Political institutions and sovereign borrowing: evidence from nineteenth-century Argentina

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Abstract I study the relationship between political institutions and sovereign borrowing when constitutional constraints are systematically chosen to obtain better credit conditions. I argue that the impact of institutional constraints on country risk premia depends on the government's concern with the country's creditworthiness and its "willingness to repay"; two variables that are hardly observable. To properly evaluate the relationship between political institutions and sovereign borrowing, I focus on the link between institutional constraints and the risk premia of Argentine bonds between 1822 and 1913. Specifically, I analyze whether a "structural break" in the government's cost of borrowing time-series exists. I use the Perron-Volesang test for structural change with unknown break dates. The statistical analysis indicates that the adoption of institutional constraints led to significant improvements in borrowing terms: the series has a single structural change; and the distinctive break point is associated with the country's adoption of constitutional checks and balances. Time-series regressions and instrumental variables (IV) estimation reinforce these findings.

1 Introduction

The notion that governments bound by the rule of law are less likely to expropriate private wealth was cemented by North and Weingast (1989). However, a lively debate still exists with respect to the link between constitutional checks and balances, access to credit, and the cost of capital. For example, Stasavage (2003: 2) argues that constitutional checks and balances are "... neither a necessary nor a sufficient condition ..." to create a credible

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commitment to secure property rights. Likewise, Mauro et al. (2006) argue that investor-friendly institutional changes rarely elicit *immediate* positive responses by investors and financial markets. They suggest that peace and stability are more likely to affect the cost of borrowing.

The existing literature's seemingly contradictory claims highlight two important problems facing this research agenda. The first relates to the difficulty of identifying the effect of institutions in the presence of endogeneity. The basic complication is that many features of a country's institutions are likely to be determined by factors that also have a direct impact on its economic outcomes (Przeworski 2004). The second complication is that many factors that may influence the adoption of institutional constraints are hard to observe. Dismissing such factors introduces an omitted variable problem that would bias any attempt at measurement that does not account for them explicitly (Greif 2006).

In this paper, I discuss the relationship between institutional constraints and sovereign borrowing when certain institutional arrangements are chosen systematically by governments to obtain better credit conditions. I argue that the impact of institutional constraints on country risk premia depends on the government's concern with the country's creditworthiness and its "willingness to repay"; two variables that are hardly observable. As such, a central implication of my argument is that empirical studies that treat institutional constraints as if they were exogenous or random can tell us very little about the effectiveness of institutions.

To properly evaluate the relationship between political institutions and sovereign borrowing, I focus on the link between institutional constraints and the risk premia of Argentine bonds between 1822 and 1913. Specifically, I analyze whether a "structural break" in the government's cost of borrowing time-series exists. If institutional constraints systematically altered interest rates, their adoption should coincide with a structural break in the time series. I use the Perron-Volesang test for structural change with unknown break dates. The model utilizes an endogenous selection procedure wherein the break date is selected when the t-statistic for testing unit roots is minimized. Since the test assumes no a priori knowledge of major turning points, it allows the data to "speak" for themselves.

The statistical analysis indicates that the adoption of institutional constraints led to significant improvements in borrowing terms: the series has a single structural change; and the distinctive break point is associated with the country's adoption of constitutional checks and balances. Time-series regressions and instrumental variables (IV) estimation reinforce these findings.

The rest of the paper is organized as follows. In the next section I present my argument regarding the *endogeneity* of political institutions to sovereign borrowing. In Sect. 3, I analyze the relationship between institutional constraints and public borrowing in nineteenth-century Argentina. Next, I examine some alternative explanations for the decline in Argentine risk premia. The final section concludes.

2 Endogenous institutional constraints

Sovereign debt possesses two intrinsic characteristics that make it different from ordinary debt issued by nongovernment entities. First, repayment is not necessarily connected with the ability to repay. A country may have the technical ability to repay the debt but still adopt a political decision not to do so. This fact is connected with the second characteristic element of sovereign borrowing: limited enforcement mechanisms.[1] To account for the possibility of

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[1] For a survey of this literature see Eaton and Fernandez (1995).

a default, borrowers may have to pay higher interest rates to compensate lenders for this risk. The premium is determined by the perceived political risk; namely, the government's "willingness to pay".

Following North and Weingast (1989), I assume that rulers can adopt additional institutional constraints that increase their credibility and thus enhance their borrowing ability. Notice, though, that rulers face the following problem. On the one hand, more institutional constraints entail losses of political power. On the other hand, so long as the ruler cares about the cost of sovereign borrowing, he may be willing to adopt institutional constraints to increase his/her credibility. As such, rulers face a tradeoff when considering how "tightly to tie their hands": the stronger the institutional constraints, the lower the credit risk (and, consequently the interest rate); yet, more constraints directly reduce the ease with which they can govern. This central tradeoff can thus lead to an underprovision of institutionalization, and high interest rates. In other words, the endogenous choice of institutions implies that the king may "tie his hands", but not too tightly.

