to achieve a Eurozone average growth of 0.3%.[56] Unemployment at 6.8% was also only slightly above the natural rate of unemployment and near the lowest levels since reunification in 1990. The CDU expected up to 42% of the vote, whereas the SPD trailed far behind with only 24%.[57] Merkel had also recovered her standing and "gained a reputation as a safe pair of hands, a cautious and skilled operator throughout the eurozone crisis."[58] Her approval ratings were at 70%.

These data suggest that the conditions in late summer 2013 satisfied the parameter configuration for the hyperactive equilibrium, $s \geq \max(e_1, e_2)$. In this equilibrium, voters reelect governments that participate in a bilateral bailout even when they know a government to be pro-EU. From the electoral perspective, there is no surprise that the German government would announce the bailout before the election. In the event, and unlike the 2010 fiasco, there was no punishment: support for the CDU/CSU remained at 41%, the SPD at 25%, and the FDP at 6%.[59] During the elections, the CDU received 41.5% of the vote (the SPD got 25.7%) and remained in power.[60]

The hyperactive equilibrium logic suggest that there should have been no electoral reason to delay decision on a bailout given the importance the German voters already attached to the crisis. Such strong priors could have allowed Merkel to pour more money into Greece even if the crisis had, in fact, abated, and do so without fear of domestic punishment. Schäu-

55. *The Financial Times*. July 10, 2013. "Code of silence seeks to avert bailout revolt in German poll."

56. *The Business Times*. August 16, 2013. "Merkel approaches poll on rocky eurozone boat."

57. *The Financial Times*. August 23, 2013. "German growth figures set to offer election boost to Merkel."

58. *Daily Mail*. August 26, 2013. "German election could be a 'game-changer'."

59. *The Financial Times*. August 23, 2013. "German growth figures set to offer election boost to Merkel."

60. Greece received its third bailout package worth €8.3 billion in April of 2014. A week later, Greece returned to the financial markets 'triumphantly' with a €3bn bond sale (*Financial Times*. April 1, 2014. "Eurozone signs off on delayed €8.3bn bailout for Greece.").

ble made a point of presenting his revelation as "old news" and very much in line with expectations: "the public was always told so."[61] Merkel was surprised by Schröder's attack: "Everyone knew what Schäuble said about Greece."[62] Schäuble, in fact, had already said in February 2012 that a third bailout could not be ruled out.[63] This was also when a report by the EU and the IMF had indicated that a bailout might be needed.[64] Thus, whatever had caused the delay in announcing the third bailout, it could not have been concern about a possible fallout during the September federal elections.[65]

7 Conclusion

This paper analyzes European cooperation during the Eurozone crisis. Starting from the puzzle of why European cooperation on the Eurozone bailouts has proven so difficult despite strong pressure to act, we develop a formal model that analyzes governmental incentives to provide coordinated bailouts, taking into account the domestic conflict over the desirability of the bailout as well as the international conflict over the distribution of bailout costs. Our model explains why Germany was so reluctant to provide a bailout to Greece even though it had economic incentives, and European pressure to do so. Above and beyond this finding, the model shows that EU governments' incentives to provide coordinated bilateral bailouts can both strengthen and weaken as a consequence of European cooperation and domestic politics. We find that electoral constraints, international cooperation, and international collective action problems can explain why (i) sometimes governments provide bailouts even if the financial crisis is not serious enough to warrant coordinated action, (ii) sometimes governments do not provide bailouts even though the financial crisis is serious enough to warrant coordinated action, and (iii) sometimes governments shift the burden of the rescue onto other governments even when could provide a bailout without getting punished domestically.

These results are not only interesting for European cooperation during the Eurozone crisis, but to international cooperation during financial crises more general. Historically, most bilateral bailouts to countries experiencing financial difficulties have been coordinated with other bilateral or multilateral donors. As long as these bailouts are salient on the domestic level in the donor country we would therefore expect very similar processes in coordinated bilateral bailouts more generally.

Our model is just a first step towards a more general theory of coordinated bilateral bailouts. The model helped interpret three episodes of coordinated bailouts during the Eurozone crisis. However, we have abstracted away from many important aspects of bilateral

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61. *Der Spiegel*. August 21, 2013. "Schämbles Grichenland-Beichte. Endlich ehrlich."; *Agence France Presse*. August 20, 2013. "Germany's Schäble says Greece will need more aid."

62. *Associated Press Archive*. August 22, 2013. "Greek bailout talk ruffles German election."

63. *Irish Times*. February 25, 2012. "Schäuble concedes third Greek bailout on the cards."

64. *New York Times*. February 20, 2012. "Europe agrees on new bailout to help Greece avoid default."

65. Schröder's claims were so out of step with the voters that the CDU went on the offensive and blamed the need for a bailout on the SPD. They attacked Schröder who, in his capacity as chancellor at the time, had been instrumental in letting Greece join the Eurozone even though it had not been ready. It had also been his economic policies that had led to Germany's violation of the Stability and Growth Pact (*Der Spiegel*. August 21, 2013. "Union contort Schröoers Griechenland-Attacke."). Merkel simply asserted that Greece should never have been allowed to join the Euro. (*CNN Wire*. August 28, 2013. "Greece joining euro was a mistake.").

bailouts that are highly relevant to some of the outcomes we observe. For example, our model can help us understand why the German government acted before the elections in 2013, but it is of no help when it comes to explaining the delay that preceded that action (except to say that it was not due to electoral concerns). The evidence points to the fact that the Eurozone members had agreed not to discuss a third bailout in order to pressure the Greek government into implementing the required reforms. The Greek government had been relatively slow in implementing the conditions imposed with the second bailout, and there were widespread fears that a clear commitment to a third bailout would further erode the incentives of the Greek government to pursue painful reforms.[66] Seen in this light, the "conspiracy of silence" was not designed to allow the German government to win the federal elections but to keep the reform pressure on the Greek government. Given the logic of the hyperactive equilibrium, one is hard pressed not to agree with this reasoning. Since we have a wealth of models that deal with contingent disbursements, we saw no need to introduce these considerations in our model, which is focused on the interaction between donors and their domestic audiences. However, an extension to our model could introduce the assumption that financial aid is conditional on economic and fiscal reforms in recipient countries, and therefore more closely model some of the more complex interactions that took place during the Eurozone crisis.

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66. The inability to form a new coalition in May after the elections had created a political crisis and renewed speculation about a Greek exit from the Eurozone and a run on Greek banks. A new round of elections in June had brought in a governing coalition but even though it had agreed in principle to the conditionality of the bailout program, it had also asked for an extension until 2017 (*Financial Times*. August 14, 2012. "Greece seeks 2-year austerity extension."). In August, the IMF revealed that Greece's bailout program was widely off track and the Troika withheld the scheduled disbursement of €31.5 billion. In August, the Eurozone governments publicly committed to delay any decision on further bailout money for Greece until after the Troika was satisfied with the progress of Greek reforms (*Financial Times*. August 22, 2012. "Eurozone leaders delay Greece aid decision.").

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A Proofs

LEMMA A. *By subgame perfection,*

$$
p_i(s_{11}) = \begin{cases} 1 & \text{if } s_{11} > e_i \\ 0 & \text{if } s_{11} < e_i \\ [0,1] & \text{otherwise} \end{cases}
\qquad
p_i(s_{00}) = \begin{cases} 1 & \text{if } s_{00} < 1 - e_i \\ 0 & \text{if } s_{00} > 1 - e_i \\ [0,1] & \text{otherwise} \end{cases}
$$

$$
p_1(s_{10}) = \begin{cases} 1 & \text{if } s_{10} > e_1 \\ 0 & \text{if } s_{10} < e_1 \\ [0,1] & \text{otherwise} \end{cases}
\qquad
p_2(s_{10}) = \begin{cases} 1 & \text{if } s_{10} < 1 - e_2 \\ 0 & \text{if } s_{10} > 1 - e_2 \\ [0,1] & \text{otherwise} \end{cases}
$$

$$
p_1(s_{01}) = \begin{cases} 1 & \text{if } s_{01} < 1 - e_1 \\ 0 & \text{if } s_{01} > 1 - e_1 \\ [0,1] & \text{otherwise} \end{cases}
\qquad
p_2(s_{01}) = \begin{cases} 1 & \text{if } s_{01} > e_2 \\ 0 & \text{if } s_{01} < e_2 \\ [0,1] & \text{otherwise} \end{cases}
\qquad \square
$$

Proof. Follows immediately from sequential rationality. ■

Proof of Proposition 1 If this is an equilibrium, Bayes rule tells us that $s_{11} = 1$ and $s_{00} = 0$, and since $e_i \in (0,1)$, by Lemma A the citizens will retain the governments in both countries along the path of play. Unilateral deviations will be unprofitable when the following four conditions are satisfied:

serious crisis: mild crisis:

$$
1 - t_1\alpha_1 C \geq p_1(s_{01}) \qquad\qquad 1 - \theta_1 \geq p_1(s_{10}) - t_1 C \quad (1)
$$
$$
1 - t_2\alpha_2 C \geq p_2(s_{10}) \qquad\qquad 1 - \theta_2 \geq p_2(s_{01}) - t_2 C. \quad (2)
$$

NATIONALIST DYAD. Since G_1 would stick to inaction in a mild crisis whenever $1 - \theta_1 \geq p_1(s_{10}) - C$, (A1) implies that it will do so for any $p_1(s_{10})$. The situation with G_2 is analogous. Nationalist governments need no additional incentives to remain inactive in a mild crisis when they are reelected for doing so.

In a serious crisis, G_1 would stick to the multilateral bailout as long as $1 - \alpha_1 C \geq p_1(s_{01})$, and since $1 - \alpha_1 C > 0$ by (A2), $p_1(s_{01}) = 0$ is sufficient to guarantee that this condition is satisfied. By the same token, $p_2(s_{10}) = 0$ is sufficient for G_2. When one of the governments is expected to take action in a serious crisis, the other needs an additional incentive to stick with the cooperative strategy and not attempt to shift the entire bailout burden on its counterpart. This incentive is provided by the electoral threat to remove any government that fails to act when the other does. The citizens' electoral strategies after unilateral bailouts can be rationalized by them believing that the crisis is serious, $s_{10} = s_{01} = 1$, in which case they remove any government that fails to act and keep any government that does. We now check whether these beliefs are intuitive.

A unilateral bailout by G_i can be observed either when G_{-i} fails to act when the crisis is serious or when G_i acts when the crisis is mild. This means that the second requirement for an intuitive equilibrium imposes no restrictions on these beliefs. Consider now an unexpected unilateral bailout by, say, G_1. The required off-the-path beliefs are $p_1(s_{10}) = 1$

and $p_2(s_{10}) = 0$. The outcome s_{10} can be induced by G_1 by deviating to action when the crisis is mild, but since it gets reelected at s_{00}, a nationalist government cannot profit by such a deviation. The outcome s_{10} can also be induced by G_2 by deviating to inaction when the crisis is serious. But for this to be profitable, G_2 would have to be reelected with positive probability, which would require the inference that the crisis is mild, a contradiction to the assumption that the outcome was induced by G_2. The equilibrium is intuitive in a nationalist dyad.

