Financial Conditions Index's Construction and Its Application on Financial Monitoring and Economic Forecasting

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Outline

- Overview
- Introduction of the FCI construction method
- Calculate China's FCI
- FCI can reflect the situation of financial operation in China
- FCI can predict the economic trends better
- Conclusion

1. Overview (1)

- Definition of Financial Conditions Index (FCI) :
  - a comprehensive index which is constructed based on the combination of variables, such as currency price (For example, money, exchange rate), and asset price (For example, stock index and house price).

- FCI can make up the shortage of using the conventional indexes, such as money supply and interest rate, in measuring the financial conditions and forecasting the economic trend.

1. Overview (2)

- In 1990s, Central Bank of Canada developed the Monetary Conditions Index (**MCI**).

- MCI has been **widely applied** in many central banks and international institutions.

- With the development of economy and finance, the information of **asset price** has been paid more and more attention to evaluate financial situation.

- Some researchers developed FCI that **adding some asset price variables** into the combination of index.

2. Introduction of FCI construction method

Constructing FCI

Selection of the Indicators

The Construction Model

Calculate the weights
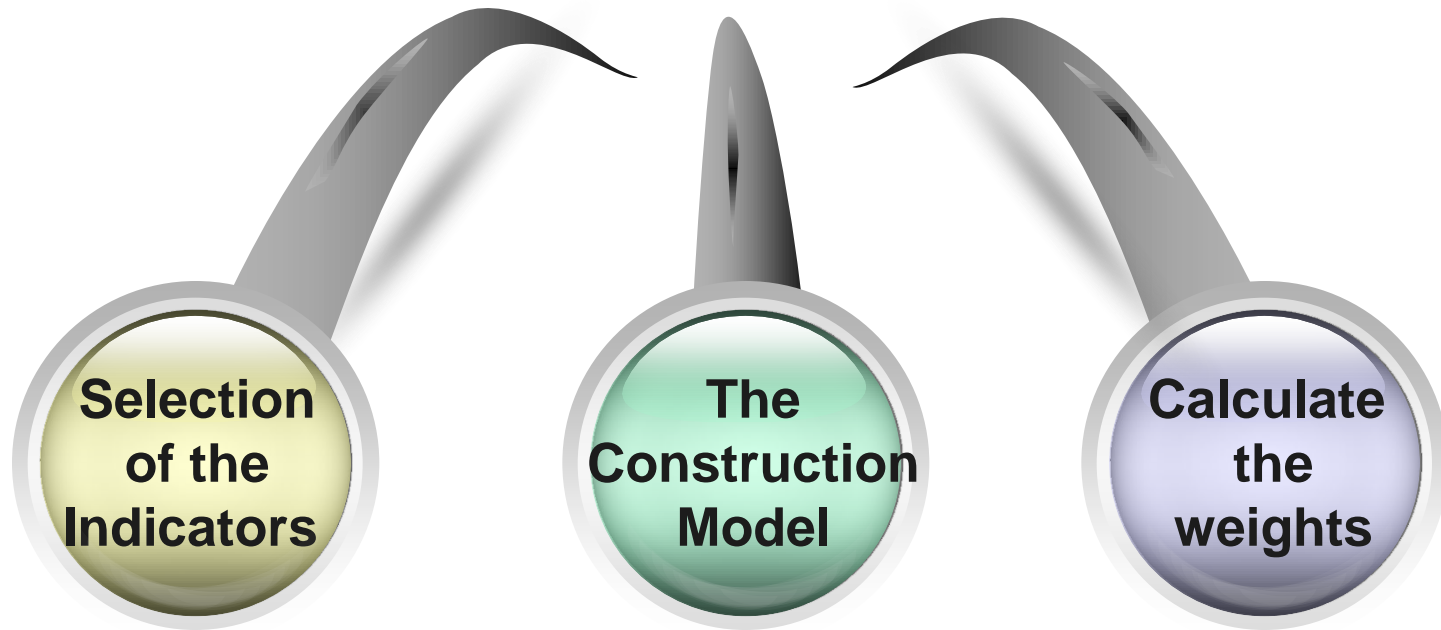
2.1 Indicator selection

