INFLATION DYNAMICS AND MONETARY POLICY IN VIETNAM

Rina Bhattacharya and Nombulelo Duma

International Monetary Fund

1

Plan of the Presentation

Background and Literature

- Background
- Inflation dynamics
- Channels of monetary transmission

The Model and Results

- Theoretical model
- Data
- Single equation
- Structural vector auto-regression

Policy Implications and Conclusions

Background and Literature

Vietnam has made good progress over the past three decades and has many strengths

- Transition from a centrally-planned to a 'socialist oriented market economy;

- An average of 9 percent real GDP growth per year;

- Location in a dynamic region;

- An abundant, young and rapidly growing labor force ;

- Relatively low labor costs;

- Relatively high savings rate and a high investment rate compared to its regional peers.

However, challenges remain, including:

- Slower GDP growth in recent years;

- A large, thinly-capitalized and heavily state-owned banking system;

- A shallow domestic capital market;

- High and volatile inflation compared to trading partners

There have been many episodes of high inflation

- Many cycles of high inflation—stabilization—high inflation...

- 1986-88: hyper inflation, with annual rates exceeding **300** percent;
  - Monetary and fiscal policy tightened
  - Inflation dropped to below 20 percent in 1992 and to close to 10 percent in 1995

- 2004 and mid-2008: peaked at 25 percent in 2008
  - Due in large part to rising international commodity prices and excess domestic demand
  - Once domestic demand and commodity prices weakened, inflation dropped to 2.5 percent in mid 2009.

High inflation episodes continued

- Late 2010 to mid 2011: inflation reached 20.3 percent in the third quarter of 2011

  - Contributing factors -fiscal stimulus; loose monetary policy; high commodity prices.

The problem with high inflation raises several key issues

- Macroeconomic management;

- Monetary policy goals;

- Monetary policy transparency and predictability;

- Prevalent use of caps on interest rates and administrative controls on credit;

- How does the monetary policy transmission mechanism operate in Vietnam?

Literature identifies several channels of monetary transmission

- Traditional interest rate channel

- Exchange rate channel

- Credit channel
  - The bank lending channel
  - The balance sheet channel

- Asset price channel

- Expectations channel

The Model and Results

The theoretical model is based on two basic relationships in economic theory

- Long-run Purchasing Power Parity for the composition of the overall domestic price index; and

- Equilibrium in the money market based on a specified money demand function

The overall price index has the following relationship:

$$P = P_D{}^\mu (EP_*)^{1-\mu} \qquad (1)$$

- Where P_D is the domestic price and P_* is the foreign price.

Equilibrium in the money market over the long run is given by

$$M^S/P = M^D/P = \alpha + \beta_1 Y + \beta_2 R + \eta \qquad (2)$$

- Here, real money supply (M^S/P) adjusts to meet real money demand (M^D/P), where real money demand is a function of output Y (real GDP) and the real interest rate R

- η represents shocks to real money demand.

- β_1 is expected to be positive (money demand is a positive function of income or output)

Combining equations (1) and (2) gives:

$$p = F(m, r, e, y, p_*; Z) = X\gamma + Z\theta + \varepsilon \qquad (3)$$

- the overall price level is a function of the money supply, real GDP, the nominal effective exchange rate, foreign inflation, and the real interest rate;

- small letters indicate natural logarithm values, $X = (m, r, e, y, p_*)$, Z is a set of control variables, and ε is an error term

There is a close relationship between core inflation and real interest rates; but less so with credit

