

Development and utilisation of financial derivatives in China

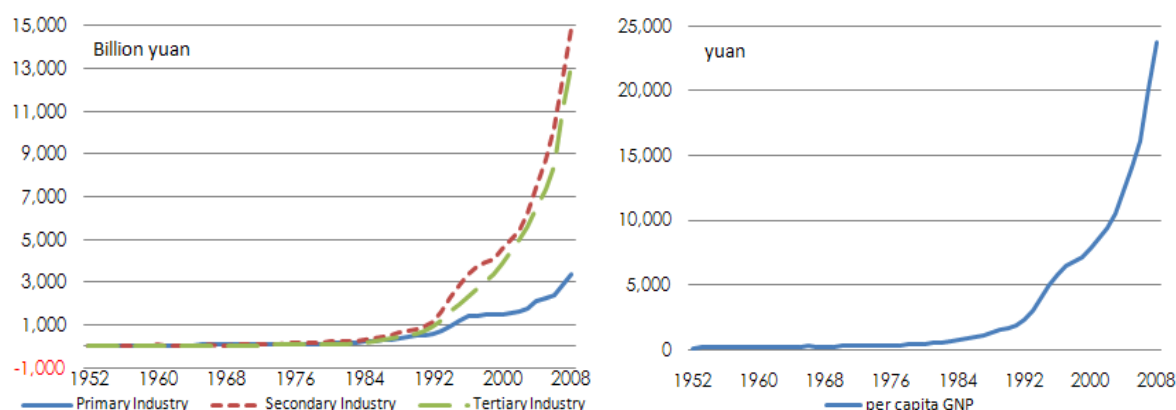
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1. Development of the financial derivatives market in China

China has made tremendous strides after three decades of reforms and a progressive opening of its markets. By mid-2010, the country's GDP reached CNY 17 trillion, more than USD 2.5 trillion, and its high economic growth rate has made a significant contribution to the global economy. GDP per capita, however, is still low.

GDP and GDP per capita

1952–2009, CNY billions



Source: National Bureau of Statistics of China.

Finance is the core of a modern economy. China's financial system has made great progress, in line with rapid economic growth, and has converged on international best practice. As an important part of the modern financial system, financial derivatives have been the focus of much attention in China. A number of RMB derivative types are in use, and the RMB derivatives market has already reached a mature stage in China.

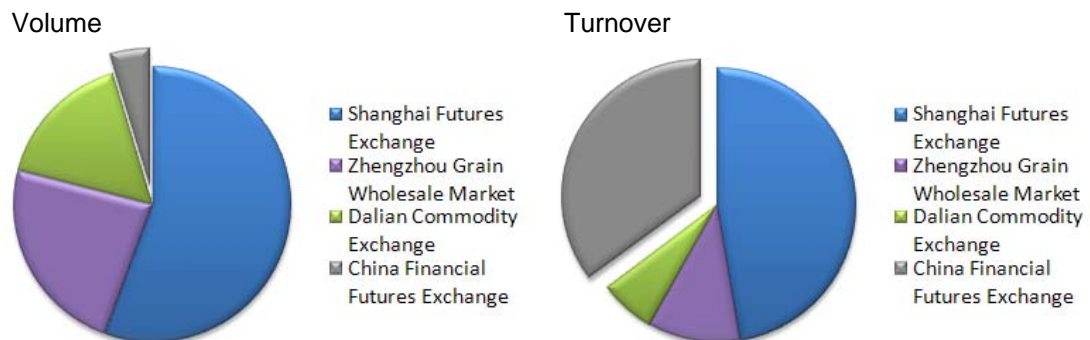
1.1 Commodity-based financial derivatives

Commodity futures are the oldest form of derivative. The first commodities futures market in China, the China Zhengzhou Grain Wholesale Market, opened on 12 October 1990. Subsequently, the Shanghai Futures Exchange and Dalian Commodity Exchange have also started operations.

