

Exchange Market Pressure  
&  
Monetary Policy:  
Evidence from Pakistan

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# exchange market pressure

Exchange market pressure is due to  
disequilibrium in money market

# Motivation

- Approaches used to examine money market disequilibrium:
  - Monetary approach to exchange rate
  - Monetary approach to BOP
- MABOP:
  - Attention focused on change in foreign reserves due to change (only) due change in domestic credit (only).
- MAER:
  - Variable focused: Exchange rate
- Managed float:
  - involves movement in reserves as well as changes in exchange rate.

# Motivation

- A composite variable that incorporates changes in Exchange rate as well as variation in foreign reserves is required to examine money market disequilibrium under managed float
- and Roper (1977) defines *emp* as:

Sum of exchange rate depreciation and reserves outflow (scaled by monetary base) ----- (Girton & Roper, 1977)

# Objectives

- Examine the relationship of monetary variables (domestic credit) & interest rate with *emp*
- Determine the Tool(s) of monetary policy *vis-à-vis* Exchange market pressure (*emp*)

# VAR system

VAR system can be written as:

$$y_t = \sum A_j y_{t-j} + Z_t + \pi_t^* + \mu_t$$

Where  $y_t = [\text{emp}, dc, i, y]$  and  $\mu_t$  is the error term matrix

$Z_t$  : Deviation from PPP

$\pi_t^*$  : international inflation

# Variables

## Endogenous

Exchange Market Pressure (emp)

Domestic credit (dc)

Domestic interest rate (i)

Real income (y, proxy: Industrial production)

## Exogenous:

Deviation from PPP (z)

International inflation ( $\pi$ , proxy: US inflation)

# Data

$$\text{EMP} = [(e_2 - e_1) \div e_1] + [(r_2 - r_1) \div h_1]$$

Where:

e: Nominal exchange rate --- line ae (end of period)

r: Foreign reserves (Rupee value)

h: Monetary base (Reserve money)



# Data

Domestic credit (dc) = Growth (Reserve money - Foreign Reserves)

Domestic interest rate (I) : T.Bills rate

# Data Spans

| From    | To      | Peculiarity  | Length<br>(Years) |
|---------|---------|--|-------------------|
| 1991:04 | 2005:12 | Initiation of the move towards market based monetary policy<br>(Full span) | 14.9              |
| 1991:04 | 1998:05 | Life period of FCDs  | 7.2               |
| 1998:06 | 2005:12 | Post-FCDs freeze / 9/11  | 7.7               |
| 2001:10 | 2005:12 | Post 9/11  | 4.4               |

# Stationarity

- Tests used
  - Seasonal unit root (HEGY methodology)
  - Dickey Fuller test
- Result:
  - All series are stationary (Variables: in growth form)

## Ordering: *DC-I-Y-EMP*

- Ordering Imposes exogeneity restrictions
- Exogeneity ranking: First variable; highest
- Ordering used implies:
  - Shock to DC affects its own current value and current value of other three variables
  - Shock to I affects its own current value and current values of Y and EMP
  - shock to Y affects its own current value and current value of EMP
  - Shock to EMP affects only its own current value

# Ordering chosen:(DC-I-Y-EMP): Economic Rationale

- Ordering chosen is based on following assumptions:
  - Domestic credit being component of reserve money is under complete control of the authorities. Not effected by other variables
  - Interest rate is partly influenced by the authorities, partly determined in market
  - Real income effects the level of exports/imports and hence EMP

Results: VAR system

Impulse Response Functions

# Shock to dc Impact on *emp*

|                 | Data Spans     |                |                |                |
|-----------------|----------------|----------------|----------------|----------------|
| Periods         | Full           | FCD            | 98-05          | 9/11           |
| 1 <sup>st</sup> | 1.09<br>(5.52) | 1.99<br>(7.38) | 1.29<br>(5.25) | 0.70<br>(2.59) |
| 3 <sup>rd</sup> |                |                | 0.68<br>(2.56) |                |

# Shock to dc

## Impact on *emp*...

- Positive impact of domestic credit upon *emp*:
  - is in conformity with the monetary approach
  - is as hypothesized



# Feedback from *emp to dc*

|                 | Data Spans     |                |       |      |
|-----------------|----------------|----------------|-------|------|
| Periods         | Full           | FCD            | 98-05 | 9/11 |
| 2nd             |                | 0.81<br>(2.18) | -     | -    |
| 5 <sup>th</sup> | 1.17<br>(2.16) |                | -     | -    |

# Feedback from dc to emp...

- FCD Span:
  - Positive, against Conventional wisdom:
- FCD Span: Reasons;
  - Sterilization of reserves outflow
    - Fiscal needs/growth objective might have dominated external account considerations
    - Rehabilitation of sick projects

# Feedback from emp to dc...

## Post 9/11

|               | Sept. 2001 | Dec. 2003 | Appreciation |
|---------------|------------|-----------|--------------|
| Exchange Rate | RS. 64.20  | RS. 57.21 | 12 %         |
| F. Resv.      | \$ 2,149   | \$ 10,941 | 409 %        |

# Feedback from *emp* to dc...

- Exchange rate appreciation was hurting the export competitiveness
- Events following 9/11 had adversely influenced exports
- the authorities decided to slow down the appreciation of exchange rate
  - SBP purchased substantial Fcy from the market

# Feedback from *emp* to dc...

|       | Inter bank | Kerb Purchases | Net Addition:<br>F. Reserve |
|-------|------------|----------------|-----------------------------|
| 99-00 | -797.0     | 1,633          | 836                         |
| 00-01 | -1,126     | 2,157          | 1,031                       |
| 01-02 | 2,483      | 1,376          | 3,859                       |
| 02-03 | 4,546      | 429            | 4,975                       |
| 03-04 | 897        | -              | 897                         |

