Exorbitant Privilege and the Sustainability of US Public Debt

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Abstract

We study the extent to which the perceived cost of losing the exorbitant privilege the US holds in global safe asset markets sustains the safety of its public debt. Our findings indicate that the loss of this special status in the event of a default significantly augments the debt capacity for the US. Debt levels would be up to 30% lower if the US did not have this special status. Most of this extra debt capacity arises from the loss of the convenience yield on US Treasuries, which makes debt more expensive following its loss, and provides strong incentives to repay debt.

1 Introduction

The active use of fiscal policy in the US for macroeconomic stabilization and transfer policies during the last two decades has resulted in a significant increase in public debt levels. The stock of public debt now exceeds 100% of GDP, which, along with rising interest rates, has generated concerns about the sustainability of US public debt and the ability and willingness of the US government to meet its debt obligations (e.g., Rogoff, 2020).

One argument that is often made to assuage these concerns is that the US's present role as a global safe asset and reserve currency supplier, and the potential loss of this "exorbitant privilege" status in the event of a default, imposes substantial default costs that incentivize the US government to continue servicing and repaying its debt. This argument was formalized in the Farhi and Maggiori (2018) model of the international monetary system. They argue that the threat of losing the monopoly rents associated with being the dominant supplier of safe assets in the event of a default, makes US debt safe.

The goal of this paper is to quantify the impact of this reputational channel on the sustainability of US public debt. Specifically, we study the extent to which the perceived cost of losing the special status the US holds in global safe asset markets sustains safe public debt. To address this question, we develop a quantitative model of defaultable debt following the tradition of Eaton and Gersovitz (1981), enriched with two features characterizing the special status of the US in safe asset markets. First, US public debt provides a non-pecuniary value to its holders, resulting in a convenience yield. Second, the US government obtains seigniorage revenues from its foreign holdings of US currency.

Our findings indicate that the loss of this special status in the event of a default significantly augments the debt capacity for the US. Debt levels would be up to 30% lower if the US did not have this special status. Most of this extra debt capacity arises from the loss of the convenience yield on US Treasuries, which makes debt more expensive following its loss, and provides strong incentives to repay debt. Our analysis holds relevance as the US's dominance in safe asset markets faces challenges from efforts by other key players, such as Europe and China, to establish competitors in the supply of safe assets and reserve currencies.

2 Model

Time is discrete and indexed by $t = 0, 1, 2, ...$ Let s_t denote the exogenous state of the world. The economy is populated by a large number of lenders and the US government. The government receives tax and seigniorage revenues each period, and chooses the level of government spending, the debt issuance, and whether to repay or default on its debt

obligations. The preferences of the government are given by

$$\mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t U(G_t),$$

where G_t is the level of government expenditures on period t.[1] We assume that the government can only issue short term debt and that the timing follows Eaton and Gersovitz (1981).[2] The key feature of our model is that we assume that the US government has *special status*. This confers two benefits on the US. First, its debt generates non-pecuniary benefits for its holders. This can arise due to the liquidity and collateral properties of US debt (see, for example, Lagos, Rocheteau and Wright, 2017). Second, the US receives seigniorage revenues from holdings of its currency. We assume that the US remains in special status so long as it has not defaulted on its debt. After default it loses its special status but can regain it stochastically.

The budget constraint for the US when it has special status is

$$G_t + B_t \leqslant \tau Y_t + \bar{s} Y_t + q^*(B_{t+1}, s_t) B_{t+1},$$

where B_{t+1} is the debt issued in period t, τ the tax rate, Y_t the output, $\bar{s}Y_t$ the seigniorage revenues, and $q^*(B_{t+1}, s_t)$ the price of debt when it has special status. In contrast, if the US does not have special status its budget constraint is

$$G_t + B_t \leqslant \tau Y_t + q(B_{t+1}, s_t) B_{t+1}.$$

In particular, the US does not receive seigniorage revenues and faces a different debt price schedule.

