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Special Column on RMB Exchange Rate

Perspectives on the RMB Depreciation under the New Exchange Rate Formation Mechanism*

By TU YONGHONG*
Translated by LIAO YIQI**

The RMB depreciation this year is a result of the dual factors of regime transition and market projection. The fundamentals of China's economy remain unchanged, and the short-term devaluation trend will be reversed soon. A transparent and managed floating exchange rate system is favorable for the market to adjust the balance of payments, and endowed the central bank with more independence in making monetary policies. The system also helps to improve China's macroeconomic management capabilities, and provides institutional guarantee to a stable and robust economic growth.

Keywords: Exchange Rate Formation Mechanism, Reform, RMB, Depreciation

In August 2015, after China implemented reform on the exchange rate formation mechanism, RMB exchange rate saw flexible two-way fluctuations and showed a depreciation tendency with occasional depreciations, which sparked market concerns. What is the correlation between this round of devaluation and the exchange rate reform? Will RMB continue depreciating? Should investors exchange RMB for foreign currency to ensure higher profits in overseas investment? Will China's economy be debilitated as a result? Questions like these have become the most contentious topics in the society. This paper holds that the RMB depreciation this year is a result of the dual factors of the regime transition and market projection. The

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* This paper first appeared on *Theoretical Horizon*, No.11, 2016, and is one of the mid-term research results of *Prevention and Resolution of Economic and Financial Risks* under the Marxist Theoretical Research and Construction Project
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fundamentals of China's economy remain unchanged, and the short-term devaluation trend will be reversed soon. A managed floating exchange rate system is favorable for the market to adjust the balance of payments, and endowed the central bank with more independence in making monetary policies. The system also helps to improve China's macroeconomic management, and provides institutional guarantee to a stable and robust economic growth.

1. RMB depreciation attracts wide attention

Exchange rate is the barometer of international economic activities. The fluctuations of exchange rate are reflection of trade and capital movements, and also an important means of adjusting the balance of payments. As the home currency of the second largest economy and the largest trading country, RMB's depreciation and appreciation have direct implications on importers and exporters, investors, wealth managers and overseas tourists, and could spill over to the economies of China's major trading partners. After a decade of unilateral appreciation, RMB is experiencing a turn of depreciation in 2016. Statistics from China Foreign Exchange Trade System (CFETS) shows that CFETS RMB Index on Oct 31, 2016 is 94.22, depreciated by 6.72% compared with the level of 100.94 at the start of the year. RMB's central parity rate against the U.S. dollar at the same period is 6.7641, devalued by 3.86% this year. On the contrary, driven by the recovery of the U.S. economy and the expectation of an interest rate increase on December, the dollar index is increased by 3.12% in October, a new yearly high, causing huge amounts of capital to flow back to the country. Under this impact, China saw an increase of the flight of arbitrage capital, and the foreign exchange reserves dropped from $3.5 trillion in August 2016 to $3.2 trillion in October 2016, a 9.4% decline in merely two months.

This year, many uncertainties were added to the international financial landscape. Brexit and the Fed's rate hike make the U.S. dollar a safe-haven currency, with the dollar index continuously rising and fully recovered from the drop after 2008 crisis. Meanwhile, panic swept China's domestic market and rumors of RMB depreciation began to spread. To control risks and make speculative gains, some companies and individuals shunned the restrictions on foreign exchange and move out of RMB into the U.S. dollar with haste. Needless to say, such arbitraging behaviors increased the prospect of RMB's depreciation and eventually made it become a reality that might otherwise not have been the case.

A small stone could make a big splash. The changes of RMB exchange rate is in the interest of many people and has become a public concern both at home and

abroad. Some believe that china's economy is losing its steam in the new normal era; RMB depreciation and large scale of capital flight coiled up into a vicious cycle. Pessimists predicted that the exchange rate between the dollar and RMB would be up to 1: 7.5. Others held that the trend of capital flight propelled by the Fed's rate hike and Brexit is ebbing, indicating the RMB depreciation is on a brake and the exchange rate against the U.S. dollar would not exceed the level of 6.82. More concerns were about the economic implications brought by the currency depreciation. Questions are amounting, for example, will RMB depreciation push up the prices of imported goods? Will prices of consumables like food and oil exacerbate inflation and squeeze people's real income? Will the depreciation give impetus to the rich to transfer their wealth from home to abroad and add more stress to the already sluggish private investment, and as a result, undermine the driving force of the economy and make it harder to create jobs? If the RMB continues to depreciate, should people exchange RMB for foreign currency to retain the value of their assets? An even more severe concern is the effects caused on the real estate market by the large-scale capital flight. Is there a possibility for a liquidity crisis to happen again as it did in 2013 and would there be a financial turmoil as a result? What's more, some foreign financial institutions and media hold a bearish view on China, expecting to make a short-sell of RMB for their own benefits. Several foreign scholars even accused China as a currency manipulator who adopted a begging-thy-neighbor strategy to facilitate export by devaluing the currency.