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Futures market transactions in China

June 2010; CNY billions



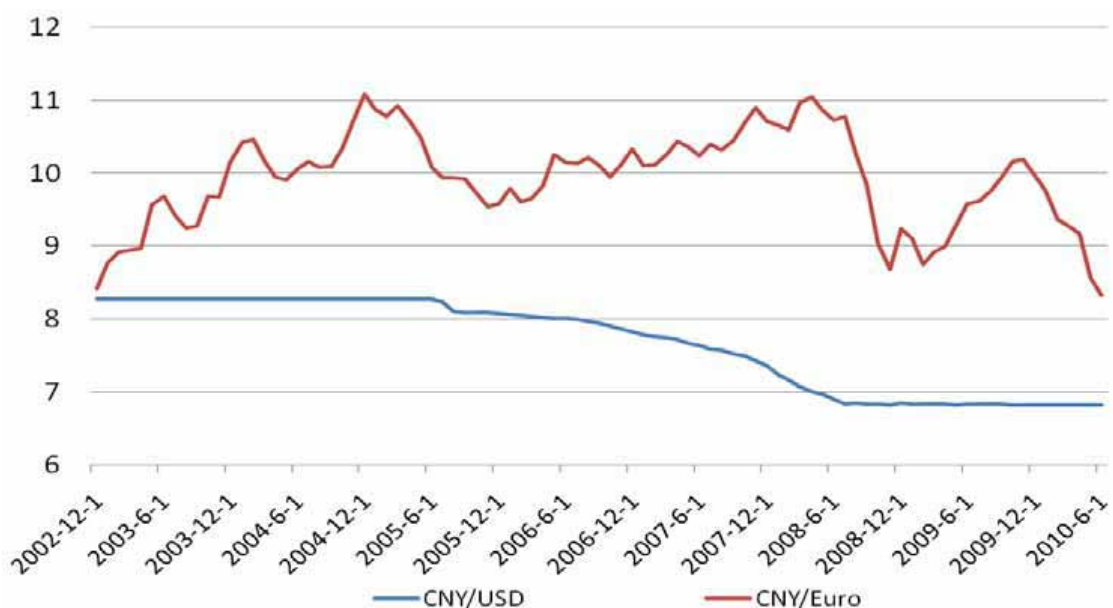
Source: China Futures Association.

1.2 Exchange rate derivatives

Because of China's growing contribution to the global economy, the RMB exchange rate has attracted an increasing amount of attention worldwide. Meanwhile, demand for derivatives, especially those related to risk management, has increased steadily from financial institutions and even from non-financial companies and individual investors.

RMB exchange rate vis-à-vis US dollar and euro

December 2002–June 2010; CNY/USD, CNY/EUR



Source: State Administration of Foreign Exchange of China.

(a) RMB forwards

In 1994, the China Foreign Exchange Trade System introduced a spot foreign exchange trading system for financial institutions. Preparatory studies for RMB forward transactions started one year later and, in January 1997, the People's Bank of China (PBC) formally established its "Interim Management Rules for RMB Forward Exchange Settlement and Sales" as a framework for the development of this business. In April 1997, the Bank of China

started up its RMB forward exchange settlement and sales business, as the first bank authorised to do so, marking an important milestone in the development of the Chinese derivatives market.

(b) RMB foreign exchange swaps

RMB exchange swap transactions were introduced in April 2006. The National Import and Export Bank of China and the Bank of China were the first to execute a deal in the nascent Chinese interbank foreign exchange market.

(c) RMB futures

In August 2006, the Chicago Mercantile Exchange (CME) launched futures and option contracts on the CNY against the US dollar, euro and Japanese yen. This brought into being the first RMB derivative market outside China.

CNY-USD futures contract

January 2010–September 2010, USD/CNY



Sources: CME for futures contracts data; SAFE for middle price data.

(d) RMB non-deliverable forwards and options

The two most commonly used OTC and off-shore exchange rate derivatives are non-deliverable forwards (NDF) and options (NDO).

