

New Evidence on Debt as an Obstacle to US Economic Growth

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Abstract

The US government debt is now in uncharted waters. From the founding of the nation until 1968, government debt moved up and down without a trend, but over the past 50 years, debt relative to the size of the economy has increased continuously. The United States does not appear to have a coherent debt policy. It is not Greece, and there is no evidence of a likely default on US government bonds in the near future. However, there is evidence that Americans have already borne the costs of high debt levels, and without a reform of policy these costs will continue in the future. Using a new econometric technique for threshold autoregression and a debt measure that includes private debt as well as public debt, we estimate that in the period 1995 to 2014, US economic growth was more than 1 percentage point lower than it would have been at a debt level below the threshold. Other Organisation for Economic Co-operation and Development (OECD) countries also had lower growth rates as a result of high debt levels. Many countries have recently adopted some form of fiscal rule, including balanced budgets, intended to limit debt and raise growth rates. Fiscal rules involve a tradeoff between limiting debt and preserving flexibility to respond to economic shocks. In this paper we discuss problems related to designing optimal fiscal rules.

JEL codes: F3, F4, C5

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1. INTRODUCTION

Greece experienced a severe debt crisis in 2010 from which it has still not fully recovered.¹ The Greek economy has shrunk by a quarter since the crisis and the bailout.² Italy's budget deficit and public debt continue to exceed European Union guidelines. The interest rates on Italian government debt have risen relative to the rates paid by other members of the eurozone, to reflect an increased risk of default. Both countries have had severe long-term debt problems, and they are included in Carmen Reinhart, Vincent Reinhart, and Kenneth Rogoff's list of "debt overhang" countries whose growth was reduced by debt.³

Until recently, the United States has had a different debt history. From the nation's founding until 1968, US gross public debt relative to GDP followed a rather simple pattern. During wars, spending increased, the government borrowed, and the debt ratio increased. After wars, the debt ratio gradually reverted toward the prewar ratio, without a clear long-term trend. There was no explicit legal limit on the debt ratio, but the empirical regularity of the long-term debt ratio gave the impression that there was an implicit contract that functioned as a coherent debt policy. Fiscal institutions in the United States demonstrated a kind of long-term fiscal discipline.

¹ Yannis Palaiologos, "Greece's Bailouts End, but Its Prospects Still Look Grim," *Wall Street Journal*, August 20, 2018.

² "Many Left Adrift as Greek Bailout Ends," *Wall Street Journal*, August 21, 2018.

³ Carmen M. Reinhart, Vincent R. Reinhart, and Kenneth S. Rogoff, "Public Debt Overhangs: Advanced-Economy Episodes since 1800," *Journal of Economic Perspectives* 26, no. 3 (2012): 69–86.

However, in recent decades the prewar stability of the long-term US debt ratio has disappeared. That ratio has increased continuously since 1968, with no apparent limit.⁴ The US gross public debt was 105 percent of GDP at the end of 2017.⁵ Americans have acquired a habit of wanting government spending that they are unwilling to pay for with taxation. Before 1968, US high-debt episodes were strictly temporary, but more recently the United States has joined Greece and Italy as a debt-overhang country. United States debt history during the past 50 years gives the appearance of a kind of debt addiction. The structural change in debt has the appearance of what Daron Acemoglu and James Robinson call a “critical juncture” for US fiscal institutions.⁶ Reinhart, Reinhart, and Rogoff define “debt overhang” as a debt load above 90 percent of GDP for at least five consecutive years.⁷ Public debt in the United States has been above 90 percent for the eight consecutive years ending in 2017. By comparison, gross public debt was 131 percent for Italy and 182 percent for Greece at the end of 2017.⁸ The United States has never experienced a complete default on its debt,⁹ but in several periods, money-interest rates on US bonds have been lower than the inflation rate. The resulting negative real rate of return on US government bonds has been described as “financial repression.”¹⁰ Although the three

⁴ Andris Strazds and Thomas Grennes, “United States Government Debt Is in Uncharted Territory,” *EconoMonitor*, September 25, 2015.

⁵ Gross debt is used in cross-country studies because comparable data for net debt are not readily available for many countries. Net debt excludes certain assets held by government agencies. At the end of 2017, when gross debt relative to GDP for the United States was 107 percent, net debt was 82 percent (*World Economic Outlook October 2018: Challenges to Steady Growth* (Washington, DC: International Monetary Fund, October 2018)). The two measures move together, and most statements are robust with respect to using gross or net debt. A total close to net debt, but slightly different, is US federal debt held by the public, which was 74 percent at the end of 2017 (Federal Reserve Bank of St. Louis, Federal Reserve Economic Data, “Federal Debt Held by the Public as a Percent of Gross Domestic Product” (FYGFGDQ188S), December 12, 2018, <https://fred.stlouisfed.org/series/FYGFGDQ188S>). All three measures lacked a clear trend before 1968, but they have been rising since then.

⁶ Daron Acemoglu and James A. Robinson, *Why Nations Fail* (New York: Crown Business, 2012), 96.

