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Moody's Analytics Asia Deep Downturn Scenario

Prepared by

Steven G. Cochrane
Steve.Cochrane@moodys.com
Chief APAC Economist

Jing Zhang
Economist

Contact Us

Email
help@economy.com

U.S./Canada
+1.866.275.3266

EMEA
+44.20.7772.5454 (London)
+420.224.222.929 (Prague)

Asia/Pacific
+852.3551.3077

All Others
+1.610.235.5299

Web
www.economy.com
www.moodysanalytics.com

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To investigate the implications of a severe downturn in the Chinese economy and financial markets, Moody's Analytics has constructed a deep economic downturn scenario using its new model of the global economy. The new model includes 64 countries in a single global model with linkages in international trade, financial markets, investment, capital flows, and foreign exchange rates.

Moody's Analytics Asia Deep Downturn Scenario

BY STEVEN G. COCHRANE AND JING ZHANG

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More specifically, the scenario assumes President Trump imposes higher tariffs on Chinese imports to the U.S., generating a sharp pullback in global investor sentiment. This causes global stock markets to decline and credit spreads in the bond market to widen, and triggers a collapse in real estate values.

Under this dark scenario, Chinese exports contract, the stock market plummets, balance sheets of banks and local governments worsen, and private and government investment spending falls sharply. After decades of growth, Chinese GDP contracts, with an accompanying pullback on imports and foreign investment that transmits the shock across the globe, pushing many other countries into recession as well.

Introduction

This paper attempts to answer a simple question: What would the economic fallout be of a Chinese hard landing on the economies of other Asian countries?

China is the world's second largest global economy and has risen as a key driver of global growth in recent years. China's influence on economies of other countries, especially within Asian markets, is becoming increasingly significant. Since 2000, exports to China increased from less than 10% to more than 20% of Asian exports. Financial linkages between China and other Asian markets are also rising as co-movements between Chinese asset returns and other economies are closer. As the world becomes more reliant on China, economic turbulence and a slowdown or recession in China will have larger spillover effects to the rest of the world, especially the Asian regional markets.

Conceptually, there are several channels through which shocks in China can be transmitted to other Asian countries, including trade, financial and psychological linkages. Countries with close trade ties to China will suffer the strongest contagion effects, as the Chinese demand for their exports shrinks. A slowdown in China will also weigh on the financial markets in Asian countries: China has been integrating with the global financial system in recent years at a fast pace, and hence a stock market crash in China will introduce investor fears and declines in other Asian stock markets. In addition, Chinese foreign direct investment and overseas bank loans have been increasing rapidly, and thus a slowdown in China will send negative shocks to investments in other countries. Also, concerns about the Chinese economic outlook will affect the global risk premium because of China's large contribution to global growth. This will cause other Asian markets to suffer from investors' risk aversion.

Methodology

We use the Moody's Analytics global model to study these spillover effects on Southeast Asian economies. The various linkages described above are modelled via the export equation, stock market price equation, interest rate equation, growth expectation equation, and investment equation. Moody's Analytics makes a number of assumptions for this scenario and incorporates these assumptions in the model. Then the model is solved to generate country forecasts.

In this scenario, a series of shocks in the U.S., including higher tariffs on imports from China, higher interest rates, and equity market turbulence, cause the Chinese economy to stumble. China soon enters a deep recession as a result of the combination of global risk and China's own problems such as overvalued housing markets, overcapacity in traditional manufacturing industries, high local and state government debts, and credit problems at commercial banks. The hard landing of the Chinese economy sends negative shocks to surrounding Asian markets and triggers a recession in these countries also. The next section provides details of the scenario assumptions for the U.S. and China. The following section describes the impact of a Chinese deep recession on Southeast Asian countries.

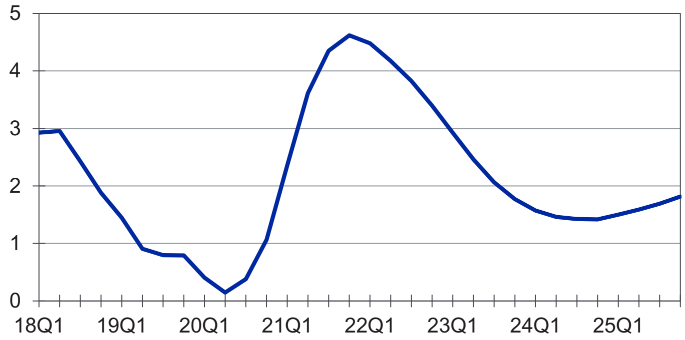
U.S. and China

In this scenario, a rise in volatility in U.S. financial markets starts in the third quarter of 2018 and lasts for about four to six quarters. U.S. stock market price indexes fall sharply, declining 25% peak to trough, with an accompanying hike in stock market volatility. This occurs as investors fear that the stock market is greatly overvalued and that the policies of the Trump administration on trade, healthcare and immigration will weaken the economy. The U.S. government puts higher tariffs on Chinese imports. Consumer confidence plummets, and oil prices plunge. Yields on 10-year Treasury bonds rise by 100 basis points because of the concern that deficits will rise greatly. The weakening consumer and investor confidence and higher interest rates cause housing markets to contract, and house prices fall by 10% peak to trough. As a result, the year-over-year growth rate of U.S. real GDP declines from around 2.9% in early 2018 to less than 0.5% in early 2020 and then it starts to recover (see Chart 1).