1.3 Interest rate derivatives

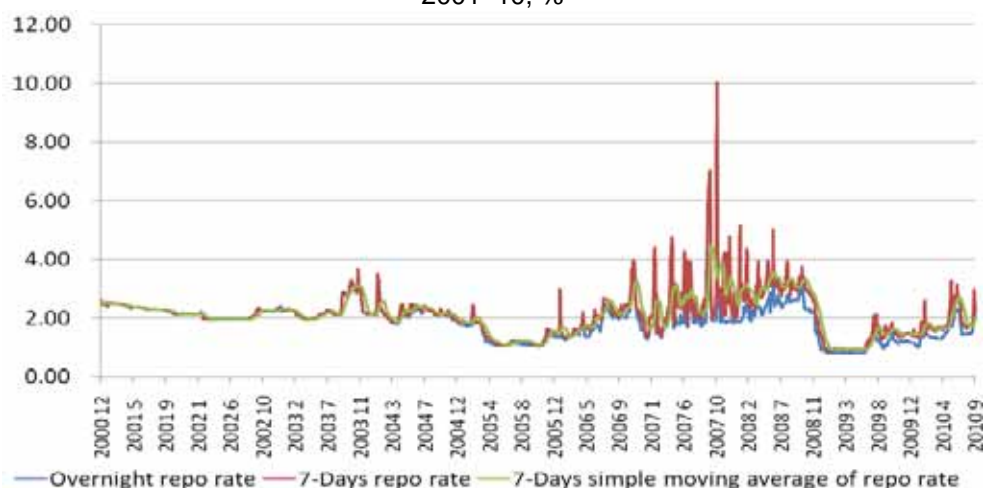
RMB interest rate derivatives can help financial institutions to smooth out fluctuations in these key economic indicators.

(a) RMB bond futures

A pilot scheme for government bond futures was introduced in December 1992 but was later suspended. Futures trading was restarted in June 2005 in the interbank lending market.

Interbank repo rate in China

2001–10, %



Source: China Foreign Exchange Trading System.

(b) RMB interest rate swaps

In February 2006, the PBC announced a pilot scheme for RMB interest rate swap transactions, which greatly promoted the development of this instrument in China.

(c) RMB exchange rate swaps

In August 2007, the PBC announced guidelines for foreign exchange swaps, which opened the way for the Chinese yuan to be swapped against the US dollar, the euro, the Japanese yen, the Hong Kong dollar and sterling in the Chinese interbank foreign exchange market. Such exchange rate swaps are widely used in the interbank market.

(d) RMB forward rate agreements

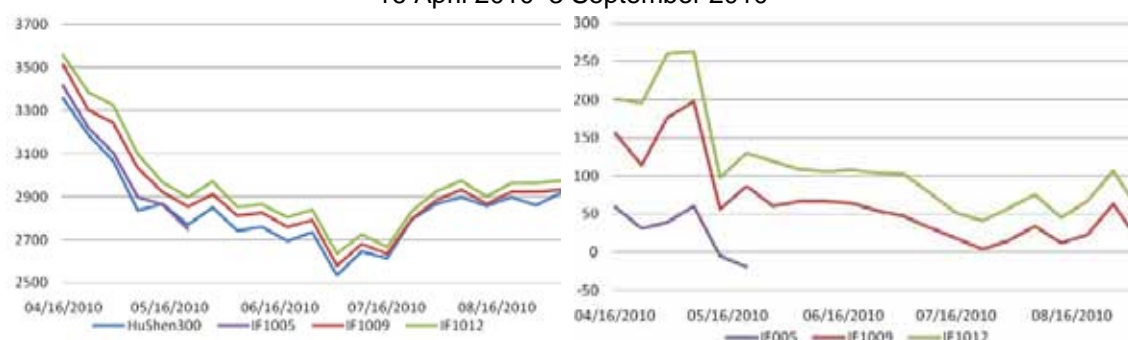
In October 2007, the PBC further authorised SHIBOR-based RMB forward rate agreements.

