Monetary Policy in Pakistan: Confronting Fiscal Dominance and Imperfect Credibility

Ehsan Choudhri
Carleton University

Hamza Malik
State Bank of Pakistan

Background

- State Bank of Pakistan (SBP) has been improving its research capability for some time

- Interest in using a DSGE model

- Research Department has already developed a RBC model

- A New Keynesian model needed to analyze monetary policy effects

Objectives

- Develop a small-scale model of a small open economy
- Extend and modify the standard version to incorporate special features of Pakistan and meet the needs of SBP for policy analysis
- Limited time series data available - - estimation of the model is postponed till a later time
- SBP is developing data sets - - plan to undertake some preliminary empirical analysis to evaluate the performance of the model

Plan of the Presentation

- Brief description of the model
- Review recent economic conditions and fiscal policy behavior in Pakistan
- Discuss selected results from model simulations
  - Focus on issues related to fiscal dominance and credibility

Key Variations

- Include a banking sector to incorporate financial frictions in the model (use a variant of the Canzoneri et al., 2008)
- Two types of households:
  - High-income households (who participate in the financial market)
  - Low-income households (who do not interact with financial markets)
- Liquidity-constrained households allow departures from the Ricardian equivalence proposition, but 2-household setup also useful for exploring income distribution effects

Key Variations (Cont.)

- Financial markets in Pakistan are not well integrated with foreign financial markets

- We assume that the interest parity relation does not hold (because of the presence sufficiently large transactions costs and/or risk premium)

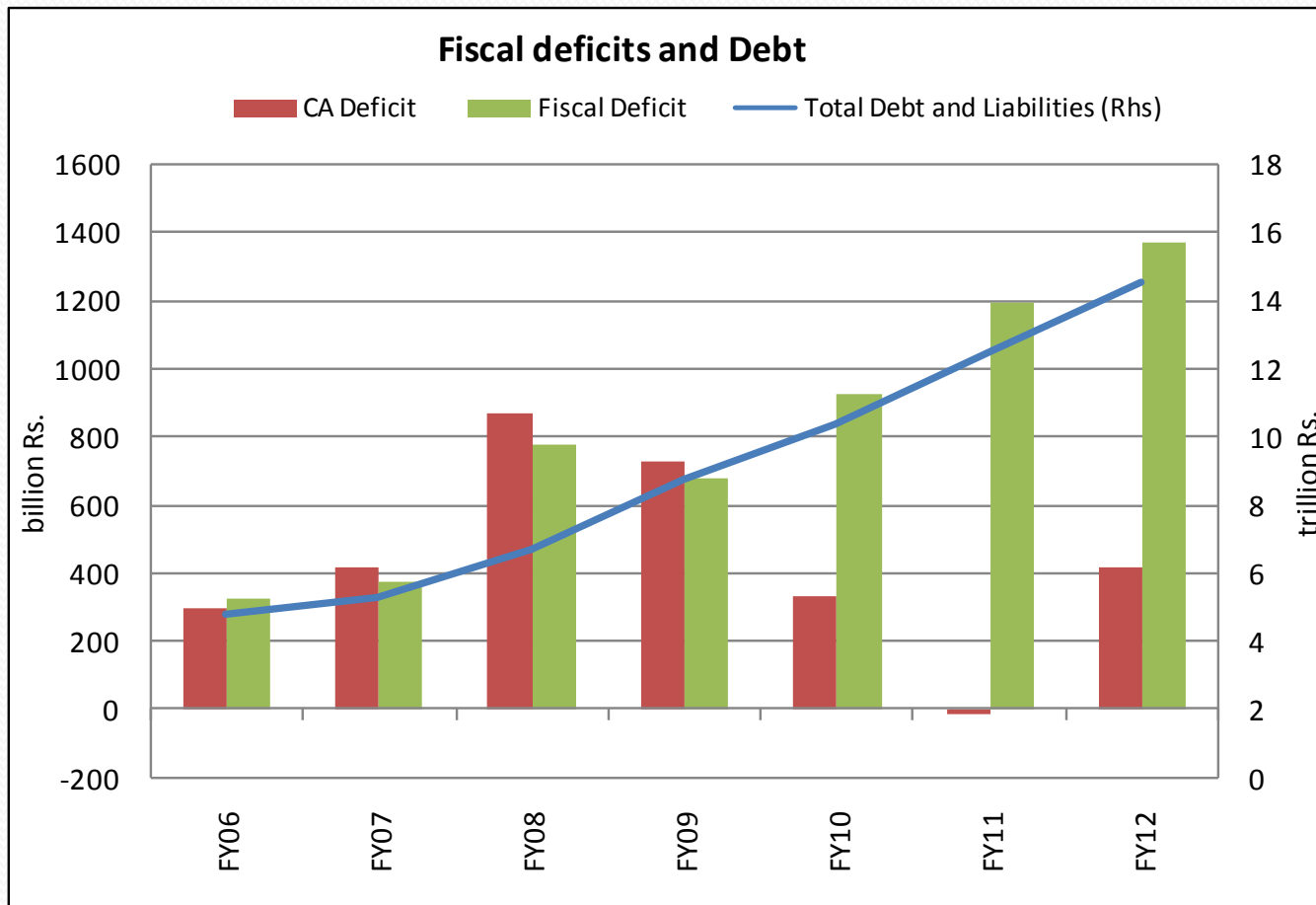- Assume investment financed by bank loans