Vietnam: Core Inflation, the Real Interest Rate, and Growth in Credit to the Economy
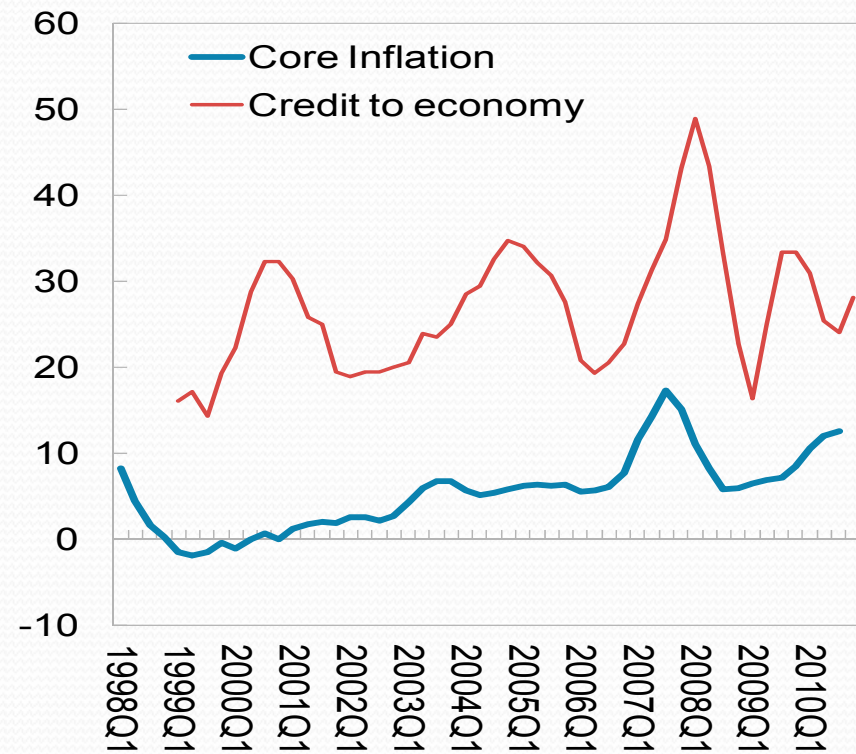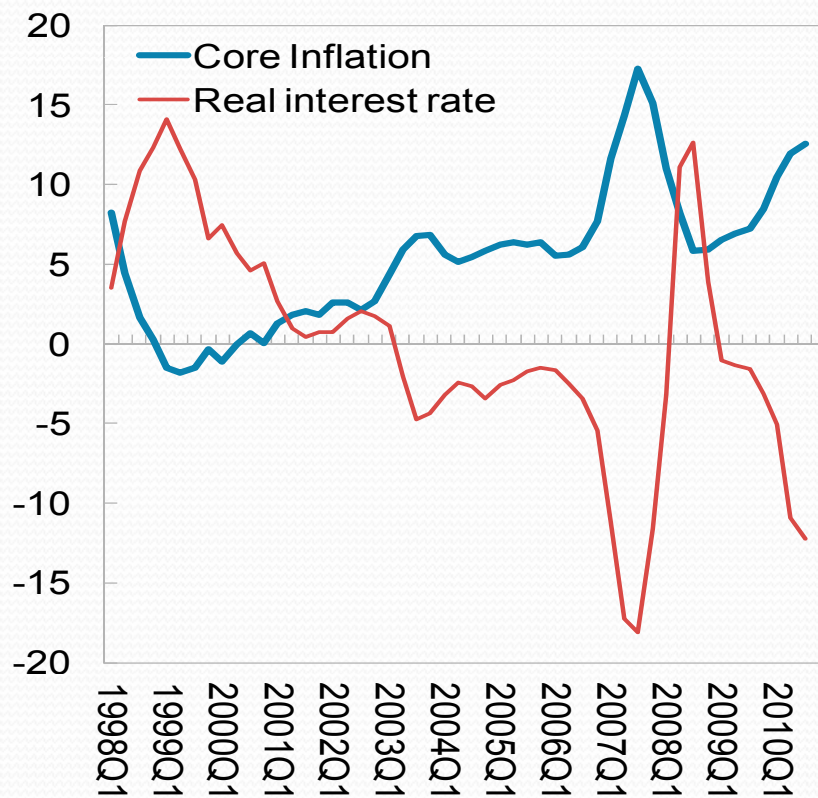
Statistical properties of the data were assessed and necessary transformations made

- The null hypothesis of a unit root can be rejected for all the variables based on ADF 't' and PP 'Z' unit root tests;

- Real GDP was seasonally adjusted using the TRAMO/SEATS seasonal adjustment procedure;

- All the variables are in percentage changes over the previous year, except for :

  - the real interest rate where the absolute change over the previous year is used;

  - Inflation, where the percentage change in prices over the following four quarters is used;

Single equation estimation reveals several things:

1. Real interest rates have a strong and significant negative impact on core inflation, with a lag

Model with credit		
Change in Real interest rate	-0.115	-0.98
L1	-0.726 ***	-5.85
L2	0.645 ***	7.29
L3	-0.020	-0.12
L4	-0.648 ***	-5.10
L5	0.519 ***	3.42

Model with money		
Change in Real interest rate	-0.761	-1.55
L1	-0.205	-0.55
L2	0.419	1.09
L3	-0.824 **	-2.47
L4	-0.025	-0.10
L5	0.760	1.41