Since the U.S. presidential campaign ended up with a conservative administration, China's trade surplus with the U.S. is likely to be narrowed down. Expectations of the Fed's rate hike this December can lead to a new round of capital flight from China. If that is the case, will RMB continue depreciating and reach the level of 7? How can China's economy maintain its robustness and stability under a more flexible and risky exchange rate regime? To find answers to these questions, we need to figure out the evolution of formation mechanism of RMB exchange rate.

2. A more reasonable, transparent and market-based formation mechanism of RMB exchange rate

Exchange rate is the price of a home currency offered to foreign-currency holders, and it is the most important market-adjuster in an open economy. History showed that China's fast rise and economic miracles are indebted to its fundamental policy of reform and opening up. Unlike many other emerging economies, China adopted a gradual schedule to implement reform and opening up, rather than trying to achieve the ultimate goal once and for all. The reform of exchange rate is no exception.

China has had four rounds of exchange rate reforms, achieving the transition from a fixed exchange rate regime under strict FX restrictions to a managed floating rate regime based on market supply and demand. It took 21 years for China to improve the RMB exchange rate system and formation mechanism, and to realize the goal of a market-based exchange rate.

The first round of reform set up the floating system. In order to deepen international division of labor and share the globalization dividends, China abolished its long-time state distribution system of foreign exchange reserve on January 1994, implemented a system for the settlement and sale of FX under current accounts, aligned official and swap center rates and set up a market-based, unified, managed floating system. The reform abolished the multiple exchange rate and established a unified exchange rate system in which the central bank managed the exchange rate with reference to the daily trading band and the central parity rate. China, at that time, faced with reforms in SOEs, operation mechanisms and administration structures, needed to control risks from exchange rate fluctuations and build a favorable exterior environment for economic accounts. Uncertainties in foreign exchange amounted after 1997 Asia financial crisis and China's WTO entry in 2001. To minimize the negative impact to the vulnerable economy caused by fluctuations of exchange rate, the central bank strengthened its regulation in exchange rate. The daily trading band width was less than the 3‰ range, and the annual fluctuation of central parity rate is about 1%. The highly stable RMB exchange rate was seen by IMF as an indicator for a conventional fixed peg exchange rate arrangement.

The second round of exchange rate reform introduced the market-determined mechanism. After China’s entry into WTO, export and FDI were gaining rapid growth, the international balance of payments improved greatly and the foreign exchange reserve doubled within 3 years. Western countries accused China of undervaluing RMB and pressed China to revalue the currency. The cost of stabilizing exchange rate was getting higher. The central bank was forced to buy FX reserves from the market, which increased the money supply and inflation pressure, and undermined the Chinese government’s macro-economic management capability. To permit a greater role for market forces in determining the RMB exchange rate and to allow exchange rate to perform its function in adjusting international balance of payments and to maintain independence in making monetary policies, measures have been taken since July 21 2005 by the central bank in reforming the exchange rate formation mechanism. Market-maker system was introduced and the five state-owned banks, 14 stock-holding banks and 7 foreign banks, with Standard Chartered Bank, Citi Bank, HSBC and Deutsche Bank included, were designated as

the market makers. This round of reform established a market-based pricing mechanism in determining RMB central parity rate, allowing the value of RMB to fluctuate based on market supply and demand. To avoid following a Japanese-style hollowed-out economy induced by the yen's sudden revaluation, and to avoid repeating the history of Japan's "Lost Decade", the PBoC still kept timely intervention in the exchange rate market to ensure a gradual appreciation of RMB.

