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## Comment

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### Introduction

When staring at the US recession of 2008–2010 and at the euro crisis of 2010–2012, it is tempting to look for common features. In both Los Angeles and Madrid, house prices more than doubled between 2000 and 2008, and household debt increased in tandem. Both in the United States and in southern Europe, total public debt reached historical levels and, during the two crises, yields on state debt increased remarkably, as did the price of credit default swaps insuring against default. A story of the crises across the two sides of the Atlantic that is based on leverage and debt is both appealing and superficially correct.

However, a closer look at the data in the two regions leaves too many questions open. The increase in house prices was not uniform across Europe (or the United States), with large movements in Ireland and Spain, but relative stagnation in Portugal and Italy, and only moderate increases in Greece, yet all of these regions went through a sovereign debt crisis. The increase in public debt was at the federal level in the United States (while at the state level in Europe), yet the American sovereign debt problems happened exclusively in a few states, California and Michigan more noticeably. Arellano et al. add a further comparison that makes a simplistic leverage story even harder to take at face value. Look at Canada. House prices also almost doubled in the first decade of the twenty-first century, and private leverage followed suit. But prices have neither fallen (at least yet) nor has there been any sovereign debt crisis. Moreover, as Arellano et al. emphasize, not only was there no public debt crisis, there was also no significant private debt crisis.

How can we make sense of these three data points in their clear commonalities, but also clear differences? At a basic level, one would like that a theory, or even just an account, of the crisis in one of these three regions is not easily dismissed with the events in the other region. Arellano and colleagues deserve credit for bringing this comparison to the frontline of work on the euro crisis, and trying to move the literature to take this comparative analysis into account. At the same time, Arellano et al. emphasize a new mechanism behind these crises, which I will discuss in the next section, and comment on and criticize in the following section, before concluding.

### **The New Contribution: A Brief Summary**

Arellano et al. propose new variables to consider, use them in an insightful model to make new predictions, and then show the potential of this approach by applying it to interpret the data.

#### *Two New Variables*

The first fundamental factor that Arellano et al. consider is the *flexibility of fiscal institutions*. In their words, this is the “ability to change taxes and borrow.” In their model, it refers to the government’s ability to freely choose the level of the primary surplus to pay debts that are coming due. Given their particular assumptions, this translates into the ability to set tax revenues, although since total public spending is taken as given, one could just as well interpret it as the primary surplus. In their discussion of fiscal flexibility in section IV of the paper, they link it to three related, but separate, objects. First, empirical work studying how the primary surpluses of US states respond to macroeconomic shocks. Second, the differences in constitutions across countries imposing limits on the ability to raise taxes. And third, the procedures and views of credit ratings agencies when judging the riskiness of state debts.

In terms of their three data points, the fiscal flexibility of US states is low: their constitutions make it hard to raise new taxes, and past fiscal adjustments have had to rely on often ill-timed spending cuts because the constraint on raising new taxes seems binding. Canadian provinces, instead, can easily raise taxes insofar as they do not have similar legal restrictions and seem to smooth expenditure shocks over time, while European states have successfully and continuously raised taxes in the past few decades to finance the expansion of their welfare states.

The second new factor is *interference in private contracts*. In their words, this is the “perceived risk of sovereign interference with domiciled private debt contracts.” In the model, it is the ability of the government to force a default on private debts while incurring a cost. In the data, discussed in section III, this interference is assessed by an institutional analysis of both the legal institutions and the history of their application. Moreover, the authors appeal again to the views of ratings agencies, which discuss this possible interference as a consideration in judging the risk of private bonds. This is perhaps best captured by the “sovereign credit ceiling” whereby ratings agencies stipulate that private creditors cannot be more creditworthy than their sovereign, in great part because the sovereign can (and do) expropriate private assets to pay public debts first.

The authors argue that the United States and Canada have a long tradition of respecting private contracts that the more recently formed European Union still lacks. The authors appeal to several clauses in European treaties that open room for exceptions to free trade and the primacy of private contracts. While they do not mention it, I would also add the differences between Anglo-Saxon and continental European legal traditions, in particular the emphasis that different legal origins put on the protection of investors (La Porta et al. 1998). Moreover, it is important that, unlike the unions of US states and Canadian provinces, the European Union of states is still a very recent work in progress, so there has not been as much time to solidify private rights and to impose limits on the states.