Model

- Other features of the model are standard. For model description see http://www.theigc.org/sites/default/files/choudhri-malik_monetary_policy_in_pakistan_march_27_2012.pdf

- For now wage-price stickiness based on Rotemberg adjustment costs

- Work in progress - - considering several extensions

Recent Conditions

- Government has not been successful in controlling its expenditures
- It has also not been able or willing to increase tax revenues
- There is a large budget deficit and a major proportion is financed by borrowing from SBP
- There is high and persistent Inflation
- Output growth is low and a policy of disinflation is not considered feasible
- In fact, an important goal is to prevent inflation form increasing further
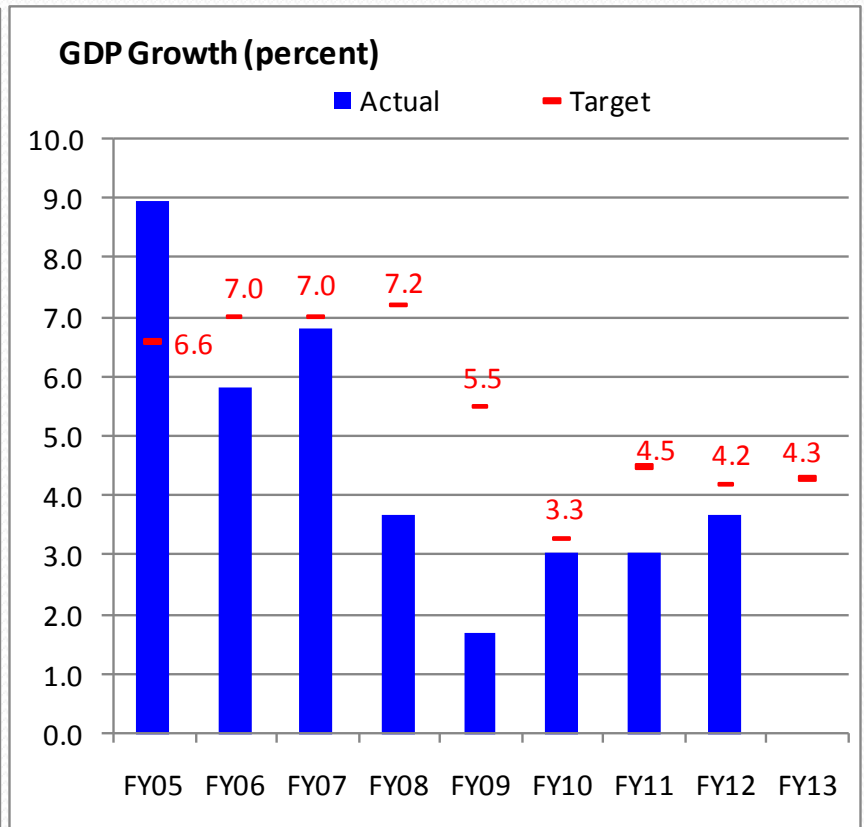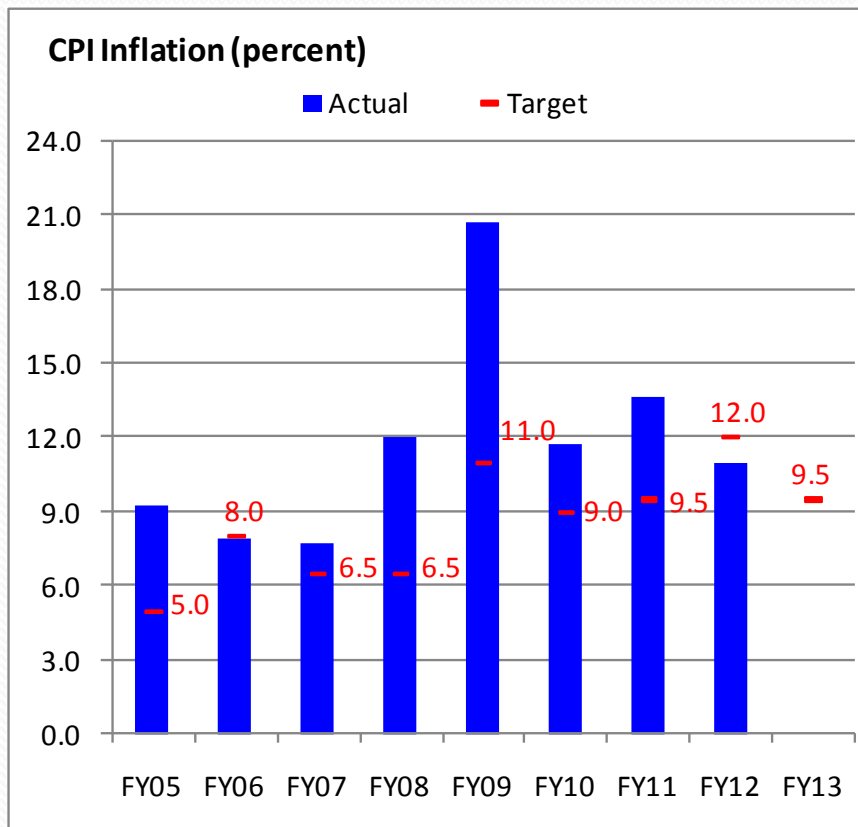
Rising Fiscal Deficit and Debt

