



Determinants and price discovery of China sovereign credit default swaps



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ABSTRACT

We study the determinants of levels and changes of sovereign credit default swap (CDS) spreads in China from January 2001 to December 2010. Both country-specific factors (such as the China stock market index and the real interest rate) and global factors (the U.S. S&P 500 stock option volatilities and default spreads, and the non-North America global stock market factor) have significant explanatory power on CDS spreads in terms of both levels and changes. China's domestic economic factors were more relevant in explaining the CDS spread levels and changes in the earlier years, while the impact of global factors has become increasingly important in recent years, particularly during the global crisis. Within a vector autoregressive (VAR) model controlling for exogenous variables, we find that China sovereign CDS spread changes lead stock returns.

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1. Introduction

For the past three decades, the Chinese national economy has demonstrated impressive economic growth, and has now surpassed Japan to become the second largest economy in the world. The substantial economic growth of China has been attributed in large part to the results of market-oriented economic reforms from a socialist regime started in late 1978. As China has opened up to the world, it is likely that its economy has become more closely linked to global economic forces, and the market prices of its securities better indicators of their underlying values. We seek to determine whether, as a result, the country default risk can now be priced better and measured more accurately than before.

One approach to measuring the default risk of a country is by analyzing the pricing of its sovereign credit default swap (CDS). The sovereign CDS market has become important in more recent years globally, especially for emerging countries where sovereign risk is an important indicator to foreign investors in assessing risks of their foreign direct investment and portfolio investments.

In this paper, we have two objectives. First, we investigate the determinants of China sovereign credit default swap spreads. Second, we investigate the price discovery role of China's sovereign CDS on its stock market movements. The results enable us to better understand factors underlying observed CDS behaviors in China and the extent to which the Chinese economy is integrated with the world economy. In particular, we conduct both level analysis and changes of default swap premiums on key variables suggested by economic theory.

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The credit default swap is the simplest type of credit derivatives that offer protection against the credit or default risk of bonds or other types of loan arrangements. The CDS buyer makes periodic payments to the protection seller over the life of the swap contract in exchange for compensation if default or some other credit event specified in the contract occurs. In a well-functioning financial market, the price of the CDS (i.e., the CDS spread) reflects the riskiness of the underlying event. As noted by [Mengle \(2007\)](#): “After inception, the value of the CDS will depend mostly on changes in credit quality as reflected in current credit spreads.” (p. 14) And, with respect to the protection offered, several authors have noted the insurance-like aspect of credit default swaps ([Gibson, 2007](#); [Nelken, 1999](#); [Tett, G., 2006](#)). This characteristic of credit default swaps is apparent in view of the relative spreads observed on instruments associated with the so-called ‘BRIC’ (Brazil, Russia, India and China) countries:

“Japan’s five-year credit default swaps—insurance that bond traders buy against the risk of default—are trading at just over 100 basis points, meaning it costs \$10,160 a year to insure \$1 million of Japanese government debt for five years . . . Insuring the same amount of Ireland’s debt costs \$61,600 a year.”

Bloomberg Business Week

March 28–April 3, 2011, p. 15

This new class of assets is designed to trade credit risk on a variety of corporate and sovereign names with a wide range of maturities.

The CDS was an important financial innovation in the late 1990s and the credit derivatives market has experienced phenomenal growth since then. At the end of 1996 the CDS market size was only around \$40 billion in nominal value. By the end of 2007, the nominal value of all outstanding CDS contracts had reached \$62.2 trillion. After the financial crisis in 2008, the outstanding CDS notional amount shrank to \$31.22 trillion as of mid-2009 due to market consolidation.

The credit derivatives market is primarily comprised of two sectors: the corporate sector, accounting for 80% of the market, and the sovereign sector, accounting for 20% of the market and mostly composed of credit derivatives on emerging sovereign bonds.³ The most active participants in the credit derivatives market include banks, insurance companies, pension funds, hedge funds and other asset managers.

The increased attention to hedging emerging market sovereign risk has fueled the evolution of the sovereign credit derivative markets. Similarly, other derivatives on hedging the Chinese currency are also available. For example, RMB futures contracts are based on the relationship between the U.S. dollar and the Chinese renminbi and are traded at the Chicago Mercantile Exchange (CME) Group in the U.S., while the non-delivery forward contracts are actively traded in the U.S., Hong Kong, and Singapore ([Fung, Leung, & Zhu, 2004](#)). The emerging credit derivatives market took off during the second half of 1997. In particular, there is an active broker market for China’s sovereign CDS. While the debate around the transparency issue and counterparty risk associated with CDS has yet to settle, the number of studies regarding the valuation and information content of CDSs continue to grow.

The Merton-type structural model links the prices of credit instruments directly to the main determinants of the likelihood and severity of default, including financial leverage, volatility, and the risk-free interest rate term structure ([Merton, 1974](#)). [Collin-Dufresne, Goldstein, and Martin \(2001\)](#) find these variables useful in regressions for changes in corporate credit spreads. [Ericsson, Jacobs, and Oviedo \(2009\)](#) find that leverage, volatility, and the riskless rate are important determinants of corporate CDS premiums. The explanatory power of the theoretical variables for levels of default swap premiums is approximately 60%. The explanatory power for the differences in the premium is approximately 23%. [Chan-Lau and Kim \(2004\)](#) explain how Merton’s theory of firm can be extended to sovereign countries. In an analogous way, a country’s default risk should be inversely related to stock prices. If the relationship between CDS spreads and stock prices does not hold, capital structure arbitrage should eliminate mispricing.

Our benchmark results focus on determinants of China’s sovereign CDS spread for the period extending from January, 2001 to December, 2010. We examine how domestic factors such as China’s stock market returns and volatility, the real interest rate, the ratio of debts to GDP and global factors such as VIX, term structure slope, default spread and a financial shock dummy variable affect the behavior of CDS spreads. We run regressions on levels in CDS spread as well as for the changes of the spread. We find that both country-specific factors and global factors are important determinants of China’s sovereign CDS. In particular, the China stock market index, the real interest rate, the U.S. S&P 500 stock option volatilities, default spreads, non-North America global stock market, and the financial crisis dummy have substantial explanatory power in explaining both levels and changes of CDS spreads. We further split the sample to two sub-periods. Country factors appear to be more important than global factors to explain the CDS spread levels and changes in the earlier years, while global factors have become increasingly important in recent years, particularly during the global crisis.

Our second objective is to examine the extent of price discovery of China sovereign CDS spreads on the stock market price and the other way around. Most studies on credit default swaps focus on corporate CDS and they reveal that CDS prices lead stock prices during credit deterioration episodes at the firm and portfolio levels ([Fung, Sierra, Yau, & Zhang, 2008](#); [Zhang, 2009](#)). These CDS are either firm specific CDS or are indices that are compiled from firms. By nature, the sovereign CDS spread is a measure on a country’s aggregate financial health and is supposed to compensate investors in this financial instrument for bearing sovereign default risk of a country. This should be driven by a country’s economic fundamentals. A country’s stock market has long been viewed as its economic barometer. A bearish or highly volatile stock market conveys a negative message to investors on the

³ The National Association of Financial Market Institutional Investors backed by the People’s Bank of China started a trial of a new credit-mitigation derivative product like a credit default swap to help domestic investors buy and sell insurance against potential credit risks in China in October 2010 (*Wall Street Journal*, October 29, 2010).

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