⁷ Reinhart, Reinhart, and Rogoff, “Public Debt Overhangs.”

⁸ International Monetary Fund, World Economic Outlook Database, October 2018.

⁹ Carmen Reinhart and Kenneth Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press, 2009).

¹⁰ Reinhart and Rogoff, *This Time Is Different*.

countries have experienced different debt histories, they all currently face substantial debt problems.

In our work, we ask whether the high debt ratios have had systematic adverse economic effects on the United States and other debtor countries. Our econometrically estimated debt thresholds indicate that Greece, Italy, the United States, and some others from a sample of 29 OECD countries over the period 1995–2014 have reached debt ratios that have significantly reduced their growth rates. However, the debt thresholds we estimate do not represent simply public debt; rather, they show the interaction of public and private debt. We note that various countries have recently adopted debt rules,¹¹ and we ask whether the problem of debt addiction and slower growth could be alleviated by some form of debt rule that would contribute to a more coherent debt policy.

The plan of the paper is the following. After the introduction, section 2 discusses the political economy of debt, including government bias toward present spending. Section 3 considers theoretical or a priori reasons why excessive debt might be harmful to growth. Section 4 discusses earlier empirical studies relating debt to growth. Section 5 describes more recent empirical work that includes the influence of both private and public debt on growth. Section 6 presents the results of our own recent empirical work that uses new econometric techniques and highlights the interaction of public and private debt and their effects on economic growth. Section 7 considers the possibility of using fiscal rules to reduce the adverse effects of debt on growth. Section 8 considers some moderately successful fiscal rules. Section 9 discusses some possible fiscal rules and the challenges of designing effective fiscal rules for the United States.

¹¹ See Marina Halac and Pierre Yared, “Fiscal Rules and Discretion under Limited Enforcement” (NBER Working Paper No. 25463, National Bureau of Economic Research, Cambridge, MA, January 2019).

2. POLITICAL ECONOMY OF FISCAL POLICY

Why would some governments issue so much debt that borrowing reduced the country's rate of economic growth? Current governments seek political support by offering immediate services and transfer payments, while promising that future governments will pay for them. The result is a bias toward present goods and excessive borrowing.¹² Aging populations also contribute to this bias. Greece, with its debt crisis and negative growth, has one of the lowest fertility rates in the world.¹³ Other slow-growing debtors, such as Italy and Japan, also have aging populations.

For the United States, Pierre Yared refers to political economy variables such as an aging population, political polarization, and high political turnover as contributors to rising debt ratios that exceed debt thresholds.¹⁴ The United States is aging, and government budget shares for compulsory spending on Social Security, Medicare, and other age-related programs continue to increase. According to projections by the Congressional Budget Office, the US government will soon spend more on annual interest payments than on the military.¹⁵ Increased polarization means there will be more extreme disputes between the political parties, such as the longest-ever federal government shutdown that began in December of 2018. Less agreement about spending and taxes means that there may be more borrowing as a last resort. Higher political turnover gives the party temporarily in control a stronger incentive to spend on current programs that favor its own agenda. In the United States, the bias toward present goods and greater debt is not a

¹² Charles Wyplosz, "Fiscal Rules: Theoretical Issues and Historical Experiences" (NBER Working Paper No. 17884, National Bureau of Economic Research, Cambridge, MA, March 2012); Alberto Alesina and Andrea Passalacqua, "The Political Economy of Government Debt," in *Handbook of Macroeconomics*, ed. J. B. Taylor and Harald Uhlig, vol. 2, ch. 33 (Amsterdam: North Holland), 2599–2651.

¹³ Palaiologos, "Greece's Bailouts End."

¹⁴ Pierre Yared, "Rising Government Debt: Causes and Solutions for a Decades-Old Trend" (NBER Working Paper No. 24979, National Bureau of Economic Research, Cambridge, MA, revised January 2019).

¹⁵ Nelson D. Schwartz, "As Debt Rises, the Government Will Soon Spend More on Interest Than on the Military," *New York Times*, September 25, 2018.

partisan issue. The federal budget has been in deficit for more than 20 consecutive years of both Democratic and Republican Congresses and presidents.¹⁶ Traditionally, Republicans have expressed more concern about excess debt than Democrats, but the Trump administration and the current Republican Congress have passed tax cuts and spending bills that substantially increase future budget deficits and the public debt.¹⁷ Recently, the Republican-dominated House Ways and Means Committee voted to convert the temporary tax cuts, which were scheduled to expire in 2025, into permanent cuts that would increase future debt.¹⁸ Congressional Democrats, who have traditionally been less concerned about debt, appear to be moving toward offering what Democratic senator Chris Coons of Delaware has called more “pie-in-the-sky promises” to voters (for example, free college and Medicare for all) without committing to how to pay for them.¹⁹ Both political parties are demonstrating a lack of fiscal restraint and evidence of present bias.

