

EE 460: Monetary Policy for long term growth and price stability

Bhanupong
Lecture 24

Outline

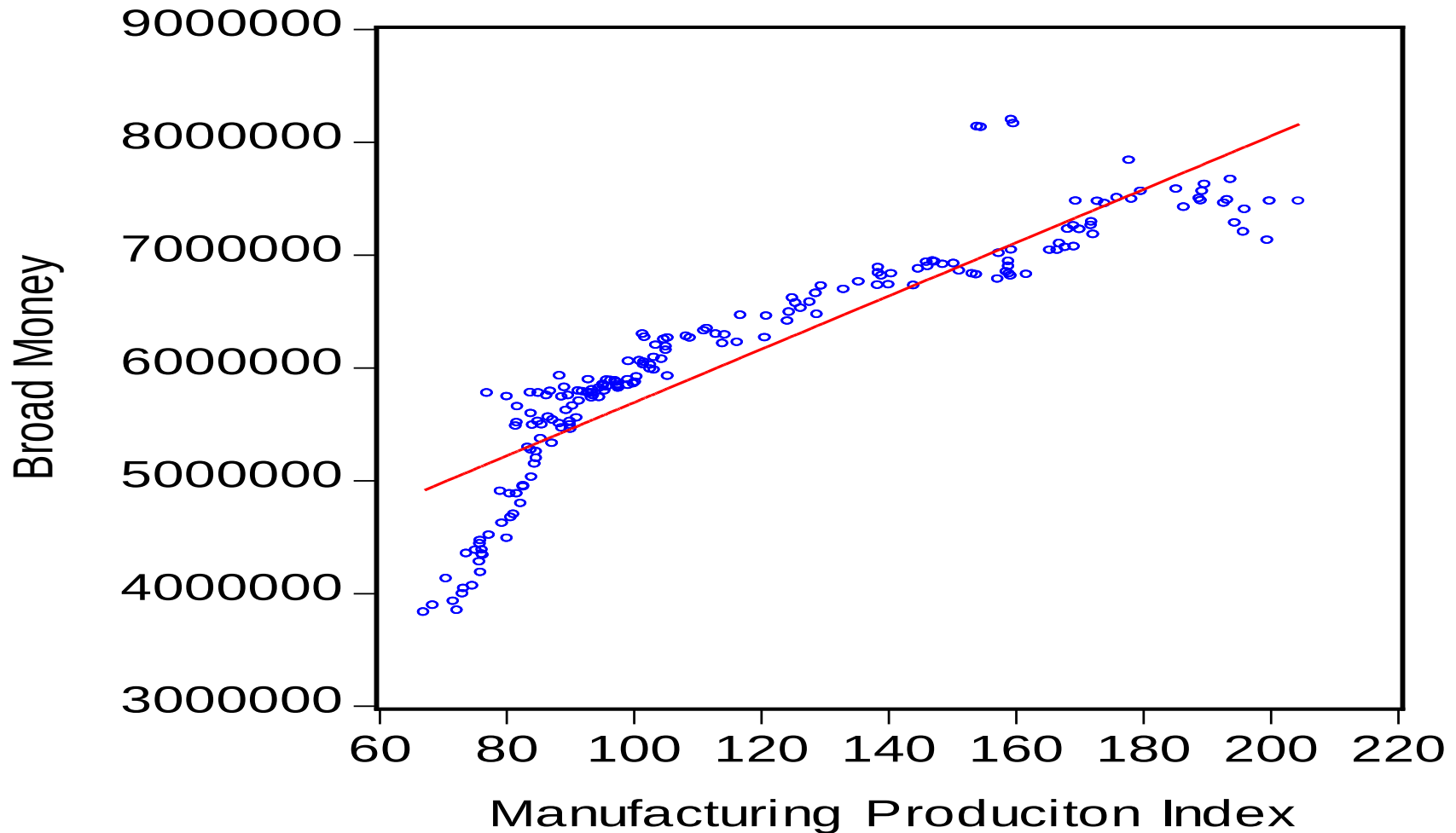
- Long run relationship: output and monetary aggregate
- Credit to GDP and a risk of financial crisis
- The Phillips curve and inflation target
- Asset price bubbles
- Quantitative Easing

The importance of monetary aggregates

- There is a long-run relationship between output and money supply.
- Expansion of monetary base is caused by capital inflows, intervention in the foreign exchange market, and domestic credit expansion by the central bank to the government and financial institutions.
- To maintain a stable growth path, **monetary base** must be kept in line with output growth

- The rate of growth of the monetary base gained momentum after 1991 when Thailand accepted the IMF Article VIII; thereby liberalizing capital account.
- The establishment of Banking International Banking Facilities (BIBFs) to create Bangkok as a regional financial center resulted in huge and rapid capital inflows.
- The influx of foreign borrowing was so large that it was impossible to sterilize the flows, resulting in to rapid expansion of the monetary base.

The long-run relationship



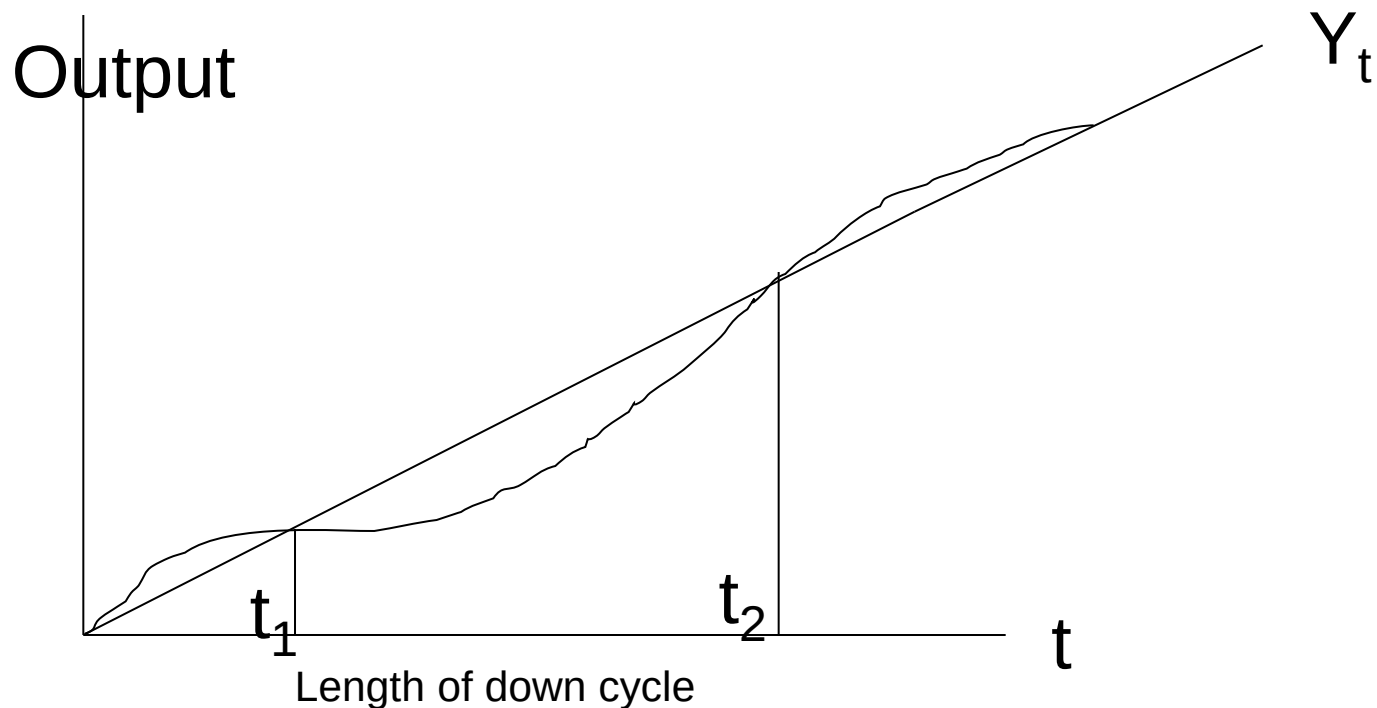
Causal relationship

- The demand for money function which contains output level.
- The production function which includes money supply as an argument.
- Changes in the quantity of money supply affects output, which in turn result in changing level of the demand for money.

Deviation from the long-term growth path

- Long-run output path is dictated by productive capacity of the economy.
- Monetary aggregates must increase at the rate corresponding to the trend growth rate of real output.
- The lending booms and contraction lead to deviations of output from its long-term growth path.