A key question is how changes in credit risk and the relative weight placed by the ruler on the cost of borrowing affect the degree of institutionalization and the interest rate. Suppose that investors became more leery of the government. In this case, unless they adjust the country's institutional constraints to the change in investors' perceptions, rulers who possess some discretionary authority will face higher borrowing costs.[2] What would happen, though, if the ruler were to react to a negative change in investors' perceptions? In this case, the ruler's optimal response would be to add constraints on his authority. Yet, given the central tradeoff between power and borrowing terms, the ruler would still fail to adopt the level of institutionalization required to minimize the interest rate.

Suppose now that investors perceptions change for the better (i.e., a decrease in credit risk). Just as before, a strategic ruler would handle this change through an adjustment in institutional constraints. In this case, the underprovision of institutionalization would persist, but the interest rate will be lower due to the change in investors' perceptions. Indeed, rulers who are perceived as being more credible need to adopt fewer institutional constraints on their authority than those who are deemed more risky.[3]

Moving onto the relative weight placed by the ruler on the cost of borrowing, how would a change in the former affect the latter? By adopting more stringent institutional constraints, the ruler would lose "power" but gain better borrowing terms. Therefore, the more the ruler cares about the country's creditworthiness, the more power he is willing to give up to approach the optimal borrowing costs. If the ruler were to put infinite weight on minimizing the country's borrowing costs, no more room for *institutional* improvement would exist.[4]

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[2]An important implication is that a change in investors' perceptions would translate into higher interest rates only when institutions are *sticky*. Therefore, the empirical findings in Mauro et al. (2006) suggesting that investor-friendly institutions do not lead to an immediate decline in the cost of capital can be accounted for by my argument.

[3]This implication resonates well with the findings in Flandreau and Flores (2009). They show that outright reactionary powers, whose bonds were underwritten by the Rothschilds, were successful borrowers. However, once a country's credit risk is taken into account, institutional constraints should be associated with better borrowing conditions.

[4]This conclusion is reminiscent of the argument in Stasavage (2003). He posits that interest rates in England fell only after bondholders took control of the Parliament. Note that in light of the argument presented here, his view can be interpreted as the special case in which the ruler cares significantly about borrowing costs.

3 Identifying the effect of institutions

The argument presented in the previous section clarifies the logical requirements and identification issues associated with the empirical evaluation of the relationship between institutional constraints and sovereign borrowing. In this section, I examine the argument's main empirical implication by focusing on public borrowing in nineteenth-century Argentina. The scope of the institutional changes in the 1850s make this an especially insightful case to study the impact of constitutional constraints on the cost of capital.

3.1 Public finance under absolute power

The early years after Argentina established independence from Spain in 1810 brought chaotic struggles and deep political instability to the former Viceroyalty of Rio de la Plata. In 1829, in the midst of a civil war, Juan Manuel de Rosas was elected governor of Buenos Aires. Invested with extraordinary faculties to "restore the order" by the Junta de Representantes, Rosas possessed ample and discretionary authority to conduct the financial affairs of the province without consulting the assembly. However, given the needs of periodic terror and repression, Rosas was constantly short of funds.

For the most part, Rosas turned to borrowing as a means of financing deficits. In 1831, under his influence, the legislature approved the issue of 6,000,000 pesos in Fondos Públicos National bonds. A year later, the government distributed 4,000,000 pesos in bonds at 50 % of par among merchants, landowners, and cattle breeders. The loan only brought temporary relief and Rosas was once again forced to borrow. The financial market of Buenos Aires was rapidly approaching its point of saturation. Nonetheless, the government issued 17,000,000 pesos in bonds in 1837 and another issue of 10,000,000 pesos in Fondos Públicos in 1840 (Burgin 1946: 204–205).[5]

Figure 1 shows the risk premium of Argentina's sovereign bonds (calculated as the spread between their yields and the British Consol) under Rosas.[6] The average spread of the Argentine bonds is roughly 650 basis points, with a maximum of 1,218 in November of 1838 and a minimum of 222 in December of 1847. It should be noted, though, that by the 1840s Rosas clearly was limited in the amount he could borrow at going interest rates. Therefore, it is not surprising that bond prices continued to improve, reaching par in September of 1846.

Deprived from borrowing, Rosas turned to currency issue as a means of financing deficits (Irigoin 2000). Currency expansion imposed no additional burden upon the treasury in the forms of amortization and repayment (in contrast to the bond issues). Furthermore, *fiat* money made it possible for him to reduce the province's real burden of public indebtedness at a rate which would have been impossible under conditions of stable money (Burgin 1946; Adelman 1999; Irigoin 2000; Bordo and Vegh 2002). However, this monetization of the debt had disastrous consequences for the economy, fostering the eventual collapse of the regime.

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[5]Even when the domestic money market showed increasing resistance to new issues of bonds, the government never turn to foreign lenders. The default on a loan obtained from Baring Brothers in 1824 forestalled prospects of renewed British and other foreign capital investment. In addition, foreign credit was also difficult to obtain for Rosas because his recurrent episodes of fiscal irresponsibility were not ignored abroad.