Finally, the equilibrium is also collusion-proof because nationalist governments have no incentive to provide a multilateral bailout in a mild crisis ($1 - \alpha_i C < 1 - \theta_i$) or do nothing in a serious one ($1 - w_i \theta_i - \alpha_i C < 1 - \alpha_i C$).

Thus, if the dyad is nationalist, the assessments constitute an equilibrium that is both intuitive and collusion-proof.

MIXED DYAD. Consider a dyad where G_1 is nationalist and G_2 is pro-EU. As before, since a nationalist government requires no additional incentive to remain inactive when the crisis is mild, only the pro-EU one is a concern in this case. If citizens were to infer that the crisis is mild when they observe unilateral action by G_2, $s_{01} = 0$, then they would remove G_2 (and retain G_1), which would be sufficient to ensure that inaction in a mild crisis is optimal for both. However, citizens cannot make this inference because their subsequent strategy would destroy the incentives for the nationalist government to participate in a multilateral bailout when the crisis is serious. To see this, recall that both types of governments must have an extra incentive to overcome international distributional conflict. If citizens were to retain G_1 after unilateral action by G_2 on the presumption that the crisis is mild, then G_1 would fail to act when the crisis is serious as well. This implies that citizens must remove both governments after unilateral action by either one. In this sense, a mixed dyad is strategically equivalent to a pro-EU one, so the same conditions apply: the governments have to be jointly vulnerable.

Are these beliefs intuitive in a mixed dyad? Consider an unexpected unilateral bailout by G_1, the nationalist government. The only way G_1 can induce s_{10} is by acting when the crisis is mild but since it is reelected for not acting, this deviation is equilibrium-dominated. Thus, citizens cannot put positive probability on the outcome being induced in a mild crisis. The only other possibility is that G_2 has failed to act when the crisis is serious, but then the citizens would have to infer that the crisis is serious and remove G_2 for not acting, making such a deviation unprofitable. Consider now an unexpected unilateral bailout by G_2, the pro-EU government. The only way G_2 can induce s_{01} is by acting when the crisis is mild. Since it is reelected for not acting, the deviation can only be profitable if G_2 is also reelected for acting unilaterally, so $s_{01} > e_2$, which further implies that $s_{01} > 1 - e_1$, and so it must be the case that G_1 is removed after unilateral action by G_2. But then G_1 has no incentive to induce the unilateral bailout by G_2 by failing to act when the crisis is serious, which means that citizens must assign zero probability to this event. Thus, the only way a unilateral bailout by G_2 could be profitable is when it is induced by G_2 itself in a mild crisis, which means that citizens cannot believe that it is serious with a high enough probability to retain G_2 for acting unilaterally. In other words, the equilibrium is also intuitive in mixed dyads.

Finally, observe that no collusive agreement can be had in this dyad. Either government would refuse a group deviation to inaction in a serious crisis: $1 - w_i \theta_i - t_i \alpha_i C < 1 - t_i \alpha_i C$,

and the nationalist government would refuse to collude in a mild crisis: $1 - \alpha_i C < 1 - \theta_i$, which holds by (A1).

PRO-EU DYAD. Proof is in the body of the article. ∎

Proof of Lemma 1 Assume that both governments act when the crisis is serious: $\sigma_i = 1$.

Suppose $\mu_i \in (0, 1)$. Bayes rule then pins down $s_{00} = s_{10} = s_{01} = 0$, which means that governments are removed for acting unilaterally, $p_1(s_{10}) = p_2(s_{01}) = 0$, retained when the other government acts unilaterally, $p_1(s_{01}) = p_2(s_{10}) = 1$, and retained if they do not act at all $p_i(s_{00}) = 1$. But since

$$
\begin{aligned}
U_1(\sim a, \mu_2) - U_1(a, \mu_2) &= 1 + t_1 C - \theta_1 - \mu_2 \left[p_1(s_{11}) + t_1 C - \theta_1 - t_1 \alpha_1 C \right] \\
&\geq 1 + t_1 C - \theta_1 - \mu_2 \left[1 + t_1 C - \theta_1 - t_1 \alpha_1 C \right] \\
&= (1 - \mu_2) \left[1 + t_1 C - \theta_1 \right] + \mu_2 t_1 \alpha_1 C \\
&> 0,
\end{aligned}
$$

where the last inequality follows from (A3), G_1 has a strict incentive not to act, contradicting the assumption that it mixes. Thus, if one government mixes, the other must be doing nothing when the crisis is mild.

Suppose that $\mu_1 = 0$ and $\mu_2 \in (0, 1)$. Bayes rule pins down $s_{11} = 1$ and $s_{01} = s_{00} = 0$, which means that both governments are retained after a multilateral bailout and after inaction, $p_i(s_{11}) = p_i(s_{00}) = 1$, and only G_1 is retained after a unilateral bailout by G_2: $p_1(s_{01}) = 1$ and $p_2(s_{01}) = 0$. But in this case, $U_2(\mu_1, \sim a) = 1 - \theta_2 > -t_2 C = U_2(\mu_1, a)$, so G_2 strictly prefers not to act as well. The case with $\mu_1 \in (0, 1)$ and $\mu_2 = 0$ is equivalent, *mutatis mutandis*.

Suppose that $\mu_i = 0$. We have already analyzed this in Proposition 1.

Suppose finally that $\mu_i = 1$. Bayes rule pins down only $s_{11} = s$. If $s < e_i$, then $p_i(s_{11}) = 0$, but then G_i expects $-t_i \alpha_i C$ if it acts and at least 0 if it does not act, so it strictly prefers not to act. Thus, $\mu_i = 1$ can only be supported in equilibrium if $p_i(s_{11}) = 1$, so a necessary condition is that $s \geq \bar{s}$. ∎

Proof of Proposition 2 By Lemma 1, we know that this equilibrium can only exist when $s \geq \bar{s}$. Since both governments act, neither government should have an incentive to shift the burden onto the other. For G_1, this means that $U_1(a, a) = 1 - t_1 \alpha_1 C \geq p_1(s_{01}) = U_1(\sim a, a)$, which certainly obtains for $p_1(s_{01}) = 0$. Thus, the equilibrium requires that both governments are removed with sufficiently high probability when their counterpart acts unilaterally: $p_1(s_{01}) = p_2(s_{10}) = 0$.

Consider now collusion-proofness. Since a multilateral bailout results in reelection, acting in a serious crisis is strictly preferable than colluding on inaction regardless of the probability of reelection after inaction: $U_i(a, a|s) = 1 - t_i \alpha_i C > 1 - w_i \theta_i - t_i \alpha_i C \geq U_i(\sim a, \sim a|s)$. The only possibly profitable collusion would be to not act in a mild crisis. However, not even a nationalist government would be interested in inaction if it expects to lose the elections: $U_i(a, a|m) = 1 - t_i \alpha_i C > -\theta_i$, so $p_i(s_{00}) = 0$ is sufficient to ensure that the equilibrium is collusion-proof.

Since both governments always act, unilateral bailouts can be induced by either government failing to act regardless of the nature of the crisis. The second requirement for an

intuitive equilibrium has no bite. Is there a deviation that can profit a government only in one type of crisis so that citizens could infer the type of crisis from that deviation? If G_i deviated and failed to act but the citizens inferred that the crisis is mild and retained G_i, then the deviation would be profitable: $1 > 1 - t_i\alpha_i C$. However, if voters reacted in this way to a unilateral bailout by G_{-i}, then G_i would also have an incentive not to act even when the crisis is serious. Thus, citizens cannot make such an inference, which means that the assessments forming the equilibrium are intuitive. ∎

Proof of Lemma 2 Consider a dyad that never acts when the crisis is mild: $\mu_i = 0$.

Suppose first that $\sigma_i \in (0, 1)$. Bayes rule pins down $s_{11} = s_{10} = s_{01} = 1$, so both are retained after a multilateral bailout, $p_i(s_{11}) = 1$, and only the one that acts unilaterally is retained, $p_1(s_{10}) = p_2(s_{01}) = 1$ and $p_1(s_{01}) = p_2(s_{10}) = 0$. But now

$$
\begin{aligned}
U_1(a, \sigma_2) &= \sigma_2(1 - t_1\alpha_1 C) + (1 - \sigma_2)(1 - t_1 C) \\
&\geq 1 - t_1 C \\
&> 1 - w_1\theta_1 - t_1\alpha_1 C \\
&\geq \sigma_2(0) + (1 - \sigma_2)(p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C) = U_1(\sim a, \sigma_2),
\end{aligned}
$$

where the second inequality follows from (A1). Thus, G_1 strictly prefers to act in a serious crisis, a contradiction.

Suppose that $\sigma_1 = 1$ while $\sigma_2 \in (0, 1)$. Bayes rule pins down $s_{11} = s_{10} = 1$, so $p_i(s_{11}) = 1$ but $p_1(s_{10}) = 1$ and $p_2(s_{10}) = 0$; that is, both governments are retained after a multilateral bailout but only G_1 is when it acts unilaterally. But this implies that G_2 will be unwilling to mix because it strictly prefers to act as well: $U_2(a, a) = 1 - t_2\alpha_2 C \geq 1 - \alpha_2 C > 0 = U_2(a, \sim a)$, where the second inequality follows from (A2). The case with $\sigma_1 \in (0, 1)$ and $\sigma_2 = 1$ is the same, *mutatis mutandis*.

Suppose that $\sigma_1 = 0$ while $\sigma_2 \in (0, 1)$. Bayes rule pins down $s_{01} = 1$, so $p_1(s_{01}) = 0$ and $p_2(s_{01}) = 1$; that is, only G_2 is retained after it acts unilaterally. But then G_2's payoff from acting when the crisis is serious is $U_2(\sim a, a) = 1 - t_2 C > 1 - w_2\theta_2 - t_2\alpha_2 C \geq U_2(\sim a, \sim a)$, where the inequality follows from (A1). Thus, G_2 would strictly prefer to act. The case with $\sigma_1 \in (0, 1)$ and $\sigma_2 = 0$ is the same, *mutatis mutandis*.

Suppose that $\sigma_i = 1$. We have already analyzed this in Proposition 1.

Suppose finally that $\sigma_i = 0$. Bayes rule pins down $s_{00} = s$. If $s > 1 - e_i$, then $p_i(s_{00}) = 0$, so G_i's payoff from inaction is $-w_i\theta_i - t_i\alpha_i C$, which is strictly worse than the minimum payoff from unilateral action, $-t_i C$ (where the inequality follows from (A1)), so G_i strictly prefers to act. Thus, $\sigma_i = 0$ can only be supported in equilibrium when $p_i(s_{00}) = 1$, so a necessary condition is that $s \leq \underline{s}$.