In a mild cycle, output fluctuates around its long-term growth path
($Y_t = Y_0 e^{gt}$)



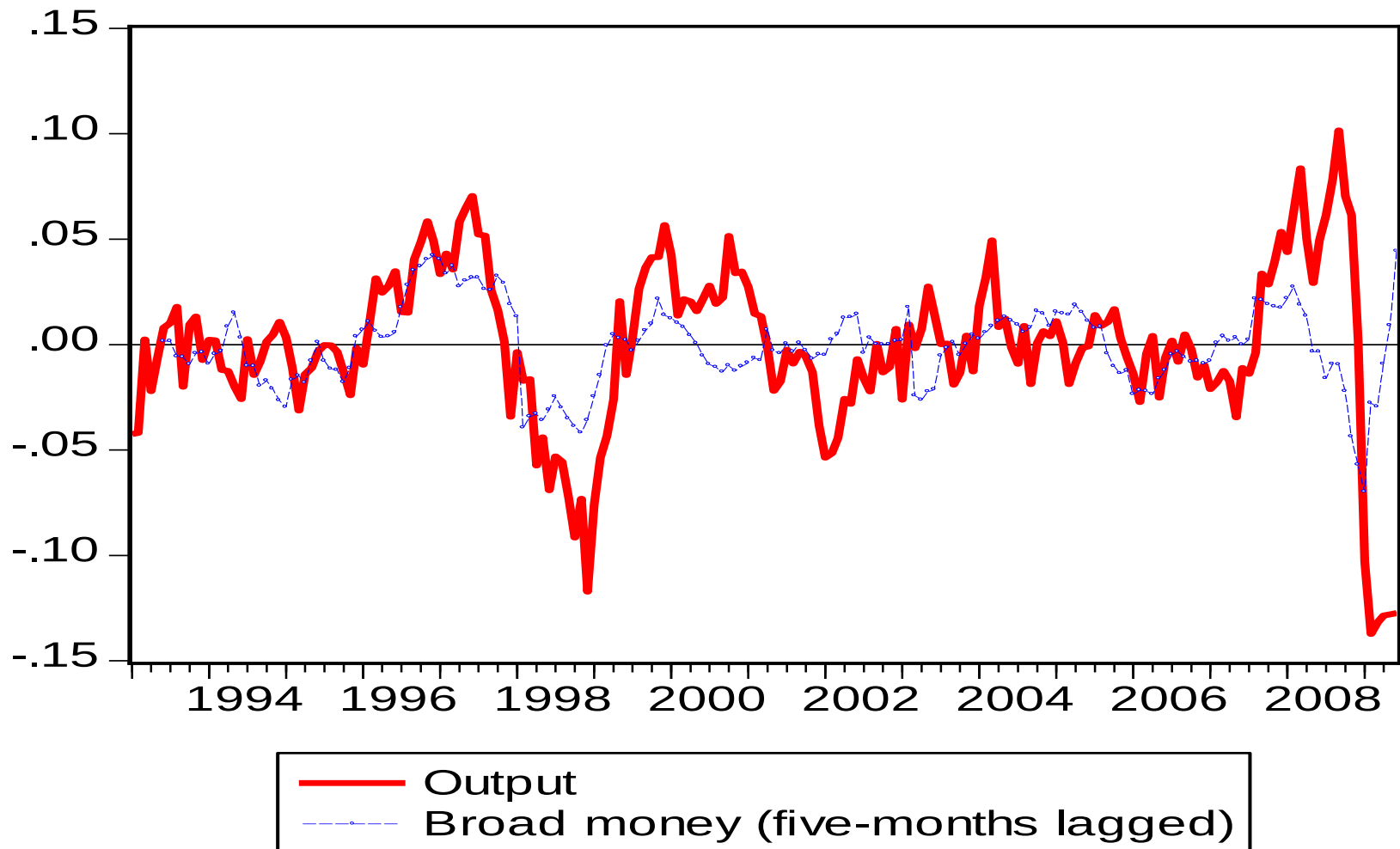
Cyclical excess

- In a **mild** cycle, output growth oscillates around its rising trend: there is no system-wide financial crisis.
- Economic booms and busts can be attributed to **excessive** expansion and contraction of monetary aggregates.

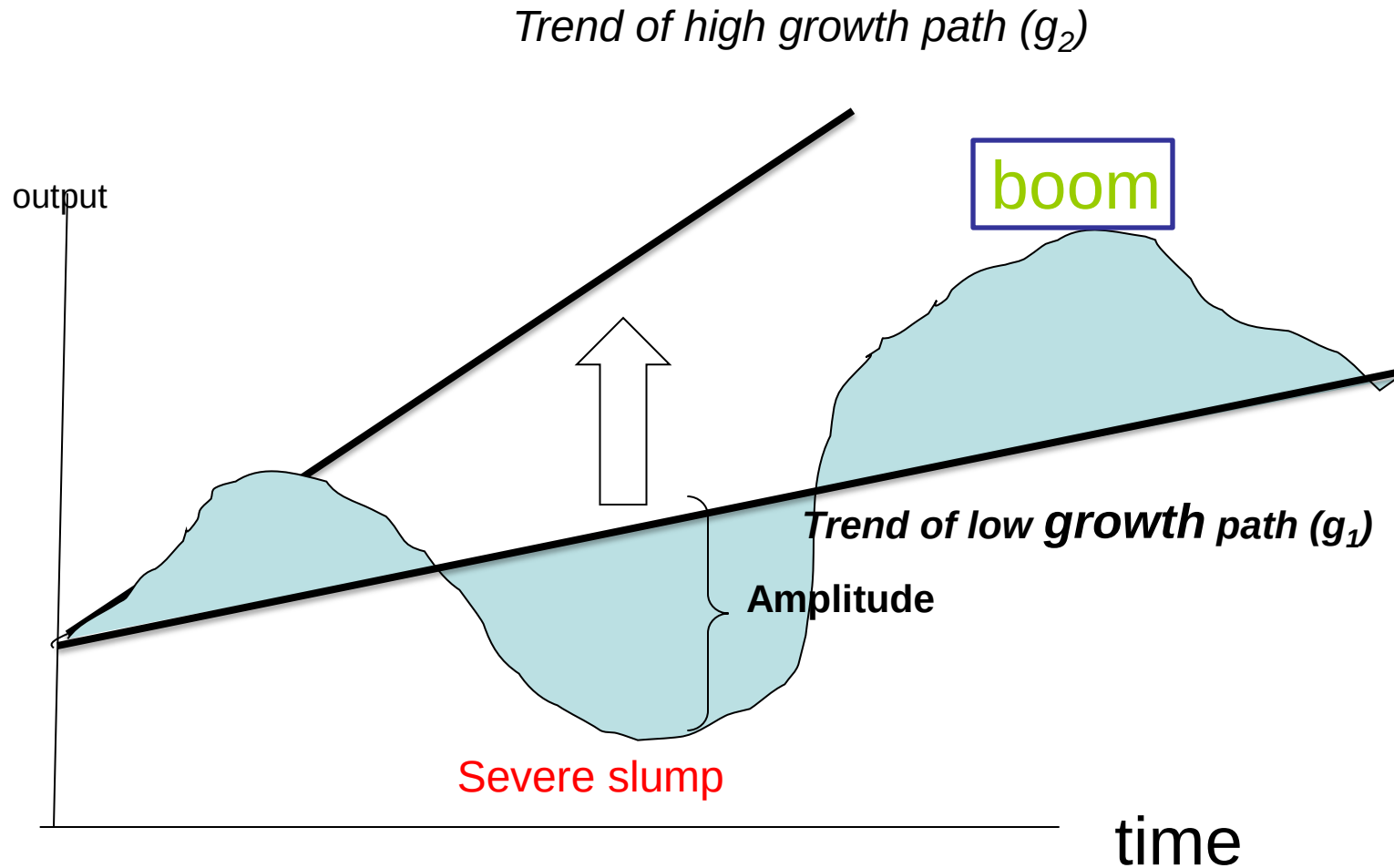
Severe cycles

- In **deep and severe** cycles, the soundness of the whole financial system is threatened.
- We are dealing simultaneously with financial crisis and depression.
- Excessive growth of money supply and its sharp reduction lead to wild fluctuations in business cycle.
- This explains monetary easing in 2009 which continued into 2010.