[6]For a discussion of how the yields were calculated see Mauro et al. (2006: 38–45) and Saiegh (2011).
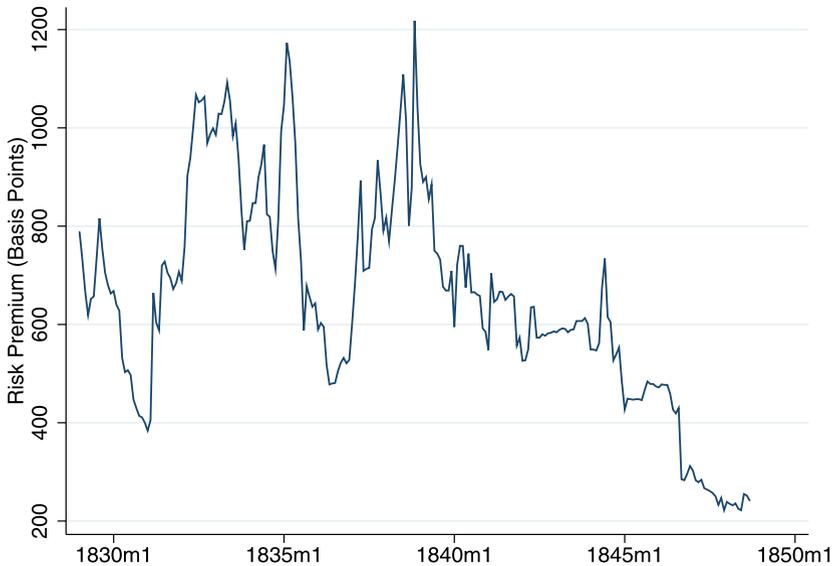
Fig. 1 Risk premia—Argentina, 1825–1848

3.2 Limited government

On February 3, 1852, the *caudillo* of Entre Rios, Justo José de Urquiza, defeated Rosas's men in the battle of Monte Caseros. In 1853 a national constitution was drafted. Still, a year later, as Urquiza became president of a new Argentine Confederation, Buenos Aires seceded. During the next few years, the two governments coexisted, resorting to token wars and, more often, to blockades and discriminating tariffs. The secession ended in 1859 when Buenos Aires agreed to join the union. After a series of reforms that accommodated the incorporation of Buenos Aires into the nation, the 1853 federal constitution was finally adopted in 1860.

The reunification of the country led to the emergence of a consensus inspired by liberal principles. The constitution enacted a well-defined structure of horizontal and vertical accountability modeled after that of the US Constitution. It provided for a federal system of representative government based on a division of power between the central government and the provinces and on the separation of executive, legislative and judicial powers. These were vested, respectively, in a president, a bicameral legislature, and a hierarchy of federal courts headed by a Supreme Court. The three powers were interconnected by a system of checks and balances.

Moreover, to ensure that the institutions of limited government were credible, a number of specific institutional structures were also established in the constitution. These clauses imposed explicit limits on the government's behavior. For example, in financial matters, the executive branch clearly was constrained by the legislature. The constitution also included a comprehensive list of individual rights and guarantees, along with the unambiguous protection of private property. Finally, a whole set of principles of economic liberalism—the promotion of free trade, foreign investment, immigration and education—was included in the constitutional text.

3.3 Institutional constraints and the cost of capital

Bartolomé Mitre's presidential inauguration in 1862, marked the beginning of a new era in Argentina. This period saw the establishment of a national legal system, an integrated judicial system, a professional army, a bureaucracy, a national bank, a taxation system, a national treasury, a national customs office, as well as other public institutions. An astonishing rate of growth, with an annual average of at least 5 %, made Argentina one of the richest nations in the world by the beginning of the twentieth century.

With respect to public borrowing, the key issue is whether limited government influenced the cost of capital. As discussed above, establishing that constitutional constraints led to better borrowing terms, requires that we address the problems posed by the endogeneity of institutions. My empirical strategy is to analyze whether a "structural break" in the government's cost of borrowing time-series exists.[7]

Before detailing the test for structural change and its results, it is useful to examine the properties of the data series. The first step is to check for stationarity. I employ three tests: the Augmented Dickey-Fuller (ADF) and the Phillips-Perron test. In addition, I also use the Kwiatkowski, Philips, Schmidt and Shin (KPSS) Lagrange Multiplier test. The evidence from the ADF and Phillips-Perron tests point in the same direction: for most specifications, the unit root hypothesis is rejected when the specification includes a time trend and/or a constant term. In the case of the KPSS test, evidence in favor of stationarity is found for the model with a time trend. The null hypothesis is rejected, however, for the case of level stationarity. The caveat here is that the test typically has low power if the series is characterized by stationary fluctuations with a one-time permanent change in level (Perron 1990).[8]

To account for the possibility of a structural breaks, I use the Perron and Volesang (1992) test for structural change with unknown break dates. The null hypothesis is that the series has a unit root with a change in its level. The alternative hypothesis is that the series is stationary with a structural break. The test can be implemented using both an additive outlier (AO) model for a sudden change and an innovational outlier (IO) model appropriate for a gradual change. Each model utilizes an endogenous selection procedure wherein the break date is selected when the t-statistic for testing unit roots is minimized.[9]

Figure 2 shows the results for the AO model. The t-statistic is minimized in 1859, with a statistically significant value of −4.49 (relative to the 5 % critical value, −3.56). Therefore, the null hypothesis can be rejected, indicating that the series is stationary with a structural break. In the case of the IO model, based on the critical value of the t-statistic, the hypothesis that a gradual shift in the mean occurred slowly over time can also be rejected. Finally, I also checked for the possibility of multiple breaks using the methodology proposed by Clemente et al. (1998). The results indicate that multiple breaks can be rejected.