Fiscal deficits and Debt

Government Borrowing

Government Recourses to the Banking System (stock position)
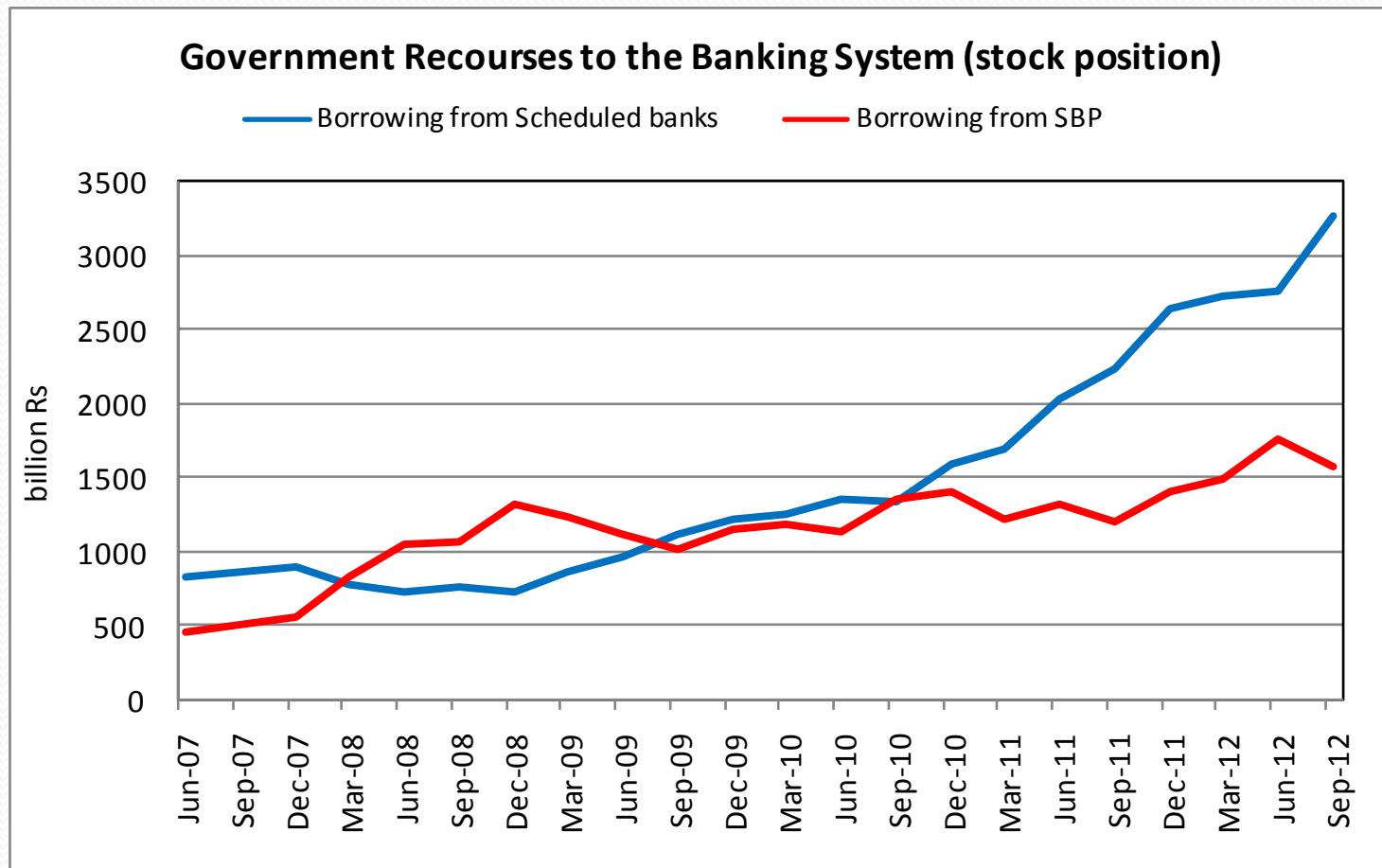
Inflation and Growth

How Independent is SBP?

- Before 1993, SBP had neither the authority nor instruments at its disposal to conduct an independent monetary policy
- Financial sector reforms of 1990s empowered SBP to formulate and implement monetary policy and regulate the financial sector
- SBP Act (1956, amended 2003) gives the SBP the authority to formulate and conduct monetary and credit policies in accordance with the targets of inflation and growth set by the Government
- Creation of Monetary and Fiscal Policy Coordination Board diluted SBP's Central Board's authority to determine and limit government borrowing

Recent Amendments in SBP Act

- To reduce fiscal dominance and enhance operational independence, SBP proposed amendment to the Act
- Recently (March 2012) National Assembly has passed a modified version of the amendments
  - Allow the government to borrow from SBP with a requirement to retire such borrowings by the end of each quarter of each fiscal year
  - Require the outstanding stock of borrowings to be reduced within eight years
  - In case of non-compliance, Minister of Finance required to provide a rational in the parliament
- These requirements are continually not met by the government

Assumptions about Fiscal policy

- SBP is constrained to meet the borrowing needs of the government
- Since the behavior of fiscal policy is not clear, we consider two possibilities:
  1. Fiscal authorities take action to stabilize the debt at some target level
  2. Fiscal authorities do not take responsibility to control debt levels
- These possibilities suggest two policy environments which have very different implications for monetary policy

Weak Monetary Independence

- Fiscal policy chooses the path of expenditures, taxes and revenue from seignorage