Single equation estimation shows that:

3. Credit growth / money supply growth variables also have a significant but delayed impact on core inflation

Model with credit		
Growth in credit to the economy	0.103	1.00
L1	0.590 ***	4.55
L2	-0.846 ***	-6.10
L3	0.321 ***	4.70
L4	0.167 ***	3.05
L5	0.113 **	1.97

Model with money		
Growth in M2 Money Supply	-1.411	-1.28
L1	-0.736 *	-1.94
L2	1.096 **	2.47
L3	0.017	0.10
L4	0.286 **	2.76
L5	0.801	1.40

Single equation estimation further shows that:

3. We cannot reject the null hypothesis that the instrument set is uncorrelated with the error term

Model with credit	
Hansen J-statistic	1.267
Chi-squared P-	0.260

Model with money	
Hansen J-statistic	1.417
Chi-squared P-	0.234

Single equation estimation further shows that:

4. We strongly reject the null hypothesis that the coefficients on the real interest rate variables and on the credit growth / M2 money supply growth variables are jointly insignificant based on joint significance tests

Model with credit	
Test on significance of interest rate variable:	
Chi-squared value	1426.98
Chi-squared P-value	0.00
Test on significance of credit growth variable	
Chi-squared value	360.76
Chi-squared P-value	0.00

Model with money	
Test on significance of interest rate variable:	
Chi-squared value	52.18
Chi-squared P-value	0.00
Test on significance of M2 Money Supply variable:	
Chi-squared value	35.35
Chi-squared P-value	0.00

The Structural VAR has the following long-run restrictions

- Inflation shocks have no long-run impact on any of the other variables in the system;

- Shocks to the nominal effective exchange rate have a long-term impact on domestic inflation.

- Credit shocks have a long-term impact on inflation and on the nominal effective exchange rate but not on the real interest rate, output growth, or foreign inflation.

The Structural VAR has the following long-run restrictions

- Shocks to the real interest rate have no long-term impact on output growth or on foreign inflation.

- Output shocks have a long-term impact on all the variables in the system except foreign inflation.

- Foreign inflation is truly exogenous, affecting all the other variables in the system in the long-run but not affected by any of them.

Short-run restrictions are given by Cholesky decomposition, which implies :

- Inflation shocks have no contemporaneous impact on any of the other variables in the system;

- Output shocks only have a contemporaneous impact on domestic inflation.

- Credit shocks have a contemporaneous impact on domestic inflation and on the nominal effective exchange rate but not on the real interest rate, output growth, or foreign inflation.

…and:

- Shocks to the real interest rate have no contemporaneous impact on output growth or on foreign price inflation.

- Nominal effective exchange rate shocks have a contemporaneous impact on all the variables in the system except foreign inflation.

- Foreign inflation is truly exogenous, affecting all the other variables in the system but not affected by any of them contemporaneously.

Other properties of the VAR include:

- VAR lag length of 5 was selected based on the Akaike and Schwarz Information Criteria;

- Elasticities of inflation to the real interest rate and money supply are computed from the impulse responses by dividing the cumulative impulse responses of inflation after j months by the cumulative responses of the real interest rate (credit to the economy) shock after j months.