These events in the U.S. trigger a deep recession in China. Chinese exports contract significantly as a result of the higher tariffs imposed by the U.S. Chinese exports start to decline in the third quarter of 2018 with a peak-to-trough fall of around CNY650 billion. Chinese stock markets fall sharply as a result of a combination of the weakening export sector, the ripple effect of the U.S. equity market turmoil, and the declining confidence among consumers and investors. The higher tariffs will hurt China's manufacturing sector, especially for durable goods such as computers, broadcasting equipment and telephones, which are China's top exports.

Chart 1: U.S. Real GDP Growth

% change yr ago



Source: Moody's Analytics

In addition to the contracting export sector, another critical trigger for the Chinese recession is a real estate crash. House prices in Chinese tier-one and some tier-two cities have been growing apart substantially from values justifiable by fundamental economic drivers in recent years, and Chinese housing markets have been driven, in large part, by high financial leverage. Both the house price-to-income ratio and the house price-to-rent ratio—common measures to determine if housing markets are overheated—have been consistently rising to historical highs. In this scenario, the Chinese housing bubble bursts and house prices tumble 30% peak to trough as the overheated market unravels.

The housing market crash introduces severe consequences. First, since mortgage loans occupy a large proportion of portfolios, the balance sheets of Chinese banks are hurt significantly. The banking system enters a crisis and credit availability shrinks.

Second, the housing crash will hurt the balance sheets of local governments, as land is an important asset for local governments. This adds headwinds to already-large local government deficits. As a response, China reduces government spending as local governments have limited capacity to borrow to alleviate the fiscal pressure.

Third, Chinese stock markets plummet in the face of the housing crash, and capital flows out of China to safer markets, causing the Chinese currency to depreciate.

Fourth, private and public investments shrink considerably as a result of a surge in bank losses and local government deficits.

Fifth, firms respond by cutting production, further weakening labor market conditions. With deteriorating employment and income, households aggressively cut spending and the saving rate rises sharply.

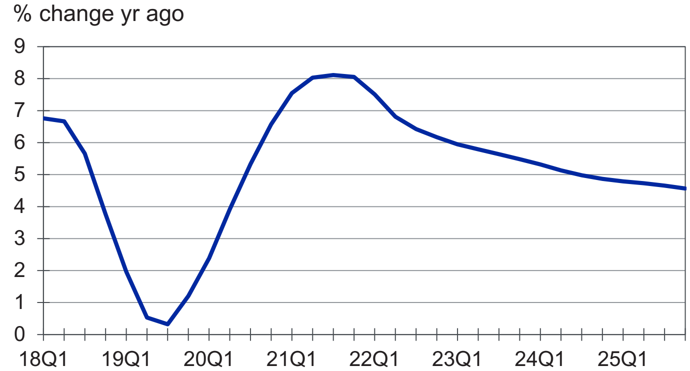
All of these factors—a contracting export sector, crashing housing markets, tumbling stock prices, a bank system crisis, rising local government deficits, shrinking investments, and a spiking household saving rate—reinforce each other and generate a vicious cycle that amplifies the deep and protracted recession in China (see Chart 2). In this deep slump, the year-over-year growth of Chinese real GDP falls from around 6.6% in early 2018 to around 0.3% in late 2019 before it starts to gradually recover.

Southeast Asian countries

The economic and financial turmoil in China sends shocks throughout Southeast Asia, resulting in a deep and protracted re-

Chart 2: China Real GDP Growth

% change yr ago



Source: Moody's Analytics

Table 1: Share of Exports to China of Total Exports in 2016

Indonesia	12%
Malaysia	13%
Philippines	11%
Singapore	13%
Thailand	11%

Sources: IMF, Moody's Analytics

cession in these countries as well. The magnitude of recession varies among these countries depending upon how closely they are tied to China and upon their own economic vulnerabilities. The Southeast Asian countries considered in this study are Thailand, Indonesia, Malaysia, Philippines and Singapore.

These Southeast Asian economies have different exposures to China via the trade and financial channels (see Table 1). All five countries export a significant share of their total exports to China, as of 2016, ranging from 11% to 13%. Thus, they will be noticeably hurt by a slowdown in China. Note that these export shares include only the direct trade linkage between each country and China. In fact, China will have further impacts through indirect linkages. For example, Malaysia also exports to Japan, Singapore and other markets. So when a negative shock occurs in China and Chinese imports shrink, it will hurt Japan and Singapore, and hence further reduce Malaysia's exports. In that way, China affects Malaysia not only directly by reducing the demand for imports from Malaysia but also indirectly by hurting Malaysia's exports through Japan, Singapore and other markets.