1.4 Equity derivatives

In February 2010, the China Securities Regulatory Commission officially approved the HuShen300 stock index futures contracts and business rules on the China Financial Futures Exchange, and HuShen300 stock index futures contracts were first traded on 16 April.

Closing price and difference of the stock index and stock index future

16 April 2010–3 September 2010



Source: China Foreign Exchange Trading System.

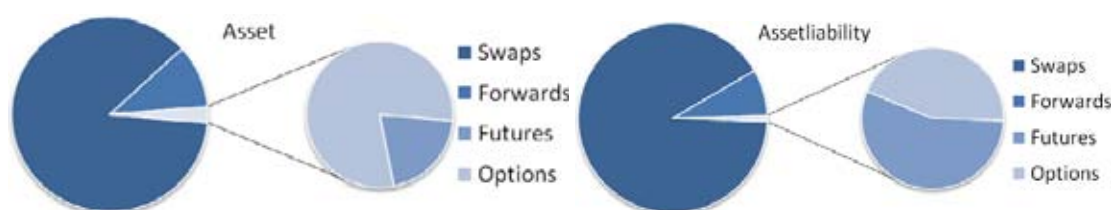
2. Utilisation of financial derivatives by China's commercial banks

China's banking sector has made great progress in line with the vigorous development of the financial markets and the economy.

- China's commercial banks have generally adopted modern capital structures. Some 16 institutions have completed IPOs.
- As of June 2010, the total assets of banking institutions in China stood at CNY 87 trillion, an 18.3% increase over the previous year.
- As of July 2010, deposits at national financial institutions amounted to CNY 69 trillion CNY, and loans to CNY 48 trillion.

Financial derivatives: share of Chinese bank balance sheets

June 2010; %



Source: People's Bank of China.

I believe that we can make two observations about the use of financial derivatives in China's commercial banks:

1. **They are widely used:**

- (a) Financial derivatives are widely used in the day-to-day operations of large banks.
- (b) A broad range of financial derivatives is available.
- (c) Financial derivatives are used for several purposes:
 - i. Not only for arbitrage.
 - ii. More banks are hedging risk exposures:
 - eg by managing the term of exposure to a specific bond; or
 - by adjusting the terms and currency of the balance sheet structure.
 - iii. In addition to own-account use, China's commercial banks are also providing widely used financial derivatives as financial products to meet the various needs of their customers.

2. **But represent a small share of the overall business:**

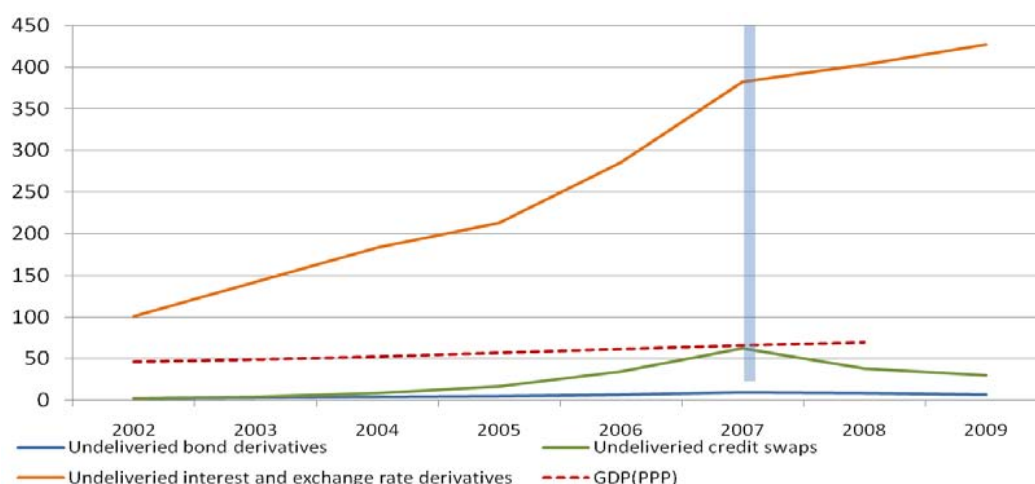
Financial derivatives transactions in China's commercial banks still represent only a small proportion of the overall business.