In sum, the view that the series is stationary with a one-time permanent change in level is supported by the statistical analysis. More importantly, the results also indicate that the distinctive break point is associated with the country's adoption of constitutional checks and balances. As Fig. 2 shows, the break coincides with the unification of the country under the 1853 constitution. Substantively the analysis shows that, in comparison to the Rosas' period, the risk premium of Argentine bonds fell considerably. Before the adoption of the

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[7]The data sources and sample's construction methods are documented in Saiegh (2011).

[8]All the results are available from the author upon request.

[9]Critical values are taken from Perron and Vogelsang (1992), Table 2, for $T = 150$. For full specifications of each model, see Perron and Vogelsang (1992) and Clemente et al. (1998).
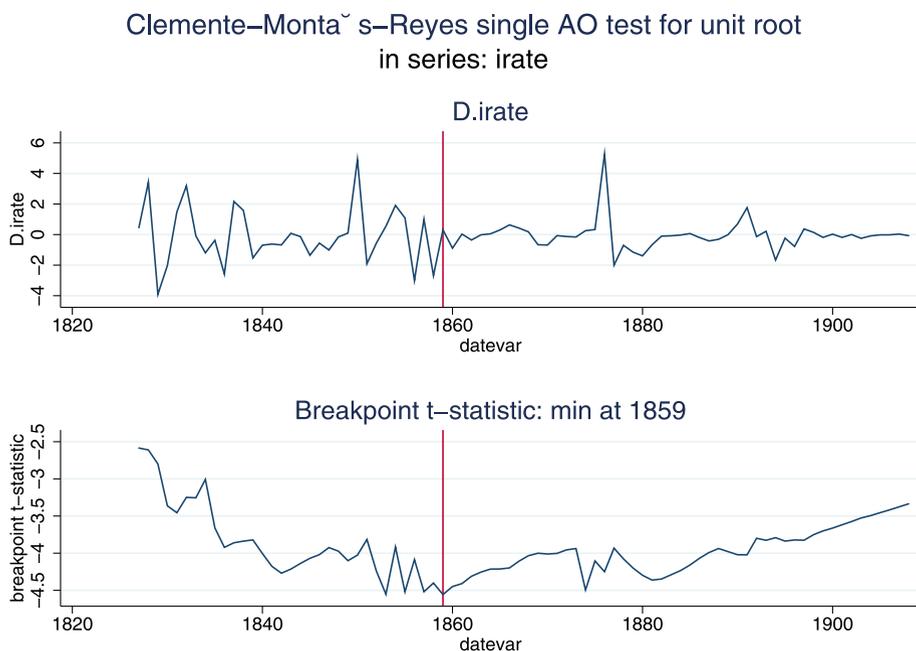
Fig. 2 Structural break in yield series (performing bonds)

constitutional constraints, the average interest rate paid by the Argentine government was roughly 9.7 %; for the period between 1860 and 1913, the cost of borrowing declined to a mean value of 6.3 % (equivalent of some 300 basis points above U.K. Consols).

This break with the past is even more remarkable since after 1860 a relaxation of credit rationing emerged. In fact, throughout the period between 1864 and 1913 there was a rapid expansion of credit available to the government. In 1864, Mitre's second year in office, government expenditures were about 7,119,931 pesos and debt was extremely limited. Twenty years later, government expenditures had grown by eight times to 56,440,137 pesos, and the public debt to 122,503,000 pesos.

Compared to the financial scenario of the pre-constitutional years, this acute change in the willingness of domestic lenders to supply funds to Argentina seems to reflect a substantial increase in the perceived government commitment to honor its agreements. A good illustration of this change is given by the period between 1891 and 1902, when Argentina suffered from credit rationing in international markets but the government was still able to raise debt in the domestic market.

