Beyond Gross Public Debt: Evidence from Public-Sector Balance Sheets in the G7 Economies

Project Summary & Research Proposal

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Abstract

As G7 economies face mounting fiscal pressures from demographic aging, rising social security deficits, and escalating debt-to-GDP ratios, traditional models of sovereign debt sustainability require urgent reassessment. This research proposes an empirical replication and expansion of the consolidated public balance sheet framework pioneered by Chien, Du, and Lustig (2025). While Chien et al. demonstrate that Japan has averted a debt crisis by running its public sector as a highly-leveraged, de facto sovereign wealth fund that harvests international risk premia, the generalizability of this model to other advanced economies remains unexamined. This project will construct consolidated financial balance sheets for the entire public sector (including central governments, central banks, and public pension systems) across all G7 nations. By measuring the duration and currency mismatches of these sovereign portfolios, we will quantify the extent of public risk-taking, estimate the true sovereign cost of capital under various monetary regimes, and evaluate whether sovereign carry trades can be replicated by other reserve-currency issuers. In strict compliance with NBER guidelines, this paper focuses on positive, quantitative balance sheet accounting and does not offer policy recommendations.

1 Introduction and Research Question

Advanced economies are currently navigating a historic demographic transition characterized by accelerating aging and a secular slowdown in long-term growth rates. These structural shifts have led to large, persistent primary budget deficits, primarily driven by expanding social security and healthcare transfer programs (Chien, Du, and Lustig, 2025). Under standard debt-sustainability frameworks, when the real interest rate on public debt (r) exceeds the real economic growth rate (g), a government must eventually run primary surpluses to stabilize its debt-to-GDP ratio (Blanchard, 2019; Mehrotra and Sergeyev, 2021).

However, several advanced economies have run persistent primary deficits for decades without triggering a sovereign debt crisis or experiencing explosive inflation. The most prominent example is Japan, where general government debt exceeds 200% of GDP (OECD, 2022). Between 1997 and 2024, Japan's real GDP growth rate averaged -0.03%, while the average real rate of return on the Japanese government bond portfolio was 1.30% (Chien, Du, and Lustig, 2025). This positive gap ($r - g > 0$) implies that Japan was operating outside the sustainable steady-state region, yet its fiscal framework survived.

The key to resolving this puzzle lies in analyzing the consolidated balance sheet of the entire public sector. As shown by Chien, Du, and Lustig (2025), the Japanese government has offset its

cumulative primary deficits by operating a massive, highly-leveraged de facto sovereign wealth fund. By borrowing domestically at ultra-low interest rates and investing in high-yield domestic equities and foreign securities, the Japanese public sector has harvested substantial risk premia, averaging net annual returns of 4.6% over the past decade (equivalent to 6% of GDP per annum).

This project proposes to replicate this consolidated balance sheet analysis and expand the sample to all G7 economies (the United States, Japan, Germany, the United Kingdom, France, Italy, and Canada). Specifically, we address the following research questions:

1. To what extent are G7 governments utilizing their public balance sheets as leveraged investment portfolios to support debt sustainability?
2. What are the duration and currency mismatches engineered on these consolidated sovereign balance sheets, and how do they respond to interest rate hikes and exchange rate shocks?
3. How do domestic financial institutions, pension fund mandates, and central bank monetary frameworks act as tools of "financial repression" to maintain low public borrowing costs across different nations?

2 Methodology and Empirical Framework

To answer these questions, we will build a comprehensive, multi-country dataset of G7 public sector financial portfolios from 1997 to 2026. Following the methodology of Chien, Du, and Lustig (2025) and Hall and Sargent (2011), the analysis will proceed in three steps:

2.1 Consolidated Public Sector Balance Sheet Construction

For each G7 country, we will consolidate the balance sheets of four distinct public entities to eliminate intra-governmental holdings (such as treasury securities held by central banks or public pension funds):

1. **General Government:** Central government, local/regional governments, and social security funds.
2. **Central Bank:** E.g., the Federal Reserve System, the Bank of Japan, the European Central Bank (pro-rated for Germany, France, and Italy), the Bank of England, and the Bank of Canada.
3. **Public Pension Funds:** E.g., Japan's Government Pension Investment Fund (GPIF) and the Canada Pension Plan Investment Board (CPPIB).
4. **State-Owned/Public Financial Institutions (PFIs):** E.g., development banks and postal savings systems.

We will classify and value assets and liabilities at market values, categorizing them into:

- **Assets:** Deposits, domestic loans, domestic equities, foreign securities (bonds and equities), and other financial assets.
- **Liabilities:** Currency in circulation, bank reserves, marketable bonds, non-marketable treasury bills, loans, postal deposits, and unfunded public pension liabilities.

2.2 Duration Mismatch Measurement

To estimate the interest rate sensitivity of each G7 sovereign portfolio, we will compute the effective duration (D) of the consolidated assets (D_A) and liabilities (D_L). Under the framework, the duration of equities is inferred via the Myron Gordon dividend growth model:

$$D_{\text{equity}} = \frac{1 + g_{\text{div}}}{r_{\text{equity}} - g_{\text{div}}} \tag{1}$$

Using historical price-to-dividend ratios from the Jordà-Schularick-Taylor Macrohistory Database (Jordà et al., 2019), we will calibrate country-specific equity durations. Loan and bond durations will be constructed using weighted averages from national debt registries and indices. The net duration of the consolidated balance sheet will be calculated to measure the fiscal impact of a 100-basis-point parallel shift in interest rates.

2.3 Currency Mismatch and Carry Trade Exposure

We will measure the net unhedged foreign currency exposure of each G7 nation's public sector. This includes measuring the volume of domestic-currency liabilities (the funding leg) relative to foreign-currency denominated assets (such as U.S. dollar-denominated assets held by Japanese or European pension funds). We will quantify the realized sovereign carry trade returns and simulate the valuation impact of a 10% bilateral currency appreciation against major funding currencies.

