Monetary and Financial Sector

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Why Forecast the Monetary Sector?

- Assess the monetary implications of policies → guidance to monetary policy
- Check on accounting and behavioral consistency across sectors
- Key component of financial programming

Monetary Implication of Policies

Monetary implication of the fiscal deficit and balance of payments deficit on:

- ❑ Inflation
- ❑ Exchange rate
- ❑ Interest rates
- ❑ Monetary Aggregates
- ❑ Credit to the private sector, etc

Accounting and Behavioral Consistency

Forecast of the monetary sector consistent with the forecasts of the other sectors.

- Projected money supply consistent with the paths for inflation, growth, and interest rates
- Credit to the private sector consistent with private investment and growth

Financial Programming Approach

Traditionally relied heavily on projections for the monetary sector

- Two main goals:
  - Sufficient credit to the private sector
  - Sufficient FX reserves
- Fiscal and monetary policies are adjusted in order to meet these goals

Monetary Targeting Regimes

- Monetary analysis has its roots in the “monetary approach to the BOP”
- Instrument is a narrow money aggregate (RM) and the intermediates target a broad money aggregate
- Money targets should be set in a manner consistent with the forecast of future money demand
- The composition of broad money and reserve money have implications for domestic credit and FX reserves

Monetary Approach to the Balance of Payments

$$\Delta M = \Delta NFA + \Delta NDA$$

Where,

$$\Delta NFA = \Delta NFA^{CB} + \Delta NFA^{ODC}$$

$$\Delta NFA^{CB} = \Delta RES = CAB + \Delta FI$$

$$\Delta NFA = \Delta M - \Delta NDA$$

If $\Delta NFA^{ODC} = 0$, $\Delta RES = \Delta M - \Delta NDA$

Numerical Example of the Monetary Approach to the BOP (in millions of USD)

	Baseline	Scenario
Monetary Survey	450	600
Net foreign assets	1550	1400
Net domestic assets	2000	2000
Broad money		
Production		
Nominal GDP	8000	8000
Velocity of circulation	4	4
Balance of payments		
Current account balance	-480	-330
Net foreign borrowing	380	380
Overall balance	-100	50
Change in net foreign assets	-100	50

A Shifting Paradigm

- Advanced economies abandoned monetary targets in the 1980's
- Developing economies followed later
- Causes:
  - Liberalization and financial deepening;
  - Increasing instability in money demand and velocity;
  - Frequent and large exogenous shocks; and
  - Lower average inflation, volatility of inflation and ore successful anchoring of expectations

Inflation Targeting and Hybrid Frameworks

- Many countries have moved towards:
  - Flexible operational targets
  - Forward-looking policies
- In IT and hybrid frameworks:
  - The inflation forecast is the intermediate target
  - The short-term policy rate typically serves as the operation target/policy instrument

Why Money Still “Matters”

- For inflation – an exogenous increase in the money supply is likely to be expansionary
- Money aggregates serve as indicators to asses inflationary conditions
- Developments in credit and balance sheet variables may poin tot financial vulnerabilities

Forecasting Money Demand: Estimating a Money Demand Equation

Demand for real money balances:

$$\ln\left[\frac{M^D}{P}\right]_t = b_0 + b_1 \ln(RY)_t + b_2 \ln(IR)_t$$

Estimating the Velocity of Circulation

Equation of exchange:

$$M^D \times v = PGDP \times RY$$

Finalizing the Asset Side of the Monetary Survey

$$\Delta MT_t = \Delta NFA_t + \Delta NDA_t$$

$$\Delta NDA_t = \Delta NDC_t + \Delta OIM_t$$

$$\Delta NDC_t = \Delta NFA_t + \Delta NDA_t$$

Forecasting Net Foreign Assets (NFA)

$$NFA_1 = e_t^{EOP}\left(\frac{NFA_{t-1}}{e_{t-1}^{EOP}} + \Delta RES_t + \Delta BNFA_t\right)$$

- e_t^{EOP} is the exchange rate (domestic currency per U.S. dollar) at the end of period t
- ΔRES is the change reserves (in U.S. dollars from the BOP
- $\Delta BNFA$ is the change in other net foreign assets of the banking system (not included in reserves) from BOP, financial account

Forecasting Other Items, Net

Other items, net (OIN) affected by:

- Valuation changes in:
  - NFA of central bank and commercial banks
  - Residents' foreign currency deposits or loans
- Other
  - Changes in bank capital
  - Bank profit/losses deriving from FX currency transactions

Forecasting Other Items, Net

$$OIN_t = OIN_{t-1} - valuation\ adjustment$$

$$valuation\ adjustment = \Delta NFA_t - Transaction\ flow$$

$$Transaction\ flow = e_t^{avg}\left(NFA_t^{\$} - NFA_{t-1}^{\$}\right)$$

Where:

- e_t^{avg} is the average exchange rate (domestic currency units per USD)
- $NFA_t^{\$}$ are at the end of period t

Forecasting Net Domestic Credit and Private Sector Credit

$$\Delta NDC_t = \Delta M_t - \Delta NFA_t - \Delta OIN_t$$

$$\Delta CPS_t = \Delta NDC_t - \Delta NCG_t$$

Finalizing the Liability Side of The Monetary Sector

Broad money components

- Currency in circulation (CY)
- Deposits (D)
- Other CB liabilities (OCB)

$$M_t = M_{t-1} + \Delta CY_t + \Delta OCB_t$$

Forecasting Reserve Money by Forecasting the Money Multiplier (mm)

$$mm = \frac{Broad\ money\ (M2)}{Reserve\ money\ (RM^*)}$$

If mm relatively constant, can estimate using past data → get forecast of RM*

→RM*=M2/mm

Forecasting the Money Multiplier (mm)

M2 = Currency (CY) + deposits (D)

RM* = Currency (CY) + DMBs' reserves (R) incl. cash in vault

$$\text{mm} = \frac{CY+D}{CY+R} = \frac{c+1}{c+r}$$

where: c = CY/D and r = R/D

Forecasting the Components of Reserve Money (1 of 2)

Liabilities to other depository corporations:

- Required reserves
- Excess reserves

$$LODC^* = RM^* - CY^*$$

Forecasting the Components of Reserve Money (2 of 2)

$$\Delta NDC^* = \Delta RM^* - \Delta NFA^*$$

$$\Delta NDC^* = \Delta NCG^* + \Delta CODC^* + \Delta CPS^* + \Delta OIN^*$$

Forecasting the NFA of MA (NFA*)

Δ NFA* includes:

- Change in NIR from BOP
- Change in other net foreign assets of monetary authorities (not included in reserves) from BOP

$$\Delta \text{NFA}^* = \Delta \text{NIR}$$

Forecasting in NCG* an OIN*

ΔNCG*	ΔOIN*	ΔCPS*
Projecting fiscal deficit less projected alternative financing (from external, domestic money markets and commercial banks, and nonbank public)	Valuation changes of NFA Changes in central bank capital account, etc	Negligible

Forecasting Claims on ODC

$$\Delta CODC^* = \Delta NDC^* - \Delta NCG^* - \Delta OIN^* - \Delta CPS^*$$

Thank You