The United States lacks a coherent public-debt policy, and there is no single government agency responsible for monitoring total private debt. An ongoing issue within the Federal Reserve Board is whether it should allocate credit across industries. Under the leadership of Ben Bernanke and Janet Yellen, the Federal Reserve (Fed) made large purchases of mortgage-backed securities as part of its quantitative easing policy, which critics labeled a subsidy to the housing sector. As of September 2018, the Fed held 26 percent of all mortgage-backed securities.²⁰ The new Fed leaders, Chairman Jerome Powell and Vice Chairman Richard Clarida, have stated that

¹⁶ Martin Feldstein, “Reagan’s Cure for America’s Debt Disease,” *Wall Street Journal*, March 6, 2018; John R. Kasich, “Entitlements Will Eat America’s Economy,” *Wall Street Journal*, May 31, 2018.

¹⁷ Nelson D. Schwartz, “U.S. Debt Might Soon Cost More Than the Military,” *New York Times*, September 30, 2018.

¹⁸ “Republicans Advance Extension of Tax Cuts,” *Wall Street Journal*, August 2, 2018.

¹⁹ Charles Blahous, “Even Doubling Taxes Wouldn’t Pay for Medicare for All,” *Wall Street Journal*, August 1, 2018.

²⁰ Wolf Richter, “The New Fed Looks Like It Is Ready to Dump Mortgage-Backed Securities,” *Business Insider*, May 19, 2018.

they prefer a Fed portfolio without mortgage-backed securities. Other federal agencies also influence private debt, including Fannie Mae and Freddie Mac, which continue to securitize half of all new mortgage loans in the United States.²¹ A coherent federal policy toward private debt is also absent.

Yared concludes that to clarify the data for actual US fiscal policy, one must also include variables from the theory of political economy. In the literature on optimal fiscal policy, it is now widely recognized that there is a bias toward current spending.²² This bias toward current government spending and larger debt may be especially common in countries with democratic governments and aging populations.²³ In the federal budget of the United States, the compulsory spending share that includes interest payments on the debt continues to increase relative to discretionary items such as infrastructure.²⁴ Within the next decade, interest payments on the debt are projected to exceed military spending. Interest payments are rising both because of a larger debt and because interest rates are rising toward their long-run average.

3. THEORETICAL ASPECTS OF DEBT AND GROWTH

At the theoretical level, public debt can affect economic growth only if there is an asymmetry between owners of government debt and taxpayers. If taxpayers fully anticipate future taxes to service government debt, and if they treat debt as equivalent to taxation, debt is expected to have a neutral effect on spending, saving, and growth. The exact channel by which debt affects economic growth remains unknown, but the consistent empirical relationship between debt and growth is informative.

²¹ Jeb Hensarling, “Fannie and Freddie, Make Way for Ginny Mae,” *Wall Street Journal*, September 6, 2018.

²² Charles Wyplosz, “Fiscal Rules: Theoretical Issues and Historical Experiences” (NBER Working Paper No. 17884, National Bureau of Economic Research, Cambridge, MA, March 2012).

²³ William Galston, “The National Debt Is Worse Than You Think,” *Wall Street Journal*, April 18, 2018.

²⁴ Schwartz, “As Debt Rises, the Government Will Soon Spend More on Interest Than on the Military.”

The hypothesis that high levels of debt can be harmful has been formalized in the literature on optimal fiscal policy.²⁵ One notion of optimal fiscal policy, introduced by Robert Barro, is of a policy that raises tax revenue in a way that minimizes the excess burden of taxation. Based on this goal, Barro's optimal tax policy is one of tax smoothing: if tax rates are fixed, tax revenue will increase and debt will decrease in an expanding economy. Conversely, revenue will decrease and debt will increase in a contracting economy. An alternative possible goal for fiscal policy is the Keynesian notion that the macroeconomy would be stabilized by lowering tax rates and increasing spending during recessions and by raising taxes and decreasing spending during economic expansions.

In Yared's survey of optimal fiscal policy,²⁶ he observes that recent data for the United States and other advanced countries contradict both of these goals for optimal fiscal policy. There is little evidence of stable tax rates that result in more stable tax revenue. Also, recent US fiscal policy has been procyclical as often as it has been countercyclical.²⁷ During the recent prolonged economic expansion, unemployment rates have been extraordinarily low (3.7 percent in September 2018), and there have been reported shortages of workers with many needed, specific skills. Instead of following the Keynesian prescription of raising taxes or reducing government spending to slow down the expansion, Congress did exactly the opposite in 2018: it reduced taxes on businesses and households and increased government spending. In September, the House Ways and Means Committee voted to make the tax cuts permanent, which would increase future budget deficits and public debt.²⁸

²⁵ Yared, "Rising Government Debt."

²⁶ Yared, "Rising Government Debt."

²⁷ Yared, "Rising Government Debt"; Schwartz, "As Debt Rises."

²⁸ "Republicans Advance Extensions of Tax Cuts."