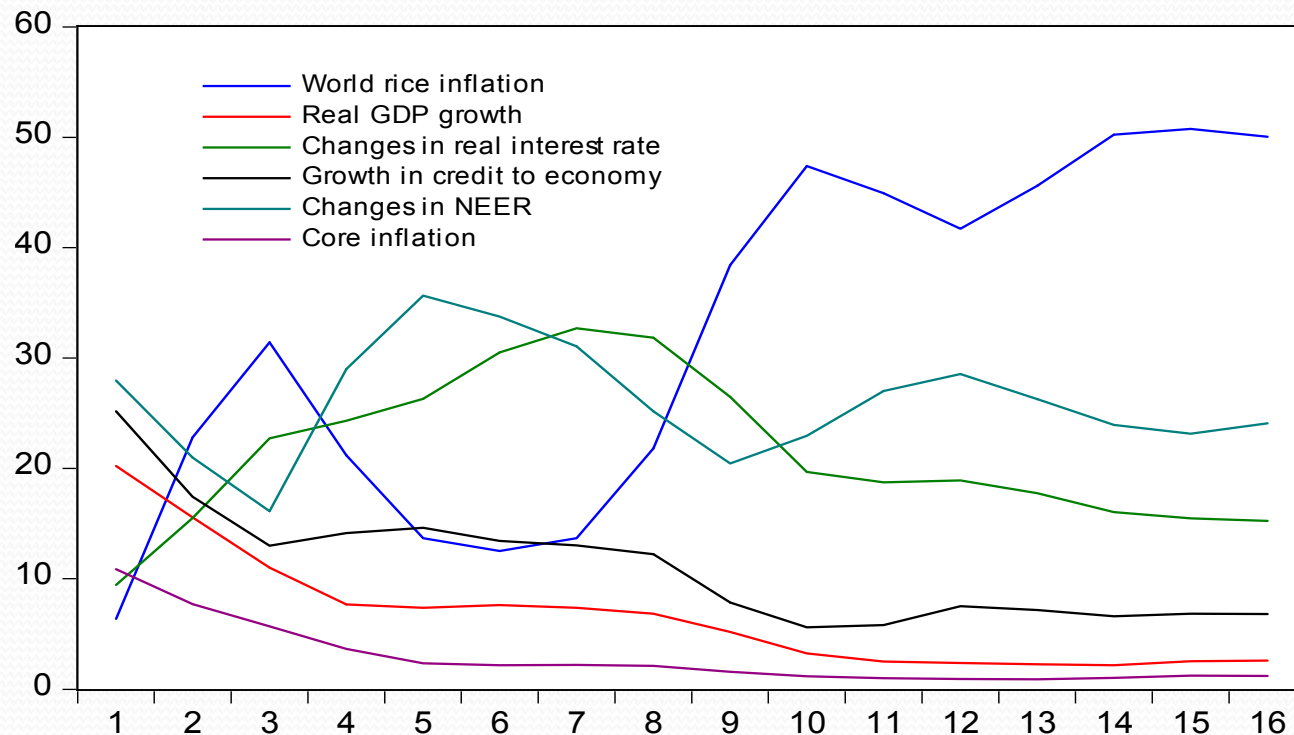# Impulse responses from Structural VAR estimation

Accumulated Responses of Core Inflation to One Standard Deviation Shocks
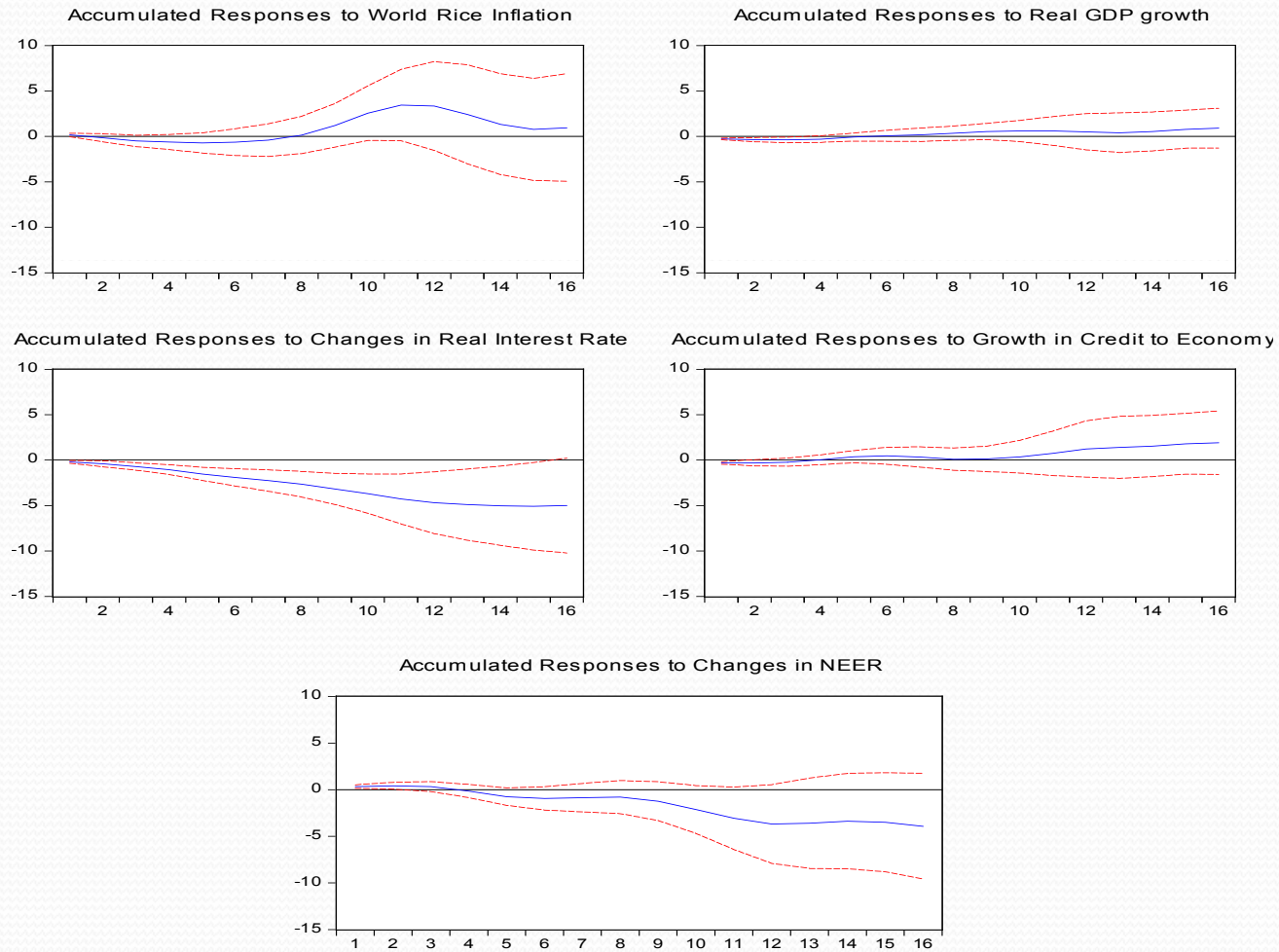
Variance decompositions reveal that:

