

CONTINGENT SOVEREIGN DEBT CONTRACTS: THE HISTORICAL PERSPECTIVE

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Introduction

Contingent sovereign debt is conceptually appealing. Economists have long argued that linking the obligation to pay to an indicator of ability to pay (such as GDP growth or export prices) could substantially reduce the risk of defaults, as well as smooth consumption (Kletzer, Newbery and Wright 1992; Borensztein and Mauro 2004; Borensztein et al. 2004). Actual examples of contingent bonds, however, are rare (Griffith-Jones and Sharma 2006). The handful of cases that exist are part of restructuring packages negotiated in the aftermath of defaults, such as the GDP-indexed bonds of Argentina and Greece.³ The lack of independently verifiable data is often cited as one of the main reasons for the scarcity of contingent debt. Governments compile all the relevant statistics about GDP growth, for example. The possibility of one-sided manipulation deters investors and makes it difficult to sustain a well-functioning market.

The age of jet travel, electronic trading and complex financial engineering has not solved these problems. Remarkably, the age of the galleon and messengers on horseback did. King Philip II, who ruled Spain between 1556 and 1598, was the first monarch to borrow from international markets on a modern scale – his debts reached approximately 60 percent of GDP (Drelichman and Voth 2010). Many of these loans were explicitly contingent on observable events; others featured options allowing either the king or the bankers to reschedule

disbursements and repayments at will, hence allowing the parties to modify cash flows in response to unforeseen circumstances. In this article, we describe the workings of the sixteenth-century Spanish system of sovereign debt, and consider why its state-contingent features have not been replicated since.

Borrowing in the Spanish Empire

Philip II of Spain was the first monarch on whose domains the sun truly never set. His territories spanned every known continent. In Europe he ruled over the Iberian Peninsula, the Low Countries, and Northern Italy. In 1580, after a brief war of succession, he acquired the crown of Portugal, as well as its merchant empire. Spanish settlers fanned out over the Americas, established themselves in the Philippines, and maintained a smattering of outposts in Northern Africa. Administering these vast territories and fighting wars to enlarge them or keep them safe caused large swings in the royal budget. Access to credit was hence crucial for the king.

Early modern states were run with a tiny bureaucracy – especially when compared to the vast administrative machinery employed today. It is particularly worth noting that they did not have a tax collection infrastructure. Most revenues were farmed out to either private entrepreneurs or to municipal corporations, who agreed to pay the king an annual lump sum in exchange for becoming the residual claimants to a revenue stream. This made the bulk of royal income very stable and predictable. Spain, however, had to deal with one significant exception: silver revenue, which in some years accounted for up to 25 percent of its national budget.

Silver was mined in the New World by private individuals. The Crown enforced a trading monopoly, requiring that all silver be shipped to Seville, where it was taxed at a rate of 20 percent. The amount of silver that reached Seville – and hence the royal coffers – fluctuated significantly. In some years hurricanes prevented the treasure fleets from sailing; and the bullion accumulated in Havana until the following season. At other times, epidemics among the labor force temporarily reduced

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³ While not classified as a default by rating agencies, Greece's "voluntary" restructuring with its creditors still implied a major capital reduction.

silver production. While the overall trend was strongly positive, the year over year fluctuations of this key component of royal revenue made financial smoothing services very valuable.

Sixteenth century Spain used two different borrowing instruments: tax-backed perpetuities, called *juros*, and short-term debt contracts with international banking houses, called *asientos*. Both had explicitly contingent features designed to share known risks. Remarkably, both the kings and his lenders showed great flexibility to keep the credit market operating when unforeseen events threatened the viability of one of the players. In other words, these lending contracts were implicitly contingent as well.

Contingent features of long-term debt

Juros were perpetual or lifetime bonds, giving the holder the right to collect a fixed annual sum, paid directly by the administrator of a specific tax. A key provision made *juros* contingent: if the proceeds of the revenue stream against which a bond was issued were insufficient to cover all the promised payments, the royal treasury was under no obligation to make up the shortfall. Which bonds were paid first was determined by a seniority structure clearly specified in the contracts themselves.