### *Three New Predictions*

Mapping these two new variables into a simple binary classification gives four possibilities, out of which Arellano et al. derive three predictions when focussing on the relevant ranges of parameters.

First, if fiscal flexibility is high and the costs of interference are high, then when a country encounters a fiscal crisis it pays for it by raising taxes. The high costs of interference make private default a bad option, and given the option of raising taxes, in the model this is less costly than public default. In this case, in the authors’ model, both public and private interest rates reflect the absence of a risk of default and therefore do not react to a fiscal crisis. Both the government and private agents in the country are able to borrow abroad given the credible commitment to repay, so that there is no sudden stop of financing.

		Interference with private contracts	
		Low	High
Fiscal flexibility	Low	U.S. states	
	High	Canadian provinces	EU countries

Fig. 1. The data points according to the theory

Second, if fiscal flexibility is still high, but there is little cost of interfering with private contracts, then anytime that the public debt constraint binds, so does the private debt constraint. That is, if the public sector has borrowed all that it can, then it must be that the private sector is also borrowing at the limit. Intuitively, because the public sector can force default by the private sector, it will use this private debt capacity to borrow. Given its fiscal flexibility, it can always tax the private sector to transfer the gains from these private defaults into the public purse. In case of an unexpected need for resources, the public sector can cause a private default instead of the more costly public default.

Third, if fiscal flexibility is instead low, and regardless of the costs of interfering with private contracts, then a default on public debt can occur, even if the costs of doing so are very high. In short, the public authorities may find themselves out of options. They simply cannot raise the resources to pay for the outstanding public debt.

#### *Who Is Where?*

The last part in Arellano et al.'s argument is to link these predictions to their three data points, as I illustrate in figure 1. The theory predicts that, unlike US states, Canadian provinces should be able to borrow large amounts from markets that realize that the fiscal flexibility exists to pay these liabilities. Moreover, the theory predicts and the data confirms that during the 2008–2012 period, the interest rates on provincial debt rose by small amounts relative to the federal debt, since default was not a predicted outcome.

The EU states, in turn, have the fiscal flexibility to sustain their observed large public debts. However, when the fiscal crisis hit, default became likely and spreads on public debt rose. The theory predicts that this would only happen if the external debt constraint was also binding,

and the evidence again seems to support this prediction. As many have noted (e.g., Mody and Sandri 2012) the premia on credit default spreads on private bonds, and especially the spread on banks were very highly correlated with the premia on public bonds. Moreover, the euro crisis in the periphery was, above all, a sudden stop of the private capital that used to flow from the core to the periphery of Europe, consistent with the tightening of a binding constraint on private indebtedness (e.g., Reis 2013b).

Finally, a few US states may be on the brink of default due to their lack of fiscal flexibility. Yet, as this was known *ex ante*, their debt levels were always low. Moreover, because they are unable to interfere with private contracts, there is almost no correlation between the interest rate on the state debt and on the private debt of corporates located in that state. During 2008–2010, the public sector may have felt a crunch in its ability to borrow, but there was no contagion toward the private sector.

### **Comments on Applying the Theory to the Euro-Area Crisis**

This comparative approach will hopefully influence the debate, the theory proposes an intriguing new hypothesis, and the arguments behind the new variables should stimulate more research. This article should have a place on reading lists that discuss the euro crisis. To start that discussion, I have five comments on the paper ranging from their variables, to their model, to the application to Europe.

#### *Comment 1: It Is Hard to Measure Fiscal Flexibility*

The authors make a compelling case for introducing fiscal flexibility into the analysis of sovereign default. But, to make scientific progress on this important topic, we need to both propose new factors as well as be able to measure them. Only this way can theories be operationalized and predictions be tested. While the concept of fiscal flexibility is tempting, thinking about how it can be measured raises as many questions as it provides answers.

To start, while the institutional evidence put forward by Arellano and colleagues is compelling, most of it pertains to tax *rates*. Yet, what is relevant for the model and for the theory are tax *revenues*. It is the ability of the government to raise resources in a crisis, by whatever means, that is important for whether there will be a sovereign default. The successive

Greek governments of the past few years have found it easy to raise tax rates, but have also found it very hard to raise tax revenues. This experience suggests that Greece may actually have low fiscal flexibility rather than high as argued by Arellano et al. since it is not legal constraints that matter per se, but rather the ability of the state to enforce those laws, prevent tax evasion, and enforce a tax base that is stable and wide.