- The role of real interest rate shocks in explaining the variance of core inflation increases steadily over the medium-term

Variance Decomposition of Core Inflation

Elasticity of Core Inflation to the Real Interest Rate and Credit Growth

Quarter	1	2	3	4	5	6	7	8	10	12
Real Interest Rate	-0.27	-0.44	-0.44	-0.50	-0.63	-0.78	-0.83	-1.09	-1.39	-3.15
Credit to the Economy	-0.37	-0.21	-0.18	0.03	0.25	0.26	0.14	0.06	3.82	8.76

Source: IMF staff calculations

- Elasticities for real interest rates are negative (as expected), and magnitudes imply a relatively strong response of core inflation to movements in the real interest rate;

- Elasticities for credit growth appear to be small and rather random at time horizons of eight quarters or less

Policy Implications and Conclusions

The following conclusions can be drawn based on the results:

- Real interest rates have a significant impact on core inflation;
  - The magnitudes of the impact are fairly strong compared with empirical estimates reported for other countries;
- Credit growth has little impact on inflation in the short- to medium-term given the elasticity;
- However, Vietnam has had the highest inflation amongst developing economies in Asia;

Three recommendations follow:

- The State Bank and Vietnam should be given a clear mandate and greater autonomy to pursue price stability as its primary policy objective;

- Use of administrative controls on interest rates and on credit allocation and growth should be faded away;

- It would also be useful to establish an interest rate corridor, incorporating both a lending rate and a deposit rate, as an important tool of monetary policy.

Thank you

Comments on "Inflation Dynamics and Monetary Policy in Vietnam"

Some comments on:

Rina Bhattacharya and Nombulelo Duma (2012) "Inflation Dynamics and Monetary Policy in Vietnam," IMF

by

Liew Yin Sze
Economic Policy Group,
Monetary Authority of Singapore

March 14, 2012

Comments on "Inflation Dynamics and Monetary Policy in Vietnam"

- A very interesting model.
- Perhaps a bit more information would be useful:
  - model specification
  - table of results, etc.
- Recent sharp swings in inflation outcomes could affect the robustness of the results.
- Comments on the results (impulse responses):
  - In general, time lag appears to be very long.
  - Muted response to GDP and credit growth surprising.
  - Similarly, elasticity of core inflation:
    - (i) Why does the impact becomes so large after 7-8 periods?
    - (ii) Negative effect of credit growth in first 3 periods surprising.

Comments on "Inflation Dynamics and Monetary Policy in Vietnam"

Some suggestions:

SVARs are particularly affected by data issues, and it would therefore be useful to either:
- confront the data with VAR models without restricting the parameters;
- account for structural breaks in the data;
- or use a systems estimation approach to test the robustness of the results.

This is important as the policy recommendations are based on the results.