Recent fiscal policy has not followed the tax-smoothing hypothesis or the countercyclical hypothesis. Furthermore, US debt has not followed the earlier US historical pattern of rising during wars and decreasing after wars. Instead, the US gross public debt ratio has inexorably continued to trend upward, from 37 percent in 1968 to 105 percent at the end of 2017. Debt ratios for many other advanced countries have also followed an upward trend in recent years.²⁹

4. EARLIER EMPIRICAL STUDIES OF DEBT AND GROWTH

The relationship between public debt and economic growth has been studied in the past with mixed success. A 2010 study by Carmen Reinhart and Kenneth Rogoff identifies debt-overhang episodes and observes lower growth rates for countries during the overhang episodes.³⁰ However, the paper was criticized for an Excel calculation error that exaggerated the negative effect of debt on growth.³¹ Critics verified a negative effect of debt on growth, but the magnitude of the negative effect was smaller than that presented in the paper.

A common surmise is that a moderate amount of borrowing can be useful, but too much debt can be harmful. In a systematic study of debt and economic growth across many developed countries since the early 1800s, Reinhart and Rogoff confirm this supposition. They observe that countries with persistently high debt-to-GDP ratios experienced slower growth rates than less indebted countries.³² Debt interacts with GDP in both the short run and the long run, and it is difficult to separate the two relationships. Reinhart and Rogoff try to focus on long-run growth by including in their analysis only debt changes that persisted for five straight years. If

²⁹ Halac and Yared, "Fiscal Rules and Discretion under Limited Enforcement."

³⁰ Carmen Reinhart and Kenneth Rogoff, "Growth in a Time of Debt," *American Economic Review* 100 (May 2010): 573–78.

³¹ Thomas Herndon, Michael Ash, and Robert Pollin, "Does High Public Debt Consistently Stifle Economic Growth?," *Cambridge Journal of Economics* 38, no. 2 (March 2014); Carmen Reinhart and Kenneth Rogoff, "Reinhart, Rogoff Admit Excel Mistake, Rebut Other Critiques," *Wall Street Journal*, April 17, 2013.

³² Reinhart and Rogoff, *This Time Is Different*.

persistently low levels of debt stimulate growth and persistently high levels reduce growth, there must be some threshold at which the debt-to-growth relationship turns around. The search for a debt threshold level motivates our econometric estimation.

Some criticism of early work is that it is purely descriptive, rather than the result of statistical estimation. Reinhart and Rogoff's 2010 work was also criticized for choosing an arbitrary 90 percent debt-threshold level rather than one determined by the data. Another criticism is that institutional differences across countries would seem to indicate the absence of any common threshold applicable to all countries. Public debt of 90 percent might reduce growth in Italy, but the same 90 percent might have no adverse effect on growth in Germany, a country with a different income level and different institutions. The endogeneity problem of whether higher debt causes lower growth, or lower growth causes higher debt, could not be dealt with satisfactorily until recently. The relationship between debt and growth is not simple, and there is now evidence that the interaction between public debt and private debt has a greater impact on growth than either public debt or private debt by itself.³³

5. RECENT EMPIRICAL WORK INCLUDING BROADER DEBT MEASURES

A broader measure may be more closely related to economic growth than public debt.

Recently, a series of papers has shown that private debt, as well as public debt, has influenced

³³ Mehmet Caner, Qingliang Fan, and Thomas Grennes, "Partners in Debt: An Endogenous Nonlinear Analysis of Public and Private Debt on Growth," February 24, 2019, available at SSRN: <https://ssrn.com/abstract=3186077>; Lars P. Feld, Alexander Kalb, Marc-Daniel Moessinger, and Steffen Osterloh, "Sovereign Bond Market Reactions to No-Bailout Clauses and Fiscal Rules: The Swiss Experience," *Journal of International Money and Finance* 70 (February 2017).

GDP, both over business cycles and in the long run.³⁴ Household debt, especially the mortgage-debt component, has been especially important for the housing sector. Household debt doubled between 2000 and 2007, and the large increase may have magnified the severity of the Great Recession. After the recession, government agencies were criticized for lowering lending standards and contributing to the housing bubble.³⁵ In 2018 government agencies continued to guarantee approximately 80 percent of home mortgages, leading critics to again accuse them of lowering lending standards.³⁶ Oscar Jorda, Moritz Schularick, and Alan Taylor find it useful to combine public and private debt in studies of GDP growth.³⁷

We have also found the interaction of public and private debt to have an empirically important effect on growth.³⁸ We refer to this interaction between public and private debt as “partners in debt.” Debt interaction is important because one cannot know the economic importance of a given public debt ratio without also knowing the corresponding private debt ratio. For example, if a country’s public debt is 90 percent of GDP, its effect on growth may be much greater if private debt is 120 percent of GDP rather than 20 percent of GDP. If debt interaction is found to be empirically important, focusing on public debt ratios alone would not