Co-movements of Southeast Asian financial markets are highly correlated with China (see Table 2). Correlation of stock market prices is calculated over two periods: the financial crisis sample period of 2006 to 2008 and a more complete sample period of 2002 to 2017. The high correlations indicate that stock market prices in these countries move closely with China, with Malaysia having the highest correlation, followed by Indonesia. Also, this co-movement was significantly higher during the 2006-2008 period precipitating the global financial crisis. These correlations provide insights on financial linkages but are not a measure of the causality and financial spillover effect from China to other countries. This is because the co-movement could be the outcome of global shocks instead of the impact of shocks originated from China.

The financial spillover effect from China to other Asian markets has been confirmed by other papers using event studies. For example, Arslanalp et al. (2016)[1] examined the reaction of Asian countries' stock markets on January 4, 2016, when the Chinese stock market price fell. In this way, they disentangled the China-specific stock market shocks from the global market shocks. During this event, stock markets of the largest Asian economies, including the countries in the Moody's Analytics study, moved in the same direction as China.

The financial and economic linkages transmit the deep recession in China to Southeast Asian markets, generating a number of negative shocks. First, as Chinese demand for imports contracts, the export sectors in Southeast Asian markets are hurt. Each country's export-oriented industries will be affected quickly, such as computer and vehicle manufacturing in Thailand; integrated circuits and refined petroleum production in Malaysia; integrated circuits and computer manufacturing in Philippines; palm oil, coal briquettes and petroleum in Indonesia; and integrated circuits and refined petroleum in Singapore.

Second, the financial markets will react immediately to the Chinese stock market turbulence due to investor risk aversion. Capital flows out of these markets to safe harbors such as the U.S. and Germany, causing currencies in the Southeast Asian countries to depreciate sharply.

Third, foreign direct investment inflows to the Southeast Asian markets

1 Arslanalp et al. (2016), "China's Growing Influence on Asian Financial Markets," IMF Working Paper, WP/16/173.

Table 2: Stock Market Price Correlation With China

	2002-2017	2006-2008
Indonesia	0.57	0.93
Malaysia	0.60	0.94
Philippines	0.53	0.88
Singapore	0.73	0.81
Thailand	0.45	0.60

Source: Moody's Analytics

from China fall and contribute to a negative shock on investment.

Fourth, loan default rates go up and banks start to tighten lending standards, causing credit availability to plunge in Asia.

Fifth, government balance sheets deteriorate and infrastructure investments decline, therefore worsening the already-poor quality of infrastructure in the emerging Asian countries, especially in Philippines, Indonesia and Thailand.

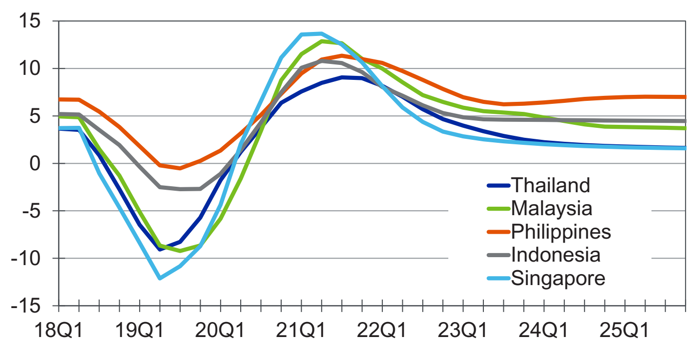
Sixth, 10-year government bond yields rise as government debt increases, causing a further pullback in investment.

Finally, Asian firms respond by cutting production and investment, causing labor market conditions to deteriorate and unemployment to rise, and households to cut expenditures and raise saving rates, further weakening the economic and financial markets.

The combination of declining trade, financial market turmoil, tightening credit conditions, deteriorating investment and production activities, and worsening employment conditions results in a deep recession

Chart 3: Southeast Asia Real GDP Growth

% change yr ago



Source: Moody's Analytics

in Southeast Asia. In this scenario, real GDP growth rates in the five Southeast Asian countries plummet in late 2018, reaching a bottom in mid- to late 2019 with year-over-year growth rates declining by around 7 to 15 percentage points peak to trough (see Chart 3). Among them, Singapore has the deepest recession, followed by Malaysia and Thailand, and then Indonesia and Philippines.

About the Authors

Steven G. Cochrane is managing director of Moody's Analytics, where he directs the research and development activities of the economic research staff. Steve's research specialty is regional economics and he manages the U.S. and global regional forecasting services. Steve also edits the Regional Financial Review, the firm's monthly publication that analyzes U.S. macro, regional, industry and international trends. Steve has been an analyst with Moody's Analytics since 1993. He earned a PhD in regional science at the University of Pennsylvania and is a Penn Institute for Urban Research Scholar. Steve earned a master's degree at the University of Colorado at Denver, and a bachelor's degree at the University of California at Davis.

Jing Zhang is an economist at Moody's Analytics. She is responsible for country and global economic forecasting models. She also developed house price models for U.S. and European countries at both national and subnational levels. She has published research papers in academic peer-reviewed journals. She earned a PhD in economics from Ohio State University, and a BA in economics and a BS in mathematics from Wuhan University, China.

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