Juros insured the king against a sudden downturn in tax revenue. If one particular revenue stream dried up, the king effectively stopped paying interest on any debt issued against that stream. The arrangement also eliminated moral hazard. Tax farmers were residual claimants, so their incentive was to collect as much tax as possible. Bondholders collected interest directly from tax administrators, who had to fulfill all *juro* payments before claiming any leftover funds as their personal profit. The incentives of tax farmers and creditors were thus aligned, while the king played no role in determining how much was collected, or in reporting the performance of a revenue source.

The occasional shortfall of a tax stream resulted in bondholders not being paid. Because the eventuality was contracted upon, this was never considered a default. However, the king was amenable to absorbing some of the losses whenever a large, unanticipated shock affected many bondholders. A case in point arose after the Morisco rebellion of 1568, which destroyed the majority of silk production in the Granada region.

The industry would not recover for decades, and *juros* written on silk taxes consequently lost much of their value. Within a few months, however, the king agreed to swap depreciated silk *juros* for others of equivalent face value, backed by healthy revenue sources.⁴ How should one interpret this apparent display of royal munificence? Lending was a repeated game, in which the parties tried to contract over foreseeable circumstances in a way that shared risks and priced them accordingly. Unforeseeable, large shocks such as the Morisco rebellion could not possibly be contracted upon ex-ante – the market was incomplete. The renegotiation shifted some of the risk ex-post to the king, keeping lenders in business and ensuring the continued viability of the market.

Contingent clauses in short-term loans

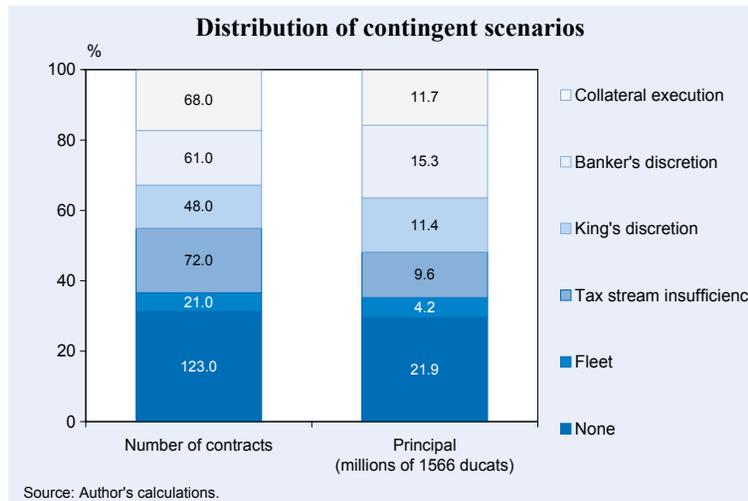
Spanish *juros* were a very successful debt instrument. They were regarded as eminently safe, and were widely held in investor's portfolios across Europe. They were among the cheapest forms of sovereign debt for the time, averaging a yield of just over seven percent (Toboso Sánchez 1987; Homer and Sylla 2005; Stasavage 2011). This success, however, owed much to the fact that *juros* were only issued against stable, farmed-out revenues. In order to leverage the enormous, but volatile riches that arrived on the treasure fleets, the Crown had to turn to short-term loans – the famous *asientos*.

Asientos were mostly contracted with international banking houses. During Philip II's reign, Genoese lenders dominated the market; while German, Spanish, and Portuguese underwriters also featured prominently. *Asientos* had an average duration of 22 months. The average principal was 200,000 ducats, with several contracts exceeding one million ducats. These were large sums; royal revenue hovered around 6 million ducats per year. *Asientos* were also significantly more expensive than *juros*; their average cost to the Crown was 23 percent (Drelichman and Voth 2011a).

As of 1566, Genoese lenders introduced the use of collateral and contingent clauses into *asiento* contracts. In the course of our six-year long project on the debts of Philip II, we transcribed and coded every clause in each of the 438 contracts subscribed between 1566 and 1600. Over two thirds of the loans contain one or more contingent clauses. If activated, they modified

⁴ The agreement is detailed in a contract between the king and Jerónimo de Salamanca, Lucas Justiniano, and Bautista Spinola dated May 19, 1569. Archivo General de Simancas, Contadurías Generales, Legajo 85.