Perhaps a more accurate way to measure fiscal flexibility would be by the distance between the economy's current position in the Laffer curve and its peak. According to this measure, Trabandt and Uhlig (2011) argue that countries like Greece might indeed have significant room for raising extra revenue using income taxes. However, Laffer-curve calculations typically focus on a single tax and too often neglect the response of tax evasion and enforcement to the level of taxes.

Using the behavior of revenues around fiscal adjustment does not take us very far either. These measure in large part the response of automatic stabilizers, over which governments typically have little discretionary control. Take, for instance, the discussion on moving toward a fiscal union in Europe, replacing national unemployment insurance schemes with a Euro-wide version of this automatic stabilizer. On the one hand, this would lead to more transfers to a country in a recession, automatically adjusting its primary surplus to help it pay for the public debt. On the other hand, this fiscal union would remove some of the ability of the government to raise tax revenues and cut spending in a fiscal crisis, as used for instance by the Portuguese reforms of the past few years that cut the generosity of unemployment benefits. Whether fiscal flexibility would improve or not is far from clear.

Another perspective on fiscal flexibility is that it should not be about the typical business-cycle shocks, thus removing the automatic stabilizers from the discussion, but rather about responding to large crises. This leads to another active discussion in Europe, on whether there should be a joint deposit insurance scheme to complete its proposed banking union so as to respond to large financial crises. This exists today in the United States, but not in Europe. In response to a banking crisis in one state, the US states could benefit today from potentially large transfers from the other states, whereas the European ones do not. From this perspective, it would be the US states that enjoy more fiscal flexibility, the opposite of Arellano et al.'s assumption.

Finally, consider Arellano et al.'s point that one could infer fiscal flexibility from the debt tolerance of private markets. Figure 2 in their paper shows that US states, on average, have less debt outstanding, even in-

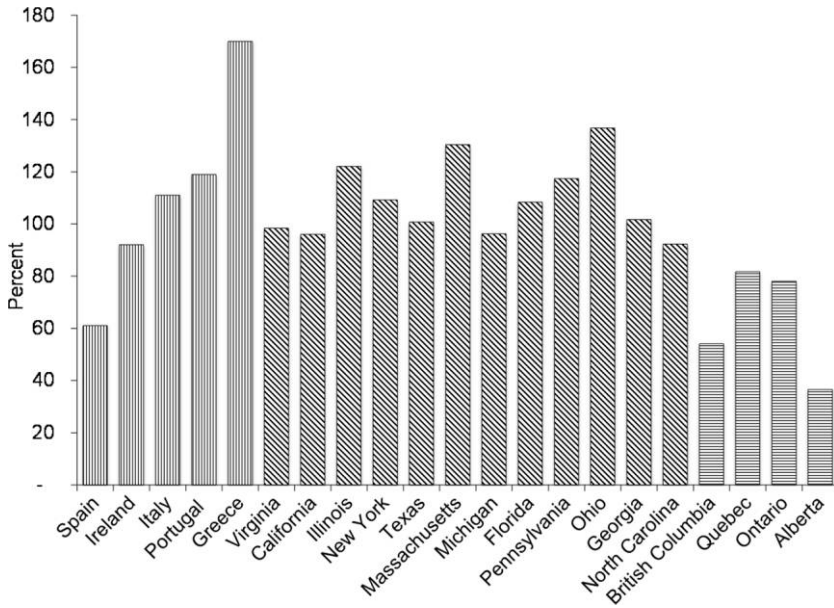


Fig. 2. Net debt including federal obligations as a ratio of GDP

cluding pension and health-care liabilities, than Canadian provinces or European countries. Figure 2 below repeats their calculation, including a few more states and countries. It includes only net debt, but it adds to US states and Canadian provinces their share of the federal debt, apportioned to each state according to its share of gross tax revenues in 2013. Debt tolerance should refer to debt capacity, and the residents of New York or Illinois are responsible not just for the debt of their states, but also for their federal debt. Adding their share of the federal debt, US states no longer stand out from their European counterparts.