Finally, it must be the case that reelection for inaction is sufficient to prevent unilateral action: $1 - w_1\theta_1 - t_1\alpha_1 C \geq p_1(s_{10}) - t_1 C$, which requires that $p_1(s_{10})$ be sufficiently low (the inequality is violated at $p_1(s_{10}) = 1$ by (A1)). Since we can write this as

$$
w_1 \leq \frac{1 - p_1(s_{10}) + t_1(1 - \alpha_1)C}{\theta_1},
$$

another necessary condition is that it is satisfied at $p_1(s_{10}) = 0$, or that $w_1 \leq \overline{w}_1$. Since this applies to G_2 as well, we obtain the requirement stated in the lemma. ∎

Proof of Proposition 3 We know from Lemma 2 that the probability of reelection after unilateral action should be sufficiently low, so if the equilibrium does not exist with $p_1(s_{10}) = p_2(s_{01}) = 0$, it will not exist with any other beliefs. With these beliefs and the conditions in the proposition, no government has an incentive to act regardless of the crisis.

Consider now collusion-proofness. Since inaction has worse consequences when the crisis is serious, it will be sufficient to show that governments have no incentives to collude on acting in such a crisis. Suppose that collusion is profitable in a serious crisis: $p_i(s_{11}) - t_i \alpha_i C > 1 - w_i \theta_i - t_i \alpha_i C$ (this would be true even if $p_i(s_{11}) = 0$ as long as $1/\theta_i < w_i \leq \overline{w}_i$). Such a collusive agreement cannot be sustained because each government has an incentive to renege from it given that the other will provide the bailout. For instance, under our assessment, G_1's payoff from reneging on the collusive agreement is $p_1(s_{01}) = 1$. Since the collusive agreement is not credible, the equilibrium is always collusion-proof.

Since neither government is supposed to act, unilateral bailouts can be induced by either government acting regardless of the nature of the crisis, so the second intuitive requirement has no bite.

The only deviation is for a government to act, which might be profitable if voters were to infer that the crisis is serious and retained the acting government. If G_i were to act in a serious crisis in the expectation that the voters retain it, the payoff would be $1 - t_i C > 1 - w_i \theta_i - \delta \alpha_i C$, where the inequality follows from (A1).

Would this provide an incentive to G_i to deviate in a mild crisis? If G_i is pro-EU, the answer is yes: $1 - \delta C > 1 - \theta_i$, where the inequality follows from (A3). Thus, a government in a pro-EU dyad cannot credibly induce the profitable beliefs by deviating, which means that the equilibrium is intuitive.

If G_i is nationalist, however, the answer is no: $1 - C < 1 - \theta_i$, where the inequality follows from (A1). Thus, the nationalist government in a mixed dyad can credibly induce the profitable beliefs because it would only engage in a unilateral bailout when the crisis is serious. Thus, the equilibrium is not intuitive for mixed dyads. ∎

We now establish some helpful general results without reference to the type of governments in the dyad.

LEMMA B. *Citizens cannot generically act probabilistically in both countries for any given contingency.* □

Proof. Pick any contingency, say s_{11}, and recall that citizens in i will only act probabilistically if $s_{11} = e_i$. If citizens in both countries were to act probabilistically, the necessary condition is $s_{11} = e_1 = e_2$, but $e_1 = e_2$ is not generic. ∎

This result implies that in any generic equilibrium, if citizens in i act probabilistically in any given contingency, the citizens in $-i$ must either retain their government or remove it with certainty. We now eliminate a collection of profiles as candidates for equilibria.

LEMMA C. *There exists no equilibrium where both players mix in one type of crisis but do not both mix in the other type of crisis: $\sigma_i \in (0,1) \ \forall i \Leftrightarrow \mu_i \in (0,1) \ \forall i$.* □

Proof. We first show that if both players mix when the crisis is serious, then they must both mix when the crisis is mild. Consider the general case where $\sigma_i \in (0,1)$, so both

mix when the crisis is serious, not necessarily with the same probabilities. Consider the strategies when the crisis is mild:

Case I: $\mu_i = 0$: by Lemma 2, either $\sigma_i = 1$ or $\sigma_i = 0$, so no equilibrium where they mix when the crisis is serious.

CASE II: $\mu_i = 1$: since inaction occurs with positive probability only when the crisis is serious, $s_{00} = 1$, both governments must be removed in that case: $p_i(s_{00}) = 0$. Since governments prefer to act when the crisis is mild, $U_1(a, a|m) \geq U_1(\sim a, a|m)$, or

$$p_1(s_{11}) - t_1 \alpha_1 C \geq p_1(s_{01}).$$

But since G_1 must also be indifferent when the crisis is serious, $U_1(a, \sigma_2) = U_1(\sim a, \sigma_2)$, or:

$$\sigma_2(p_1(s_{11}) - t_1 \alpha_1 C) + (1 - \sigma_2)(p_1(s_{10}) - t_1 C)$$
$$= \sigma_2 p_1(s_{01}) + (1 - \sigma_2)(-w_1 \theta_1 - t_1 \alpha_1 C).$$

This equality cannot be satisfied given the inequality above. To see this, it is sufficient to establish that $p_1(s_{10}) - t_1 C > -w_1 \theta_1 - t_1 \alpha_1 C$. This inequality will certainly hold if it is satisfied at $p_1(s_{10}) = 0$. But then we can re-write it as $w_1 \theta_1 > t_1(1 - \alpha_1)C$, which holds by (A3) because $w_1 \theta_1 > C > t_1(1 - \alpha_1)C$. It then follows that $U_1(a, \sigma_2) > U_1(\sim a, \sigma_2)$, so G_1 will not mix when the crisis is serious.

CASE III: only one of the players mixes when the crisis is mild. WLOG, let $\mu_2 \in (0, 1)$. There are two possibilities. Suppose first that $\mu_1 = 1$, in which case Bayes rule pins down $s_{00} = s_{01} = 1$, which imply that $p_1(s_{00}) = p_1(s_{01}) = 0$, so G_1 is always removed for failing to act. But then acting in a serious crisis is strictly better than not acting:

$$U_1(a, \sigma_2) = \sigma_2(p_1(s_{11}) - t_1 \alpha_1 C) + (1 - \sigma_2)(p_1(s_{10}) - t_1 C)$$
$$> -t_1 C > -w_1 \theta_1 - t_1 \alpha_1 C = U_1(\sim a, \sigma_2),$$

a contradiction of the supposition that G_1 is willing to mix in a serious crisis.

Suppose now that $\mu_1 = 0$, in which case Bayes rule pins down $s_{11} = s_{10} = 1$, which imply that $p_2(s_{11}) = 1$ and $p_2(s_{10}) = 0$. Since G_1 does not act when the crisis is mild but G_2 is willing to mix, it follows that $U_2(\sim a, a|m) = U_2(\sim a, \sim a|m)$ must obtain, so $p_2(s_{01}) - t_2 C = p_2(s_{00}) - \theta_2$. But now

$$U_2(\sigma_1, a) = \sigma_1(1 - t_2 \alpha_2 C) + (1 - \sigma_1)(p_2(s_{01}) - t_2 C)$$
$$= \sigma_1(1 - t_2 \alpha_2 C) + (1 - \sigma_1)(p_2(s_{00}) - \theta_2)$$
$$> \sigma_1(0) + (1 - \sigma_1)(p_2(s_{00}) - w_2 \theta_2 - t_2 \alpha_2 C) = U_2(\sigma_1, \sim a),$$

which contradicts the supposition that G_2 mixes in a serious crisis.

This exhausts the possibilities, so it cannot be the case that only one player mixes in a mild crisis when both mix in a serious one. The sole remaining possibility, of course, is that they both mix when the crisis is mild.

We now show that if both players mix when the crisis is mild, then they must both mix when the crisis is serious. Suppose $\mu_i \in (0, 1)$, and consider the three possibilities for a serious crisis.

CASE I: $\sigma_i = 1$, in which case Lemma 1 implies that either $\mu_i = 0$ or $\mu_i = 1$, a contradiction.

CASE II: $\sigma_i = 0$, in which case Bayes rule pins down $s_{11} = s_{10} = s_{01} = 0$. This means that $p_1(s_{11}) = p_1(s_{10}) = 0$ and that $p_1(s_{01}) = 1$. Since G_1 is willing to mix when the crisis is mild,

$$U_1(a, \mu_2) = \mu_2(-t_1\alpha_1 C) + (1 - \mu_2)(-t_1 C) = \mu_2 + (1 - \mu_2)(p_1(s_{00}) - \theta_1),$$

so a necessary condition for this to be satisfied is $-t_1 C > p_1(s_{00}) - \theta_1$. But since G_1 prefers not to act in a serious crisis when G_2 does not act either, it follows that

$$U_1(a, \sim a|s) = -t_1 C \le U_1(\sim a, \sim a|s) = p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C < p_1(s_{00}) - \theta_1,$$

a contradiction with the necessary requirement we derived above.

CASE III: only one of the players mixes when the crisis is serious. WLOG, let $\sigma_2 \in (0, 1)$, so we have two possibilities to consider. Suppose first that $\sigma_1 = 1$, in which case Bayes rule pins down $s_{00} = s_{01} = 0$, which imply that $p_2(s_{00}) = 1$ and that $p_2(s_{01}) = 0$. Since G_2 mixes in a serious crisis when G_1 acts, it follows that $U_2(a, a|s) = U_2(a, \sim a|s)$, and so $p_2(s_{11}) - t_2\alpha_2 C = p_2(s_{10})$. But now

$$\begin{aligned} U_2(\mu_1, a|m) = \mu_1(p_2(s_{11}) - t_2\alpha_2 C) + (1 - \mu_1)(-t_2 C) \\ < \mu_1 p_2(s_{10}) + (1 - \mu_1)(1 - \theta_2) = U_2(\mu_1, \sim a|m), \end{aligned}$$

where the inequality follows from the implication above and the fact that $-t_2 C < 0 < 1 - \theta_2$. This contradicts the supposition that G_2 is willing to mix in a mild crisis.

Suppose now that $\sigma_1 = 0$, in which case Bayes rule pins down $s_{11} = s_{10} = 0$, so $p_2(s_{11}) = 0$ and $p_2(s_{10}) = 1$. Since G_2 is willing to mix in a mild crisis, it must be that

$$U_2(\mu_1, a|m) = \mu_1(-t_2\alpha_2 C) + (1 - \mu_1)(p_2(s_{01}) - t_2 C) = \mu_1(1) + (1 - \mu_1)(p_2(s_{00}) - \theta_2),$$

and a necessary condition for this to hold is that $p_2(s_{00}) - \theta_2 < p_2(s_{01}) - t_2 C$. But since G_1 does not act in a serious crisis,

$$U_2(\sim a, \sim a|s) = p_2(s_{00}) - w_2\theta_2 - t_2\alpha_2 C < p_2(s_{00}) - \theta_2 < p_2(s_{01}) - t_2 C = U_2(\sim a, a|s),$$

contradicting the supposition that G_2 mixes when the crisis is serious.