We now consider a recursive representation of the government's problem. The state variables in any period are (s, B). Let $V^*(s, B)$ denote the value of repayment when the US government has special status, $V(s, B)$ the value if it does not have special status, and $\underline{V}(s)$ the value of default. Then, the special status repayment value is

$$V^*(s, B) = \max_{B'} U(G) + \beta \mathbb{E} \max\{V^*(s', B'), \underline{V}(s')\},$$

subject to

$$G = \tau Y(s) + \bar{s} Y(s) - B + q^*(s, B') B'.$$

[1] We model a government problem with preferences over spending, as in Bocola, Bornstein and Dovis (2019).

[2] Specifically, the government first chooses to repay or default and then chooses debt issuance facing a price schedule that depends on the state and choice of debt issuance.

The non-special status repayment value is

$$V(s,B) = \max_{B'} U(G) + \beta \mathbb{E}\left[\theta \max\{V^*(s',B'), \underline{V}(s')\} + (1-\theta)\max\{V(s',B'), \underline{V}(s')\}\right],$$

subject to

$$G = \tau Y(s) - B + q(s,B')B',$$

where θ is the probability that the US regains special status. Finally, the default value is given by

$$\underline{V}(s) = U(\tau Y(s)) - \nu_d + \beta \mathbb{E} V(s',0),$$

where ν_d is a utility cost of default.[3] Note that default results in autarky for one period.

Next, we characterize the debt pricing functions. Lenders value payments using a stochastic discount factor $\Lambda_{t,t+1} = \Lambda(s_t, s_{t+1})$. The pricing of debt arises from the zero-profit condition of competitive lenders. If the US has special status the payoffs to lenders in recursive form is

$$-q^* b' + \mathbb{E}\left[\Lambda(s,s')\left(1-\delta^*(s',B')\right)b'\right] + f(b'),$$

where b' is the debt holdings of an individual lender, f is an increasing and concave function that represents the non-pecuniary value of holding US debt, and $\delta^*(s',B')$ is the default policy function of the US government when it has special status. The optimality condition of the lender's problem generates a debt pricing function

$$q^*(s,B') = \mathbb{E}\left[\Lambda(s,s')\left(1-\delta^*(s',B')\right)\right] + f'(B').$$

In the absence of special status the pricing function is standard and given by

$$q(s,B') = \mathbb{E}\left[\Lambda(s,s')\left(1-\delta(s',B')\right)\right],$$

where $\delta(s',B')$ is the default policy function when it does not have special status.

The default decision of the government must satisfy

$$\delta^*(s',B') = \begin{cases} 0 & \text{if } V^*(s',B') \geqslant \underline{V}(s') \\ 1 & \text{otherwise} \end{cases},$$

and similarly for $\delta(s',B')$. A recursive equilibrium can be defined in the standard fashion.

[3] This can capture other sources of default costs, including those arising from trade or domestic financial disruptions.

3 Calibration

The model is calibrated at an annual frequency. Table 1 reports the parameter values. We set a subset of parameters to predetermined values and calibrate the remaining to match a set of moments related to the public debt and external balance sheet of the US. We assume a CRRA utility function $u(g) = g^{1-\gamma}/(1-\gamma)$ and set $\gamma = 2$. The output process is assumed to be log-normal with $\ln y_{t+1} = \rho \ln y_t + \sigma\varepsilon_{t+1}$ with standard values for ρ and σ, and the lender's sdf is $\Lambda_{t,t+1} = \exp(-\kappa\sigma\varepsilon_{t+1} - 0.5\kappa^2\sigma^2)/r$, where $\kappa > 0$ parameterizes the risk aversion of lenders (see, for example, Hegarty et al., 2022). We also introduce additive preference shocks to the values of repayment and default, as in Dvorkin et al., 2021. These shocks help better match the data and with convergence of the quantitative model. We also assume that these preference shocks, are drawn i.i.d. from a Gumbel distribution with mean 0 and scale parameter ζ.