- (a) First, consider the total volume of global financial derivatives transactions.
 - i. According to ISDA statistics for OTC derivatives transactions, traditional interest rate and exchange rate derivative products have shown the most rapid growth, with the global total face value of the transactions increasing to USD 427 trillion in 2009 from USD 865.6 billion in 1987, representing an almost fiftyfold expansion over 22 years.

- ii. By the end of 2009, the volume of CDS had increased to USD 30 trillion, up from USD 918.9 billion eight years earlier, representing a thirty-threefold expansion.
- iii. The development of emerging equity derivatives trading is relatively slow, expanding less than threefold over seven years, from USD 2.5 trillion at end-2002 to USD 6.8 trillion in 2009.

Global derivatives market compared with GDP

2002–09; trillions of US dollars



Source: Derivatives data from ISDA Operations Survey 2010; GDP data from China Economic Net.

(b) Let us look at the total volume of financial derivatives transactions in China's banking sector.

i. Notional amount:

- Interest and exchange rate derivatives posted a volume of almost CNY 6.8 trillion in 2008 and 2009, and increased significantly this year. By the end of June, the total of interest rates and exchange rates derivatives had reached CNY 9.7 trillion.
- The USD 1.42 trillion derivatives market in China accounts for only 0.33% of the global market, which is worth about USD 427 trillion. Compared with China's share of global GDP, China's banking sector is obviously very cautious in its use of derivatives, and there is still much work to do.

ii. Fair value:

Because of the financial crisis, by June 2008, the net value of derivatives was CNY 104.7 billion, which fell by half by the end of 2008, and dropped to zero by the end of 2009.

3. The use of financial derivatives by the Bank of China

The Bank of China (BOC) was founded in 1912, almost a century ago. In 2006, BOC successfully listed on the Hong Kong Stock Exchange and the Shanghai Stock Exchange, as the first Chinese commercial bank to complete an IPO both in mainland China and in Hong Kong. By the end of June 2010, the Bank's total assets and equity attributable to shareholders amounted to CNY 9.7 trillion and CNY 567 billion, representing an increase of

11% and 4% from the prior year-end respectively. The Bank achieved a profit after tax of CNY 54.4 billion, an increase of 26%. Return on average total assets (ROA) and return on average equity (ROE) were 1.18% and 19.79% respectively, an increase of 0.04 and 2.40 percentage points. As an international bank, BOC has pioneered the use of derivatives in China's banking sector. According to BOC's 2010 interim report, the notional amount of its derivatives exposure is as follows:

- As of end-June, the total is CNY 2.68 trillion, about one fourth of the total for all financial institutions in China.
- The derivatives are mainly exchange rate-based, with interest rate derivatives as the runner-up.

Bank of China has a comprehensive and rigorous risk management policy that complies with the New Basel Capital Accord and the "Guidelines on the Risk Management of Commercial Banks" issued by the China Banking Regulatory Commission.

Specifically, for the trading account:

- BOC monitors overall risk exposures and limits, as well as carrying out stress testing and trade tracking daily.
- Uses VaR (value-at-risk) to estimate the maximum potential loss in a specific holding period on a group-wide basis.
- Backtests on a daily basis with a view to improving the accuracy and reliability of its models.
- Stress testing is used to supplement the VaR based on scenarios that subject the group's trading profile to extreme market conditions.