This exhausts the possibilities, so it cannot be the case that only one player mixes in a serious crisis when both mix in a mild one. The sole remaining possibility, of course, is that they both mix when the crisis is serious. ∎

LEMMA D. *If neither government acts when the crisis is serious, then neither government acts when the crisis is mild either:* $\sigma_i = 0 \; \forall i \Rightarrow \mu_i = 0 \; \forall i.$ □

Proof. Suppose neither player acts when the crisis is serious, $\sigma_i = 0$, but one of them, say G_1, acts with positive probability when the crisis is mild, $\mu_1 \in (0, 1]$. Suppose first that $\mu_2 = 0$, in which case Bayes rule pins down $s_{10} = 0$, so $p_1(s_{10}) = 0$. Since G_1 prefers not to act in a serious crisis, $U_1(\sim a, \sim a|s) \ge U_1(a, \sim a|s)$, or $p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C \ge -t_1 C$.

But since G_1 cannot fail to act with positive probability in a mild crisis while G_2 does not act, $U_1(a, \sim a|m) \geq U_1(\sim a, \sim a|m)$, or $-t_1 C \geq p_1(s_{00}) - \theta_1 > p_1(s_{00}) - w_1 \theta_1 - t_1 \alpha_1 C$, a contradiction.

Suppose now that $\mu_2 = 1$, so Bayes rule pins down $s_{11} = 0$, so $p_1(s_{11}) = 0$. But then $U_1(\sim a, a|m) = p_1(s_{01}) \geq 0 > -t_1 \alpha_1 C = U_1(a, a|m)$, so G_1 would not mix when the crisis is mild, a contradiction.

Suppose now that $\mu_2 \in (0, 1)$. But then Lemma C implies that $\sigma_i \in (0, 1)$, a contradiction. ∎

LEMMA E. *If one government does not act in a serious crisis, then the other cannot mix:* $\sigma_i = 0 \Rightarrow \sigma_{-i} \in \{0, 1\}$. □

Proof. Assume $\sigma_1 = 0$ and $\sigma_2 \in (0, 1)$. Since G_2 is willing to mix in a serious crisis,

$$U_2(\sim a, a|\cdot) = p_2(s_{01}) - t_2 C = p_2(s_{00}) - w_2 \theta_2 - t_2 \alpha_2 C = U_2(\sim a, \sim a|s)$$
$$> p_2(s_{00}) - \theta_2 = U_2(\sim a, \sim a|m),$$

so $\mu_2 = 1$ in any equilibrium. Bayes rule then pins down $s_{00} = 1$, so $p_2(s_{00}) = 0$. But then G_2 will not be willing to mix because $p_2(s_{01}) - t_2 C \geq t_2 C > -w_2 \theta_2 - t_2 \alpha_2 C$. Thus, there exists not equilibrium of this type. ∎

Proof of Lemma 3 Assume that $\sigma_1 = 1$ and $\sigma_2 = 0$. We have three cases to consider.

CASE I: $\mu_1 = 1$. Suppose that $\mu_2 \in (0, 1]$, in which case $s_{11} = 0$, so $p_2(s_{11}) = 0$. But then $U_2(a, a|m) = -t_2 \alpha_2 C < 0 \leq p_2(s_{10}) = U_2(a, \sim a|m)$, so G_2 strictly prefers not to act in mild crisis, a contradiction.

Suppose now that $\mu_2 = 0$, so $s_{10} = s$. Since G_2 can induce s_{11} and G_1 can induce s_{00} regardless of the crisis type, the second intuitive requirement has no bite for these off-the-path beliefs. Since G_1 prefers to act in a mild crisis, $p_1(s_{10}) - t_1 C \geq p_1(s_{00}) - \theta_1$. We now have two cases to consider.

First, if $s_{10} = s < e_1$, then $p_1(s_{10}) = 0$, so the condition is $p_1(s_{00}) \leq \theta_1 - t_1 C$. If G_1 is nationalist, $\theta_1 - C < 0$, so the condition cannot be satisfied. If G_1 is pro-EU, then $p_1(s_{00}) \leq \theta_1 - \delta C < 1$. If this belief intuitive? Suppose G_1 were to deviate to inaction when the crisis is mild. If doing so convinced citizens to reelect it, the deviation would be strictly profitable. This inference would be valid (and the equilibrium belief non-intuitive) if G_1 does not have an incentive to deviate if the crisis is serious even though doing so would get it reelected. For this, $1 - w_1 \theta_1 - \delta \alpha_1 C < -\delta C$, or $w_1 > \overline{w}_1$ is required. In other words, the equilibrium is intuitive when $s < e_1$ only if G_1 is pro-EU and $w_1 \leq \overline{w}_1$.

If $s_{10} = s > e_1$, then $p_1(s_{10}) = 1$, and the requirement is $1 - t_1 C \geq p_1(s_{00}) - \theta_1$. This is always satisfied if G_1 is pro-EU. If G_1 is nationalist, however, the requirement is that $p_1(s_{00}) \leq 1 - (C - \theta_1) < 1$. Is this belief intuitive? If G_1 were to deviate to inaction in a mild crisis and if doing so got it reelected, then such a deviation would be profitable. But since $1 - C > 1 - w_1 \theta_1 - \alpha_1 C$, such a deviation would not be profitable if the crisis is serious even if it resulted in reelection. This means that citizens can safely infer that the deviation had taken place in a mild crisis, so the belief is not intuitive. In other words, the equilibrium is intuitive when $s > e_1$ only if G_1 is pro-EU.

CASE II: $\mu_1 = 0$. Suppose that $\mu_2 \in (0, 1)$, in which case $s_{00} = s_{01} = 0$, so $p_2(s_{00}) = 1$ and $p_2(s_{01}) = 0$. But then $U_2(\sim a, \sim a|m) = 1 - \theta_2 > 0 > -t_2 C = U_2(\sim a, a|m)$, so G_2 strictly prefers to not act, a contradiction.

Suppose now that $\mu_2 = 1$, in which case $s_{10} = 1$ and $s_{01} = 0$ so that $p_2(s_{10}) = p_2(s_{01}) = 0$. Since G_2 must prefer to act in a mild crisis, $U_2(\sim a, a|m) = -t_2 C \geq p_2(s_{00}) - \theta_2 = U_2(\sim a, \sim a|m)$ must obtain. Thus, $p_2(s_{00}) \leq \theta_2 - t_2 C$ is required. If G_2 is nationalist, $\theta_2 - C < 0$ by (A1), so this requirement cannot be satisfied. If G_2 is pro-EU, then $p_2(s_{00}) \in (0, 1)$, so $s_{00} = 1 - e_2$.

This belief, however, is not intuitive. To see this, suppose G_2 were to deviate to inaction when the crisis is mild and the citizens correctly inferred at s_{00} that the crisis is mild so that $p_2(s_{00}) = 1$. Given then strategies, the only other way this outcome can be induced if by G_1 not acting when the crisis is serious, but then G_1's best possible payoff from this deviation would be $U_1(\sim a, \sim a|s) = 1 - w_1 \theta_1 - t_1 \alpha_1 C < 1 - t_1 C = U_1(a, \sim a|s)$, making it unprofitable. Thus, citizens can safely infer $s_{00} = 0$, making the inference $s_{00} = 1 - e_2$ nonintuitive.

Suppose finally that $\mu_2 = 0$, in which case $s_{10} = 1$ and $s_{00} = 0$, so that $p_1(s_{10}) = 1$, $p_2(s_{10}) = 0$, and $p_i(s_{00}) = 1$. Since G_1 prefers not to act in a mild crisis, $U_1(\sim a, \sim a|m) = 1 - \theta_1 \geq 1 - t_1 C = U_1(a, \sim a|m)$ must obtain, so $t_1 C \geq \theta_1$ is required. By (A1) and (A3), this inequality is only satisfied if G_1 is nationalist. We now show, however, that in this case the equilibrium is not intuitive. Since G_2 is supposed not to act in a serious crisis, it must be that $U_2(a, \sim a|s) = 0 \geq p_2(s_{11}) - t_2 \alpha_2 C = U_2(a, a|s)$, which requires that $p_2(s_{11}) < 1$. But since G_2 is the only one who can induce s_{11} with a unilateral deviation and can do so only when the crisis is serious, the intuitive requirement is that $s_{11} = 1$ so $p_2(s_{11}) = 1$, a contradiction.

CASE III: $\mu_1 \in (0, 1)$. Suppose that $\mu_2 \in (0, 1)$. But then Lemma C tells us that $\sigma_i \in (0, 1)$ for both players, a contradiction.

Suppose now that $\mu_2 = 1$, in which case $s_{11} = s_{01} = 0$ and $s_{10} = 1$ so that $p_i(s_{11}) = 0$, $p_1(s_{10}) = p_1(s_{01}) = 1$, and $p_2(s_{10}) = p_2(s_{01}) = 0$. But now $U_1(a, a|m) = p_1(s_{11}) - t_1 \alpha_1 C = -t_1 \alpha_1 C < 1 = p_1(s_{01}) = U_1(\sim a, a|m)$, which means that G_1 strictly prefers not to act in a mild crisis, a contradiction.

Finally, suppose that $\mu_2 = 0$, in which case $s_{00} = 0$ and $s_{10} = s/[s + \mu_1(1 - s)]$, so $p_i(s_{00}) = 1$. Observe that s_{01} can only be induced with positive probability by G_2 acting when the crisis is mild, so the intuitive requirement pins down $s_{01} = 0$, so that $p_1(s_{01}) = 1$ and $p_2(s_{01}) = 0$. (In contrast, s_{11} could be induced by G_2 irrespective of the nature of the crisis, so this requirement places no restrictions there.)

Since G_1 is willing to mix in a mild crisis, $U_1(a, \sim a|m) = p_1(s_{10}) - t_1 C = 1 - \theta_1 = U_1(\sim a, \sim a|m)$, so $p_1(s_{10}) = 1 + t_1 C - \theta_1$. By (A1), $1 + C - \theta_1 > 1$, so this requirement cannot be satisfied if G_1 is nationalist. If, on the other hand, G_1 is pro-EU, then $1 + \delta C - \theta_1 \in (0, 1)$ because $1 + \delta C > \theta_1 > \delta C$ by (A3). Since $p_1(s_{10}) \in (0, 1)$ requires $s_{10} = e_1$, we obtain $\mu_1 = (1 - e_1)s/[e_1(1 - s)]$, which is only valid if $s < e_1$.

We now show that this supposed equilibrium is not collusion-proof. Since G_2 prefers not to act in a serious crisis, $U_2(a, \sim a|s) \geq U_2(a, a|s)$, or

$$p_2(s_{10}) \geq p_2(s_{11}) - t_2 \alpha_2 C. \tag{3}$$

Recall that G_2's expected payoff when the crisis is mild is $\mu_1 p_2(s_{10}) + (1 - \mu_1)(1 - \theta_2)$.