Figure 1



cash flows, maturities, and interest rates. We classify these scenarios into five broad categories, according to the event that triggered the deviation from the baseline payment schedule. The first two are associated with exogenous events: the timing of the arrival of the fleets, and the performance of specific tax streams. Two more are actually options. Sometimes the king is granted the ability to unilaterally reschedule payments within specified parameters (a scenario we call “king’s discretion”), while in others the banker is allowed to request an early payment, usually in the form of juros (we call this “banker’s discretion”). Finally, a fifth type of contingency specifies under which conditions the lenders can seize the posted collateral, and in what amounts. Figure 1 shows the distribution of contingent scenarios, by number of contracts and by principal affected.

About one third of the contingent scenarios were triggered by insufficient revenue – either by a fleet not arriving, or by a tax stream failing to perform as expected. Over 40 percent leave it at the bankers’ or the king’s discretion to change the nature of the payments, and the rest refer to collateral execution scenarios.

Contingent debt as insurance

Contingent sovereign debt contracting serves to provide insurance to both the king and his bankers. This was accomplished by spreading known risks in a mutually agreed fashion, and by providing flexible tools to deal with unforeseen circumstances. Table 1 shows the effect of each type of contingent scenario on the rate of return and the maturity of short-term loans.

Column (1) shows the average cost the king had to pay to enter into a contract containing a specific type of contingency relative to a non-contingent loan. Column (2) reports the additional cost incurred if the contingency was actually invoked, and column (3) shows the average increase in maturity associated with each type of scenario. Writing a contingency on the arrival of the fleet implied a four percentage points increase in the rate of return of a contract, (although the difference was not statistically significant). Actually executing the contingency was not

very expensive, and the average maturity increase was 2.6 months. The lack of significance is not surprising; while the exact timing of an arrival could vary, whether the fleet would arrive at all was never in much doubt. Treasure ships were heavily escorted, and losses to piracy or to the elements were minimal. There was little to insure beyond a variation of a few months in the time of payment, and the costs of doing so were accordingly small.⁵

Tax stream insufficiencies were different. When a particular revenue stream failed to perform, this was invariably bad news for the king. Shortfalls one year were unlikely to be recovered the next. Writing and executing tax-related contingencies results in a combined reduction of 3.3 percentage points in the interest rate on average, as well as in a maturity extension of 4.6 months. Bankers effectively provided insurance in case of a fiscal shortfall. Revenues backing asiento payments were largely farmed out, as were those backing juros. The performance of each tax stream was therefore independently verifiable, and moral hazard was not a problem.

If the king wished to include an option to unilaterally reschedule payments in a contract, he had to pay an additional 4.3 percentage points. Actually exercising the option resulted in a further 4.1 percentage points charge. This scenario is the converse of the previous one. The king does not have a verifiable reason for deferring payment, and hence the lenders cannot rule out moral

⁵ The worst that could happen to a fleet was to be delayed for a whole year. Such cases did not constitute contemplated fleet contingencies, but were dealt with via banker discretion or collateral execution scenarios instead.

Table 1

Interest rate and maturity differentials by contingency type				
Contingency type	Frequency	Return differentials		Maturity differential (in months)
		(1) baseline minus non contingent average*	(2) contingency minus baseline*	(3) contingency minus baseline*
Fleet	26	4.1% (0.72)	0.4% (0.75)	2.6 (0.00)
Tax stream insufficiency	100	-1.6% (0.10)	-1.7% (0.06)	4.6 (0.00)
King's discretion	63	4.3% (0.03)	4.1% (0.06)	1.6 (0.30)
Banker's discretion	102	1.6% (0.08)	1.5% (0.04)	-0.2 (0.84)
Collateral execution	118	-2.1% (0.03)	-2.3% (0.01)	2.1 (0.00)
Total / Average	408	0.0%	-0.1%	2.1
P-values in parentheses.				
* Coefficient from a regression of rate of return on contingency type dummy, use of foreign exchange clauses, duration, and loan size. Standard errors are clustered at the contract level and are shown in parentheses.				

Source: The authors.

hazard. The result is a risk premium being assessed. That over 60 contracts were written with such clauses reflects the high value that the king placed on the ability to reshuffle payments ex-post without violating the letter of the agreement.

Banker discretion options allowed bankers to request that outstanding repayments be made ahead of time in the form of juros. In view of the earlier termination of the contract, our estimate of the interest rate increases when this option is exercised. However, since juros were illiquid and transferring them required costly permissions, there was probably no net profit from such an operation. The main advantage of these clauses was to give bankers an immediate “out” if they perceived that the king was likely to default on a contract in the near future.