Derivative financial instruments

CNY millions

	As at 30 June 2010			As at 31 December 2009		
	Contractual/ notional amount	Fair value		Contractual/ notional amount	Fair value	
		Assets	Liabilities		Assets	Liabilities
Exchange rate derivatives						
Currency forwards and swaps, and cross- currency interest rate swaps (1)	2,094,011	25,501	(17,361)	1,629,325	20,810	(12,353)
Currency options	7,011	60	(20)	4,331	16	(14)
Subtotal	2,101,022	25,561	(17,381)	1,633,656	20,826	(12,367)
Interest rate derivatives						
Interest rate swaps	531,339	7,919	(10,859)	459,885	6,213	(9,404)
Interest rate options	2,532	-	(105)	839	-	(4)
Interest rate futures	8,253	9	(7)	1,958	6	(3)
Subtotal	542,124	7,928	(10,971)	462,682	6,219	(9,411)
Equity derivatives	8,151	165	(137)	4,548	102	(106)
Commodity derivatives	31,609	1,656	(1,434)	20,611	1,224	(915)
Credit derivatives	543	3	-	3,482	143	(424)
Total	2,683,449	35,313	(29,923)	2,124,979	28,514	(23,223)

Trading book VaR by risk category

USD millions

	For the six month period ended 30 June					
	2010			2009		
	Average	High	Low	Average	High	Low
Bank trading VaR						
Interest rate risk	5,00	9,88	2,19	5,18	9,22	1,59
Foreign exchange risk	1,09	2,78	0,23	0,81	5,27	0,20
Volatility risk	0,12	0,61	0,01	0,45	2,82	0,03
Total Bank trading VaR	4,74	10,29	1,87	5,28	9,51	1,68

Source: Bank of China 2010 interim report.

4. Some views on financial derivatives

Generally speaking, criticism about derivatives in the financial crisis has focused on the following aspects:

1. Derivative transactions are too far divorced from the real economy, and the transaction chain is too long and complicated.
2. Highly leveraged, which has resulted in the explosive expansion of trading.
3. Fair value accounting has also attracted criticism, to the effect that FVA fuelled the crisis.

(a) Difficulties in measurement:

- i. Measurement of “fair value” depends on market quotations, ie the “mark to market”. However, in the financial crisis and other exceptional circumstances, this may give a misleading view of the intrinsic value of financial assets.
- ii. Lack of active market prices: when no actual market value can be referenced, the measurement of fair value is forced to rely on “mark to model”.
 - However, the more complex the mathematical model, the more severely the valuation depends on parameters, and estimates of such parameters are always very subjective.
 - In addition, mathematical models are always based on a hypothesis that simplifies reality. Ultimately, the hypothesis undermines the validity of the model. The efficient market hypothesis and the investor rationality hypothesis are just two examples.

(b) Procyclicality

During boom times, FVA reinforces the effects of greed to create asset bubbles, adding fuel to an already overheated economy. In a recession, FVA accentuates the downturn in the economy, creating a black hole for assets and fomenting investor panic.

In response, the International Accounting Standards Board has issued IFRS 9 to replace IAS 39, with the aim of improving the classification and measurement of financial instruments. Looking ahead, I think that problems remain to be solved and further development is required.

In conclusion, my thoughts about financial derivatives are as follows:

1. Derivatives are inevitable, and will certainly see much greater development in the future.
2. As fear is bred by the unknown and risks from uncertainty, financial practitioners, especially regulators, should adapt their strategy to the challenges outlined above.
 - (a) On the one hand, the speed of innovation in exotic derivatives must be restricted to a safe pace. More attention needs to be paid to product pricing, risk measurement, disclosure, and the way products are used. On the other hand, the design and use of financial derivative products needs to relate closely to the real economy, so that derivatives transactions don't become an end in themselves.
 - b) Stronger disclosure is important, so that investors are fully informed about the transactions they enter into.
3. Financial derivatives have been widely used in China in line with the reforms and economic growth of recent years, but much work remains to be done in the areas of how derivatives are actually used and the related institution building. If the financial crisis has exposed the development of financial derivatives in western financial markets as somewhat too rapid, the situation in China is quite different.