- However, it is willing to adjust primary balance to keep government debt at a target level

- Monetary policy can not choose an inflation target independently - - sets an inflation target consistent with long-run seignorage

- Monetary policy is otherwise not constrained in the use of an interest rate rule

Fiscal Dominance

- Fiscal policy is not prepared to stabilize government debt and monetary policy accommodates fiscal needs
- One view is that such lack of fiscal adjustment would make inflation targeting completely infeasible
- Another view is that monetary policy still has a role to play in controlling inflation if inflation expectations are anchored (Benigno and Woodford, 2006)
- Kumhof et al. (2008) develop an implementable interest rate rule under fiscal dominance which includes fiscal variables

Interest Rate Rules

- Basic policy rules under weak monetary independence are

$$\tau_{H,t} = \overline{\tau}_H + \phi_{\tau b}\left(b_{P,t-1} - \overline{b}_{P.t}\right)$$

$$\ln(1 + R_t) = \ln(1 + \overline{R}) + (1 + \phi_{r\pi})\ln(\Pi_{t+1} / \overline{\Pi}) + \phi_{ry}\ln(y_t / \overline{y}) + \ln \xi_{r,t}$$

$\tau_{H,t}$ = tax on H household, $b_{P.t}$ = real debt, R_t = nominal interest rate

$\Pi_t = P_t / P_{t-1}$, P_t = Price level, y_t = output, $\xi_{r,t}$ = policy shock

Overbar indicates steady-state or target value

- Interest rate rule under fiscal dominance is

$$\ln(1 + R_t) = \ln(1 + \overline{R}) + (1 + \phi_{r\pi})\ln(\Pi_{t+1} / \overline{\Pi}) + \phi_{ry}\ln(y_t / \overline{y}) + \phi_{rb}\left(b_{P,t-1} - \overline{b}_{P.t}\right) + \ln \xi_{r,t}$$

Credibility Issues

- Credibility problems arise under both policy regimes
- Under weak monetary independence, government commitment to stabilizing debt may not be credible
- There may be a concern that the government would raise primary surplus permanently leading to higher long-run segniorage and inflation
- Under fiscal dominance, there may be doubts about the central bank's ability to keep both long term debt and inflation at target levels

Endogenous Credibility

- Use a model of endogenous credibility (based on Isard et al., 2001 and Alichi et al., 2009)
- Public assumes two policy scenarios. The two scenarios assume that inflation converges to:
1. Target inflation rate
2. Higher inflation rate
- Actual inflation performance determines the credibility stock - - weights assigned to each scenario
- The weight on the forward looking component in inflation expectations depends on the credibility stock

Data for calibration

Description	Average Annual Value
Bank Deposit to GDP Ratio	0.263
Currency to Deposit Ratio	0.389
Cash Reserves to Deposits Ratio	0.052
Government Securities to Deposit Ratio for Banks	0.610
Govt. Expenditures as Share of GDP	0.198
Investment Expenditures as a share of GDP	0.188
Rate of Capital Depreciation	0.084
Share of Imports in GDP	0.161

Calibration

- Steady-state values of model variables were matched with the data

- We assume that targets for inflation and debt are set to maintain recent levels

- Inflation target = 12% (annual CPI inflation)

- Debt target = 60% of potential output

- Steady-state seignorage calculated as 1.35% of income

Calibration (Cont.)

- Values of key utility-function parameters similar to recent DSGE models for emerging economies
- Prices assumed to be less sticky than wages (as suggested by studies on frequency of wage-price change in Pakistan)
- Survey data on informal sector used to determine Relative size of H and L households

# Effects of an Increase in Government Expenditures

- Include several shocks in the model
- Focus on the effect of shocks to government expenditures

$$\ln g_t = (1 - \rho_g) \ln \bar{g} + \rho_g \ln g_{t-1} + x_{g,t}, \quad \rho_g = .5$$

Assume $x_g = .025$ for 4 quarters

- Compare the effects under:

1. Weak Monetary Independence and model-consistent inflation expectations (baseline case)

2. Weak Monetary Independence and endogenous credibility

- Illustrate for a simple rule $(\phi_{r\pi} = .5, \phi_{ry} = 0)$

# Inflation: Baseline Case Versus Endogenous Credibility
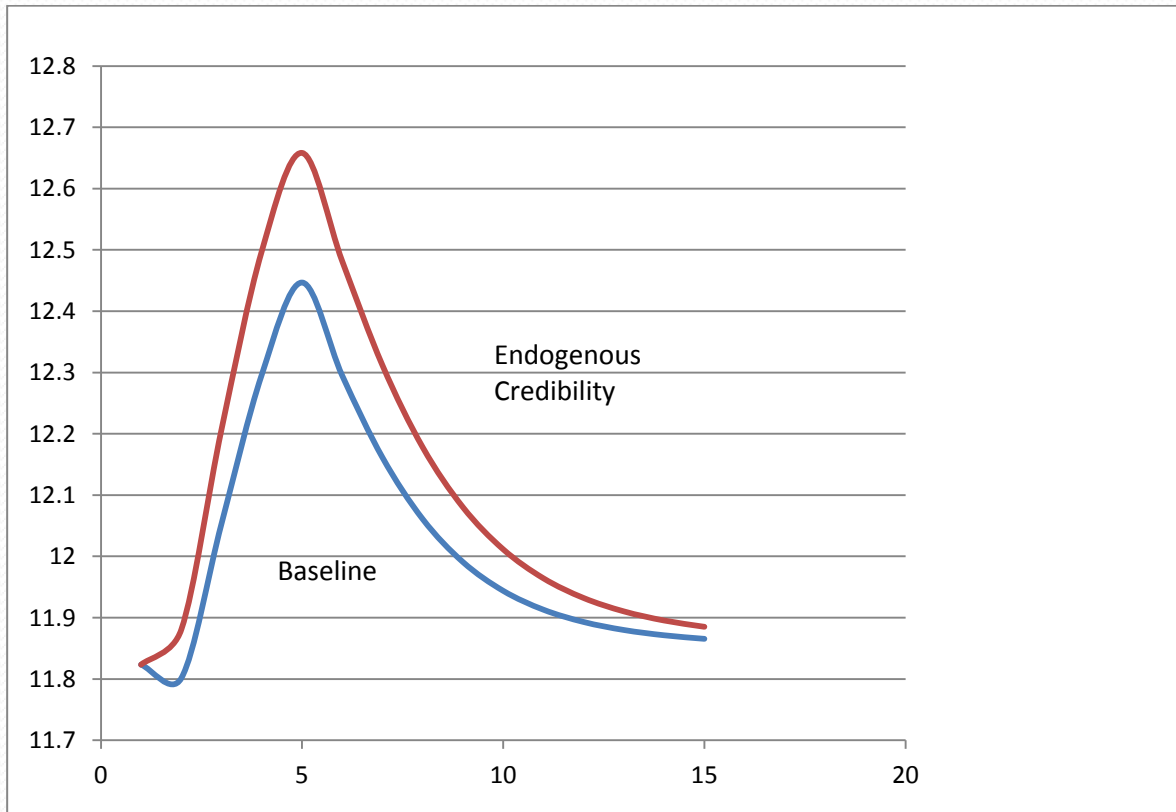
Effects under Fiscal Dominance

- Equilibrium determinacy is obtained for a wide range of positive and negative values for the inflation coefficient (given negative debt coefficient)