4 Alternative explanations

The empirical evidence suggests that the adoption of constitutional constraints led to a drastic change in the pattern of public borrowing in Argentina. This finding is consistent with, but does not necessarily imply, the notion that checks and balances are a necessary condition for securing better borrowing terms. In particular, the structural break could also be attributed to other historical factors. In this section I evaluate alternative explanations for the decline in Argentine bond yields after 1860.
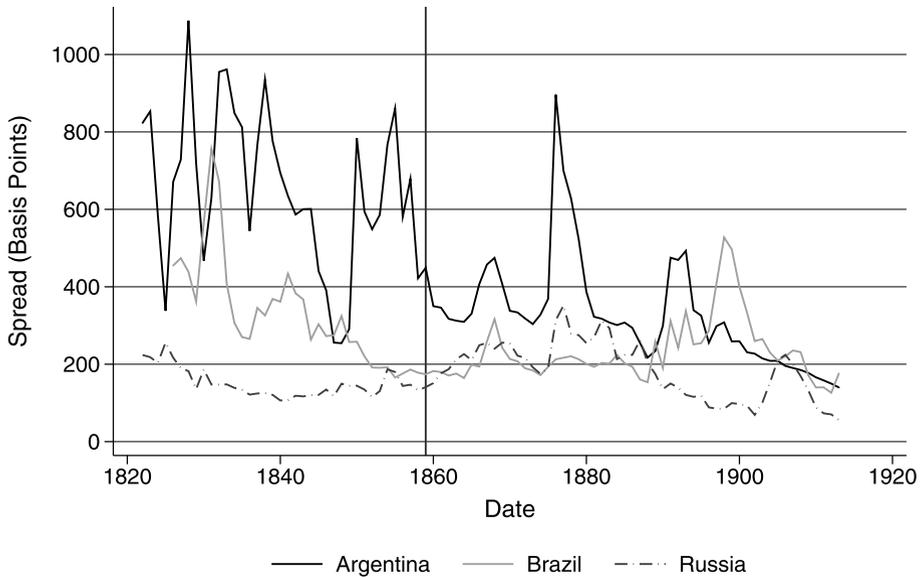
Fig. 3 Emerging market spreads

4.1 International factors: financial globalization

The market price of risk fell dramatically in the second half of the nineteenth century. Therefore, financial globalization is a plausible alternative explanation for the decline in Argentina's cost of capital during this period. In Fig. 3, I present changes in the spread between the yield of Argentine bonds and the British Consol on the London market from 1859 to 1913. I also present the same data for two other emerging market countries, Brazil and Russia.

The first impression conveyed by Fig. 3 is that there is a relationship between Argentina's cost of capital and the international trend (caused, perhaps by a "supply effect," namely the increase in the outflow of capital from the United Kingdom). However, the data also indicate that there was substantial cross-country variation in spreads. It is clear from Fig. 3 that the spreads of Russian and Argentinean/Brazilian bonds moved in opposite directions at different points in time (and particularly at the end of the nineteenth century). The data also suggest that there was nothing special about the 1850s, when Argentina adopted its constitutional constraints.

Figure 3 also clearly shows that the yield on Argentine bonds displayed some remarkably idiosyncratic fluctuations. For example, between 1877 and 1880, the Argentine government found itself paying interest rates that were higher than those that had prevailed in the previous five years. It is also worth noting that the spread between yields on Argentine government debt and British government debt narrowed only by the end of the period, more than 50 years after the adoption of the 1853 constitution.

4.2 Domestic factors: political and macroeconomic stability

Another possible explanation for the observed decline in yields after 1860 is that they were a by-product of the benefits associated with peace, political order, governability, and changes

in economic principles and policy. In particular, I am concerned with the following set of questions: could Argentina's better borrowing terms be due to newfound political stability, rather than checks and balances in the new constitution? Did yields fall because Argentine governments established a record of consistent debt repayment? Could the observed decline in risk premia be due to increased confidence in the value of Argentine currency?

To answer these questions, I examine fluctuations in Argentina's borrowing costs. Table 1 reports the estimated effects of domestic factors on Argentina's cost of sovereign borrowing in a multivariate context. The equation for all models is:

$$Y_t = \alpha + \beta C + \delta \mathbf{X} + \varepsilon_t, \tag{1}$$

where Y_t is the yield in a given year and C is a dummy variable that takes the value of 1 for the post-constitutional period (1859–1913) and 0 otherwise. Hence, β can be interpreted as the average post-1859 interest rate. I also include a vector of determinants of the cost of borrowing, denoted by $\mathbf{X}$. As discussed above, no problems of serial correlation exist (the series is stationary with a one-time permanent change in its level). Therefore, the parameters α, β, and the vector δ, are estimated by OLS with robust standard errors.[10]

The results support the conclusion from the structural break test: the effect of the constitutional constraints on Argentina's borrowing costs were highly persistent. As mentioned above, the average interest rate paid by the Argentine government after the adoption of the constitutional constraints was roughly 6.3 %. As can be seen from Table 1, after controlling for a number of factors, the estimated coefficient for $\alpha - \beta$, the average yield of Argentine bonds after 1859, is roughly 6 % across all specifications. In other words, these findings suggest that, at best, the aforementioned alternative hypotheses can explain the deviations of borrowing costs from the post-1860 trend.

A closer examination of the results offers a number of additional insights. First, the decline in yields after 1860 does not seem to be a by-product of the benefits associated with peace, political order and governability. The binary variable militarized disputes (*War*) includes both intra-state as well as inter-state wars. The data come from the Correlates of War (COW) project, and takes a value of 1 if a dispute occurred in a particular year and a value of 0 otherwise. The results indicate that political stability did not have an effect on interest rates independent of the institutional structure: military disputes have a positive and statistically significant effect on the country's borrowing costs only for the post-1860 period (*Const. * War* in Table 1, model 1). Indeed, much of the politics during that era was still stained with blood, as the federal government had to confront frequent civil and military uprisings.[11] Hence, while it would be misleading to associate the post-1860 period in Argentina with peace and governability, it seems that most lenders were aware of the prevailing political conditions and thus were consistently able to price them.