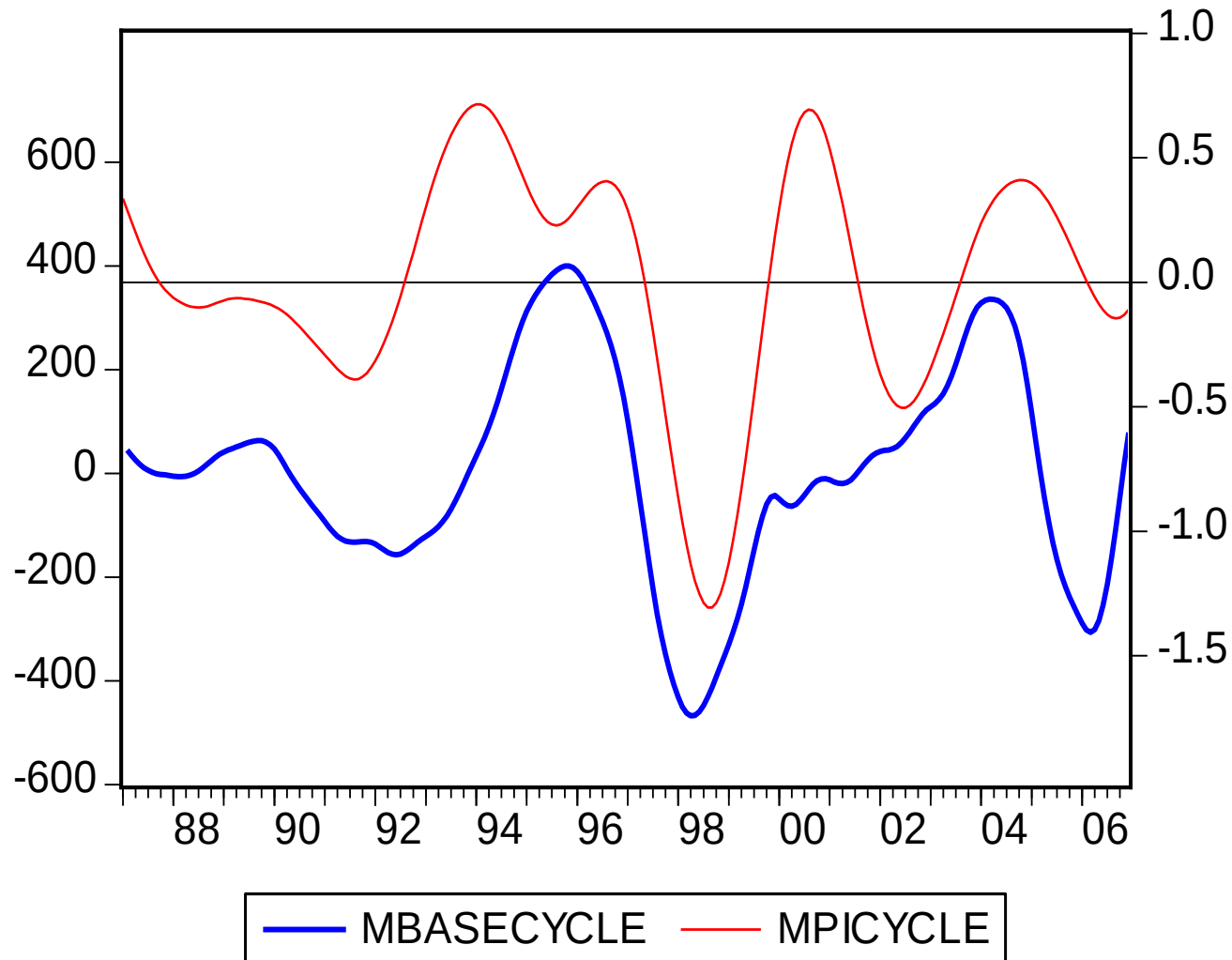
Cyclical relationship of money and output variables



Severe Business Cycles



Monetary and output cycles



Output responses

- When the monetary base grew excessively over its long-term trend, output growth would also expand at the rate faster than its normal growth rate.
- When the monetary base contracted below its normal growth path, the economy experienced a downturn.

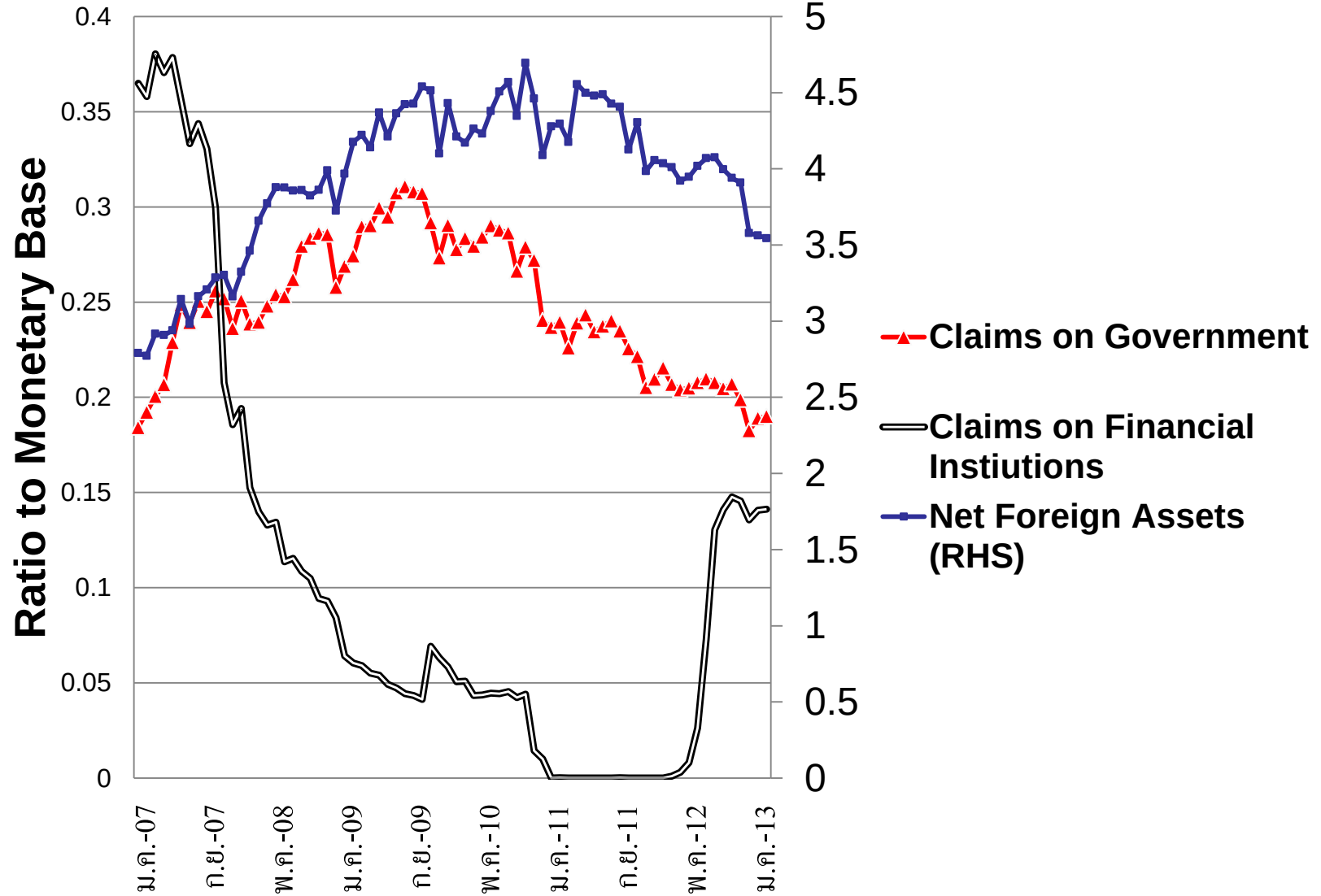
From peaks to troughs of economic cycles

- The peaks of monetary growth were associated with the peaks in manufacturing output.
- Similarly, the deepest contraction in output synchronized with the trough in the monetary cycle.
- Monetary base changes have a strong impact of output fluctuation.
- Cyclical movement in the monetary base can be used to predict the cyclical movement in industrial output.

Policy lessons

- Both monetary and output cycles are related.
- The causations run both ways.
- Shocks in the monetary sector can be transmitted into the real sector and vice versa.
- The implication for stabilization policy is that monetary authority should avoid large swings in monetary aggregate.

Monetary Base: 2004-2013



Inflation, output gap and inflation expectations

$$\pi_t = E_{t-1} \pi_t + \phi(Y_t - \bar{Y}_t) + v_t$$

Inflation depends on expected inflation because firms set prices in advance.

The expectation of high inflation induces firms to announce price hikes which causes high inflation in the overall economy.