Table 1: Calibration

Param.	Description	Value	Param.	Description	Value
β	Domestic discount rate	0.95	ζ	Scale of discrete choice shock	1.37
γ	Risk aversion	2	κ	Foreign risk aversion	2525
r	Foreign lending rate	0.03	η_f	Convenience benefit parameter	-5.083
ρ	Output process persistence	0.951	ν_f	Convenience benefit elasticity	0.545
σ	Output process volatility	0.008	θ	Prob. of regaining special status	0.0
ν_d	Utility cost of default	16.9	$\bar{s}$	Seigniorage parameter	0.0012
τ	Government tax rate	0.3			

We assume that the benefit function $f(b) = \nu_f b^{1-\eta_f}/(1-\eta_f)$. To parameterize this function we build on Krishnamurthy and Vissing-Jorgensen (2012) and Choi, Kirpalani and Perez (2022) and estimate

$$\mathcal{S}_t = \alpha + \beta \ln b_t + \delta X_t + \varepsilon_t, \tag{1}$$

where $\mathcal{S}_t$ is a measure of the convenience yield, $\ln b_t$ is the log of the ratio of public debt to GDP, and X_t is a vector of controls. In this specification, the demand semi-elasticity of prices to quantities is given by β. To obtain an estimate of the actual elasticity, we take the ratio of the semi-elasticity to the sample average of $\mathcal{S}_t$. This equation is then estimated using both OLS and IV methods. We use a baseline value of $\eta_f = 0.54$ as in Choi, Kirpalani and Perez (2022). We calibrate the value of ν_f to match a mean convenience yield of 62 basis points.

To estimate the size of the seigniorage revenues we use the foreign holdings of USD (approximately 1 trillion) and a 3% interest rate to compute $\bar{s} = 0.12\%$ of average GDP.[4]

[4]The US government obtains seigniorage from domestic and foreign holdings of US dollars. We only focus on the latter because it is less likely that the US dollar is substituted, domestically, for another currency in the event of a sovereign default.

We analyze how the results change with different interest rates.

Finally, we calibrate the parameter associated with the lenders stochastic discount factor, the default cost, and the scale of the discrete choice shock distribution to match the following four moments listed in Table 2.

Table 2: Moments

Moments	Data	Model
Mean(Debt/GDP)	100%	100%
Mean(Convenience yield)	0.62%	0.61%
Mean(CDS spreads)	0.20%	0.20%
Mean(Pure default spreads)	0.08%	0.12%

Notes: Mean(Debt/GDP) is the average ratio of US total public debt to GDP over the last 15 years. Mean(Covenience yield) is taken from Choi et. al. (2022). Mean(CDS spreads) is the spread on the 1 year US CDS averaged over the last 15 years. The decomposition of CDS spread into pure default spreads and risk premium is from Hegarty et. al. (2023).