Turning to economic policies, one of the issues at stake is whether the structural break in the risk premia series can be attributed to macroeconomic stability rather than to the adoption of institutional constraints. Specifically, greater confidence in the value of Argentina's currency is another factor that could have affected the price of its public debt after 1860. As noted above, inflationary financing was a hallmark of the Rosas administration. Following his fall several attempts to implement monetary reforms were made. The conflict between

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[10]The disturbance terms for each period are allowed to be correlated.

[11]During the 1870s, the country suffered numerous insurrections, provincial rebellions, revolts, and a military confrontation between the governor of Buenos Aires and the national government. In 1890, an uprising against the national government initiated a period of uncertainty in Argentine politics: numerous revolts were plotted in the following decade, including two revolutionary outbreaks in 1893.

Table 1 Argentine borrowing costs, 1822–1913 (by type of debt)

	Performing (1)	Performing (2)	Swapped (3)	Swapped (4)	Rescheduled (5)	Rescheduled (6)
Constant	10.084***	9.354***	10.109***	9.480***	10.101***	9.492***
	(15.56)	(19.09)	(15.62)	(19.72)	(15.60)	(19.72)
Constitutional Const.	−3.938***	−3.057***	−3.712***	−2.952***	−3.671***	−2.938***
	(5.50)	(6.50)	(5.24)	(6.39)	(5.18)	(6.35)
War (lagged)	−0.680	0.366	−0.703	0.196	−0.696	0.180
	(0.81)	(0.89)	(0.87)	(0.49)	(0.86)	(0.44)
Inflation	0.027**	0.026**	0.025**	0.025**	0.026**	0.025**
	(2.34)	(2.16)	(2.28)	(2.10)	(2.30)	(2.10)
Const. * War	1.645*		1.414		1.374	
	(1.85)		(1.60)		(1.56)	
Const. * Inflat.		0.016		0.013		0.015
		(0.59)		(0.50)		(0.56)
1876 Crisis	3.713***	3.472***	3.471***	3.266***	3.435***	3.230***
	(4.95)	(4.79)	(4.64)	(4.49)	(4.59)	(4.46)
Credit Abundance	−0.886***	−1.125***	−1.129***	−1.332***	−1.092***	−1.296***
	(2.65)	(3.52)	(3.50)	(4.28)	(3.33)	(4.13)
Baring Crisis	0.262	0.082	2.237***	2.082***	4.823***	4.673***
	(0.52)	(0.17)	(4.25)	(4.10)	(6.36)	(6.35)
R^2	.52	.50	.50	.48	.54	.53
N	91	91	91	91	91	91

Notes: All columns contain the results of OLS specifications with robust standard errors. The variable *War* has been lagged by one year. Z-scores are in parentheses. * indicates significance at a 10 % level; ** indicates significance at a 5 % level; *** indicates significance at a 1 % level

Buenos Aires and the Confederation, however, stood in their way. In fact, inflationary financing reached new levels: to cope with increasing military expenditures, the government of Buenos Aires issued 185,000,000 pesos between 1859 and 1861 alone (Cuccorese 1966). In 1863, an effort to establish paper money as the unit of account for the whole nation (17 pesos fuerte per ounce of gold) failed. A mechanism instituting the free convertibility of the peso was adopted by the government of the province of Buenos Aires in 1867. However, in May 1876, the government decreed the suspension of convertibility of the Banco de la Provincia de Buenos Aires's notes (della Paolera and Taylor 2001).

As the results in Table 1 show, after 1876, Argentina's bond yields increased by roughly 3 %, but they fell back in the 1880s when a new convertibility plan was announced.[12] In 1883, a bimetallic system with a fixed ratio of 25:1.6129 between silver and gold was established. This period of convertibility lasted only until January 1885, at a time of financial crisis in Europe and following a period of expansionary monetary and fiscal policy (Bordo and Vegh 2002). In the 1890s, the government adopted a rigid commitment device, namely, a "hard" gold standard rule (della Paolera and Taylor 2001). But fluctuations in the value of the money in circulation continued until 1899, when convertibility finally was restored. This time, convertibility proved to be more resilient, and it lasted until the outbreak of the First World War. The adherence of Argentina to an internationally approved gold standard regime clearly was a decision that had implications for the price of bonds.

The effect of monetary instability on the yield of Argentine securities can be seen in Table 1: consistent with the Fisher equation, borrowing costs are positively associated with the inflation rate.[13] The interaction between inflation and constitutional constraints indicate that the former also had a positive and statistically significant effect on interest rates for the post-1860 period. The average yield of Argentine bonds in the post-1860 period (centered around the 6 % average), however, was consistently lower than in the previous era for all observed values of inflation between 1860 and 1913 (which ranged from −15 to 24.6).