³⁴ Atif Mian, Amir Sufi, and Emil Verner, “Household Debt and Business Cycles Worldwide,” *Quarterly Journal of Economics* 132, no. 4 (2017): 1755–1817; Stephen G. Cecchetti and Enisse Kharroubi, “Why Does Credit Growth Crowd Out Real Economic Growth?” (NBER Working Paper No. 25079, National Bureau of Economic Research, Cambridge, MA, September 2018); Marco Lombardi, Madhusudan Mohanty, and Ilhyock Shim, “The Real Effects of Household Debt in the Short and Long Run” (BIS Working Paper No. 607, Bank for International Settlements, Basel, Switzerland, January 26, 2017); Atif Mian and Amir Sufi, “Finance and Business Cycles: The Credit-Driven Household Demand Channel,” *Journal of Economic Perspectives* 32, no. 3 (2018): 31–58; Norman Loayza, Amine Ouazad, and Romaine Ranciere, “Financial Development, Growth, and Crisis: Is There a Crisis?” (NBER Working Paper No. 24474, National Bureau of Economic Research, Cambridge, MA, April 2018).

³⁵ Atif Mian and Amir Sufi, *House of Debt: How They (and You) Caused the Great Recession and How We Can Prevent It from Happening Again* (Chicago: University of Chicago Press, 2014).

³⁶ Paul Kupiec and Edward Pinto, “The Government Creates Another Housing Bubble,” *Wall Street Journal*, June 1, 2018; Jeb Hensarling, “Fannie and Freddie, Make Way for Ginnie Mae,” *Wall Street Journal*, September 6, 2018.

³⁷ Oscar Jorda, Moritz Schularick, and Alan M. Taylor, “Sovereigns vs. Banks: Credit, Crises, and Consequences,” *Journal of the European Economic Association* 14, no. 1 (2015).

³⁸ Caner, Fan, and Grennes, “Partners in Debt.”

be very helpful in determining whether public debt was adding to economic growth or subtracting from it.

We have used gross debt to measure public debt. Broader measures of public debt have been discussed and calculated, but their empirical importance has not yet been demonstrated. For example, Laurence Kotlikoff argues for a broader measure of public debt that he calls “fiscal gap,” which includes the unfunded liabilities related to Social Security and other government promises.³⁹ Adding unfunded Social Security claims would more than double the official public debt. James Hamilton has calculated some major off-balance-sheet liabilities of the US government that include housing loan guarantees, other loan guarantees, deposit insurance, Federal Reserve actions, and government trust funds. As of 2012, the sum of these off-balance-sheet items, sometimes called implicit or conditional debt, was approximately six times the reported on-balance-sheet debt.⁴⁰

6. OUR NEW EMPIRICAL RESULTS

In a recent paper, we estimated debt thresholds for a broad set of 29 OECD countries over the period 1995–2014.⁴¹ To deal with the endogeneity problem, we used a panel threshold econometric method recently developed by Myung Hwan Seo and Yongcheol Shin to study the nonlinear impact of the debt level on growth.⁴² Also, we used five-year averages to separate short-term business cycle effects from longer-term effects on economic growth. We included as explanatory variables public debt, private debt, and the interaction between the two debt

³⁹ Laurence Kotlikoff, “The US Is Dead Broke and the Tax Bill Does Nothing to Help Matters,” *The Hill*, December 21, 2017.

⁴⁰ James D. Hamilton, “Off-Balance-Sheet Federal Liabilities,” *Cato Papers on Public Policy* 3 (2014): 1–40.

⁴¹ Caner, Fan, and Grennes, “Partners in Debt.”

⁴² Myung Hwan Seo and Yongcheol Shin, “Dynamic Panels with Threshold Effects and Endogeneity,” *Journal of Econometrics* 195 (2016): 169–86.

measures. An advantage of the Seo and Shin method is that it allows the data to determine the threshold levels; earlier methods required users to impose threshold levels and test for their existence.⁴³

Statistical results are shown in table 1. The threshold variables (q) are for private debt, public debt, and the interaction between private and public debt. The terms are related multiplicatively, so that if private debt is 1.10 (110 percent of GDP) and public debt is 1.25, the interaction term would be 1.375 (1.10×1.25). We included country-specific information that allowed us to estimate debt thresholds that varied by country, and we demonstrated the empirical importance of the interaction between public and private debt under regime shifts.

Table 1. Threshold Panel Data Model Results, 1995–2014

	Variables and statistics	Coefficients (SE)
	Y_{t-1}	-0.2765*** (0.0825)
Exogenous var	Trade	-0.3069 (0.2482)
	Edu	1.0231*** (0.1574)
	Inflation	0.6312*** (0.1768)
	Gov consumption	1.5767** (0.6387)

(continued on next page)

⁴³ Mehmet Caner, Thomas Grennes, and Fritzi Koehler-Geib, “Finding the Tipping Point: When Sovereign Debt Turns Bad,” in *Sovereign Debt and the Financial Crisis*, ed. Carlos Prima Braga and Gallina A. Vincelette (Washington, DC: World Bank, October 2010), 51–64; Manmohar Kumar and Jaejoon Wu, “Public Debt and Growth” (IMF Working Paper WP/10/174, International Monetary Fund, Washington, DC, 2010).

