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Liquidity premiums on government debt and the fiscal theory of the price level[☆]

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ABSTRACT

We construct a dynamic general equilibrium model where agents use nominal government bonds as collateral in secured lending arrangements. If the collateral constraint binds, agents price in a liquidity premium on bonds that lowers the real rate on bonds. In equilibrium, the price level is determined according to the fiscal theory of the price level. However, the market value of government debt exceeds its fundamental value. We then examine the dynamic properties of the model and show that the market value of the government debt can fluctuate even though there are no changes to current or future taxes or spending. The price dynamics are driven solely by the liquidity premium on the debt.

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1. Introduction

The fiscal theory of the price (FTPL) is a controversial idea that states that fiscal policy, not monetary policy, pins down the aggregate price level. The argument for this follows from the intertemporal government budget constraint which states that the *real* value of the outstanding stock of government debt is pinned down by the discounted stream of real future surpluses. Since the initial stock of *nominal* debt is given, for any fixed stream of surpluses, this theory argues that the price level must adjust to make the real value of the government debt satisfy the intertemporal government budget constraint. Furthermore, dynamic movements of the price level are driven by expected changes in future fiscal policy.

While a substantial debate has occurred over the last two decades regarding the validity of this theory, one assumption is common to both sides of the debate – the sole purpose of government debt is to reallocate taxes across time. However, government debt is commonly used as collateral for secured lending in financial markets. Consequently, its market value may include a liquidity premium that reflects its value for trading in addition to serving as a claim on the stream of future surpluses. This suggests that price level movements may be driven by changes in the liquidity value of government debt rather than changing expectations of fiscal policy.

Our objective in this paper is to construct a model where government debt serves as collateral in secured lending arrangements. We show that if the real value of the government debt is sufficiently high, there is no liquidity premium on the debt and the price level is pinned down in the usual way by the fiscal theory of the price level. However if the real value

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of government debt is sufficiently low, then collateral constraints bind and the price of government debt reflects a liquidity premium on the debt. In this case, the market value of government debt exceeds its “fundamental value” which is the discounted stream of future surpluses. When the collateral constraint binds, the price level is pinned down by a modified version of the fiscal theory of the price level.

Once the collateral value of government debt is accounted for, we obtain some interesting results that we believe are new to this literature. First, when the collateral constraint binds, any event that increases the real value of government debt relaxes the collateral constraint and expands economic activity in the secured lending sector. For example, an increase in future taxes or a cut in government spending, raises the fundamental value of the government debt and thus the real value of the debt. This then leads to an expansion of economic activity via an increase in secured lending. As a result, surprisingly, raising taxes or cutting government spending are “stimulative”.

Second, we can generate movements in the price level even though there are no expected changes in current or future fiscal policies. As a result, our model can help to understand observed movements in the price level when there is no change in perceived fiscal policy.

2. Related literature

The literature on the fiscal theory of the price level is vast. Early advocates of this theory are [Begg and Haque \(1984\)](#), [Auerneimer and Contreras \(1990\)](#), [Leeper \(1991\)](#), [Sims \(1994\)](#), [Woodford \(1995\)](#) and [Cochrane \(1998\)](#). Subsequently, a substantial debate arose about the implications of this theory or whether it was even correct. Rather than rehash this long debate, we recommend reading the fulsome survey of the literature by [Leeper and Leith \(2016\)](#). What we want to do is touch on a few papers that are closely related to our model.

The first is the work of [Canzoneri and Diba \(2005\)](#). They study an endowment economy and impose a standard cash-in-advance constraint. However, they allow nominal bonds to be used as an exchange medium. Since bonds dominate money in rate of return, bonds will drive money out of circulation. To avoid this, they assume that using bonds in transactions is costly with those costs being a convex function of the real value of bonds used. Thus, households use bonds first and once the marginal cost gets high enough, they finance the rest of their consumption with money. Their main focus is on price level determinacy when the monetary authority follows an interest rate peg. In our framework, there is no money so an interest rate peg is not considered. Furthermore, Canzoneri and Diba assume an exogenous payment technology that has no microfoundations underpinning it. Bonds in our model are a substitute for limited commitment in lending arrangements and are thus microfounded. Finally, studying an endowment economy precludes studying the impact of fiscal policy on production and consumption, which we do.

[Canzoneri et al. \(2016\)](#) use another variant of a cash-in-advance model in which there are “cash goods”, “bond goods” and “credit goods”. Due to the ability to use government bonds to acquire bond goods, bonds yield liquidity services. They then study optimal monetary and fiscal policy where the government trades off liquidity provision against public debt management. While they study price volatility in response to the optimal fiscal policy, the FTPL is not discussed.

Another paper in this vein is [Dominguez and Gomis-Porqueras \(2016\)](#). They use [Berentsen and Waller's \(2011\)](#) variation of the [Lagos and Wright \(2005\)](#) model where agents hold a portfolio of money and bonds. Bonds are not a medium of exchange but can be sold on a secondary market to acquire cash should they need more cash (due to unexpected shocks). Away from the Friedman rule, this creates a liquidity premium on government bonds. The authors then explore determinacy of equilibria and stability using monetary and fiscal rules a la [Leeper \(1991\)](#).

Finally, [Bassetto and Cui \(2018\)](#), in this volume, is the closest framework to our model. In one part of their paper, they use a Lagos and Wright model (as we do) and bonds serve as a medium of exchange. They then study whether or not the FTPL holds in the case where government debt has a liquidity premium. Their particular focus is to study equilibria when the real interest rate on the bonds is negative and what types of fiscal policy generate unique equilibria. We focus on the case where the real interest rate is positive and how the dynamics of the liquidity premium affects the aggregate price level.

3. Environment

Time is discrete, the horizon is infinite and there is a measure two of infinitely-lived agents with perfect foresight who consume perishable goods and discount only across periods at rate $\beta = 1/(1+r)$.¹ In each period agents engage in two sequential rounds of trade, denoted by “DM” and “CM”. Markets differ in terms of economic activities and preferences. In the DM, a measure 1 of agents are always consumers and a measure 1 are always producers. Consumers get utility $u(q)$ from consuming $q > 0$ units of the DM good, with $u'(q) > 0$, $u''(q) < 0$, $u'(0) = +\infty$, and $u'(\infty) = 0$. Producers incur a utility cost $c(q) \geq 0$ to produce q units of DM goods, with $c'(q) > 0$, $c''(q) \geq 0$ and $c'(0) = 0$. The efficient quantity in this market is q^* which solves $u'(q^*) = c'(q^*)$. We assume that trade in the DM is pairwise and consumers and producers are matched randomly with probability σ .

In the CM all agents can consume and produce. Following [Lagos and Wright \(2005\)](#), in the CM all agents have quasilinear preferences $U(x) - h$, where the first term is utility from consuming x units of the CM good, and the second is disutility from

¹ The basic framework builds on [Lagos and Wright \(2005\)](#).

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