Type	Indicators
Money Supply	narrow money supply(M1),broad money supply(M2)
Exchange Rate	bilateral exchange rate
	exchange rate index, such as efficient exchange rate from BIS
Interest Rate	market interest rate: short term interest rate, bond interest rate, bond interest margin
	policy interest rate: deposit or loan benchmark interest rate
Capital Market	market value/GDP, price earnings ratio, stock wealth owned by household, stock price
Real Estate Price	house average price, real estate climate indices

2.2 Common forms of the FCI

The FCI's estimation equation is:

$$FCI_t = \sum_i w_i(q_{it} - \bar{q}_{it})$$

Where q_{it} is indicator i's value at time t, $\bar{q}_{it}$ is indicator i's long-term trends or equilibrium values at time t, w_i is indicator i's weight.

In addition, the FCI's form by principal component analysis method is:

$$FCI_t = \sum_i w_i F_{it}$$

Where F_{it} is principal component i's value at time t, w_i is principal component i's weight.

2.3 Classification of the methods building the FCI

- **Reduced Aggregate Demand Equation model**

  Calculate the weights in FCI based on the coefficients of equation.

- **The VAR model**

  Calculate the weights based on the impact level.

- **Weighted principal components**

  Take the significance probability of the principal component as the weights

The shortage of existing methods

- One problem is about the estimation models. Deviation from equilibrium of each variable need to be estimated in the common measuring form of the FCI, which may cause large error.

- Another one is about the determination of the weights, whose estimation models will differ depending on the purpose of FCI.

The innovation of this paper (1)

- we select the percent change rate of the variable as indicators to construct the FCI, which not only effectively describe the indicators, but also avoid errors arising from of gap measuring.

$$FCI_t = \sum_i w_i \frac{q_{i,t} - q_{i,t-12}}{q_{i,t-12}}$$

Where q_{it} is indicator i's value at time t, $q_{i,t-12}$ is indicator i's value at the same period of last year, $\frac{q_{i,t} - q_{i,t-12}}{q_{i,t-12}}$ is indicator i's growth rate at time t, w_i is indicator i's weight.

The innovation of this paper (2)

- Second, the Principal Component Analysis and Dynamic Factor methods are both introduced to build FCI.

- Dynamic Factor method can directly extract factor sequences which depict the characterized fluctuation of variables, without determining weights.

3. Calculate China's FCI

| Type	Indicators	Sign	Data resources
Money supply	M2, the current growth rate of balance at period-end	M2	People's Bank of China
Interest rate	7 days interbank funding weighted average nominal interest rates	in	The national interbank funding center
Exchange rate	RMB's nominal effective exchange rate index, the current growth rate	ex	Bank for International Settlements
Stock index	Shanghai securities composite index, the current growth rate	stock	Shanghai Stock Exchange
House price	Commercial housing sales price(Commercial housing sales divided by the number of commercial housing sales area), the current growth rate	hp	National Bureau of Statistics