	Variables and statistics	Coefficients (SE)
Endogenous, lower regime	Private debt	0.2752*** (0.0968)
	Gov debt	-0.3915 (0.6396)
	Pri*gov debt (q)	0.3834 (0.3545)
Difference between upper and lower regime	Private debt	-0.6040*** (0.1022)
	Gov debt	-0.1583** (0.0745)
	Pri*gov debt(q)	-0.6478* (0.3531)
\gamma	Pri*gov debt	137.2776*** (44.5805)
Upper regime (%)	0.3103	
Linearity (p -value)	0.0560	
J-test (p -value)	0.7869 (0.8526)	
Endogenous variable with regime shift		Beta hat
Private debt (lower regime)		0.2752***
Private debt (upper regime)		-0.3288
Gov debt (lower regime)		-0.3915
Gov debt (upper regime)		-0.5498***
Pri*gov debt (q) (lower regime)		0.3834
Pri*gov debt (q) (upper regime)		-0.2644***

Notes: Significance levels 0.01, 0.05, and 0.10 are noted by ***, **, and *, respectively. Growth rate is the dependent variable.

First, we found evidence that debt interaction has a threshold effect on growth. The estimated threshold of 137 percent for the United States indicates that debt levels above 137 percent reduced the rate of economic growth for the United States during the sample period.

Additional debt has a different effect on growth in the two regimes. For example, suppose the interaction term rises from 100 (below the threshold) to 200 (above the threshold) owing to an increase in private debt. An economy that would otherwise grow at 3 percent on average would now grow at only 2.35 percent, solely owing to the interaction between public and private debt. This reduction is attributable to the coefficient -0.6478 percent, which is the difference between high- and low-debt regimes. If we also factor in the negative effect of the private-debt variable (-0.6040), the new growth rate will be only 1.75 percent in the next five years. The sum of the interaction and private-debt terms reduces growth by approximately 1.25 percent ($0.65 + 0.60$).

That US growth during the sample period was more than 1 percentage point per year below what it would have been if debt had been below its threshold is relevant to the recent policy discussion of whether US growth would be 2 percent per year or 3 percent or higher. If excessive debt were responsible for reducing annual production of goods and services by that magnitude, there would be a substantial gain from reforming debt policy.

Italy was identified in the 2010 Reinhart and Rogoff study as having a chronic public-debt-overhang problem.⁴⁴ Our results support the hypothesis that Italy's debt has been high enough to reduce its rate of economic growth. Italy's growth rate was 1.02 percent per year lower than it would have been if private debt had been reduced to its threshold level of 111 percent of GDP. Of Italy's total growth rate, 0.44 percentage points per year were attributable to higher private debt, and 0.58 percentage points were attributable to the interaction between private and public debt. Italy's actual real growth rate, averaged over five years ending in 2014, was -0.42 percent. If its private debt had been lowered to its threshold value, its real growth rate over the same five years would have been $+0.62$ percent. Lack of real economic growth is a

⁴⁴ Reinhart and Rogoff, "Growth in a Time of Debt."

sensitive issue in Italy, as the country has not experienced any net economic growth since the introduction of the euro in 1999.⁴⁵ The United States is not Italy, and the two countries have had different debt histories. But both have reached debt levels high enough to significantly reduce their rates of economic growth.

7. FISCAL RULES

The increase in debt relative to GDP across many countries and the concurrent absence of fiscal discipline have increased interest in fiscal rules that limit spending, taxation, or debt. The number of countries adopting fiscal rules has increased from 7 in 1990 to 92 in 2015.⁴⁶ It is especially difficult to understand why governments would increase debt to levels that reduce economic growth. Fiscal rules have inherent limitations because they must trade off commitments to not overspend as part of present bias with flexibility to react to shocks. For example, annually balanced budgets represent a strong commitment, but they have been widely criticized for being too rigid to respond to shocks.⁴⁷ The object is to impose some restraint to avoid slower growth, but allow enough flexibility to respond to shocks to the economy. The absence of rules means that current decision makers have complete discretion to choose debt limits. Many types of fiscal rules can be designed, but they all face problems that may reduce their effectiveness.

Enforcement is a problem, and according to the International Monetary Fund, rules are enforced only about half the time.⁴⁸ Enforcement is easier if the rules are transparent, and vague rules may result in frequent disputes that often end up in court. Delegation of power is an issue,

⁴⁵ Konstantinos Karagounis, Dimitrios Syrrakos, and John Simister, “The Stability and Growth Pact, and Balanced Budget Fiscal Stimulus: Evidence from Germany and Italy,” *Intereconomics* 50, no. 1 (2015): 32–39.

⁴⁶ Halac and Yared, “Fiscal Rules and Discretion under Limited Enforcement.”

⁴⁷ Halac and Yared, “Fiscal Rules and Discretion under Limited Enforcement.”