It may also be argued that Argentine yields fell because the country established a reputation for being a good creditor. However, this was not the case either. During the 1880s it appeared that Argentina's credit was inexhaustible. At the same time that the scope of borrowing increased, the rate that lenders charged the government also fell. This is reflected in the point estimate of *Credit Abundance*, which has a negative sign and is statistically significant.[14] From early 1889, however, foreign investors became reluctant to absorb additional Argentine government debt and, in addition, many of them were actually selling Argentine bonds in London (Mitchener and Weidenmier 2008). A year later, the world's largest merchant bank, Baring Brothers & Co. (commonly known as Barings of London) failed to attract subscribers for a loan underwritten to reorganize Buenos Aires' water supply. This event signaled a shortage in the supply of foreign capital for Argentina, and was followed by a steep decline in the price of the country's securities.

Controversial viewpoints regarding the country's response to the Barings crisis exist. Some accounts imply that, following the firm's collapse, the Argentine national government declared an across-the-board default on its foreign debt (Ford 1956; Fishlow 1985; Mitchener and Weidenmier 2008). However, Argentina never technically defaulted on its bearer external debt or bonds. Rather, it reached a debt rescheduling agreement with foreign

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[12]The variable *1876 Crisis* takes the value of 1 for the period between 1876 and 1879, and 0 otherwise.

[13]The variable *Inflation* measures the annual percentage change in Argentina's consumer price index. Source: Ferreres (2005)

[14]The variable *Credit Abundance* takes the value of 1 for 1888–1890, and 0 otherwise.

creditors (della Paolera and Taylor 2001; Gerchunoff et al. 2008). The distinction between default and debt rescheduling in this case is not just semantic: unlike unilateral defaults, which usually involve severe loses to investors, foregone debt service was capitalized under the Rothschild and Romero agreements, so creditors faced no "haircuts". In fact, these agreements were very creditor-friendly. The treatment of Argentine debt in global capital markets supports this view. According to Mitchener and Weidenmier (2008) Argentine yield spreads rose 675 basis points in the first year after the onset of the crisis, compared to an average increase of 844 basis points for Latin America. Moreover, the average yield spread for the Latin American sample (excluding Argentina) increased by 759 and 1,608 basis points in the two- and four-year periods after the onset of the financial crisis. In contrast, the Argentine yield spreads rose 682 and 689 basis points, respectively.[15]

The findings in Table 1 address the effect of the Baring crisis on the yield of Argentine bonds.[16] The results indicate that in the case of performing bonds this effect is statistically indistinguishable from zero. This finding is clearly the consequence of my decision to exclude from this series bonds in default. Models 2–6 were estimated using yields of bond issues that were directly affected by Baring crisis.[17] Bond yields increased by 2.45 % and 4.16 % in the series including swapped debt and non-performing issues, respectively. Yet, for both series the average interest rate paid by the Argentine government between 1860 and 1913 was roughly 6 %. It is thus clear that the Baring crisis did not have long-term effects on the risk premia of Argentine bonds.[18]

Overall, the results presented in Table 1 demonstrate that the constitutional constraints had a permanent effect on Argentina's borrowing terms. And while other political and economic conditions explain variations in the value of the country's debt between 1860 and 1913, these fluctuations drifted around the post-1860 trend.

4.3 Instrumental variables (IV) estimation

The endogeneity of constitutional constraints inevitably raises concerns regarding the consistency of OLS. I employ an instrumental variables estimator to address this issue. My strategy is to use militarized disputes (the variable *War* described above) as an instrument for constitutional constraints. The narrative of the Argentine case presented above leaves little doubt that the instrument is relevant: the reunification of the country under the 1853 constitution was a reaction to Rosas's traumatic—and violent—rule.

The critical issue is then whether the instrument satisfies the exclusion restriction. Specifically, the question is whether armed struggle is correlated with any other factors (other than constitutional constraints) which may have affected investors' perceptions regarding the country's creditworthiness. An empirical check of the validity of the exclusion restriction is already provided by the results in Table 1. The variable *War*(*lagged*) is correlated

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[15]Unlike the Argentine federal government, the provincial and municipal authorities did not reach agreements of this kind with their creditors. As such, holders of provincial bonds did lose accrued interest and, in most instances, suffered reductions in principal. The fact that lower levels of government defaulted on their debts, however, does not invalidate the argument that the introduction of limited government reduced credit risk in Argentina.

[16]The variable *Baring Crisis* takes the value of 1 for the period between 1890 and 1897, and 0 otherwise.

[17]These data were graciously provided to me by Kris Mitchener and Mark Weidenmier.

[18]In light of these results, I re-estimated the structural break test using yields of bond issues that were directly affected by the Barings crisis: (a) the 6 % Funding Loan (swapped debt); and (b) the 5 % 1884 Loan (debt in default). In both cases, there is a single structural break in the series, and it coincides with the adoption of the constitutional constraints.