FCI
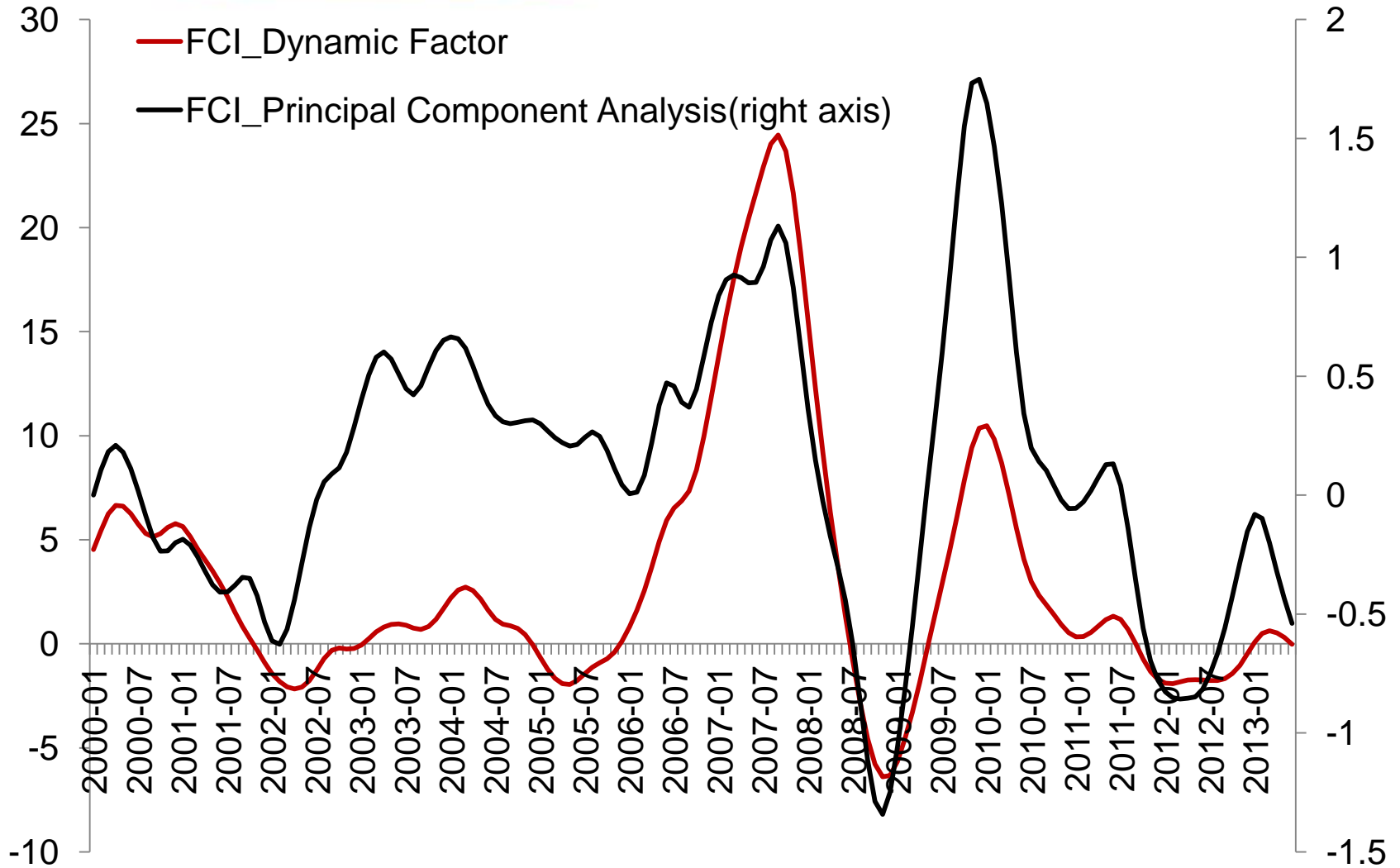
FCI and MCI