Since $s_{10} = e_1$, we have only two generic possibilities to consider. If $s_{10} < 1 - e_2$ (i.e., governments are not jointly vulnerable), then $p_2(s_{10}) = 1$. But then G_2 can strictly benefit if G_1 were to provide a unilateral bailout with certainty while G_1 will continue to be indifferent. This agreement is Pareto-improving and will be credible as long as G_2 does not want to break it. When G_1 acts with certainty, $U_2(a, \sim a|m) = p_2(s_{10}) \geq p_2(s_{11}) - t_2\alpha_2 C = U_2(a, a|m)$, where the inequality holds by (3), so G_2 will not be willing to break it. Thus, the equilibrium is not collusion-proof when governments are not jointly vulnerable.

If $s_{10} > 1 - e_2$ (i.e., governments are jointly vulnerable), then $p_2(s_{10}) = 0$. Since $1 - \theta_2 > 0$, G_2 can strictly benefit if G_1 were not to act at all, and since G_1 will continue to be indifferent, this agreement is Pareto-improving. It would also be credible if G_2 is unwilling to break it by deviating to a unilateral bailout. If $U_2(\sim a, a|m) = p_2(s_{01}) - t_2 C \leq 1 - \theta_2$, then the agreement would be credible, and the equilibrium will not be collusion-proof. Suppose, then, that $p_2(s_{01}) - t_2 C > 1 - \theta_2$, or $p_2(s_{01}) > 1 + t_2 C - \theta_2$. This inequality can only be satisfied if G_2 is pro-EU because otherwise $1 + C - \theta_2 > 1$ by (A1). When G_2 is pro-EU, $p_2(s_{01}) \in (0, 1)$ by (A3), which contradicts the requirement that the only intuitive belief is $s_{01} = 0$, which means that $p_2(s_{01}) = 0$. Thus, even a pro-EU government will not want to break the collusive agreement, which means that the equilibrium is not collusion-proof when governments are jointly vulnerable either. ∎

Proof of Proposition 4 Assume that G_1 is pro-EU and $\sigma_1 = \mu_1 = 1$ while $\sigma_2 = \mu_2 = 0$. Since $s_{10} = s$, we need to consider two generic case.

CASE I: $s > e_1$, so $p_1(s_{10}) = 1$. This implies that G_1's strategy is optimal regardless of the off-the-path beliefs: $U_1(a, \sim a|\cdot) = 1 - \delta C > 1 - \theta_1 = \max U_1(\sim a, \sim a|m) > 1 - w_1\theta_1 - \delta\alpha_1 C = \max U_1(\sim a, \sim a|s)$.

Consider now G_2's strategy. Again, there are two generic possibilities. If $s < 1 - e_2$, then $p_2(s_{10}) = 1$, so G_2's strategy yields the highest possible payoff in both contingencies (reelection after a bailout by the other player). This means that G_2 would have no incentive to participate in any collusive agreement. Moreover, since G_1's strategy is optimal regardless of the off-the-path beliefs, this further implies that the equilibrium is intuitive. This equilibrium requires that $e_1 < s < 1 - e_2$.

The other possibility is that $s > 1 - e_2$, so $p_2(s_{10}) = 0$; that is, G_2 is always removed in equilibrium. To refrain from acting in this case, it must be that there is not sufficient benefit from a bilateral bailout $U_2(a, \sim a|\cdot) = 0 \geq p_2(s_{11}) - t_2\alpha_2 C = U_2(a, a|\cdot)$, which means that $p_2(s_{11}) \leq t_2\alpha_2 C < 1$, so $s_{11} \leq e_2$ is required. This belief is intuitive because if G_2 were to get reelected at s_{11}, then it would have an incentive to deviate irrespective of the nature of the crisis.

The only potentially beneficial collusive agreement is to a unilateral bailout by G_2. This collusion can be prevented as long as either $p_1(s_{01}) \leq 1 - \delta C$ or $p_2(s_{01}) - \delta C \leq 0$; that is, as long as at least one of the governments does not get reelected with high probability after a unilateral bailout by G_2. Thus, either $s_{01} \geq 1 - e_1$ or $s_{01} \leq e_2$ would work.

To summarize, when $s > e_1$, then the equilibrium requires nothing further when governments are not jointly vulnerable, and requires that $s_{11} \leq e_2$ and either $s_{01} \geq 1 - e_1$ or $s_{01} \leq e_2$ when $s > \max(e_1, 1 - e_2)$.

CASE II: $s < e_1$, so $p_1(s_{10}) = 0$, so G_1 is always removed in equilibrium. This requires

that G_1 act when the crisis is mild, so $-\delta C \geq p_1(s_{00}) - \theta_1$, or $p_1(s_{00}) \leq \theta_1 - \delta C < 1$; that is, it cannot be reelected with high probability after inaction, or $s_{00} \geq 1 - e_1$. (This also ensures the optimality of acting in a serious crisis.)

Consider now G_2's strategy. Again, there are two generic possibilities. If $s > 1 - e_2$, so $p_2(s_{10}) = 0$; that is, G_2 is also always removed in equilibrium. As before, this means that there is not enough benefit from a bilateral bailout, so $p_2(s_{11}) \leq \delta\alpha_2 C$, so $s_{11} \leq e_2$ is required. The only potentially beneficial collusive agreement is to deviate to a unilateral bailout by G_2. Although G_1 always wants to collude regardless of the probability of reelection in that contingency, G_2 would not agree to collude as long as $p_2(s_{01}) - \delta C < 0$, which requires $s_{01} \leq e_2$. This equilibrium will be intuitive as long as no player can induce citizens to reelect it. Consider G_1: if it deviated to inaction in a mild crisis and doing so persuaded the citizens to reelect it, this deviation would be profitable in a serious crisis as well as long as $w_1 \leq \overline{w}_1$. Analogously, reelection would give G_2 the same incentive to deviate to a bilateral bailout in both contingencies. Thus, the equilibrium is also intuitive. This equilibrium requires that $1 - e_2 < s < e_1$.

If $s < 1 - e_2$, then $p_2(s_{10}) = 1$, so G_2's strategy yields the highest possible payoff in both contingencies (reelection after a bailout by the other player). This means that G_2 would have no incentive to participate in any collusive agreement. The equilibrium will also be intuitive if there is no way for G_1 to persuade citizens to retain it after inaction. Suppose G_1 deviated in a mild crisis and got reelected. Citizens would do this only if G_1 has no incentive to deviate in a serious crisis as well. This requires that $1 - w_1\theta_1 - \delta\alpha_1 C \leq -\delta C$, or $w_1 > \overline{w}_1$. In other words, this equilibrium is also intuitive provided $w_1 \leq \overline{w}_1$. This equilibrium requires that $s < \min(e_1, 1 - e_2)$.

The necessary conditions on s partition the possibilities into the four cases listed in the proposition. ∎

B Limited Burden-Sharing

We now ask under what conditions some limited burden-sharing is possible. We first show that when some such limited cooperation occurs, one of the governments must carry most of the burden regardless of the nature of the crisis (in this the result is equivalent to burden-shifting), and that the other must also be cooperating irrespective of the crisis.

LEMMA F. *If $\sigma_i = 1$ and $\sigma_{-i} \in (0, 1)$, then $\mu_i = 1$ and $\mu_{-i} \in (0, 1)$ in any intuitive collusion-proof equilibrium.* □

Proof.   Assume $\sigma_1 = 1$ and $\sigma_2 \in (0, 1)$. There are three cases to consider.

CASE I: Suppose that $\mu_1 = 0$, in which case $s_{11} = 1$ and $s_{10} = 1$, so $p_i(s_{11}) = 1$ and $p_2(s_{10}) = 0$. But then $U_2(a, a|s) = 1 - t_2\alpha_2 C > 0 = p_2(s_{10}) = U_2(a, \sim a|s)$, so G_2 strictly prefers to act when the crisis is serious, a contradiction.

CASE II: Suppose that $\mu_1 \in (0, 1)$. By Lemma C, we need only consider $\mu_2 = 1$ or $\mu_2 = 0$ (because if $\mu_2 \in (0, 1)$, then both must mix in a serious crisis).

Consider first $\mu_2 = 0$, in which case $s_{11} = 1$ and $s_{00} = 0$, so $p_i(s_{11}) = p_i(s_{00}) = 1$. The indifference condition for G_1 in a mild crisis then becomes $U_1(a, \sim a|m) = p_1(s_{10}) - t_1 C = 1 - \theta_1 = U_1(\sim a, \sim a|m)$. If G_1 is nationalist, this condition cannot be satisfied

because $p_1(s_{10}) - C \leq 1 - C < 1 - \theta_1$ by (A1). If G_1 is pro-EU, the condition is $p_1(s_{10}) = 1 + \delta C - \theta_1 \in (0,1)$, because $\delta C < \theta_1 < 1 + \delta C$ by (A3). This requires that $s_{10} = e_1$. The indifference condition for G_2 in a serious crisis is $1 - t_2\alpha_2 C = p_2(s_{10})$. By (A2), this implies that $p_2(s_{10}) \in (0,1)$, so $s_{10} = 1 - e_2$. By Lemma B, this is not a generic solution, so no such equilibrium exists.

Consider now $\mu_2 = 1$, in which case $s_{10} = 1$, and $s_{01} = 0$, so $p_1(s_{10}) = p_1(s_{01}) = 1$. But then $U_1(a, a|m) = p_1(s_{11}) - t_1\alpha_1 C < 1 = p_1(s_{01}) = U_1(\sim a, a|m)$, so G_1 strictly prefers not to act in a mild crisis, a contradiction.

CASE III: Suppose that $\mu_1 = 1$. We have three subcases to consider.

Consider first $\mu_2 = 1$, in which case $s_{10} = 1$, so $p_1(s_{10}) = 1$ and $p_2(s_{10}) = 0$. Since G_2 mixes in a serious crisis, $U_2(a, a|s) = p_2(s_{11}) - t_2\alpha_2 C = 0 = p_2(s_{10}) = U_2(a, \sim a|s)$. Thus, $p_2(s_{11}) \in (0,1)$, so $s_{11} = e_2$ is required. Since G_1 prefers to act in a mild crisis, $U_1(a, a|m) = p_1(s_{11}) - t_1\alpha_1 C \geq p_1(s_{01}) = U_1(\sim a, a|m)$. Since $p_1(s_{01}) \geq 0$, this implies that $p_1(s_{11}) > 0$, which requires $s_{11} \geq e_1$. Since $s_{11} = e_2$, only $s_{11} > e_1$ is generic, so $p_1(s_{11}) = 1$. But then the equilibrium cannot be collusion-proof. Consider an agreement to always act in a serious crisis. This is strictly beneficial to G_1 because $1 - t_1\alpha_1 C > \sigma_2(1 - t_1\alpha_1 C) + (1 - \sigma_2)(1 - t_1 C)$. Since G_2 is indifferent whenever G_1 acts, this agreement is Pareto-superior. It will be credible if G_1 does not want to break it; if G_1 fails to act when G_2 does, then its payoff will be $p_1(s_{01}) \leq 1 - t_1\alpha_1 C$, where the inequality follows from the requirement for the optimality of G_1's strategy in a mild crisis. Thus, G_1 has no incentive to break the agreement, which means that this equilibrium is not collusion-proof.