⁴⁸ Halac and Yared, “Fiscal Rules and Discretion under Limited Enforcement.”

and there may be disputes about whether specific powers have been delegated from higher- to lower-level governments. Also, in the United States, there have been disputes about whether Congress has delegated power to the president and under what conditions a president can declare a national emergency and override restrictions on executive power.

Sometimes rules are so vague, there is no clear distinction between “advisory rules” and those intended to be compulsory. The European Union’s Stability and Growth Pact establishes limits on budget deficits (3 percent of GDP) and government debt relative to GDP (90 percent of GDP). The limits have been frequently violated by members, and Konstantinos Karagounis and his coauthors have described the pact as a “sclerotic aspect of the Economic and Monetary Union.”⁴⁹ Recent Italian elections have increased the influence of populist parties that complain that Brussels has acquired excessive power and imposed harmful fiscal restrictions on Italy. Some Italian officials of the current ruling coalition have discussed dropping out of the eurozone and reintroducing the lira.⁵⁰ The new Italian government and the European Commission had a dispute in October 2018 because the proposed budget deficit would be within the European Union limit, but the proposed debt ratio would exceed that limit. Italy’s debt problems have resulted in an increase in the interest-rate spread on euro-denominated Italian government bonds relative to German government bonds.⁵¹

If rules have escape clauses that make them easy to circumvent, they will have little effect on behavior. The US Congress’s debt limit has been increased so frequently that it is hardly binding on decision makers. When it has been binding, it has caused brief shutdowns of certain nonessential government services, but it has not affected the long-term trend of the debt

⁴⁹ Karagounis, Syrrakos, and Simister, “The Stability and Growth Pact, and Balanced Budget Fiscal Stimulus.”

⁵⁰ “Italy Watchdog Casts Doubt on Official Growth Estimate,” *Wall Street Journal*, October 9, 2018.

⁵¹ “Dilemma of Italy’s Populists: Weak Banks,” *Wall Street Journal*, October 6, 2018; “The Next Recession: Special Report on the New Economy,” *Economist*, October 13, 2018.

ratio. Similarly, Japan has had a balanced-budget requirement for some time, but in recent years its parliament has voted annually to make each year an exception. In many cases governments have circumvented balanced-budget rules by using creative accounting. Other escape clauses include wars, natural disasters, and severe recessions; in some cases, their applicability is at the discretion of government officials.

The legal responsibility of national governments for the debts of lower-level governments can be a problem. Enforcement can be made more difficult if rules are not transparent. China currently faces a problem caused by the national government's effort to limit the debt of local governments without reducing productive government investments.⁵² Chinese lenders are also accused by foreign governments of providing subsidized loans to state-owned enterprises. In Switzerland, when a court determined that a canton was not responsible for the debts of municipalities, the new information allowed the canton to borrow at a lower interest rate.⁵³

Credibility is a related problem.⁵⁴ National governments have sometimes bailed out lower-level governments, even if they were not legally obliged to do so. The precise relationship between the national government and state and local governments varies across countries, and it is subject to a credibility problem. Leaders of national governments may say they will not bail out lower-level governments, but they may not be believed. In the United States, following the Revolutionary War, the new federal government assumed the debts of the former colonies that were incurred before the United States was a nation-state. State governments have not been bailed out since then, although debt assistance was requested by states in the 1830s, when many of them defaulted on bonds. States were not bailed out at that time, but the bailout issue remains

⁵² "The Next Recession"; "Beijing Censures Municipal Debt Spree," *Wall Street Journal*, September 18, 2018.

⁵³ Feld, Kalb, Moessinger, and Osterloh, "Sovereign Bond Market Reactions to No-Bailout Clauses and Fiscal Rules."

⁵⁴ Halac and Yared, "Fiscal Rules and Discretion under Limited Enforcement."

open today, as many states and cities have large unfunded liabilities for pensions.⁵⁵ The issue of credibility also applies to statements by government officials about whether they will bail out private companies that have debt problems.

8. EXPERIMENTS WITH FISCAL RULES

Some countries have had success with fiscal rules. The Swiss “debt brake,” implemented in 2003, has reduced the national debt relative to GDP with no apparent adverse effect on GDP growth.⁵⁶ Swiss fiscal institutions previously had a deficit bias. Tax rate increases required a change in Switzerland’s constitution, but increases in spending required only a simple majority vote by representatives. Before the implementation of the debt brake, the ratio of federal debt to GDP had increased from 13 percent in 1991 to 25 percent in 1997. The Swiss growth rate for real GDP increased by about 1 percentage point after the debt brake. Real GDP grew by 1.47 percent per year over the 10 years ending in 2002, and it grew by 2.46 percent per year over the period 2005–2016 (excluding the Great Recession years of 2008–2009).

Sweden has also had some success with fiscal rules. Inspired by an economic crisis in 1992–1993, Sweden has required a balanced budget over the business cycle that is partly influenced by a bipartisan fiscal council. The council imposes spending limits, and as a result, the debt-to-GDP ratio has declined from 70 to 40 percent.⁵⁷ The image of the fiscal council as being nonpartisan is important, and relative consensus on many economic issues makes it easier to implement this fiscal rule. A fiscal council member, Lars Jonung, has stated that the Swedish

⁵⁵ Mitch Daniels, “When States Get in Financial Trouble, Don’t Bail Them Out,” *Wall Street Journal*, August 4, 2018.