Comments on "Inflation Dynamics and Monetary Policy in Vietnam"

Looking beyond the model...

Monetary policy transmission in Vietnam may be complicated by the rapid changes taking place in the economy and financial system, as well as the partial dollarisation.

Purist approach unlikely to work; reliance on range of policy tools.
- "Traditional Asian approach" of multiple instruments comes to mind – interest rates, quantitative credit restrictions, reserve requirement, macro-prudential policy tools.

Increasingly, macro-prudential tools seen as useful complement to standard monetary policy in EMEs.
- Eg, Singapore, HK, Indonesia, in dealing with capital inflows and asset price inflation pressures.

But this practical approach must be underpinned by sound economic principles.

It is worth recalling that one reason for the Asian Financial Crisis was the pursuit of inconsistent macroeconomic policies.

- Some central banks attempted to fix both interest rates and exchange rates while allowing free capital mobility.
- The resultant rise in capital inflows soon overwhelmed the system.

Comments on "Inflation Dynamics and Monetary Policy in Vietnam"

The Mundell-Fleming open economy trilemma remains a useful model to frame the basic policy choices, and ensure policy consistency.
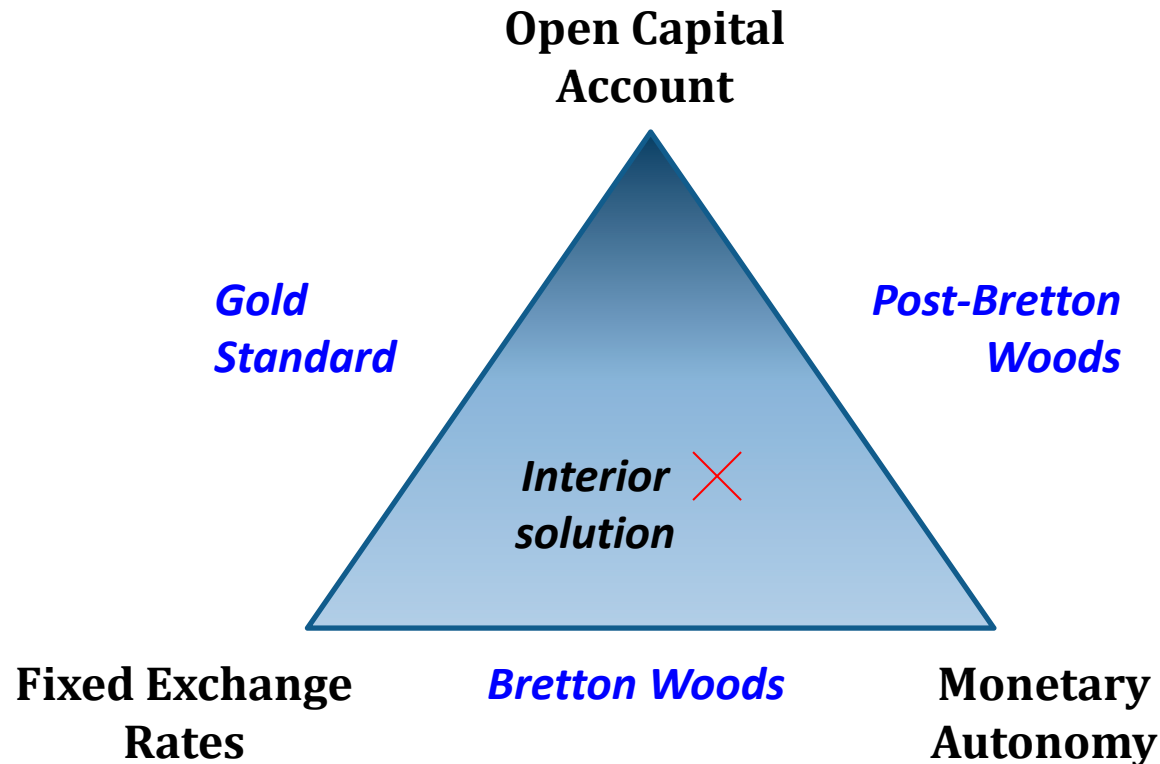
Although the trilemma is not a watertight constraint, ensuring macroeconomic policy consistency is important, even as central banks pursue multiple objectives with multiple instruments.

Pragmatism does not mean losing sight of some of the basic tenets of macroeconomic policy; eg, that low inflation forms the best basis for sustained economic growth.