Adaptive expectation

People expect prices to continue rising at the same rate they have been rising.

$$E_t \pi_{t+1} = \pi_t$$

$$E_{t-1} \pi_t = \pi_{t-1}$$

From the Phillips curve

$$\pi_t = E_{t-1}\pi_t + \varphi(Y_t - \bar{Y}_t) + v_t$$

With Adaptive expectation,

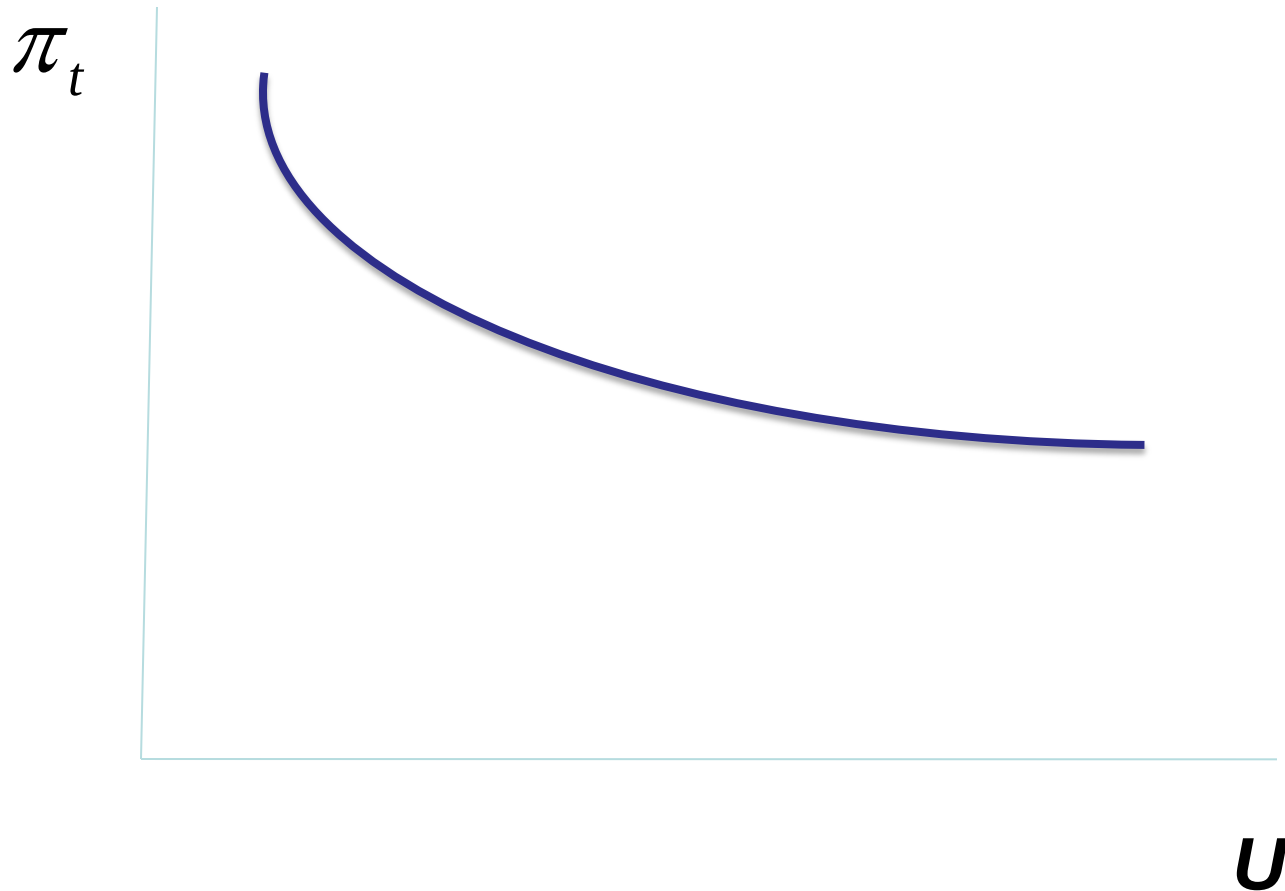
$$E_{t-1}\pi_t = \pi_{t-1}$$

$$\pi_t = \pi_{t-1} + \varphi(Y_t - \bar{Y}_t) + v_t \quad (DAS)$$

$$U_t = -\lambda(Y_t - \bar{Y}_t), \quad \lambda > 0$$

$$\pi_t = \pi_{t-1} - \eta U_t + v_t; \eta \equiv \varphi / \lambda$$

The Phillips Curve



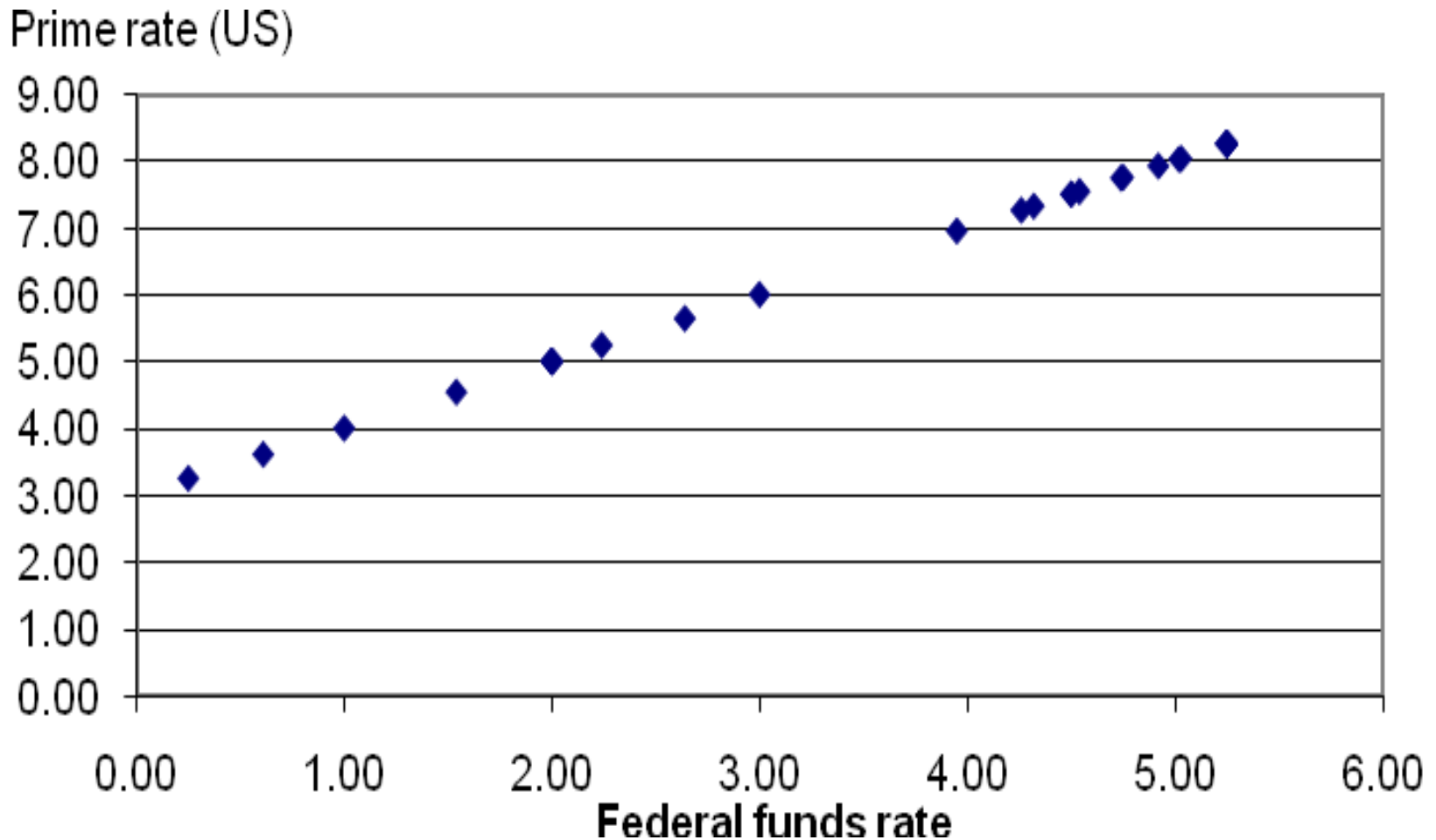
The cost of price stability

- When there is a trade-off between price stability and unemployment, monetary expansion can reduce unemployment at the expense of higher price level.
- How high is the price we have to pay in terms of reducing unemployment?
- Inflation expectations play a crucial role in determining the cost of disinflation.