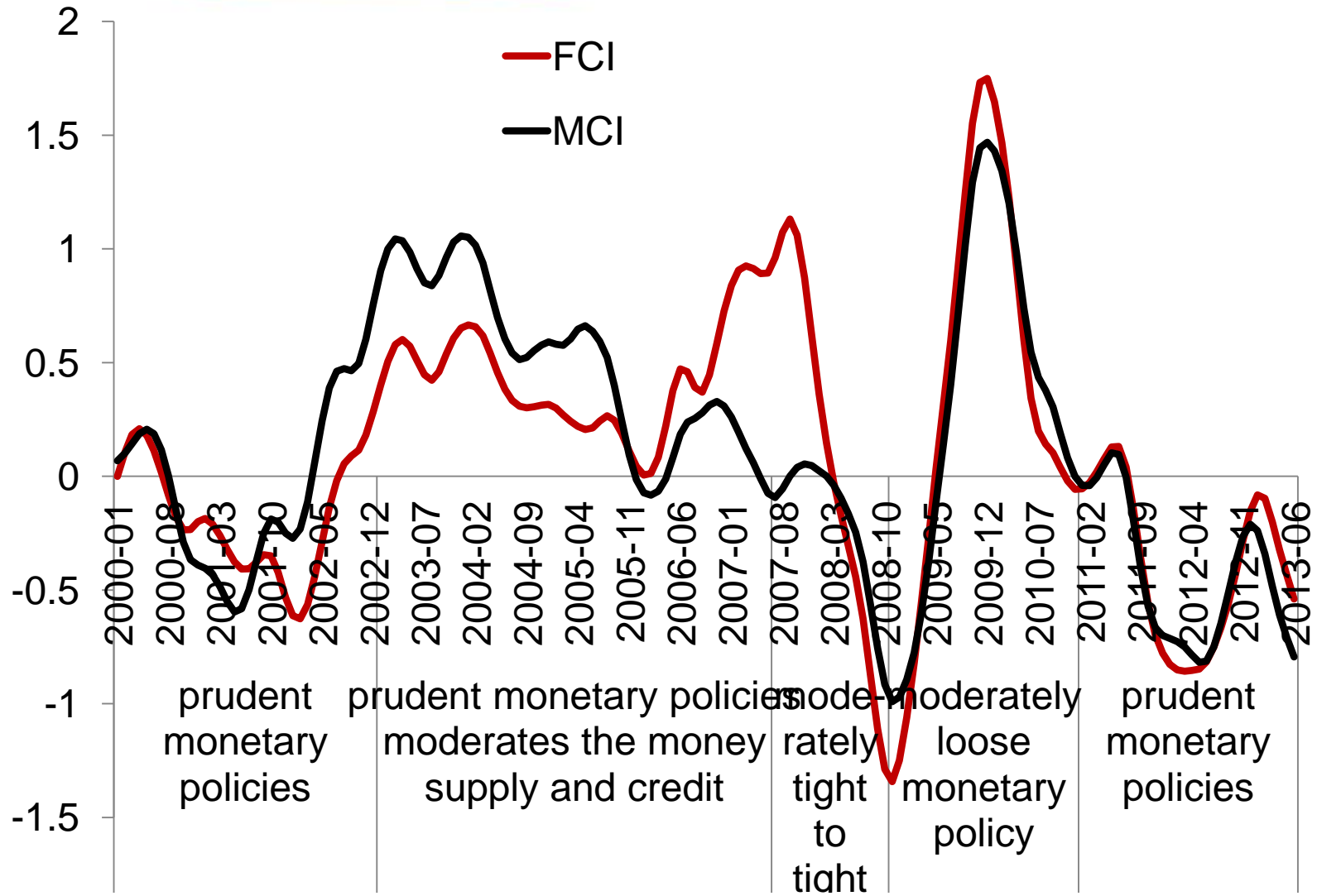
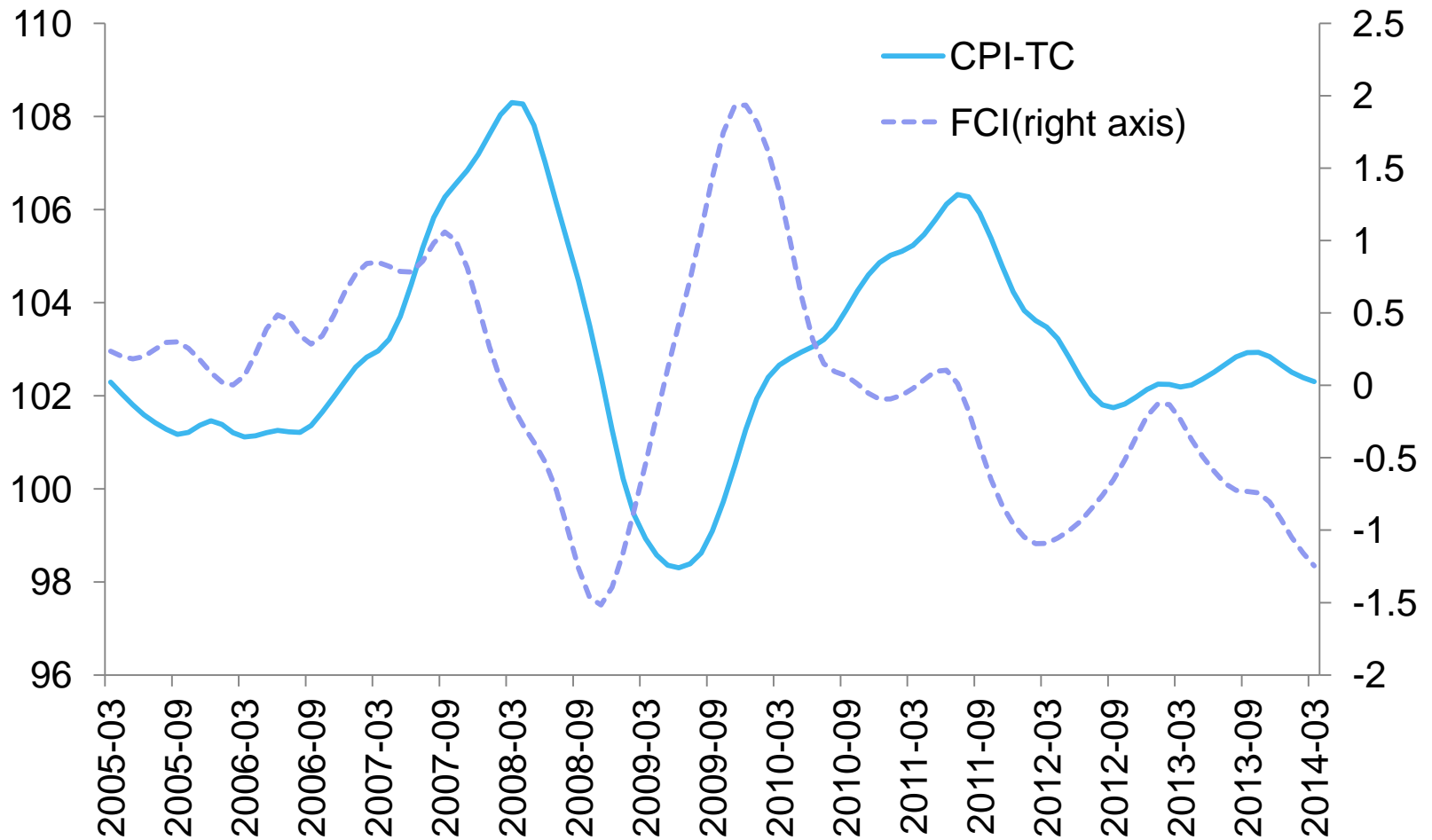# 4. FCI can