In Singapore, for example, open capital account is a given. Our decision to choose the exchange rate as instrument of monetary policy implies giving up ability to also control interest rates at the same time.

Comments on "Inflation Dynamics and Monetary Policy in Vietnam"

As an economy in transition, uncovering the monetary policy transmission mechanism in Vietnam is no easy task.

Although there are restrictions on foreign capital movement, domestic residents appear to be able to shift between local currency and USD assets, gold, etc.

This raises the question of whether a small open economy model – with free capital mobility – is a reasonable approximation of the situation in Vietnam.
- If so, the constraints of the trilemma largely apply.
- This could have policy implications, ie., can policies on both interest rates and exchange rates be pursued simultaneously.

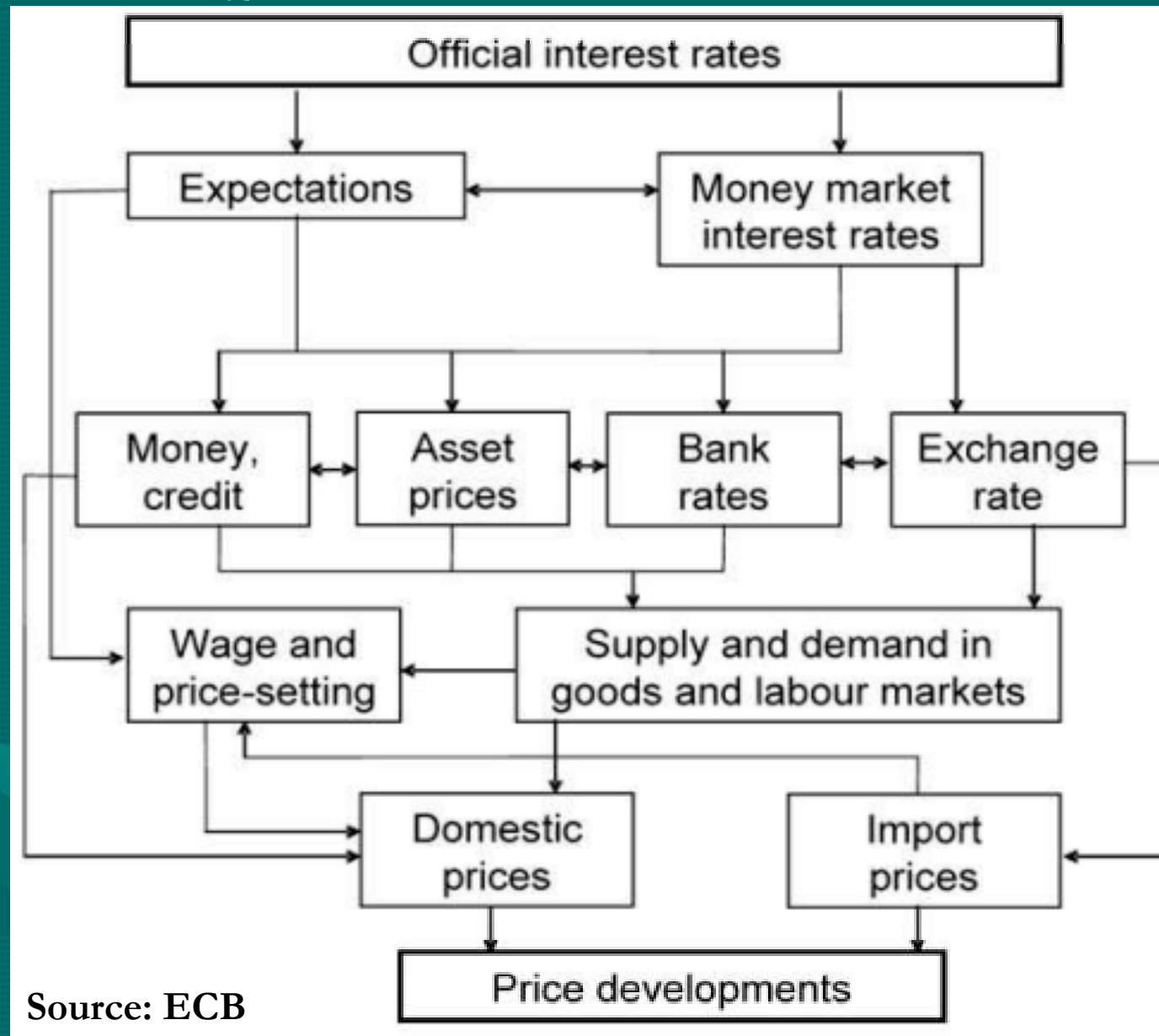# THANK YOU

Inflation Dynamics and Monetary Policy in Vietnam

Rina Bhattacharya and Nombulelo Duma

International Monetary Fund

Discussant: **Nguyen Do Quoc Tho**

State Bank of Vietnam

Outline

1. Monetary policy transmission mechanism
2. Vietnam inflation - determinants
3. Comments

1. Monetary policy transmission mechanism

Source: ECB

2. Vietnam inflation – determinants
Monetary variables
M2

- ✓ IMF (2003): 10% core inflation variation (1995-2003).
- ✓ IMF (2006): significantly affected CPI dynamics with a 12-month lag (2001-2006).
- ✓ Camen (2006): < 5% of CPI forecast variance (1996-2005).
- ✓ Le and Pfau(2008): no effect on inflation (1996-2005).
- ✓ Vo (2009): significant and positive impact on CPI (2001-2007).
- ✓ Nguyen and Nguyen (2011): modest impact on CPI (2001-2010).

2. Vietnam inflation – determinants
Monetary variables

Interest rate

✓ Camen (2006): < 5% of CPI forecast variance (1996-2005).

✓ Le and Pfau (2008): no effect on inflation (1996-2005).

✓ Nguyen and Nguyen (2011): modest impact on CPI (2001-2010).

2. Vietnam inflation – determinants
Monetary variables

Credits

✓ Camen (2006): 25% of CPI variation up to 24 months (full sample: 1996-2005). Small during 1996-2003.

✓ Al-Mashat (2004): no robust link despite a sustained rapid growth of credits due to a rapid rate of monetisation in Vietnam as reflected in a strong decline in velocity (1996-2003).

2. Vietnam inflation – determinants
Exchange rates

✓ IMF (2003): NEER explained 10% core inflation variation, pass-through of 0.25 in the first year (1995-2003).