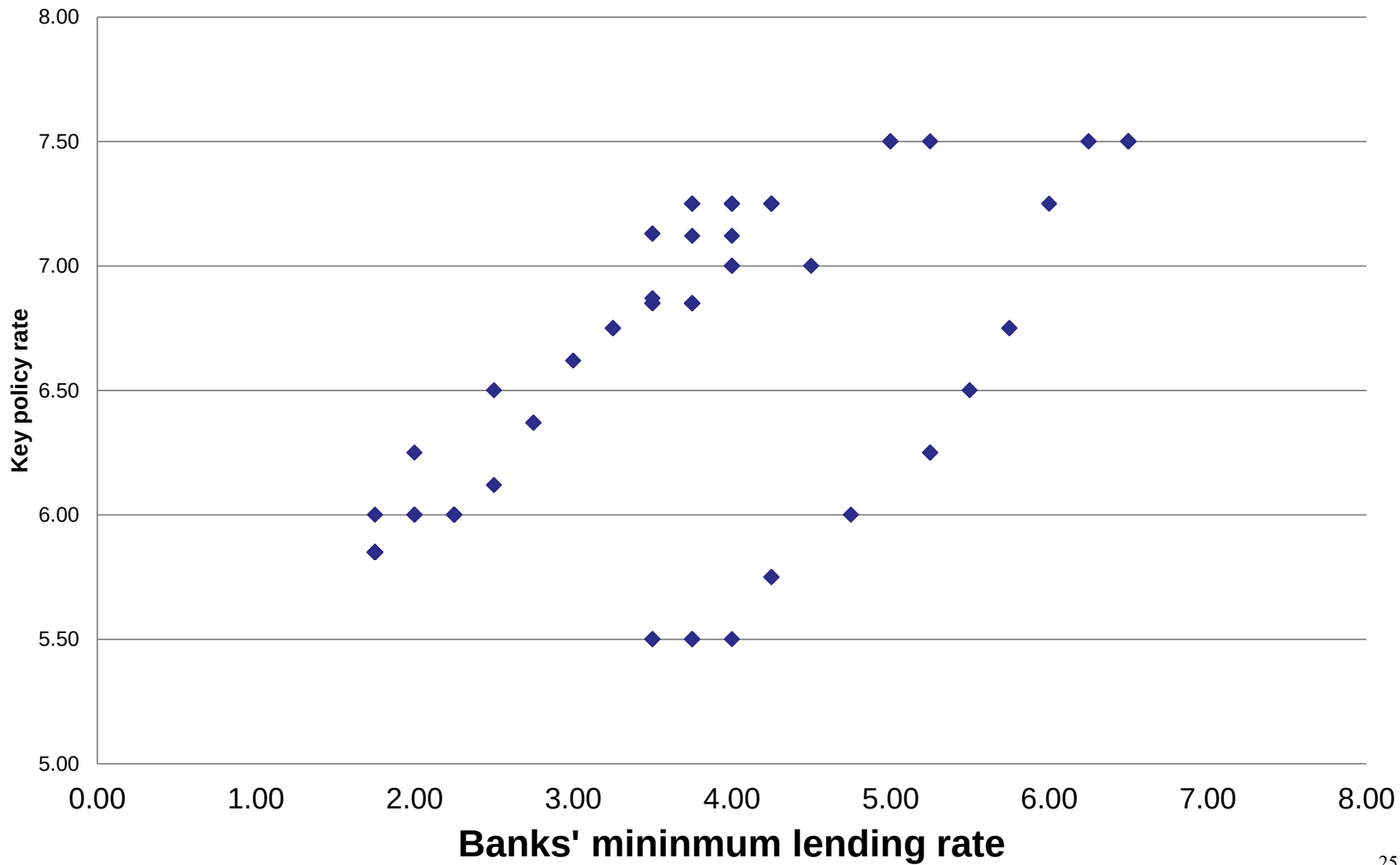
Phillips curve is still alive

- Except for the abnormal year of 1998, there exist a negative relationship between unemployment and inflation.
- The year 1998 experienced cost pushed inflation caused by currency depreciation; thereby revising inflationary expectations.
- For every one-percentage point reduction in unemployment, inflation was raised by roughly 1.8%.
- The cost of price stability is high in terms of unemployment.

Predictable outcome



Bank of Thailand and Commercial banks' lending interest rates Jan 2005-Feb 2012



Monetary policy transmission channels

- Interest rate
- Credit availability
- Exchange rate
- Asset prices

Some situations of ineffective channels

- Liquidity trap
- Interest-insensitive investment
- Exchange rate intervention
- Rudimentary money and capital markets

Cost and quantity of bank credit

- Monetary policy instrument is effective in changing the cost of capital.
- Whether the interest rate can exert an immediate impact on the real economy depends on the responsiveness of consumption and investment to the user cost of capital.
- It is possible that the quantity of credit or credit availability is also vital to investment and durable consumption.

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Economic Research

Global Data Watch

November 7, 2014

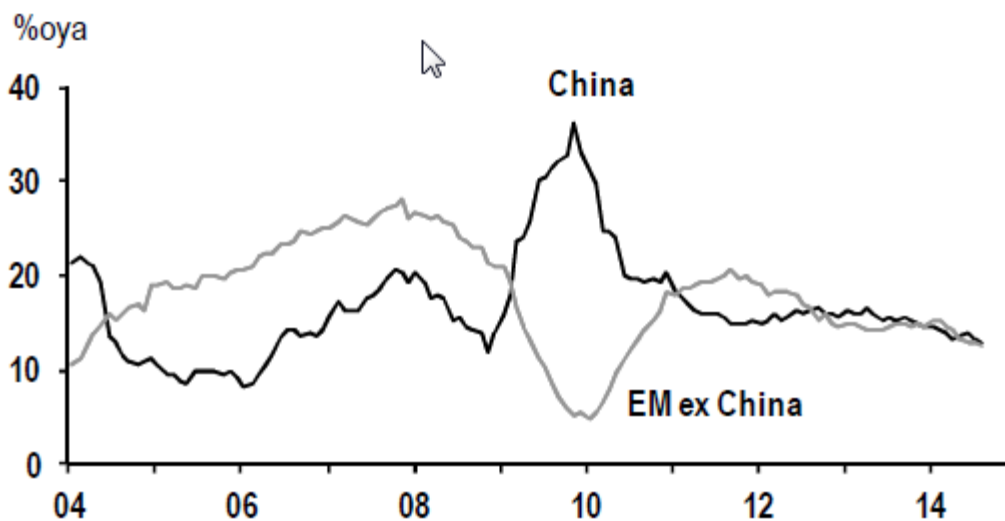
Economic Research Note

EM private leverage still rising

Modest EM banks are tightening lending standards

- Growth in EM private bank loans has moderated but still exceeds GDP growth
- Buildup of private leverage most worrisome in Asia
- IIF survey shows modest net majority of EM banks still tightening
- Eventual Fed tightening poses risk

EM domestic bank loans



Source: J.P. Morgan

EM domestic bank loans

% of GDP

	2008	Aug-14	Change per annum
EM	70.7	94.1	4.0
EM Asia	97.6	123.9	4.4
China	99.6	139.1	6.7
India	49.8	55.6	1.2
Indonesia	23.7	32.2	1.4
Korea	152.2	134.2	-2.9
Malaysia	93.8	121.9	5.1
Singapore	93.8	128.4	5.7
Taiwan	136.9	146.5	0.6
Latvia	90.2	122.1	5.5

IMF Study: Credit to GDP and risk of a financial crisis

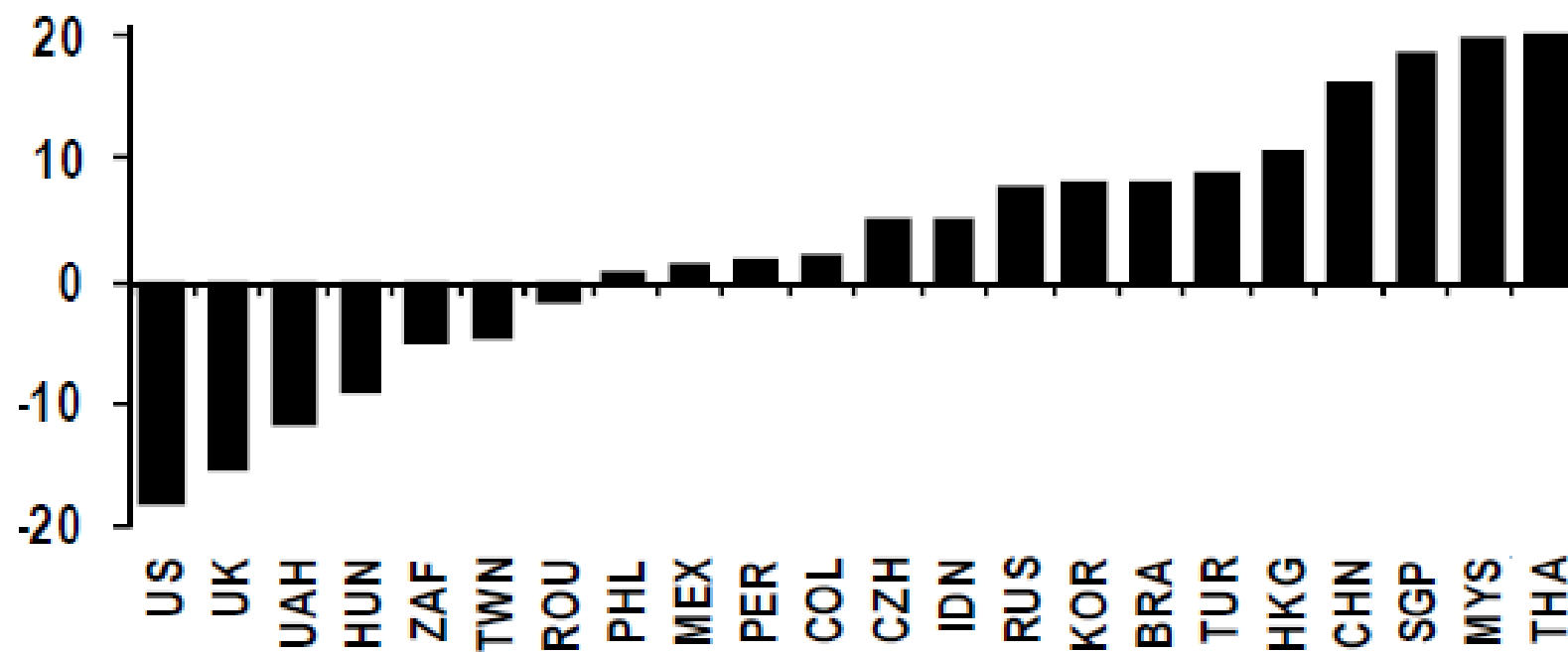
- It is impossible to know the “appropriate” level of credit to GDP. This ratio depends on the diversity of the financial system (how bank-centric) and the maturity of its banks, which itself is dependent on such factors as the domestic regulatory environment, culture, and so forth. It is easier to make judgments about the growth of credit. Rapid increases in credit tend to be a telltale sign of deteriorating loan quality.
- IMF researchers have found that increases in the credit to GDP ratio in excess of 5%-pts in one year were associated with a heightened risk of a financial crisis.
- In our EM aggregate, the credit ratio has increased about 25%-pts since 2008, or 4%-pts per annum for six years straight. Importantly, the metric only reflects bank loans. Non-bank lending also has been strong in some countries.