Consider now $\mu_2 = 0$, in which case $s_{11} = 1$, so $p_i(s_{11}) = 1$. Given the strategies, only G_1 can induce s_{01} and it can only do so in a serious crisis. This means that the only intuitive off-the-path belief must be $s_{01} = 1$, so $p_1(s_{01}) = 0$. Consider now an agreement to always act in a serious crisis. Since G_2 is indifferent whenever G_1 acts, we only need to show that G_1 strictly benefits from this agreement and that it would not want to break it. But then $U_1(a, a|s) = 1 - t_1\alpha_1 C > \sigma_2(1 - t_1\alpha_1 C) + (1 - \sigma_2)(p_1(s_{10}) - t_1 C) = U_1(a, \sigma_2|s)$ because $1 - t_1\alpha_1 C > 1 - t_1 C \geq p_1(s_{10}) - t_1 C$, which implies that the agreement is Pareto-superior. If G_1 were to break it, $U_1(\sim a, a|s) = p_1(s_{01}) = 0 < 1 - t_1\alpha_1 C = U_1(a, a|s)$, so G_1 would not want to do so. This means that this equilibrium is not collusion-proof.

This leaves $m_2 \in (0,1)$ as the sole remaining possibility. ∎

We shall state the following result for the case where G_1 carries the larger share of the burden but the analogous result can be derived for the case where G_2 does it.

PROPOSITION A. *If $e_1 < \min(e_2, 1 - e_2) \leq s$ and G_1 is pro-EU, then there exists an intuitive collusion-proof* limited burden-sharing *equilibrium in which G_1 always acts, $\sigma_1 = \mu_1 = 1$, and G_2 sometimes does, with probabilities specified below. Define:*

$$\hat{\sigma}_2 = \frac{w_1\theta_1 - (1 - \alpha_1)\delta C}{w_1\theta_1 - (1 - 2\alpha_1)\delta C} \qquad \hat{\mu}_2 = \frac{\theta_1 - \delta C}{\theta_1 - (1 - \alpha_1)\delta C}$$

$$\widetilde{\sigma}_2 = \frac{e_2}{s} \cdot \frac{s - (1 - e_2)}{2e_2 - 1} \qquad \widetilde{\mu}_2 = \frac{1 - e_2}{1 - s} \cdot \frac{s - (1 - e_2)}{2e_2 - 1}$$

$$\underline{\sigma}_2(\mu_2) = \mu_2 \cdot \frac{e_2(1 - s)}{(1 - e_2)s} \qquad \overline{\sigma}_2(\mu_2) = 1 - (1 - \mu_2) \cdot \frac{(1 - e_2)(1 - s)}{e_2 s}$$

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$$\underline{\mu}_2(\sigma_2) = \sigma_2 \cdot \frac{(1-e_2)s}{e_2(1-s)} \qquad \overline{\mu}_2(\sigma_2) = \frac{1-s-e_2+se_2\sigma_2}{(1-e_2)(1-s)}.$$

- $s > \max(e_2, 1-e_2)$: *the strategies and retention probabilities are:*

$$(\sigma_2^*, \mu_2^*; p_2(s_{11}), p_2(s_{10})) = \begin{cases} (\overline{\sigma}_2(\hat{\mu}_2), \hat{\mu}_2; 1, 1-t_2\alpha_2 C) & \textit{if } \hat{\sigma}_2 > \overline{\sigma}_2(\hat{\mu}_2) \\ (\hat{\sigma}_2, \underline{\mu}_2(\hat{\sigma}_2); t_2\alpha_2 C, 0) & \textit{if } \hat{\sigma}_2 < \underline{\sigma}_2(\hat{\mu}_2) \\ (\underline{\sigma}_2(\hat{\mu}_2), \hat{\mu}_2; t_2\alpha_2 C, 0) & \textit{if } s < \frac{1}{2} \textit{ or } \hat{\sigma}_2 < \overline{\sigma}_2(0) \\ (\hat{\sigma}_2, \overline{\mu}_2(\hat{\sigma}_2); 1, 1-t_2\alpha_2 C) & \textit{otherwise} \end{cases}$$
$$(4)$$

- $e_2 < s < 1-e_2$: *if $\hat{\sigma}_2 \geq \widetilde{\sigma}_2$ and $\hat{\mu}_2 \geq \widetilde{\mu}_2$, then the strategies are given by (4); otherwise the equilibrium does not exist.*

- $1-e_2 < s < e_2$: *if $\hat{\sigma}_2 > \widetilde{\sigma}_2$ and $\hat{\mu}_2 > \widetilde{\mu}_2$, then the strategies are $(\widetilde{\sigma}_2, \widetilde{\mu}_2)$, with any probabilities that satisfy $p_2(s_{11}) - t_2\alpha_2 C = p_2(s_{10})$; otherwise they are given by (4).*

In this equilibrium, G_1 is retained in all contingencies, whereas G_2 is retained with higher probability for cooperating in a bilateral bailout (and sometimes removed altogether for failing to act when G_1 does). □

Proof.   Assume that $\sigma_1 = \mu_1 = 1$, $\sigma_2 \in (0, 1)$, and $\mu_2 \in (0, 1)$. The off-the-path beliefs s_{00} and s_{01} can be induced unilaterally by G_1 regardless of the nature of the crisis, so the second intuitive requirement has no bite. The on-the-path beliefs are:

$$s_{11} = \frac{\sigma_2 s}{\sigma_2 s + \mu_2(1-s)} \quad \text{and} \quad s_{10} = \frac{(1-\sigma_2)s}{(1-\sigma_2)s + (1-\mu_2)(1-s)},$$

Since G_2 mixes, $p_2(s_{11}) - t_2\alpha_2 C = p_2(s_{10})$. This implies that $p_2(s_{11}) > 0$ and $p_2(s_{10}) < 1$, so

$$s_{11} \geq e_2 \quad \text{and} \quad s_{10} \geq 1-e_2 \tag{5}$$

are required. Moreover, it also implies that if $p_2(s_{11}) = 1$, then $p_2(s_{10}) > 0$, which then means that $p_2(s_{10}) \in (0, 1)$, so $s_{10} = 1-e_2$. Finally, if $p_2(s_{10}) = 0$, then $p_2(s_{11}) < 1$, which then means that $p_2(s_{11}) \in (0, 1)$, so $s_{11} = e_2$ must hold. Collectively, these imply that at the voters in G_2 must be indifferent at least one, and possibly both, of the on-the-path information sets. Thus, the three possible configurations are $(s_{11} > e_2, s_{10} = 1-e_2)$, $(s_{11} = e_2, s_{10} > 1-e_2)$, and $(s_{11} = e_2, s_{10} = 1-e_2)$.[67]
   From (5), we can infer that

$$\underline{\sigma}_2(\mu_2) \equiv \mu_2 \cdot \frac{e_2(1-s)}{(1-e_2)s} \leq \sigma_2 \leq 1 - (1-\mu_2) \cdot \frac{(1-e_2)(1-s)}{e_2 s} \equiv \overline{\sigma}_2(\mu_2).$$

Observe now that since $\underline{\sigma}_2(0) = 0$ and $\overline{\sigma}_2(1) = 1$, and because both $\underline{\sigma}_2(\cdot)$ and $\overline{\sigma}_2(\cdot)$ are linear and strictly increasing, if $\overline{\sigma}_2(0) < 0$ and $\underline{\sigma}_2(1) > 1$, it will be the case that

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67. This is because $p_1(s_{11}) = 1 \Rightarrow p_1(s_{10}) \in (0, 1)$, $p_1(s_{11}) = 0$ is not admissible, and $p_1(s_{11}) \in (0, 1) \Rightarrow \{p_2(s_{10}) = 0 \text{ or } p_2(s_{10}) \in (0, 1)\}$ because $p_2(s_{10}) = 1$ is not admissible.

$\underline{\sigma}_2(\mu_2) > \overline{\sigma}_2(\mu_2)$ for all μ_2; i.e., there will be no mixing probabilities that can satisfy the necessary conditions. Since $\underline{\sigma}_2(1) > 1 \Leftrightarrow s < e_2$ and $\overline{\sigma}_2(0) < 0 \Leftrightarrow s < 1 - e_2$, this equilibrium can only exist when $s \geq \min(e_2, 1 - e_2)$.

Observe now that $\underline{\sigma}_2(\mu_2) = \overline{\sigma}_2(\mu_2)$ yields, when it exists, $\widetilde{\sigma}_2$ and $\widetilde{\mu}_2$ as specified in the proposition. These are obviously the mixing probabilities that result in $(s_{11} = e_2, s_{10} = 1 - e_2)$. Note further that from our inferences about the admissible configurations, we can conclude that any equilibrium requires that the mixing probabilities lie along either $\underline{\sigma}_2(\cdot)$ only, $\overline{\sigma}_2(\cdot)$ only, or both (i.e., be at the intersection as the probabilities we just derived).

There are three possible configurations then:

- $s \geq \max(e_2, 1 - e_2)$, in which case $\underline{\sigma}_2(\mu_2) < \overline{\sigma}_2(\mu_2)$ for all μ_2;

- $e_2 < s < 1 - e_2$, in which case $\underline{\sigma}_2(\mu_2) < \overline{\sigma}_2(\mu_2)$ only if $\mu_2 > \widetilde{\mu}_2$;

- $1 - e_2 < s < e_2$, in which case $\underline{\sigma}_2(\mu_2) < \overline{\sigma}_2(\mu_2)$ only if $\mu_2 < \widetilde{\mu}_2$.

Since G_1 must prefer to act, $U_1(a, \sigma_2) \geq U_1(\sim a, \sigma_2)$ and $U_1(a, \mu_2) \geq U_1(\sim a, \mu_2)$, or:

$$\sigma_2(p_1(s_{11}) - t_1\alpha_1 C) + (1 - \sigma_2)(p_1(s_{10}) - t_1 C) \tag{6}$$
$$\geq \sigma_2 p_1(s_{01}) + (1 - \sigma_2)(p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C)$$
$$\mu_2(p_1(s_{11}) - t_1\alpha_1 C) + (1 - \mu_2)(p_1(s_{10}) - t_1 C) \tag{7}$$
$$\geq \mu_2 p_1(s_{01}) + (1 - \mu_2)(p_1(s_{00}) - \theta_1)$$

CASE I: Suppose that $p_1(s_{11}) - t_1\alpha_1 C < p_1(s_{10}) - t_1 C$, which can only be satisfied if $p_1(s_{10}) > 0$ and $p_1(s_{11}) < 1$. This makes colluding to a unilateral bailout by G_1 Pareto-dominant. We now show that if this equilibrium is collusion-proof, then it must be non-generic.

Observe that the equilibrium will be collusion-proof only when the agreement is not credible in a serious crisis. Since G_2 is indifferent when G_1 acts, we only need to consider a deviation by G_1 to inaction when G_2 is not acting with certainty. The agreement will not be credible only if $U_1(\sim a, \sim a|s) = p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C > p_1(s_{10}) - t_1 C = U_1(a, \sim a|s)$, which can only be satisfied if $p_1(s_{10}) < 1$. Recalling that $p_1(s_{10}) > 0$, this implies that $p_1(s_{10}) \in (0, 1)$, so $s_{10} = e_1$ is required.