- Zero lower bound constraint on the interest rate is not a problem

- Compare two cases

1. Negative inflation coefficient $(\phi_{r\pi} = -.5, \phi_{rb} = -.1)$

2. Positive inflation coefficient $(\phi_{r\pi} = .5, \phi_{rb} = -.1)$

- Inflation and debt behavior very different in the two cases

Inflation: Fiscal Dominance with Positive and Negative Inflation Response
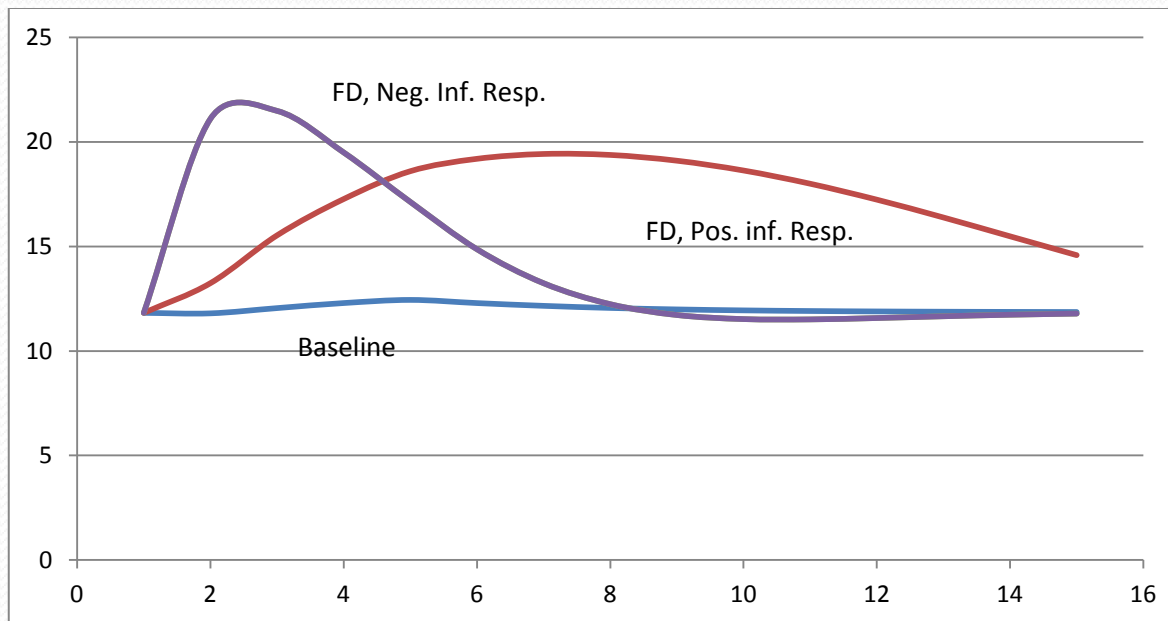
Real Debt: Positive and Negative Inflation Response under Fiscal Dominance
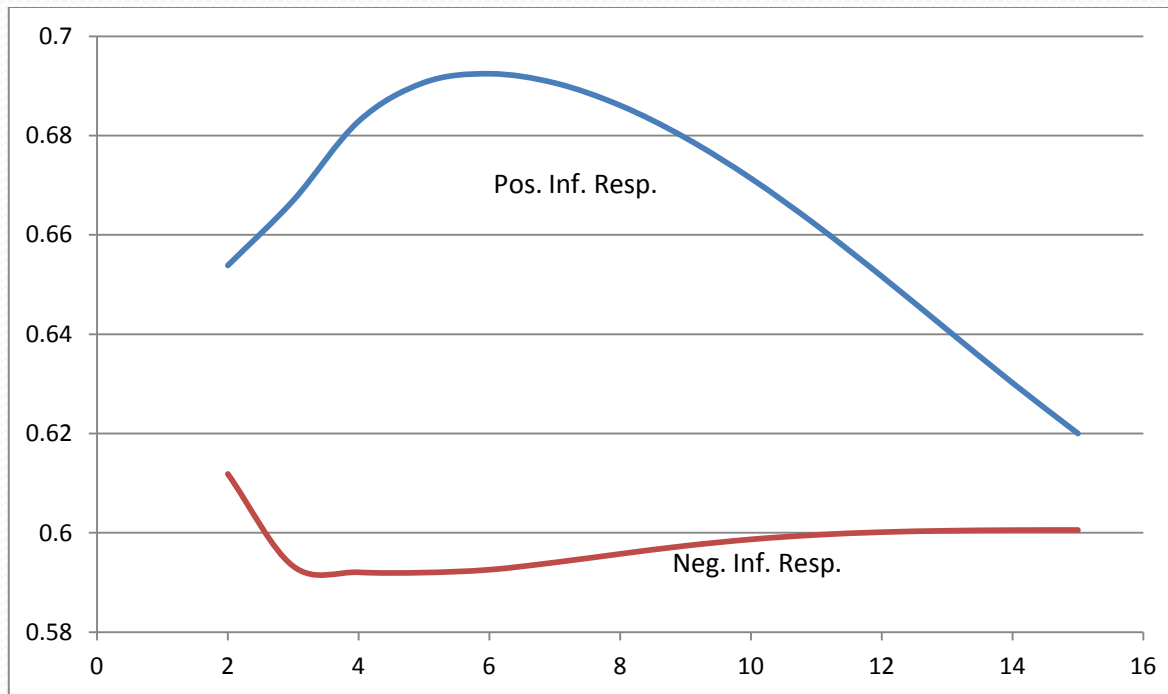
Welfare Losses (proportion of steady state consumption) for the Govt. Expenditure Increase