Table 2 IV estimates of the effect of institutions on borrowing costs

	2SLS	MLE	2SLS	MLE
	(1)	(2)	(3)	(4)

Second Stage. Dep var: Interest Rate (Performing Debt)

	2SLS (1)	MLE (2)	2SLS (3)	MLE (4)
Constant	10.027***	9.933***	10.827***	11.041***
	(14.60)	(11.05)	(12.81)	(12.94)
Constitutional Constraints	−3.853***	−3.693**	−5.137***	−5.338***
	(3.85)	(2.80)	(3.99)	(4.37)
Inflation	0.025**	0.030***	0.020*	0.026***
	(2.30)	(2.66)	(1.69)	(2.76)
1876 Crisis	3.695***	3.488***	4.207***	3.490***
	(4.75)	(4.93)	(4.92)	(5.48)
Credit Abundance	−0.905**	−1.109***	−0.393	−0.976***
	(2.07)	(3.52)	(0.71)	(2.81)
Baring Crisis	0.237	0.051	0.730	0.084
	(0.42)	(0.11)	(1.11)	(0.20)

First Stage. Dep var: Constitutional Constraints

	2SLS (1)	MLE (2)	2SLS (3)	MLE (4)
War (Lagged)	−1.244***	−1.246***		
	(4.21)	(4.21)		
Political Instability (Lagged)			−1.927***	−1.876***
			(3.42)	(3.00)
Observations	91	91	91	91
F-statistic for Instrument	19.19	17.74	16.16	11.67

Notes: All columns contain the results of IV estimations with robust standard errors. Z-scores are in parentheses. The variables *War* and *Political Instability* have been lagged by one year. * indicates significance at a 10 % level; ** indicates significance at a 5 % level; *** indicates significance at a 1 % level

with constitutional constraints ($r = -0.48$), but it has no direct effect on borrowing costs. Instead, militarized disputes affect borrowing costs only through constitutional constraints (Model 1 in Table 1). Therefore, the exclusion restriction is satisfied.

Table 2 reports the IV estimates of the effect of constitutional constraints on Argentina's borrowing costs. The dependent variable is the annual yield on performing bonds. Models (1) and (2) use militarized disputes as an instrument and are estimated using 2SLS and Maximum Likelihood, respectively. As shown in Table 2, the IV estimates also show a negative and statistically significant relationship between constitutional constraints and the cost of borrowing. Moreover, the IV values are almost identical to the least squares estimates. Indeed, endogeneity tests indicate that the OLS estimates presented in Table 1 are consistent.

As a final robustness test, I estimate the same model using an alternative measure of political instability as my instrument for constitutional constraints. I constructed the variable *Political Instability* using information drawn form the Polity IV dataset. The widely used *Polity Score*, classifies political regimes using a 21-point scale ranging from −10 (hereditary monarchy) to +10 (consolidated democracy). It also has a separate coding scheme to account for situations of anarchy or "interregnum", foreign "interruption", or "transition". My measure of political instability is thus coded as 1 when the *Polity Score* indicates that

any of these situations exist, and 0 otherwise. An empirical check of the validity of the exclusion restriction indicates that *Political Instability* is correlated with constitutional constraints ($r = -0.42$), but does not have an effect on borrowing costs. When an OLS model (analogous to Table 1, regression 1) is reestimated using this measure instead of militarized disputes, its point estimate too is statistically indistinguishable from zero (1.171, z-score: 1.37, not shown). And, the same is true for the interaction between political instability and constitutional constraints: its point estimate is indistinguishable from zero (1.326, z-score: 1.48, not shown).

Models (3) and (4) report the IV estimates of constitutional constraints' effects on the annual yield of performing bonds when *Political Instability* is used as an instrument. As before, the models are estimated using 2SLS and Maximum Likelihood, respectively. In the case of political instability, the results suggest that the endogeneity of constitutional constraints does have an effect on the estimates: the null hypothesis of consistent OLS estimates can be rejected at the 5 % confidence level. And, as Table 2 indicates, some differences between the OLS and IV estimates exist. If anything, though, the OLS estimates reported in Table 1 tend to underestimate rather than overestimate the effect of constitutional constraints on borrowing costs. According to the IV values, the estimated average yield of Argentine bonds between 1860 and 1913, is actually below 6 %.

5 Concluding remarks

The claim that governments are willing to *tie their hands* to achieve better borrowing conditions is at the core of the theoretical debate regarding the relationship between political institutions and sovereign lending. As such, the empirical evaluation of these theories is usually hampered by their very own logic. If the form and function of these institutional arrangements depend on the conditions under which they emerge, then the institutional variation observed in the real world is unlikely to be random.

Moreover, when unobservables are not taken into account, the impact of institutional constraints on borrowing terms cannot be identified properly. Consider the role of creditworthiness. The argument presented in this paper implies that a rulers' choice regarding institutional constraints depends on his country's perceived probability of default. Therefore, credit risk may sometimes lead to greater degrees of institutionalization, as in the case when governments adopt institutional reforms that enhance their borrowing abilities. However, in other instances, creditworthiness may have the opposite effect, as when autocratic governments with good credit have no need to adopt any meaningful institutional constraints to borrow funds. More generally, the endogeneity of institutions in the presence of unobservables is one reason why many empirical studies fail to find that cross-national variations in institutional constraints explain cross-national differences in risk premia.

This paper demonstrates that the effects of political institutions on sovereign borrowing can be identified when the appropriate econometric techniques, such as tests for structural change with unknown break dates, are employed. I find that during the period between 1820 and 1859, the absence of constitutional limitations was associated with credit rationing, short-term borrowing, and the use of money creation to finance public deficits. The creditworthiness of the Argentine government was ultimately established when constitutional checks and balances were finally adopted.

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