Outstanding EM Asia Credit Exposure

- EM Asia credit exposure stands out, in terms both of the level and the expansion in the ratio of credit to GDP. China is central to the regional position but the country has company in Singapore, Hong Kong, Thailand, and Malaysia. (Note that social finance in China, which also includes non-bank credit, stands close to 200% of GDP.) In Latin America, the main concern is Brazil. In EMEA EM, it is Turkey.
- It is not clear how the buildup in EM private leverage will end, or what its repercussions might be. One likely trigger is Fed tightening. History suggests a rise in US interest rates will pressure the emerging economies, draining portfolio flows and weakening currencies.

Household debt as a share of GDP

%pt chg since 2008



Source: J.P. Morgan, BIS, national central banks

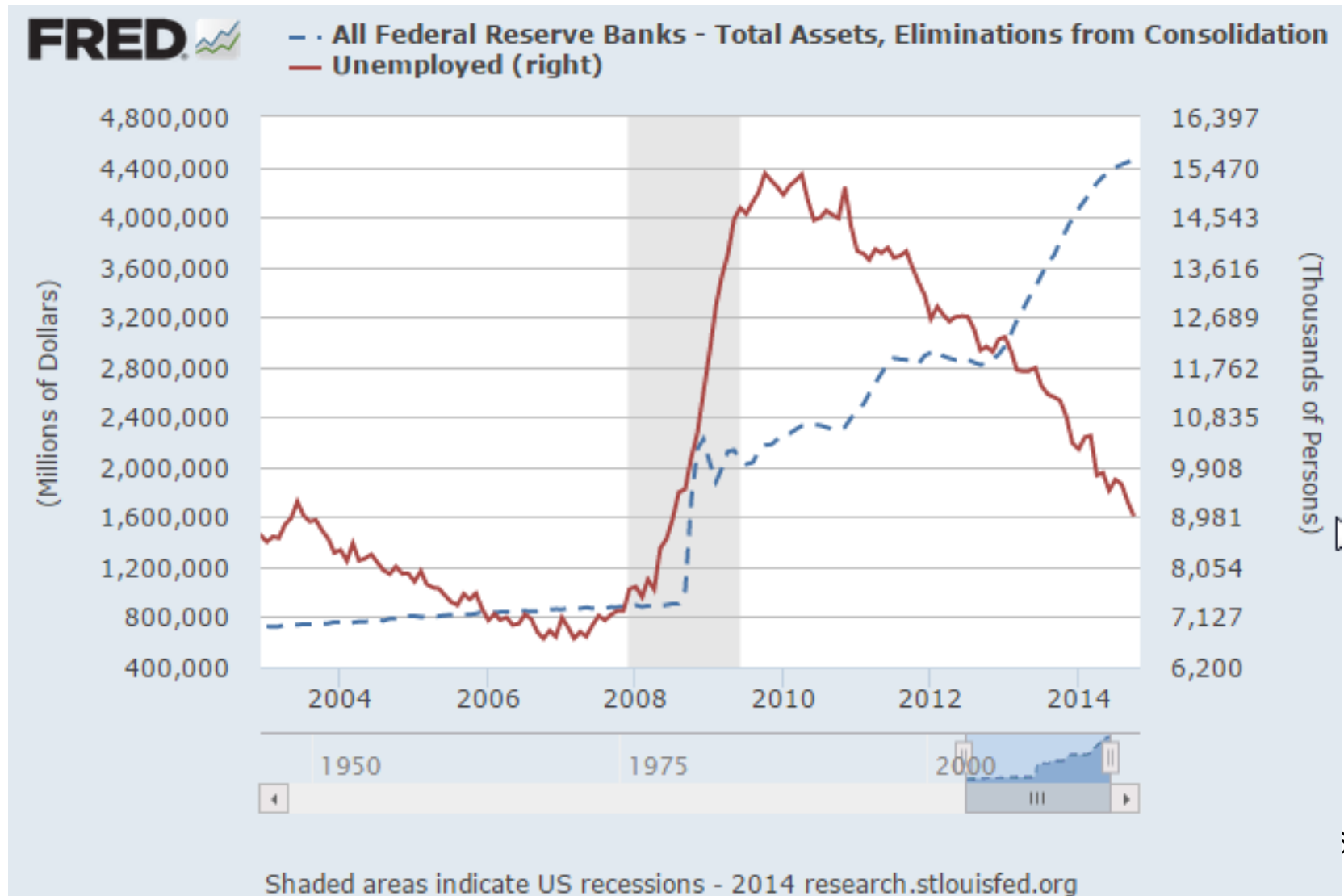
A vicious circle

- Domestic interest rates are likely to rise, especially in the more stressed countries where monetary authorities are compelled to tighten policy.
- To the extent that EM debt is short-term or floating, these rate increases will boost debt service. The likely increase in defaults and bankruptcies will signal banks to curtail lending more aggressively. This process could become a vicious circle, feeding back on economic activity.
- Some of this debt has been pushed out in duration and some has been issued in local currency, both of which will limit stress. However, the slowing of credit origination and ultimate deleveraging that has yet to begin poses a threat at a time when EM growth already₃₄ has downshifted significantly.

Monetary policy transmission mechanism

- The exchange rate channel does not work properly when the Bank of Thailand intervenes in the foreign exchange market.
- The ***credit channel*** through credit availability effect is the most important channel.

Impact of the FED's quantitative easing



Inflation Targeting in theory

- An **independent** central bank is a requirement for successful inflation targeting.
- Inflationary expectations can be **reduced** since credibility of monetary policy is enhanced by both institutional and instrumental independence of the central bank.
- As more countries have abandoned fixed exchange rates, they desperately need a **nominal anchor** for the price level.

Caveat on inflation targeting

- For countries that are highly dependent on external trade, inflation targeting is akin to targeting the exchange rate.
- Adopting inflation targeting implies a **commitment to no other nominal targets.**
- When there is **no close and stable relationship** between the short-run monetary instruments and long-term interest rates (under developed bond market), a policy rule like the Taylor's rule may not produce a desirable outcome.
- In particular, if monetary policy has a **long and variable lag effects.**

Taylor rule and inflation target π^*

i = Nominal interest rate: key policy rate

$$i_t = \rho + \pi_{t-1} + \phi_1(\pi_{t-1} - \pi^*) + \phi_2(y_t - y^p)$$

ρ = the natural real rate of interest

y^p = potential output

Φ = a positive reaction parameter

Flexible inflation targeting?

- We are now entering an episode of a slowdown in growth.
- Growth depends less on consumption and investment.
- Fiscal policy has become less effective in stimulating growth.
- Did inflation targeting pass the real test in 2010? How about 2013?

Flexible Inflation Target (FIT)

- Many central banks have adopted FIT
- FRB in 2012 (2% target)
- BOJ announced 2% target in Jan 2013
- But FIT has problems
- Financial stability and prevention of asset bubbles may override FIT
- Under zero interest rate policy, QE may not be effective to achieve FIT

Monetary autonomy

- The monetary authorities employ the interest rate policy that can affect bank lending rate and price stability.
- During the period of excess liquidity, monetary autonomy was demonstrated when the federal funds rate had no impact on domestic interest rates for both key policy and commercial banks' interest rates.