Observe further that if $p_1(s_{01}) \geq p_1(s_{11}) - t_1\alpha_1 C$, then the other conditions, $p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C > p_1(s_{10}) - t_1 C > p_1(s_{11}) - t_1\alpha_1 C$, would imply that (6) cannot be satisfied. It must be the case, then, that $p_1(s_{11}) - t_1\alpha_1 C > p_1(s_{01}) \geq 0$. Recalling that $p_1(s_{11}) < 1$, we conclude that $p_1(s_{11}) \in (0, 1)$, so $s_{11} = e_1$ is also required.

But if $s_{10} = s_{11} = e_1$, then $\sigma_2 = \mu_2$, which in turn implies that $s_{10} = s_{11} = s$. But then the collusion-proof equilibrium can only exist if $s = e_1$, which is non-generic.

CASE II: Consider $p_1(s_{11}) - t_1\alpha_1 C > p_1(s_{10}) - t_1 C$. This means that G_1 strictly prefers a bilateral bailout to a unilateral one, so it provides incentives for collusion to such a bailout (because G_2 is indifferent whenever G_1 acts). For the equilibrium to be collusion-proof, this agreement must not be credible. Since G_2 is indifferent, it must be G_1 that would not want to abide by it. Thus, the equilibrium requires that $U_1(\sim a, a) = p_1(s_{01}) > p_1(s_{11}) - t_1\alpha_1 C = U_1(a, a)$. This now requires that $p_1(s_{00}) - \theta_1 < p_1(s_{10}) - t_1 C$ or else

(7) cannot be satisfied. We conclude that the preference ordering for G_1 in this equilibrium must be

$$p_1(s_{01}) > p_1(s_{11}) - t_1\alpha_1 C > p_1(s_{10}) - t_1 C > p_1(s_{00}) - \theta_1 \qquad (8)$$

Although there is an infinite number of ways that (8) can be satisfied, it does place some limits on the admissible probabilities. Observe now that this ordering ensures that at $\sigma_2 = \mu_2 = 0$ both (6) and (7) are satisfied with strict inequality, whereas at $\sigma_2 = \mu_2 = 1$ neither one is satisfied. Since the expected utilities are linear in the probabilities, it follows that there exist unique values that satisfy the conditions with equality:

$$\hat{\sigma}_2 = \frac{p_1(s_{10}) - t_1 C - [p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C]}{p_1(s_{10}) - t_1 C - [p_1(s_{00}) - w_1\theta_1 - t_1\alpha_1 C] + p_1(s_{01}) - [p_1(s_{11}) - t_1\alpha_1 C]}$$

$$\hat{\mu}_2 = \frac{p_1(s_{10}) - t_1 C - [p_1(s_{00}) - \theta_1]}{p_1(s_{10}) - t_1 C - [p_1(s_{00}) - \theta_1] + p_1(s_{01}) - [p_1(s_{11}) - t_1\alpha_1 C]}$$

such that (6) is satisfied if, and only if, $\sigma_2 \leq \hat{\sigma}_2$ and (7) is satisfied if, and only if, $\mu_2 \leq \hat{\mu}_2$. These establish upper bounds on the equilibrium probabilities for G_2's strategy.

Since G_1's expected payoffs are strictly increasing in G_2's mixing probabilities and because G_2 is indifferent among mixtures, any equilibrium of this type is Pareto-inferior to any other equilibrium of this type with higher mixing probabilities. Since there is no reason to expect that governments not to coordinate on a Pareto-super equilibrium in this set, we shall now derive the appropriate mixtures.

To understand the following, note that the definitions in the propositions are such that

$$\underline{\mu}_2(\sigma_2) \equiv \underline{\sigma}_2^{-1}(\sigma_2) \quad \text{and} \quad \overline{\mu}_2(\sigma_2) \equiv \overline{\sigma}_2^{-1}(\sigma_2).$$

In other words, just like $\underline{\sigma}_2(\mu_2)$ and $\overline{\sigma}_2(\mu_2)$ return the values of σ_2 such that (σ_2, μ_2) satisfies $s_{11} = e_2$ and $s_{10} = 1 - e_2$, respectively for any given value of μ_2, so do $\underline{\mu}_2(\sigma_2)$ and $\overline{\mu}_2(\sigma_2)$ for any given value of σ_2.

Recalling the three possible configurations that restrict the sets of admissible mixing probabilities, we observe that there are six cases to consider, depending on where $(\hat{\sigma}_2, \hat{\mu}_2)$ is located with respect to these sets. The first three cases can occur under each of the configurations:

(i) $\hat{\sigma}_2 \in [\underline{\sigma}_2(\hat{\mu}_2), \overline{\sigma}_2(\hat{\mu}_2)]$. Since this means that $\underline{\sigma}_2(\hat{\mu}_2) < \hat{\sigma}_2 < \overline{\sigma}_2(\hat{\mu}_2)$, it follows that $s_{11} > e_2$ and $s_{10} > 1-e_2$, but we know that this cannot occur in this equilibrium. One possible reduction is to the admissible probabilities $(\hat{\sigma}_2, \overline{\mu}_2(\hat{\sigma}_2))$, which makes the smallest admissible decrease in μ_2, and so dominates all other pairs that involve $\overline{\sigma}_2(\cdot)$ since they require not only further reductions in μ_2 but also lowering σ_2. The other possible reduction is to $(\underline{\sigma}_2(\hat{\mu}_2), \hat{\mu}_2)$, which dominates all other pairs that involve $\underline{\sigma}_2(\cdot)$.

Which of these would be Pareto-superior? Obviously, conditional on knowing that the crisis is serious, G_1 would have a strict preference to the equilibrium with $\hat{\sigma}_2$, but on knowing that the crisis is mild, it will strictly prefer the equilibrium with $\hat{\mu}_2$. In expectation, therefore, his preference depends on his priors: if $s > 1/2$, the former equilibrium is superior, otherwise, the latter is. We conclude that the Pareto-dominant

equilibrium in this case must involve the strategies $(\hat{\sigma}_2, \overline{\mu}_2(\hat{\sigma}_2))$ if $s > 1/2$, and the strategies $(\underline{\sigma}_2(\hat{\mu}_2), \hat{\mu}_2)$ otherwise.

We should note that when $\overline{\sigma}_2(0) > \hat{\sigma}_2 > 0$, then $\overline{\mu}_2(\hat{\mu}_2)$ does not exist. Since $(\hat{\sigma}_2, 0)$ cannot occur in equilibrium by Lemma F and since $\underline{\sigma}_2(0) = 0$, so $(0,0)$ is the other candidate profile, which is an altogether different form of equilibrium (that we studied in Proposition 4), it follows that the only equilibrium of this type must be $(\underline{\sigma}_2(\hat{\mu}_2), \hat{\mu}_2)$.

(ii) $\hat{\sigma}_2 > \overline{\sigma}_2(\hat{\mu}_2) > \underline{\sigma}_2(\hat{\mu}_2)$. In this case, $\hat{\sigma}_2$ is not admissible, and the smallest reduction that admits an equilibrium is to $\overline{\sigma}_2(\hat{\mu}_2)$. This is because $\overline{\sigma}_2(\cdot)$ is increasing, which means that any other reduction to an admissible pair would require both σ_2 and μ_2 to decrease. This means that G_2's strategy in the Pareto-dominant equilibrium is $(\overline{\sigma}_2(\hat{\mu}_2), \hat{\mu}_2)$.

(iii) $\hat{\sigma}_2 < \underline{\sigma}_2(\hat{\mu}_2) < \overline{\sigma}_2(\hat{\mu}_2)$. In this case, $\hat{\mu}_2$ is not admissible, and the smallest reduction that admits an equilibrium is to μ_2 that solves $\underline{\sigma}_2(\mu_2) = \hat{\sigma}_2$, which we can write compactly as $(\hat{\sigma}_2, \underline{\mu}_2(\hat{\sigma}_2))$.

If $e_2 < s < 1 - e_2$, then any solution requires $\sigma_2 \geq \widetilde{\sigma}_2$ and $\mu_2 \geq \widetilde{\mu}_2$. By definition of this case, $\hat{\mu}_2 > \widetilde{\mu}_2$ (because otherwise $\underline{\sigma}_2(\hat{\mu}_2) < \overline{\sigma}_2(\hat{\mu}_2)$ would not be satisfied). If $\hat{\sigma}_2 \leq \widetilde{\sigma}_2$, then there can be no equilibrium: since $\underline{\sigma}_2(\cdot)$ is decreasing, any reduction of $\hat{\mu}_2$ to the required μ_2 would result in $\underline{\sigma}_2(\mu_2) < \widetilde{\sigma}_2$, which violates the requirement that $\sigma_2 \geq \widetilde{\sigma}_2$. Thus, if $e_2 < s < 1 - e_2$ this equilibrium can only exist if $\hat{\sigma}_2 > \widetilde{\sigma}_2$. It is readily verified that the other two configurations do not need additional restrictions.

The last three cases can only occur if $(\widetilde{\sigma}_2, \widetilde{\mu}_2)$ exists; i.e., if $\underline{\sigma}_2(\cdot)$ and $\overline{\sigma}_2(\cdot)$ intersect, which means that either $e_2 < s < 1 - e_2$ or $1 - e_2 < s < e_2$ obtains:

(iv) When $e_2 < s < 1 - e_2$, and either $\hat{\sigma}_2 < \widetilde{\sigma}_2$ or $\hat{\mu}_2 < \widetilde{\mu}_2$ obtains. In this case, the equilibrium does not exist because $(\widetilde{\sigma}_2, \widetilde{\mu}_2)$ are the smallest mixing probabilities that admit existence, and these exceed the limits that rationalize G_1's strategy. (This case overlaps with the exception in (iii) above.)

(v) When $1 - e_2 < s < e_2$ and both $\hat{\sigma}_2 > \widetilde{\sigma}_2$ and $\hat{\mu}_2 > \widetilde{\mu}_2$ obtain. The smallest reduction that admits an equilibrium is to the Pareto-dominant one: $(\widetilde{\sigma}_2, \widetilde{\mu}_2)$.

(vi) When $1 - e_2 < s < e_2$ and both $\hat{\sigma}_2 \leq \widetilde{\sigma}_2$ and $\hat{\mu}_2 > \widetilde{\mu}_2$ obtain. The smallest reduction is to the equilibrium where G_2's strategy is $(\hat{\sigma}_2, \underline{\mu}_2(\hat{\sigma}_2))$. (This is analogous to the solution we derived in (ii) above.)

This exhausts the possibilities and completes the description of the Pareto-dominant equilibrium. It is important to realize that these solutions all ensure that the pair of mixing probabilities will satisfy at least one, and possibly both, of the constraints in (5) with equality, as required.