3 Alignment with NBER Conference Themes

This research proposal directly aligns with several key topics specified in the NBER Call for Papers:

- **Measurement of the Gap between Interest Rates and Growth Rates:** Our project directly measures the actual sovereign borrowing cost versus the real economic growth rate, but introduces the critical missing piece: the gross return on sovereign assets. This expands the standard debt sustainability equation to account for portfolio returns, showing how risk-taking can structurally lower the necessary present value of future primary surpluses.
- **Duration Mismatch and Asset Purchases:** We analyze how central bank balance sheet policies (QE and QT) alter the maturity and duration structure of consolidated liabilities. In Japan, QE converted long-duration JGBs into overnight bank reserves, reducing liability duration to 3.2 years while assets stood at 24.5 years. Our study will compare this with the Federal Reserve's QT program, assessing how the reduction in central bank asset holdings shifts duration risk back to the private sector and impacts the fiscal deficit.
- **The Experience of Other Nations and Fiscal Institutions:** By conducting a comparative G7 analysis, we highlight the role of national fiscal institutions. For instance, we will contrast the institutional freedom of Canada's CPPIB and Japan's GPIF (which holds 75% of its portfolio in risky domestic/foreign equities and bonds) with the U.S. Social Security Trust Fund, which is legally restricted to holding non-marketable U.S. Treasury securities.
- **Central Bank Balance Sheets and Financial Repression:** We will evaluate the mechanics of financial repression across G7 nations. This includes measuring the concentration of debt held by captive domestic buyers (such as regulated banks and pensions) and the role of central bank reserve pricing, exploring how these structural factors allow governments to borrow at below-market rates.

4 Preliminary Data and Comparative Feasibility

An initial comparison between Japan and the United States highlights the rich comparative potential of this G7 study, as well as several structural differences that must be modeled. To establish the baseline empirical feasibility of the project, Table 1 presents key metrics constructed from the baseline paper's dataset.

Table 1: Preliminary Comparison: Consolidated Public Sector and Household Balance Sheets (2024Q2 / 2023)

Portfolio / Balance Sheet Metric	**Japan**	**United States**
Consolidated Public Sector Portfolio (2024Q2, % of GDP)		
Total Financial Assets	192.4%	45.7%
of which: Domestic Equities	41.7%	12.7%
of which: Foreign Securities	61.8%	–
Total Public Liabilities	270.0%	129.4%
of which: Bank Reserves & Repos	90.8%	14.2%
of which: Marketable Treasury Bonds & T-Bills	103.8%	72.2%
of which: Unfunded Public Pensions	–	15.2%
Public Sector Net Liabilities	77.6%	83.7%
Household Portfolio Structure (2023, % of GDP)		
Total Household Assets	352.9%	406.0%
of which: Currency and Deposits	188.9%	61.8%
of which: Equities & Mutual Funds	63.4%	196.9%
Household Net Wealth	294.8%	336.9%
Sovereign Debt Market Metrics		
Foreign Ownership Share of Outstanding Public Debt	$< 10.0\%$	$\sim 30.0\%$
Consolidated Public Liability Duration	3.2 Years	Long-term / Market-driven
Consolidated Public Asset Duration	24.5 Years	Short-term / Liquid

The preliminary comparison reveals four crucial insights that our G7 expansion will explore:

- **Asset Base and Leverage:** The Japanese public sector holds massive financial assets (192.4% of GDP) relative to the United States (45.7% of GDP). The U.S. federal government possesses very few financial assets, meaning a federal "sovereign wealth fund" would have to be financed entirely by issuing new debt.
- **Investor Base and Market Elasticity:** Foreign investors hold approximately 30% of outstanding U.S. Treasury securities, whereas foreign ownership of Japanese Government Bonds is under 10% (see Table 1). This price-elastic foreign base makes persistent mispricing of U.S. debt highly unlikely without severe global repercussions.
- **Household Savings Portfolios:** Japanese households hold 188.9% of GDP in low-return deposits, while U.S. households hold 61.8% of GDP in deposits and over 196.9% in equities and bonds. This high financial sophistication in the U.S. limits the government's ability to use deposit-based financial repression to lower borrowing costs.
- **Global Reserve Currency Status:** The U.S. dollar benefits from a significant "convenience yield" due to its global reserve status. However, prolonged financial repression could erode this convenience yield, leading to dollar depreciation and undermining its safe-asset status.

5 Project Timeline and Deliverables

The project will be completed in accordance with the NBER schedule for the May 20–21, 2027 conference, as detailed in Table 2.

Table 2: Proposed Project Timeline to May 2027 Conference

Phase	**Timeline**	**Key Deliverables and Milestones**
Phase 1	Sept–Oct 2026	Comprehensive data collection from Flow of Funds for G7 countries.
Phase 2	Nov–Dec 2026	Consolidated balance sheets. Presentation at the NBER virtual preconference.
Phase 3	Jan–Feb 2027	Implementation of Myron Gordon duration models and mismatch estimation.
Phase 4	Mar–Apr 2027	Draft paper synthesis, robustness checks, and counterfactual simulations.
Phase 5	May 2027	Final paper submission and presentation in Washington, DC.

6 NBER Policy Guidelines Compliance Statement

In strict adherence to the NBER guidelines, this paper is designed as a purely positive, quantitative empirical study. It models the mechanics of public sector portfolios, measures asset-liability mismatches, and estimates historical risk premia. It does not advocate for or against specific tax, spending, or central banking policies, nor does it provide normative policy recommendations for G7 treasuries or central banks.

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