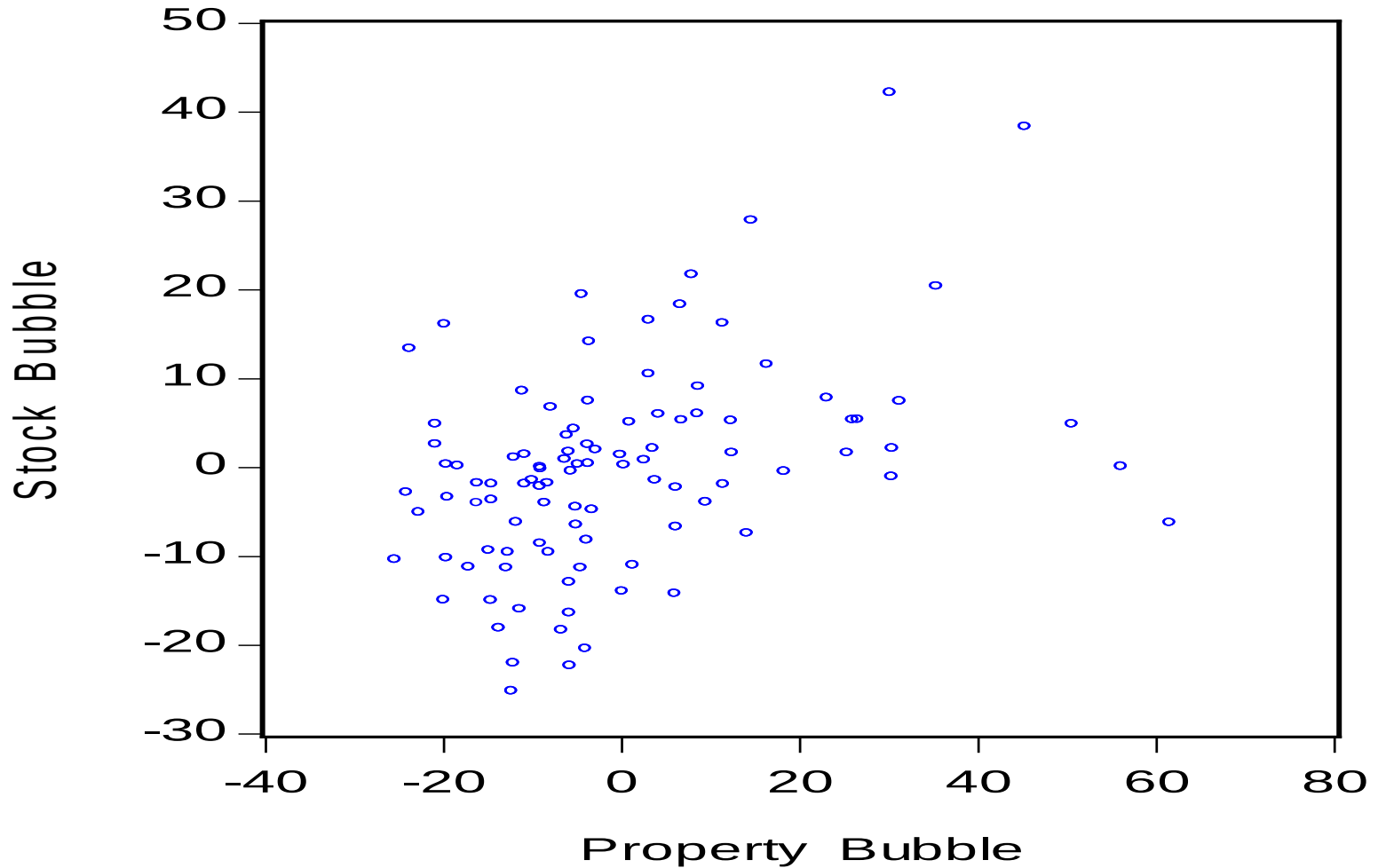
Flexible inflation targeting strategy

- The central bank key interest rates responds to inflation ***and*** real exchange rate changes.
- There had been an attempt to prevent the appreciation of the real effective exchange rates.

Bubbles, what bubbles?

- The relationship between asset prices bubbles in Thailand, using data from January 2000 to July 2008 is shown in the next slide.
- Similarly the size of the property bubble can be approximated from the deviation from the trend of construction activity, approximated by permitted construction in urban areas.
- The size of the stock price bubble can be captured by the percentage deviation from its trend line.

The two bubbles



First thing, first

- A positive relationship exists between speculations in both asset markets.
- There is a question regarding to how and where the bubble started.
- The lead-lag relationship between the two bubbles can shed light on preventive measures to prevent the busting of asset bubbles.