✓ IMF (2006): NEER pass-through of 0.03 in the first year (2001-2006).

✓ Vo (2009): NEER pass-through of 0.08 in the first year (2001-2007).

✓ Camen (2006): NEER explained 19% of CPI forecast variance (1996-2005).

✓ Nguyen and Nguyen (2011): nominal devaluation increases inflation.

2. Vietnam inflation - determinants

- **Output gap:** IMF (2006), Truong and Chu (2005)
- **Oil and Rice price:** IMF (2003), Camen (2006)
- **Own innovations:** IMF (2003), IMF (2006), Truong and Chu (2004), Pham (2009), Nguyen and Nguyen (2011).

3. Comments

Gaps in the extant literature

- Mixed evidence

- Asset price and expectation channels

- Most tested variables were nominal: Central bankers "must act nominal while thinking real" (Blinder, 1998).

3. Comments

- Great effort in investigating the transmission mechanism of monetary policy in Vietnam from 1998Q1 – 2010Q3: interest rate, exchange rate and credit channels.
- Good choice of tested variables:
  - Core inflation instead of headline inflation.
  - Real interest rate rather than nominal.
- Robustness checks: 2 empirical methodologies.
- New evidence on the effectiveness of the interest rate channel and its policy implication (?).

3. Comments

However, the followings could be considered:

1. Place the paper in the extant literature

   - Interest rate: stronger

   - NEER: stronger

   - Credits: weaker

2. Mainly empirical presentation. Economic stories/ intuitions behind the empirical results?

3. Comments

3. The results are not robust

E.g. slide 23 – real interest rate coefficients: all significances disappeared and switched to L3, i.e. weaker impact. Why? Similar stories for other variables in Tables 3 and 4.

4. Long memory/persistence of past inflation
5. Other determinants: role of inflation expectation, asset price (VNindex), oil price, etc.

3. Comments

7. Further robustness checks:

  – Other measures of interest rates: e.g. OMO rates, nominal rate – forward looking CPI, etc.

  – REER instead of NEER

  – Output gap instead of real GDP

  – Tradeables v.s. non-tradeables

  – Single equation: what if we regress credits and M2 growths in 1 equation?

  – Subsamples, structural break due to Vietnam's accession to WTO in 2007 (?)

3. Comments

8. Puzzle: Why Vietnam has had the highest inflation amongst Asian developing economies? (IMF, 2006)

9. Recommendation on the interest rate corridor: What could be a good "floor"?

Thank you!