*Comment 2: The Diabolic Loop Alternative*

Public interference in private contracts is a plausible and appealing way to explain the correlation between private and public interest rates in Europe. But there are others, and the literature on the euro crisis has particularly emphasized one: the role of banks.<sup>1</sup>

Brunnermeier et al. (2011) first highlighted that behind the euro crisis was a diabolic loop between banks and sovereigns. When markets feared that Spain or Ireland would not pay their public debt, the price



of government bonds fell. But, because banks in those countries hold large amounts of this public debt, this fear leads to immediate losses and contraction in their highly leveraged equity. This in turn feeds back to the public authorities in two ways. Directly, because the increased risk that banks might become insolvent raises the probability of a bank bailout. Indirectly, because banks with lower equity contract credit, causing a recession and worsening public finances. Through either or both of these channels of the diabolic loop, the initial fear would be justified.<sup>2</sup>

This explanation can also account for the difference between Europe and the United States because of the differences in their banking systems.<sup>3</sup> First, Europe lacks a euro-wide safe asset, so while US banks can hold federal securities in their portfolio, European banks hold instead bonds of their sovereigns, creating the diabolic loop. Second, while there is federal deposit insurance and federal regulation of banks so that the costs of bailouts would be shared by all US states, European sovereigns would have to shoulder the full burden of bailing out their large banks, as the Irish government discovered in 2011. Third, banks were crucial in Europe in intermediating capital flows across countries (Brunnermeier and Reis 2015). Therefore, financial problems associated with the structure of modern banks, and global imbalances associated with competitiveness and trade across nations, become intertwined in Europe. In the United States, banks are much less important in channeling capital across state borders. Fourth, when a sudden stop of private capital happened in Europe, banks could look to the central banks for funding, and through the TARGET II system, public capital could flow in from the Eurosystem. Yet, accessing Eurosystem funds required posting as collateral public bonds, therefore worsening the diabolic loop at the height of the crisis.

*Comment 3: Bailouts in the Model*

In the model, the government must pay a cost to force the private sector to renege on its debt. In the United States, this cost is large, consistent with the contract clause of the constitution that, as Arellano et al. explain, puts a serious limitation on individual states forcing the dissolution of private contracts.

However, US states can bail out local companies. This is not illegal, and in fact happens (perhaps too) often. Consider then the following strategy. The public sector can take over a private company in its state,

which includes taking ownership of its assets but also shouldering its liabilities. If the state then defaults on its public debt, it will also default on these new liabilities. Via the bailout, private debt then becomes public debt. Public and private interest rates would be the same, and there would never be a private debt crisis separately from a public debt crisis.

It is not difficult to extend the Arellano et al. model to include bailouts. The government now never interferes with private contracts, but it can bail out the private sector and assume its debt at a new dead-weight cost, say  $\Delta^b$ . After a fiscal crisis, the government now has three options: (a) it can do no bailout and no default, in which case the full private and public debt must be paid costing  $D^p + D^s$ ; (b) it can default, but do no bailout at cost  $D^p + \Delta^s$ ; or (c) it can bailout and default at cost  $\Delta^b + \Delta^s$ . A similar analysis to the one in Arellano et al. shows what configuration of shocks and debt outstanding leads to each of the equilibria. But it is no longer the case that we can easily distinguish between Europe, Canada, and the United States in terms of their relative costs of bailing companies out.

#### *Comment 4: What Came Before Matters*

Greece, Ireland, Portugal, and Spain did not suddenly and unexpectedly find themselves with high debt and an inability to pay for it in 2010–2011. Rather, the crisis was in part the result of a decade of stagnation in productivity growth in their economies mixed with fragility in the banking system, and it was as much due to the resulting low-growth prospects as it was to the size of the debt (Brunnermeier and Reis 2015). Starting with the introduction of the euro, there were large capital flows from the core to the periphery of Europe. These took the form of debt contracts and were intermediated by banks. As this fast financial integration came without an effective financial deepening (Reis 2013b), the capital was misallocated both within and across sectors, flowing toward low-productivity sectors. As a result, total factor productivity stagnated for a decade while nontradables grew, pushing up wages and appreciating the real exchange rate. There was therefore a private-sector crisis, and a long-lasting one, before the public debt crisis hit in 2010. In fact, Ireland and Spain's public debts were small and falling before the crisis, while Portugal's debt increased exclusively via the growth of pensions in spite of cuts in discretionary public spending and increases in taxes.