⁵⁶ Christian F. Pfeil and Lars P. Feld, “Does the Swiss Debt Brake Induce Sound Federal Finances? A Synthetic Control Analysis” (Freiburg Discussion Papers on Constitutional Economics No. 18/08, Walter Eucken Institute, Freiburg, Germany, 2018).

⁵⁷ Lars Jonung, “The Swedish Experience of Fiscal Reform: Lessons for Portugal” (Working Paper No. 2014:27, Department of Economics, Lund University, Lund, Sweden, August 2014).

system might not work well in the United States, where there is now extreme polarization of the population. For a council to be effective, there must be a consensus that the council will be nonpartisan. For example, a council cannot be so close to the government that it produces official economic forecasts for the government. Given institutional economic and political differences, one size may not fit all countries when it comes to fiscal rules.⁵⁸ Jonung has stated that there is no exact optimal debt rule, but debt should be low enough before a crisis or recession to allow an active fiscal policy that might mitigate the recession. This is fiscal space, and it might be measured by the distance from a debt threshold.

9. FISCAL RULES FOR THE UNITED STATES

The United States currently has no binding fiscal rules. Fiscal policy is at the discretion of current governments, and the country lacks a coherent fiscal policy. Public trust in the government was near a historical low at the end of 2017.⁵⁹ The public debt-to-GDP ratio has trended upward with no apparent limit. The historical pattern of reducing the debt ratio after wars was abandoned after 1968. The congressional debt limit has been changed so frequently that it is hardly binding on Congress. Japan's required balanced budget is similarly ineffective because it is easy for the parliament to escape the discipline of the fiscal rule by voting to override it. President Obama created the Simpson-Bowles Commission in 2010 in an attempt to establish some fiscal restraint. However, there was not sufficient support for the recommendations of the commission, and they were ignored. The Committee for a Responsible Federal Budget is a bipartisan institution that advocates for systematic fiscal discipline. An

⁵⁸ Wyplosz, "Fiscal Rules; Theoretical Issues and Historical Experiences"; Jonung, "The Swedish Experience of Fiscal Reform."

⁵⁹ Pew Research Center, "Public Trust in Government: 1958–2017" (Washington, DC: Pew Research Center, December 14, 2017).

annually balanced budget is an extreme form of a fiscal rule that has been frequently proposed for the federal government, but it has been criticized for being too rigid, especially in dealing with budget deficits induced by recessions. Many states, such as North Carolina, require annually balanced budgets, but they exclude from the balanced-budget calculation certain investment projects that go into a separate capital budget.

Determining exactly what obligations to include in the federal debt is an important practical problem for any debt rule. The narrow definition of public debt includes only the bond debt of the federal government. However, there is also a large implicit debt related to the unfunded liabilities of the Social Security, Medicare, and Medicaid programs, which are related to the aging of the population. As Kotlikoff and Hamilton have shown, these implicit debts are far larger than the official debt, and it would be difficult to come to a consensus on which debts to include in a fiscal rule.⁶⁰ In the annual federal budget, spending on open-ended, age-related programs has become an increasing share of the total budget.⁶¹ To develop a coherent debt policy, the unfunded liabilities associated with these entitlements must be taken into account.

Congress and the president have control over the public debt within limits. They have less control over private debt, although they can influence certain important forms of private debt, such as mortgage debt and student loans. In making decisions about public debt, fiscal authorities could take account of the size of private debt and its interaction with public debt for its effect on economic growth.

⁶⁰ Kotlikoff, “The US Is Dead Broke and the Tax Bill Does Nothing to Help Matters”; Hamilton, “Off-Balance-Sheet Federal Liabilities.”

⁶¹ John Cogan, “Why America Is Going Broke,” *Wall Street Journal*, February 22, 2018.

10. CONCLUSION

Increases in public and private debt relative to GDP have occurred in recent decades in many countries. The sharp contrast between rising public debt relative to GDP in the United States during the last 50 years and its previous lack of such a trend gives the appearance that Americans have become addicted to public debt. There is growing empirical evidence that rising debt has already reduced rates of economic growth in some countries, such as Greece, Italy, and the United States, and is threatening to affect more countries as well. Both public and private debt are relevant to economic growth, and their interaction is important for estimating debt thresholds that vary by country. Rising debt ratios and increasing evidence of their possible adverse effects have increased interest in establishing fiscal rules. Fiscal rules have many different characteristics, and the experience with such rules so far has been mixed. No single rule is best for all countries, and it is important to match characteristics of fiscal rules to the characteristics of economic, political, and legal institutions of each country. Designing optimal fiscal rules will be challenging, especially given the interaction between public debt and private debt. However, reform of debt policy is important because of the large forgone output associated with the current suboptimal debt policies.