GDP-Indexed Bonds: Benefits for Issuing Countries, Investors and International Financial Stability

Jean-Baptiste Gossé
Economics and International and European Relations Directorate
Banque de France

Based on a study co-authored by Bruno Cabrillac and Ludovic Gauvin

Workshop on GDP-linked securities
Paris, March 10 2017
Aims of the study

- The study seeks to determine which countries could provide the more benefits from using GDP-indexed bonds instead of conventional debt:
  - From the issuer’s point of view: impact on the volatility of the debt trajectory
  - From the investor’s point of view: gains of diversifying its portfolio in terms of variance (and Sharpe ratio)

The larger the potential gains for both issuers and investors are, the more the country would provide a seedbed for the development of this new type of bonds
Design of the GIBs and debt dynamics

- Bonds denominated in national currency
- Principal indexed on nominal GDP
- Fixed coupon rate (not indexed on nominal GDP)
- Coupon varies with nominal GDP through the indexation of the principal

Public debt/GDP dynamics would no longer be procyclical
Reducing default risk by stabilizing debt ratios in the cycle

Public debt-to-GDP ratio

Debt service (% of debt)

\[
d_t^i = \frac{(1+c_{t-1}^i)(1+x_t^i)}{(1+g_t)} d_{t-1}^i - s_t = (1 + c_{t-1}^i) d_{t-1}^i - s_t
\]
Expected effect on the risk premium

GDP-indexed bonds

- Novelty premium
- Liquidity premium
- Indexation premium
- Default premium

Sources of increase in risk premium

Sources of decrease in risk premium

Short-term and small amount of GIBs issued

Conventional bonds

- Liquidity premium
- Indexation premium
- Default premium

Liquidity premium

Large amount of GIBs issued

Medium/long term and large amount of GIBs issued

Default premium
For middle income countries, in more than 80% of cases the holder of GIBs in local currency would have gains in USD.

**Annual exchange rate change and nominal growth (1996-2015) for Higher middle income countries**

![Graph showing annual exchange rate change and nominal growth](image)

**Source:** IMF

**Note:** The red triangle corresponds to the area for which the combination of exchange rate change and nominal growth implies gains for investors.
Significant potential gains for foreign investors in the long term
Average GDP nominal growth breakdown in USD (1996-2015)

Source: IMF
Methodology to quantify main benefits both for issuers and investors

- **Gains for the issuing country**: Decrease in the debt-to-GDP ratio resulting from the issuance of GIBs rather than traditional debt instruments over a 25 year-horizon for the 5% least favourable public debt paths.

  - Using the methodology of Blanchard et al. (2016), debt dynamics are simulated from 2015 to 2040.

- **Gains for the investors**: Average potential decrease in the volatility of a benchmark portfolio for a diversification through investment in GIBs rather than in equities for a given country.

  - The benchmark portfolio consists of 80% of US shares (S&P 500) and 20% of risk-free assets (T-bills). The investor compare a portfolio diversified through buying equities or GIBs of another country.
Reducing the uncertainty around debt trajectories

The charts above visually depict the reduction in volatility by 2040 resulting from the replacement of conventional bonds by other bonds in local currency only, indexed on inflation and indexed on GDP. The orange areas show the gap between the 5th and the 95th percentiles of simulations (i.e. for the 5% most and least favourable debt paths, respectively) and the curve the median for 10,000 draws based on the variance-covariance matrix.
Gains for issuing countries (in % of debt over GDP in the 5% worst scenarios) and for investors (in volatility of a benchmark portfolio, compared to equity)