The final category specifies under which circumstances bankers could seize the collateral posted on a contract. Collateralized contracts were two percentage points cheaper than uncollateralized ones, reflecting the additional security provided. The clauses often imposed a waiting period after a missed payment before allowing for the collateral to be seized, leading to an average maturity extension of two months. This wait resulted in a profitability reduction of 2.3 percentage points.

Defaults

Philip II's fame in the annals of finance does not come from his use of complex borrowing instruments; on the contrary, he is known as the first serial defaulter in history (Reinhart and Rogoff 2009). The king suspended payments on his short-term debt four times, in 1557, 1560, 1575, and 1596 (juros were never defaulted upon). We have elsewhere shown that the long-term fiscal position of the king was sustainable, and that defaults stemmed from acute liquidity crises that were resolved very quickly by modern-day standards (Drelichman and Voth 2010). We have also documented that defaults were not opportunistic, as lenders operated a tightly-knit network that could exclude the king from financial markets and keep him honest (Drelichman and Voth 2011b). After each suspension, a negotiated settlement was reached with creditors. Haircuts were moderate, and lending resumed promptly. One question, however, remains: if overall borrowing was sustainable, defaults were not opportunistic, and contingent contracts allowed for risk sharing, what explains the king's defaults?

Our explanation follows the literature that views defaults as equilibrium outcomes in the presence of incomplete markets (Kovrijnykh and Szentes 2007; Arellano 2008). Essentially, it is not possible to contract over every potential state of the world. Some eventualities, like the Morisco rebellion destroying the silk industry, could not be foreseen. Others, like disastrous military defeats,

were politically impossible to contract over. When a scenario that had not been contracted upon arose, a default was likely. As long as the events that precipitated defaults were outside the control of the king and exogenously verifiable by the bankers, the defaults could be considered “excusable” (Grossman and Van Huyck 1988). Indeed, we find that both suspensions covered by our dataset fit this pattern. In 1575, three years of low silver revenues coincided with the outbreak of hostilities on two fronts – the Mediterranean and the Low Countries. In 1596, renewed attacks from the French and the British forced a large increase in spending, leading to another default. In both cases, lenders could easily verify the absence of silver fleets or the foreign attacks.

Conclusion

Some economists have argued that defaults “complete” markets – by sharing the burden of a negative shock between borrower and lender. While payments stops achieve this aim, they are also typically associated with massive slumps, imploding banking systems, and collapsing foreign trade. Is there really no better way to allow risk-sharing in sovereign debt markets?

We argue that Philip II of Spain and his Genoese bankers developed a system that dealt with adverse shocks much more effectively than modern-day debt markets. This system avoided the pain of pro-cyclical adjustment, while mobilizing huge resources. It did so in a particular way: while rating agencies today consider a single missed payment as a default, early modern finance operated under a much more elastic definition. Strict adherence to the letter of a non-contingent contract or outright repudiation was not the only possible outcome; in fact, both instances were rare. Typically, contracts included a variety of contingencies designed to adjust the obligations of borrowers and lenders in different states of the world. If an unforeseen shock threatened the liquidity of one of the parties, the other often showed flexibility in rescheduling its payments. The king swapped the worthless juro of the lenders affected by the Morisco rebellion; Genoese bankers accepted haircuts after unusual military or fiscal events. In both cases, the value of continuing the relationship was greater than the short-term gains of intransigency. Thus, explicitly and implicitly, contingent debt allowed for risk sharing and consumption smoothing in an uncertain environment.

Why can't such a system be replicated today? Philip II's system cannot simply be copied – no galleons with

silver provide modern European states with anxiously awaited windfalls, however fervently finance ministers would wish it were otherwise. No tightly knit group of Genoese lenders controls overall access to borrowing markets. And yet, it seems odd that so little experimentation has gone into better risk-sharing arrangements: oil importers could issue debt with coupons varying inversely with oil prices; automatic maturity extensions could be written into sovereign bond covenants in case risk premia hit a certain pre-defined level, reducing the risk of roll-over crises. We are not proposing any particular solution; we are simply pointing out that it seems strange that, for all of the financial sophistication of today's markets, sixteenth-century financiers should have come up with more creative ways to make borrowing safe and effective than today's market players.

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