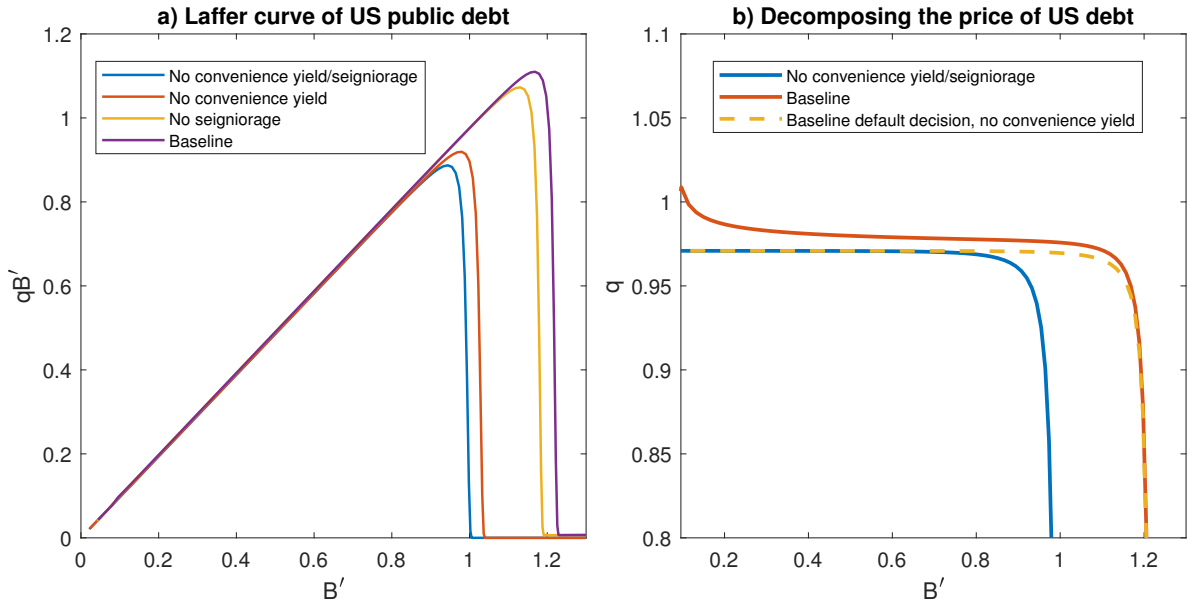
4 Results

We use the calibrated model to quantify the additional debt capacity that the US enjoys as a result of its special status. Panel a) of figure 1 displays the debt Laffer curves for both the benchmark economy and other counterfactual economies sharing the same parameterization but lacking any special status, and hence, having no risk of losing it in default. The special status of the US increases the maximal debt that can be sustained in equilibrium by approximately 22% of GDP. The majority of this increased debt capacity arises from the convenience channel: an economy where US debt doesn't offer a non-pecuniary benefit to holders features a maximum debt level 18% lower, whereas an economy without foreign seigniorage features a maximum debt that is only 3% lower.

The absence of a convenience yield affects the price of debt through two mechanisms. Firstly, it directly increases the cost of debt due to the lack of non-pecuniary benefits and second, it reduces the incentives for the US to repay debt, as the cost of default is lower. Panel b) of figure 1 illustrates that the second mechanism is quantitatively more relevant for large and empirically realistic levels of debt, whereas the first mechanism is relevant for very low levels of debt.

We then evaluate the impact on equilibrium levels of debt, that is, the optimal debt choices by the sovereign facing different debt Laffer curves. Table 3 presents the average debt choices from model simulations for various economies with and without special status and under different parameterizations. There are three main takeaways from the analysis. Firstly, the loss of special status upon default significantly affects debt sustainability, with equilibrium debt levels up to 30% lower without the special status. Secondly, in line with the

Figure 1: Laffer curve and decomposing the price of US public debt



Notes: Panel a) shows the debt Laffer curves for different economies with and without the convenience yield on US debt and seigniorage from foreign dollar holdings. Panel b) shows the price of debt for economies with and without the convenience yield on US debt (red and blue lines) and a counterfactual economy in which default decision is from the baseline economy but the price does not contain convenience yield (yellow dashed line. All curves are evaluated at the median level of output.

earlier analysis, the effects are primarily driven by the convenience channel, as indicated in the fourth column. Finally, the effects are sensitive to the probability of regaining the special status after a default and less so to the international interest rate (see the different rows of Table 3). The decrease in debt due to the loss of special status exceeds 20% when the loss of special status is permanent, and is less than 10% when the special status is regained on average 10 years after a default. On the other hand, although different interest rates directly influence the loss of foreign seigniorage, their impact on debt is minimal.

5 Conclusion

We showed that the US's current role as a global safe asset and reserve currency supplier, and its loss in the event of a default, generates significant additional debt capacity for the US government. While this is not the only reason for the US's ability to sustain large levels of debt, it is important because its dominant status is unlikely to be permanent. History has shown alternance in safe asset dominance: the role that the UK once had is now played by the US, and it could be shared with other key players in the future (Chen et al., 2022; Choi et al., 2023). Our analysis suggests that losing this role can pose challenges for the sustainability of US public debt.

Table 3: Exorbitant privilege and US debt sustainability

	Prob. of regaining special status		
	0	0.05	0.1
$\mathtt{r} = 0.02$			
Baseline	100	100	100
No foreign seigniorage	96	98	99
No convenience yield	75	87	90
Neither	72	86	89
$\mathtt{r} = 0.03$			
Baseline	100	100	100
No foreign seigniorage	97	98	98
No convenience yield	82	88	90
Neither	80	87	89
$\mathtt{r} = 0.04$			
Baseline	100	100	100
No foreign seigniorage	97	98	98
No convenience yield	86	88	89
Neither	83	86	87

Notes: This table reports the average US public debt for different economies with and without special status, under different parameters.

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