Moreover, since the equilibrium mixing probabilities always lie on either $\underline{\sigma}_2(\cdot)$ or $\overline{\sigma}_2(\cdot)$ with the precise location dependent all exogenous parameters except e_1, any solution where the resulting posterior beliefs s_{11} and s_{10} happen to equal some precise value of e_1 cannot be generic. In other words, $s_{11} \neq e_1$ and $s_{10} \neq e_1$ in any generic equilibrium.

Selecting the Pareto-dominant equilibrium is not particularly constraining because the preference ordering in (8) can be satisfied in infinite ways (as can the indifference condition for G_2), and they determine the crucial limiting probabilities $\hat{\sigma}_2$ and $\hat{\mu}_2$. Consider first the off-the-path beliefs s_{01} and s_{00}. Since G_2 is mixing, a deviation by G_1 is going to result in inaction with positive probability. Unless G_2's probability of inaction in a serious crisis is significantly smaller than its probability of inaction in a mild crisis, this deviation would be worse for G_1 when the crisis is serious. If so, G_1 should be less likely to deviate when the crisis is serious: $\sigma_1 > \mu_1$. Since

$$\sigma_1 > \mu_1 \quad \Rightarrow \quad \lim_{\sigma_1 \to 1, \mu_1 \to 1} s_{01} = \lim_{\sigma_1 \to 1, \mu_1 \to 1} s_{00} = 0,$$

we can consider $p_i(s_{00}) = p_1(s_{01}) = 1$ and $p_2(s_{01}) = 0$ as reasonable off-the-path expectations regardless of the values of e_i. In that case, (8) cannot be satisfied for a nationalist G_1: $p_1(s_{10}) - C \leq 1 - C < 1 - \theta_1 = p_1(s_{00}) - \theta_1$. Thus, with these reasonable off-the-path expectations, the equilibrium can only exist if G_1 is pro-EU.

For the rest of the proof, assume that G_1 is pro-EU. Since $1 - \theta_1 > 0$, it must be that $p_1(s_{11}) > p_1(s_{10}) > 0$ as well, so $s_{10} \geq e_1$ and $s_{11} \geq e_1$ are both necessary. Since no equilibrium with $s_{11} = e_1$ or $s_{10} = e_1$ is generic (by the argument above), we conclude that in any equilibrium it must be that $s_{11} > e_1$ and $s_{10} > e_1$, so $p_1(s_{11}) = p_1(s_{10}) = 1$. In other words, this equilibrium requires not only that G_1 is pro-EU but also that it gets reelected regardless of the contingency.

Consider now the three admissible configurations of mixing probabilities for G_2. If $(s_{11} > e_2, s_{10} = 1 - e_2)$, then a necessary condition for $s_{11} > e_1$ and $s_{10} > e_1$ is $e_1 < 1 - e_2$, that is, non-competitive elections. The three orderings that admit possible values for the posterior beliefs to solve them while preserving necessary inequalities are: (i) $1 - e_2 > e_1 > e_2$: $s_{11} > e_1$ is not guaranteed; (ii) $e_2 > 1 - e_2 > e_1$: sufficient to guarantee both $s_{11} > e_1$ and $s_{10} > e_1$; (iii) $1 - e_2 > e_2 > e_1$: sufficient. If $(s_{11} = e_2, s_{10} > 1 - e_2)$, then a necessary condition for $s_{11} > e_1$ and $s_{10} > e_1$ is $e_2 > e_1$. If $1 - e_2 > e_2$, then this condition is also sufficient. If $1 - e_2 < e_2$, then $e_1 < e_2$ is sufficient. The three orderings that admit possible values for the posterior beliefs to solve them while preserving necessary inequalities are: (i) $e_2 > e_1 > 1 - e_2$: $s_{10} > e_1$ is not guaranteed; (ii) $e_2 > 1 - e_2 > e_1$: sufficient; (iii) $1 - e_2 > e_2 > e_1$: sufficient. If $(s_{11} = e_2, s_{10} = 1 - e_2)$, then the necessary conditions are $e_2 > e_1$ and $1 - e_2 > e_1$. The two orderings that admit possible values for the posterior beliefs are: (i) $e_2 > 1 - e_2 > e_1$: sufficient; (ii) $1 - e_2 > e_2 > e_1$: sufficient. To summarize these results, $e_1 < \min(e_2, 1 - e_2)$ is sufficient to guarantee that on-the-path posterior beliefs will satisfy the requirements that ensure that G_1 is reelected with certainty and the probabilities of reelection for G_2 are sequentially rational. ∎

C Slovakia's Burden-Shifting, Summer 2010

After the Eurozone members officially agreed to the bailout on May 2, the Slovakian government – the newest member in the Eurozone – proved unwilling to ratify the agreement domestically, thereby scuttling its promise to provide its share of 1.02% (€150 per Slovak citizen) to the Greek bailout package. The domestic ratification was delayed until after the

elections. The government was ousted and the new government refused to sign the deal. Slovakia never paid its share of the bailout. Why did the Slovakian government agree to the bailout before the elections, but then decided to delay it until after the elections? And why did the new government not sign the deal after the elections?

From the vantage point of the Slovakian government, the situation maps onto the burden-shifting equilibrium (see Proposition 4).[68] Recall that the burden-shifting equilibrium requires (1) that the governments who provide the bailout are pro-EU (with no restriction on the government who decides to shift the burden), and (2) that the citizens are relatively certain that the crisis is serious. Both requirements were satisfied after May 2. First, it had become obvious that governments were expecting for the Eurozone to fall apart without a serious intervention by the IMF and the Eurozone members. Second, all other Eurozone governments had committed to the bailout package (i.e., they are pro-EU). Initially, the Slovak government expected to win the elections hands down. Fico's Smer party was at the top of the polls and had pledged to boost social spending after elections.[69] Since the citizens were more or less convinced that the crisis was serious (despite lingering skepticism about whether the Greeks deserved help), providing the bailout should not have hurt the government's electoral prospects. With e_{-i} relatively low but s high, the situation resembles the second parameter configuration of the equilibrium, $e_i < s < 1 - e_i$, where both governments expect to be retained for acting.

Before the Slovak government could act, however, its domestic prospects worsened considerably. The opposition parties had opposed the Greek bailout, and now they managed to make it a key electoral problem. The largest opposition party, the liberal SDKY, announced that it would try to block the loan. Even Smer's coalition partner, the nationalist SNS, declared itself against the loan.[70] In addition to the public's unhappiness about helping people they perceived as having lived beyond their means, the Slovak government would have to borrow to pay their share of the loan. Experts were worried that Slovakia would not receive that money back.[71] The Greek bailout became increasingly important as a campaign issue. In mid May, opposition parties attempted to hold a parliamentary debate on Slovakia's participation in the Greek bailout and the government used various tactics to block that initiative. The debate was eventually cancelled after four unsuccessful attempts to reach the quorum necessary to open it (when members of the government party did not show up). Fico was criticized for not allowing a debate and for negotiating a deal that was highly disadvantageous for the Slovak population. The opposition argued that the only reason why the government had agreed to the loan was because it was leading Slovakia down the same path and that it expected Slovakia itself to need European financial support soon.[72]

The coalescence of the opposition on the Greek bailout lowered Smer's electoral chances (increased e_{-i}). Since it is unlikely that in the interim the voters had also lowered their estimate about the seriousness of the crisis, the resulting situation resembles the fourth parameter configuration of the equilibrium, $s > \max(e_i, 1 - e_i)$, where the government that fails to act is removed. In other words, whereas the government initially thought it would

68. Slovakia is G_{-i} and the other Eurozone members are G_i.

69. *Agence France Presse*. May 8, 2010. "Greek aid riles eurozone newcomer Slovakia."

70. *Agence France Presse*. May 3, 2010. "Slovak PM wants Greece to act before borrowing.

71. *The Slovak Spectator*. June 28, 2010. "Slovakia stalls on euro bailout."

72. *The Slovak Spectator*. May 17, 2010. "Slovakia's new election issue: Greece."

win the election because the opposition was not very attractive and voters thought the crisis was serious enough to reward the government for acting, the increasing support for the opposition resulted in a situation where the uncertainty about the seriousness of the crisis was no longer sufficient to make voters reward the government for providing the bailout. In such unpleasant circumstances, the government could at least save itself the cost of the action by shifting the entire burden on the other members of the Eurozone.

Interestingly, the equilibrium indicates that at this point Smer was doomed: it would be removed both on and off the path of play (i.e., irrespective of its actions with respect to the bailout). This does not mean, of course, that the government took it lying down. In fact, Smer attempted to deflect some of the criticism by... agreeing with it. As the elections approached, Fico grew increasingly hostile to a bailout package. Although he said that the Slovak government would not block the package itself, he insisted that any loan would have to be approved by whichever government won from the elections. No money would be transferred before that.[73] The last-ditch effort did not work: the government was ousted in June, and replaced by a different coalition controlling a slim majority (79 out of 150 seats). In fulfillment of campaign promises, the new government completed the burden-shifting by refusing to ratify the Greek bailout package.[74] Ivan Kuhn, member of the Conservative Institute think tank, justified the decision by the government:

> The European Financial and Stabilisation mechanism can work in terms of [its] legal and economic aspects without Slovakia. Slovakia's contribution is only a small fragment of the financial package. Yet the rescue package was created de facto beyond the legislative framework of the EU, so the presence of all the EU members is not necessary.[75]

In other words, the Slovak government had successfully shifted the burden onto its Eurozone colleagues.

One might wonder whether the Eurozone members could punish Slovakia for this blatant instance of free-riding. Since ours is a simple two-period model that does not allow for conditional strategies that could, in principle, admit sanctions designed to deter such behavior, we cannot speak to that except to say that if, for some reason, such punishment were not credible, the behavior should emerge even in a repeated setting. In fact, the Slovak government was *not* at all concerned about possible sanctions from the European Union and its refusal to participate came despite fierce pressure from the other Eurozone members. With startling, but refreshing, frankness, Kuhn summarized the problem with potential sanctions:

> But in no way do I agree that Slovakia in such a case would find itself rejected by the rest of the EU and that we would be punished. This is something that the EU and its member countries cannot afford to do to another member country.

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73. The delay could not be attributed to the length of the legislative process; Fico's government had repeatedly used a shortened legislative procedure to approve different bills.

74. The new coalition comprised the liberal SDKU-DS, Freedom and Solidarity, the Christian Democrat KDH, and the ethnic Hungarian party Most-Hid) under prospective prime minister, Iveta Radicova. *Agence France Presse*. June 13, 2010. "Slovakia's emerging coalition plans austerity drive."; *The Slovak Spectator*. June 28, 2010. "Slovakia stalls on euro bailout."

75. *The Slovak Spectator*. June 28, 2010. "Slovakia stalls on the euro bailout."

Thus, whereas it was electoral problems that prompted the Slovak government to backtrack on its initial agreement to participate in the bailout, its refusal to participate was not an attempt to win the elections: it was a simple matter of saving the financing costs once it was clear that others will pick up the tab.