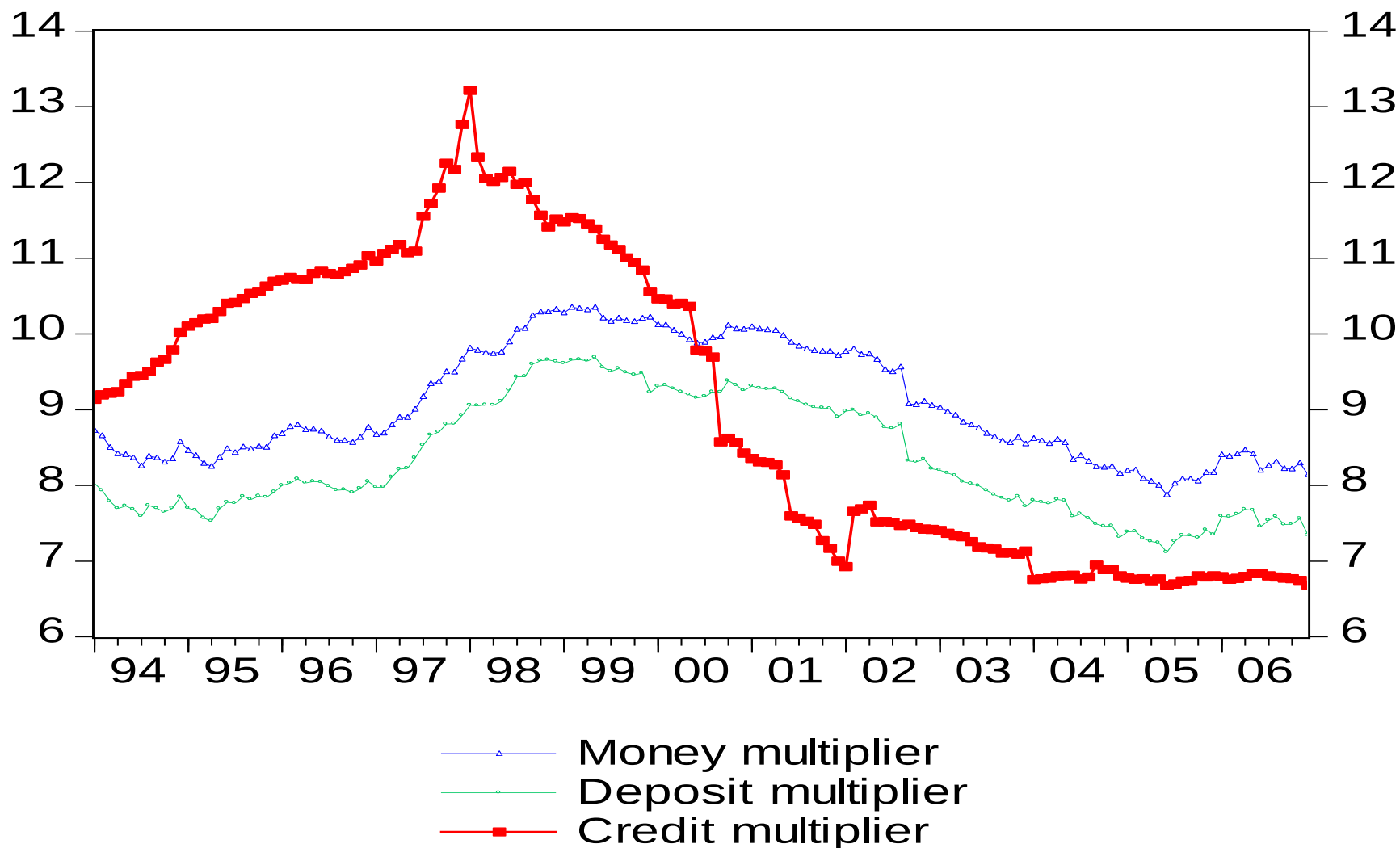
$$Credit = \kappa MB$$

$$MB = NFA + CoG + CoF$$

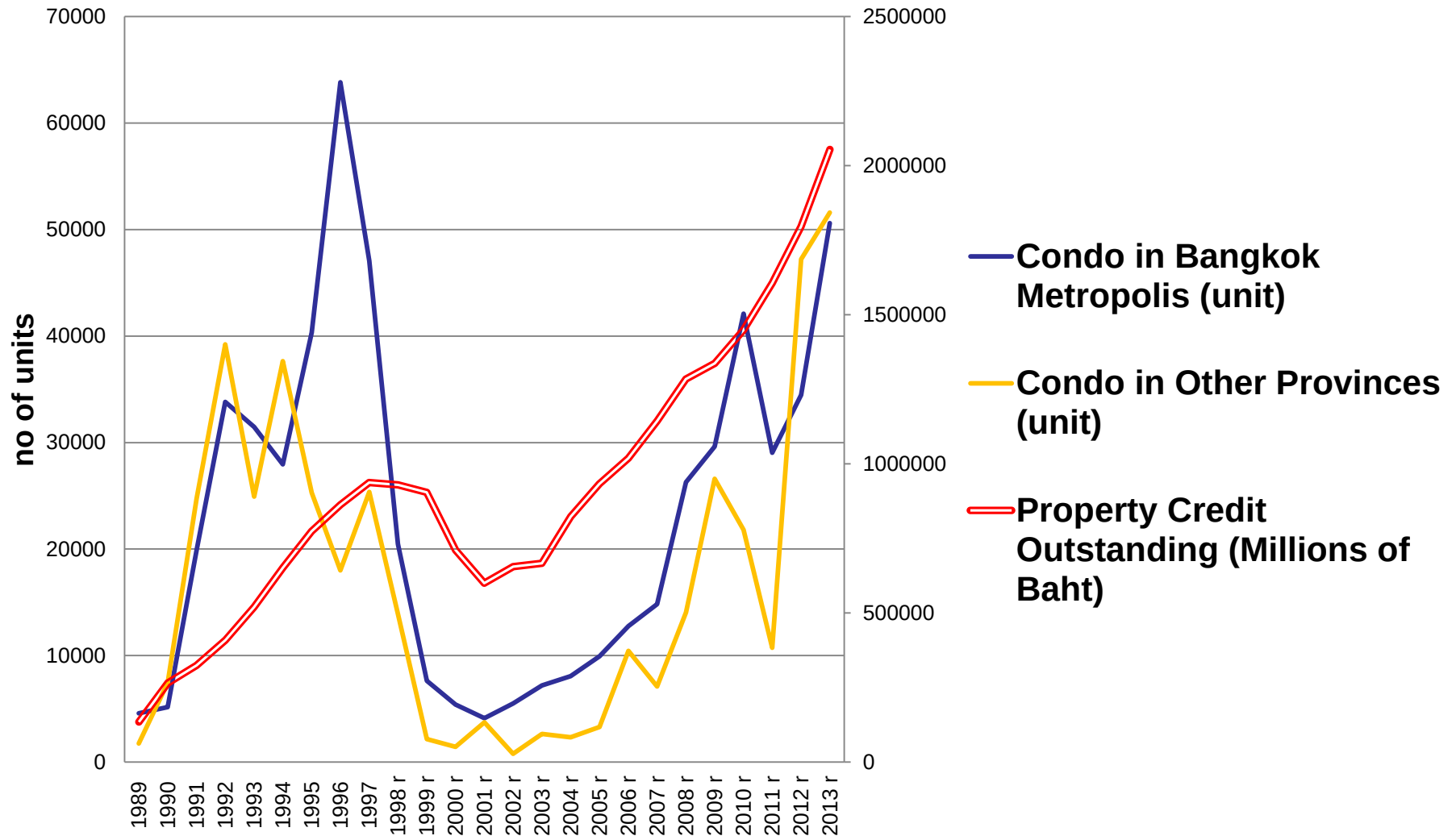
$$\kappa = \kappa(\bar{R}, r_L, \bar{r}_p, \psi)$$

- Prior to the economic crisis in 1998, there was excessive lending, which can be captured by the rapidly rising credit multiplier.

At the peak of lending boom



Thailand's property credit and speculation



An early warning indicator

- Credit multiplier increased abnormally high and deviated entirely from the behavior of deposit and money multipliers.
- We can monitor the financial sector by using the credit multiplier as an early warning indicator for over-lending.

The central bank can prick the bubble

- Rising bank minimum lending rate increases the credit multiplier, while the BOT's lending rate reduces the credit multiplier.
- Deposit multiplier does not lead to a significant change in credit multiplier as the behavior of savers is entirely different from banks.

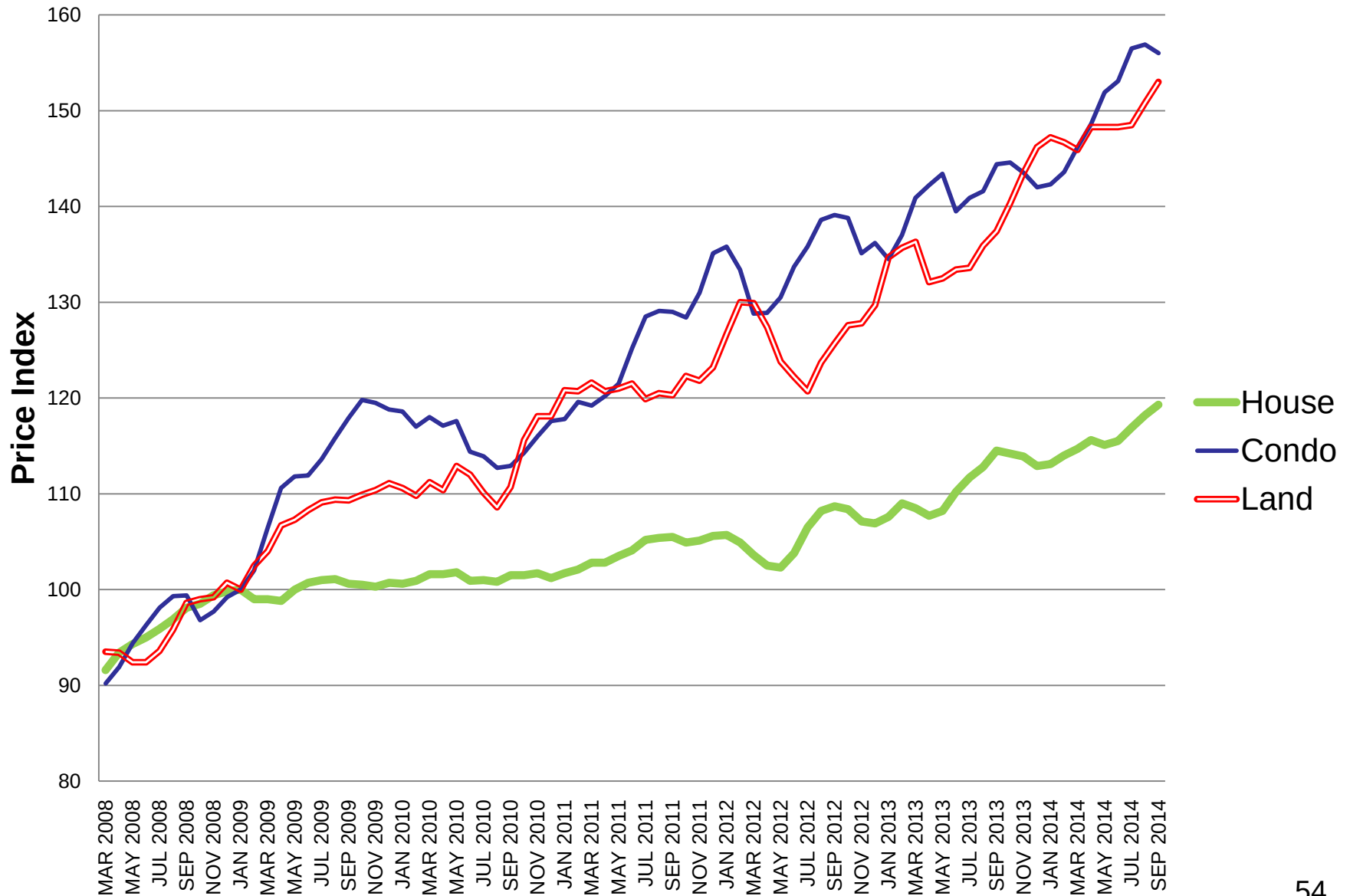
The central bank and the control of credit multiplier

- There is a significant degree of inertia in bank lending.
- When interest rate is high, commercial banks are willing to take more risk to obtain higher returns from their assets.
- If the Bank of Thailand raises the interest rate on its lending facilities, banks would be discouraged in lending, thereby causing a decline in the credit multiplier.

Slow supply adjustments

- Quantity demand adjusts faster than the quantity supply
- Long gestation period of property development
- Lack of price adjustments: Downward price rigidity prevents market clearance.
- Expectations change rapidly

House and land prices



Concluding remarks

- The bubble in the stock market preceded the bubble in the real estates markets.
- It is desirable and possible to prick the bubble by using tight credit policy to curb excessive credit growth.
- Impose maximum Loan-To-Value ratio (LTV)
- If monetary policy can produce sustainable growth with price stability, there would be favorable consequences on other development issues such as poverty reduction, employment, income distribution, and urban migration.

Conclusion

- Monetary policy is effective in stabilizing the economy, but it should be employed in line with fiscal policy stance.
- Some novel goals of inclusive and quality growth require other policy mix to bring about the benefits of growth to the vulnerable.

Concluding remarks

- Monetary policy should not be employed for micro objectives that might lead to distortion of resource allocation.
- If growth with stability can be achieved, the Bank of Thailand can obtain a broader goal of poverty reduction.