Compare this account with that of California's public debt crisis. Silicon Valley was the beacon of productivity growth, and the private sector in the state had been thriving. Banks were secondary for many firm's finances, and there was no appreciable increase in capital flows into California or change in wages relative to its neighboring states. Arellano and colleagues contrast the two public debt crises, in Europe and a few US states, and emphasize that they see no spillovers to the private sector in the United States, unlike in Europe. Yet, in Europe, I would argue that the crisis started in the private sector well before the public sector in at least three of the four crisis countries (Ireland, Portugal, and Spain), but was not there in 2000–2008 in California or Illinois.

*Comment 5: Canada as a Different Source of Data*

The Canadian data illuminates the thesis of Arellano et al.'s paper in more than one way. While the authors focus on the spread between Canadian provinces and the federal government after 2008, going further back in history provides another illuminating episode. On October 30 of 1995, there was a referendum on whether Quebec should leave Canada and become an independent state. This question had been heavily debated for many years, and the turnout of 93.5% was extraordinary. All the way to the day of the vote, polls showed an almost even split of the vote, and the actual result was 50.6% against leaving Canada.

Figure 3 shows the spread on provincial debt around the election. Interest rates clearly declined following the election results. It was not clear, in spite of being heavily discussed during the campaign, how a potential new Quebec government would treat private contracts between its citizens and the rest of Canada. This rudimentary difference-in-difference supports the authors' hypothesis. Once the risk of this interference disappeared, spreads fell.

This example also indicates what may be the more relevant risk of interference in Europe. If a country were to leave the euro, it would likely have to redenominate the debt contracts of its citizens to other Europeans. Otherwise, the expected depreciation of the currency would greatly increase the value of those debts in the new domestic currency, as the "original sin" would hit. During the euro crisis, this seemed to be a concern, at least with respect to Greece. The interest rates on Greek public and private debt rose more than that of any other European country during the crisis.

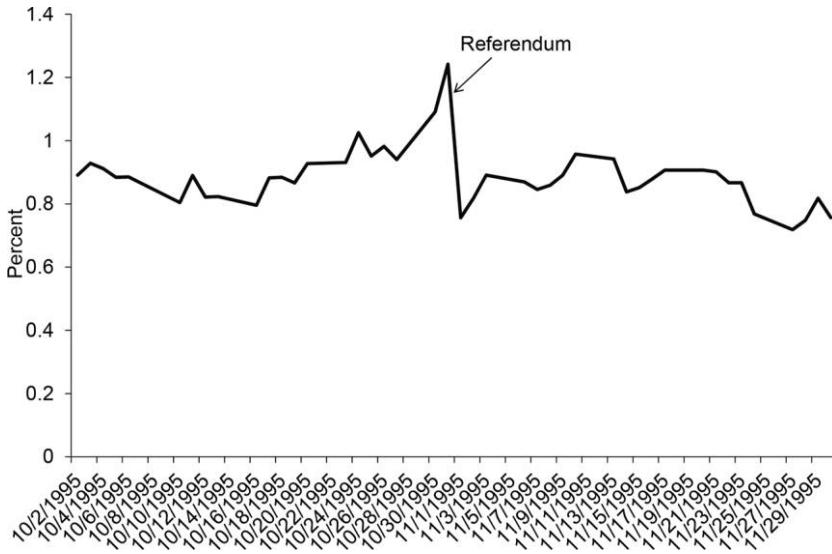


Fig. 3. Quebec-Canada spread on 10-year bonds around independence referendum

**Conclusion**

If nothing else, the events of the past few years have reminded us that sovereign debt crises can and do happen everywhere and often, including in the richest areas of the world. There is much to gain from not looking at the euro crisis in isolation, but in comparison with other events across the world and time, as Arellano et al. and a wave of recent work has done (e.g., Reinhart and Rogoff 2009; Taylor 2015). In particular, considering two new factors, fiscal flexibility and government interference with private contracts, will likely be important to understand these crises. In these comments, I raised some challenges both in measuring and applying these factors as well as in applying them to the euro crisis. There remains much to be done in this exciting area, and Arellano and colleagues have taken the important first step in what I hope will be a stimulating literature.

**Endnotes**

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1. See Gennaioli, Martin, and Rossi (2014b) and Bocola (2015), among many others.
2. See Reis (2013a) for a simple model of this at work.
3. See Brunnermeier et al. (2011) and Gennaioli, Martin, and Rossi (2014a).

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