reflect the situation of financial operation in China
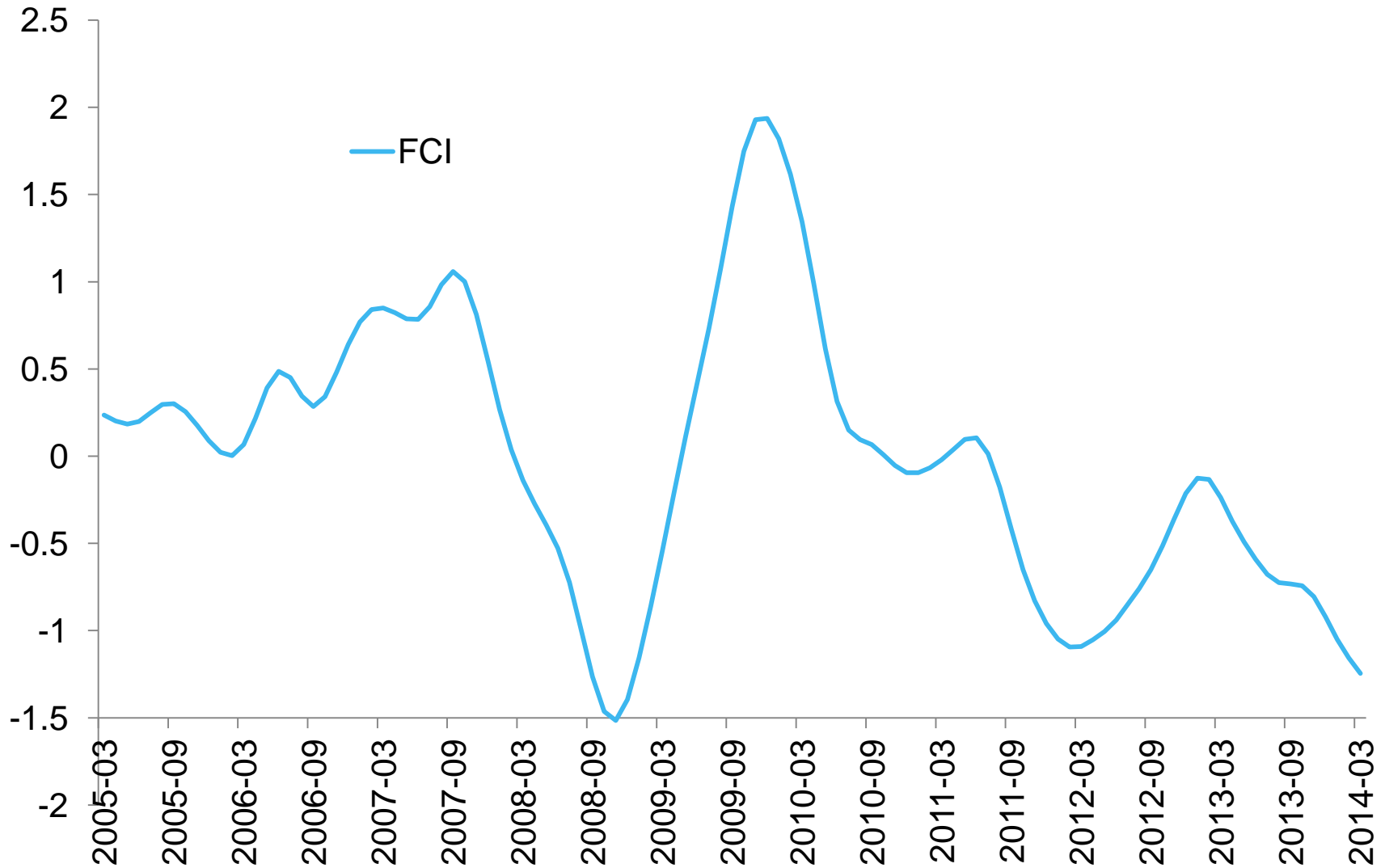
- **FCI performs better as a leading indicator of CPI**