	Low-Income Households	High-Income Households
Endogenous Credibility	0.0019	0.0101
FD (Neg. Inf. Resp.)	0.0173	0.1279
FD (Pos. Inf. Resp.)	0.0125	0.0539

Stochastic Simulation

- Include shocks to productivity, government expenditures and import prices
- Chose autoregressive coefficients and standard deviations of shocks to government expenditures and import prices based on time series data for these variables
- Parameters of productivity shock chosen to match output variability in the model with that in data
- Compare the effect of different regimes on the variability of inflation deviation (from the target rate) and output gap

Inflation and Output performance

	Inflation Deviation (standard deviation)	Output Gap (standard deviation)
Baseline	0.0962	0.0316
Endogenous Credibility	0.0949	0.0408
FD (Neg. Inf. Resp.)	0.1116	0.0930
FD (Pos. Inf. Resp.)	0.1311	0.0814

Other Issues

- Optimal interest response under weak monetary independence
- Implications of Interest rate smoothing and exchange rate management
- Crowding out of private investment by government expenditures
- Explaining the rise ofgovernment borrowing from private banks

Concluding Remarks

- Under fiscal dominance, monetary policy can implement an interest rate rule that stabilizes both inflation and debt

- Even under an appropriate monetary policy rule, fiscal dominance would lead to high and volatile inflation and cause large losses

- Fiscal dominance would also lead to credibility problems which would worsen economic conditions

- Macroeconomic performance can be improved considerably if fiscal policy takes the responsibility to stabilize debt

References

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- Kumhof, M., R. Nunes, and I. Yakadina, 2008, "Simple Monetary Rules under Fiscal Dominance," Board of Governors of the Federal Reserve System, International Finance Discussion Papers No. 937.

Endogenous Credibility Model

Equations

$$\ln \Pi_t^e = \lambda_t \ln \Pi_{t+1} + (1 - \lambda_t) \ln \Pi_{t-1} + bias_t + \ln \xi_{\pi^e, t}$$

$$\ln \Pi_t^{LO} = \zeta \ln \Pi_{t-1} + (1 - \zeta) \ln \bar{\Pi} + \ln \xi_{\pi^{LO}, t}$$

$$\ln \Pi_t^{HI} = \zeta \ln \Pi_{t-1} + (1 - \zeta) \ln \tilde{\Pi} + \ln \xi_{\pi^{HI}, t}$$

$$cred_t = \frac{\left(\ln \Pi_t^{HI} - \ln \Pi_t \right)^2}{\left(\ln \Pi_t^{HI} - \ln \Pi_t \right)^2 + \left(\ln \Pi_t^{LO} - \ln \Pi_t \right)^2}$$

$$\lambda_t = \rho_\lambda \lambda_{t-1} + (1 - \rho_\lambda) cred_{t-1}$$

$$bias_t = \upsilon \left(\lambda_t \ln \Pi_{t+1}^{LO} + (1 - \lambda_t) \ln \Pi_{t+1}^{HI} - \ln \bar{\Pi} \right)$$

$$\zeta = 0.6, \rho_\lambda = 0.2, \upsilon = .25, \bar{\Pi} = 1.03, \tilde{\Pi} = 1.06$$