# Feedback fro *emp* to *dc*

- Thus to maintain competitiveness:
  - *As the emp declined, dc was increased*
  - *IRF's should have indicated negative feedback from emp to dc*
    - *Then why the nil response*
      - *Reason: Sterilization of intervention activity*

# Feedback from *emp* to dc: Sterilization of foreign inflows

|   | <u>Impact on SBP (in RS.)</u> |      |
|---|-------------------------------|------|
|   | NFA                           | NDA  |
| • Interbank US \$ purchases (net)                                   | 150                           |      |
| • Kerb Purchases  | 84                            |      |
| • Government borrowing from<br>commercial banks (RS. 160.4 billion) |                               |      |
| • Retirement of Government securities<br>with SBP                   |                               | -287 |
| • Net Impact  | 234                           | -287 |
| • Net impact on Reserve<br>Money (Domestic Credit)                  |                               | -53  |

# Shock to interest rate Impact on *emp*

|                 | Data Spans     |                |       |                |
|-----------------|----------------|----------------|-------|----------------|
| Periods         | Full           | FCD            | 98-05 | 9/11           |
| 1st             | 0.43<br>(2.28) | 0.66<br>(3.06) | -     | 0.67<br>(2.61) |
| 2 <sup>nd</sup> |                |                | -     | 0.97<br>(2.89) |



# Shock to interest Impact on emp

- Inc. in int.rate →  
dec. in md →  
er dep. →  
inc. FCDs yield →  
inc. in FCDs vol.  
→  $\Delta$  in *emp*

|        | Apr. 91 | May 98 | Inc/Dep. |
|--------|---------|--------|----------|
| i.rate | 8.80%   | 16.2%  | 744bp    |
| e.rate | Rs.23.5 | RS.44  | 87%      |

## Why the FCAs continued

| Year  | Imports<br>(\$ in bil.) | Resv.<br>(avg.) | Resv./<br>Imports<br>(%) |
|-------|-------------------------|-----------------|--------------------------|
| 90-91 | 8,325                   | 366             | 4.27                     |
| 91-92 | 8,998                   | 534             | 5.39                     |
| 92-93 | 10,049                  | 808             | 8.04                     |
| 93-94 | 8,685                   | 1,186           | 13.66                    |
| 94-95 | 10,926                  | 2,642           | 25.66                    |
| 95-96 | 12,015                  | 1,626           | 13.53                    |
| 96-97 | 11,241                  | 1,040           | 9.25                     |
| 97-98 | 10,301                  | 1,268           | 12.31                    |

## Why FCAs continued....

Low level of foreign reserves forced the authorities to embrace the vicious circle of *interest rate hike-exch. Rate depreciation*

# Shock to emp

## Impact on interest rate

|         | Data Spans     |                |                |                |
|---------|----------------|----------------|----------------|----------------|
| Periods | Full           | FCD            | 98-05          | 9/11           |
| 1st     |                |                | -              | 0.07<br>(1.66) |
| 2nd     | 0.13<br>(3.70) | 0.12<br>(2.40) | 0.07<br>(1.68) |                |

# Impact of *emp* on *i*

- FCD Span: Positive,  
Why:
  - Defense of Rupee
    - Dollarization
  - To control inflation

|        | Apr. 91 | May 98 | Inc/Dep. |
|--------|---------|--------|----------|
| i.rate | 8.80%   | 16.2%  | 744bp    |
| e.rate | Rs.23.5 | RS.44  | 87%      |

# Impact of *emp* on *i...*

- FCD Span:
  - Polar objective of authorities:
    - Encouraging FCDs through *dollarization*
    - Controlling inflation
  - Authorities had to embrace the vicious circle:
    - Increase in *emp* → increase in *i*

# Feedback from *emp* to *i*

- Span: 1998-05
  - Two distinct parts: Pre-9/11 & Post 9/11
  - Pre 9/11: Measures that declined *emp*:
    - Freeze on FCDs
    - Two-tier exchange rate
    - Rationing of imports

# Trade deficit and *emp*

|       | Trade Deficit | <i>emp</i> |
|-------|---------------|------------|
| 97-98 | -1,867        | 1.34       |
| 98-99 | -2,085        | 0.07       |
| 99-00 | -1,412        | 0.34       |
| 00-01 | -1,269        | 1.7        |
| 01-02 | -294          | -3.6       |
| 02-03 | -536          | -4.2       |



# Feedback from *emp* to *i*

- Post 9/11: Positive
  - For 35 months out 53 months the *emp* not only low but negative as well.
  - Given low pressure:
    - The need to defend the Rupee was not there
    - Therefore the interest rate declined as well.

# Feedback from *emp* to *i*

- Statements from SBP
  - Improvement in the external sector also had a major impact on SBP policies ---- the absence of pressures on the exchange rate allowed SBP to reduce the Bank discount rate.(SBP Annual report 2001-02, p.156).
  - The continued forex inflows ---- during FY03 allowed, the SBP to reduce the discount rate to an all-time low at 7.5 percent in November 2002. (SBP Annual report 2002-03, p.147).

# Sensitivity Analysis

- Results have tested for following alternate *Orderings*:
  - *dc-i-emp-y*
  - *dc-emp-i-y*
  - *emp-dc-i-y*
- The results are by & large robust

# Conclusion

- Dominant instrument of monetary policy (mp) vis-à-vis *emp*:
  - Domestic Credit (Money Supply)
- Interest has been used as a MP instrument during the FCD span
- For interest rate to serve as instrument of MP reasonable degree of capital mobility is required.
- Positive feedback from *emp* to dc is unconventional:
  - Growth objective/ fiscal needs might have forced the authorities to sterilize outflows of FCY

Thank you