	coefficient of correlation	leading length(months)
FCI	**0.72**	**10**
M2	0.48	12
interest rate	-0.41	12
exchange rate	0.59	11

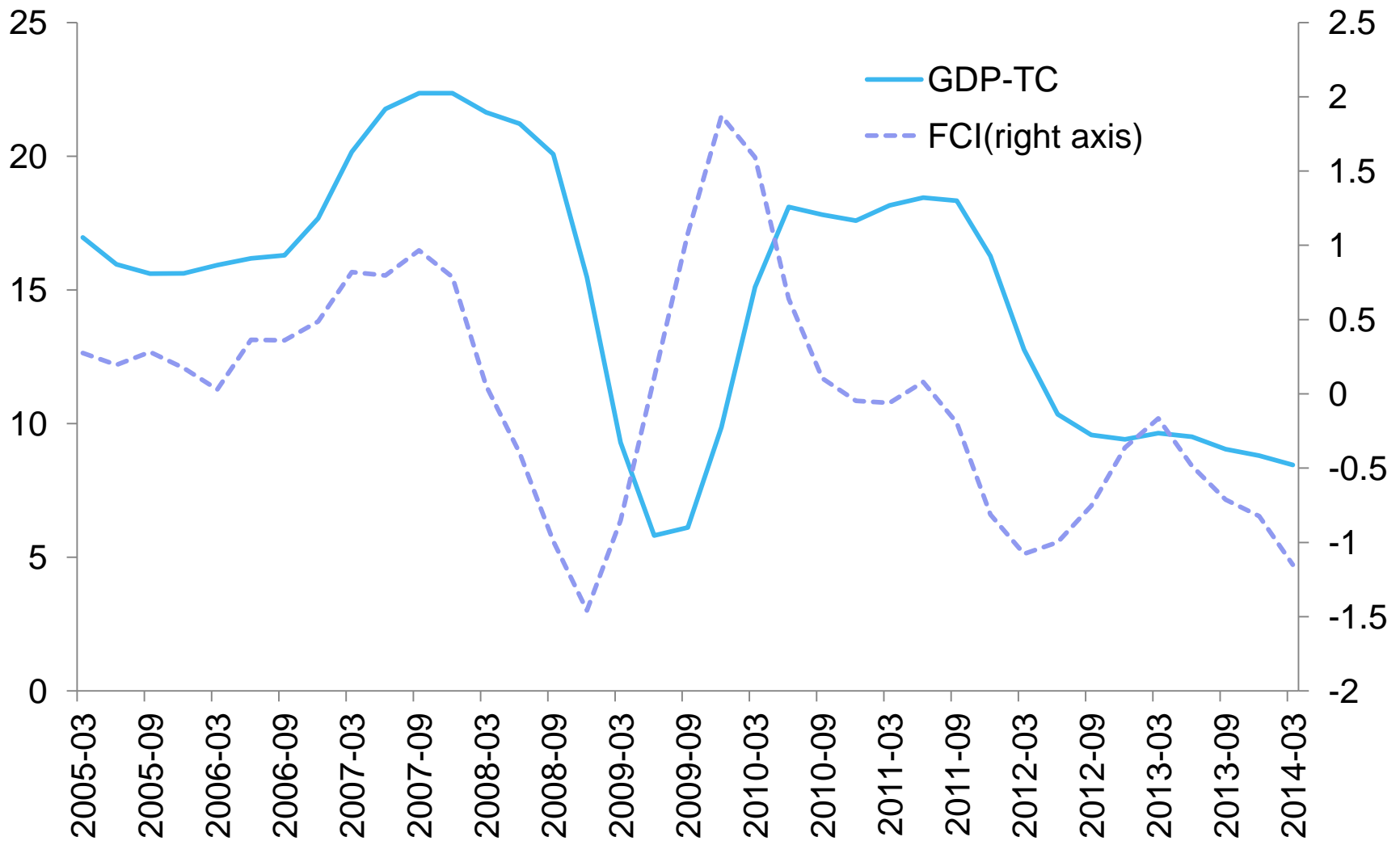# 5. FCI can predict the economic trends better (2)

5. FCI can predict the economic trends better (3)

- **FCI performs better as a leading indicator of GDP**

	coefficient of correlation	leading length(quarters)
FCI	0.82	2
M2, interest rate and exchange rate	No passing the statistical test，and the anteriority is not significant	

5. FCI can predict the economic trends better (4)

6. Conclusion

- FCI can better reflect the situation of China's financial operation, and can better predict the economic trends. Therefore, FCI can serve as an important reference index, whose performance is superior to single financial variables.

- Though the literature found that introducing asset-price variable into MCI to design FCI is an important approach to improve the MCI's performances in economic forecasting and policy decision-making, but assets price in China's FCI provides limited information. With further developing of the financial market, asset prices information will be more important.

Thank You !