The third round of exchange rate reform widened the daily trading band and added flexibility. After the outbreak of 2008 financial crisis, global economic and financial framework has changed in many dimensions. After the Fed's QE policy led to the devaluation of the U.S. dollar, to mitigate exchange losses, China embarked on RMB internalization in 2009. Meanwhile, China became the driver of world economy. Large amounts of capital gravitated to China due to the high rate of return on investment, driving the FX reserve up to $ 3.9 trillion and fuelling the expectation of RMB's appreciation. On June 19 2010, the central bank kept improving the exchange rate formation mechanism and made the exchange rate more flexible. Dynamic management and adjustment on the fluctuations of RMB exchange rate were implemented, expanding the daily trading band against the U.S. dollar from 3‰ to 5‰, and the trading band against the euro and yen to 1%-3%. The band against the U.S. dollar in 2012 and 2014 was expanded to 1% and 2% respectively. With increasingly flexible exchange rate, trade in FX market became more active, the market became more effective in discovering price, and exchange rate played a greater role in adjusting import and export as well as capital flows. The continuing trend of RMB's appreciation prodded China's trade structure to upgrade and transform, with low-value-added export processing trade decreasing year by year and the international balance of payments improving. Trade surplus in current accounts dropped from 10% in 2007 to 3% in 2015. China's economy no longer over relies on exports, but is mainly driven by domestic demand and consumption.

The fourth round of exchange rate reform has freed the central parity rate from intervention. The Third Plenary Session of the 18th CPC Central Committee highlighted the policy of comprehensively deepening reform which asked for a decisive role of market in resource distribution. To better use the domestic and overseas markets and to better mobilize the resources at home and abroad, so as to improve the operating efficiency of the economy, the RMB change rate must be able to timely and accurately reflect the demand and supply of FX market and play the role of adjusting international payments of balance. In particular, RMB internalization is faster than expected, and RMB is very likely to be included into the SDR basket. The international community wishes china to follow the rule and

custom of a floating exchange rate regime. Against this backdrop, on 11 August 2015, the PBoC updated the RMB exchange rate formation mechanism once again and stipulated a market-based central parity rate system in which the market-makers decided the rate with reference to the closing rate in the previous day and changes in the currency basket. To increase the transparency of the process, the China Foreign Exchange Trade System released the CFETS index and RMB exchange-rate index with reference to the Bank for International Settlements (BIS) basket and the SDR basket, to better illustrate the currency formation and the weights of each currency in the basket. China Monetary Policy Report Quarter 1 in 2016 elaborated the updated central parity rate system and clarified how the central parity rate is determined. The central parity rate on day T equals the closing rate on day T-1 plus risk filtration coefficient β× (hidden central parity rate on day T minus the central parity rate on day T-1). In the formula, the closing rate is determined by the market demand and supply, and the hidden central parity rate means the adjustment of RMB/USD exchange rate in a bid to maintain stability of the RMB exchange rate against the currency basket. In cases of abnormality, the central bank can choose different β value to filter the risks induced by over-fluctuations of exchange rate. Market-makers can release the central parity rate with reference to changes in the CFETS basket, the BIS basket and the SDR basket. With this round of reform, the RMB exchange rate fulfilled its marketization goal and a transparent and improved formation system consistent with international standard was established. RMB has been unpegged from the U.S. dollar and began to change with reference to the currency basket. That is, China provided an institutional guarantee which allows the RMB to fluctuate independently from the dollar and other currencies and increases RMB's role as a major currency in international trade and capital flow and other activities of payments and transactions.

3. Three causes behind the short-term RMB depreciation

Under the new exchange rate system, the exchange rate will be determined by the market supply and demand and will be free from the interventions from the central bank, unless there occur any abrupt or unusual incidents, say, international financial crisis, natural disasters or large-scale speculation impact and other incidents that might threaten China's economic and financial security. According to the exchange rate formation principles and empirical studies, short-term exchange rate has a special formation mechanism, usually irrelevant with the economic fundamentals, but is determined by information channels, capital movements in the short term and market expectations, among which the direction and scale of capital flows are the

most deciding factors.

In 2016, international financial market has experienced a string of accidents which escalated capital movements and brought volatilities to the FX market. Many countries of the G20 saw their currencies fluctuate in a wide margin, with exchange rate changes exceeding 3% of the daily trading band and some currencies rising or dropping by more than 10%. On Oct. 2016, RMB dropped by 1.28% against the U.S. dollar; the euro, Japanese yen and British pound depreciated by 2.05%, 3.02% and 4.67% respectively vis-à-vis the U.S. dollar; the Russian ruble, Singapore dollar, South Korean won, Turkish lira depreciated by 1.75%, 1.87%, 3.74% and 2.43% respectively vis-à-vis the U.S. dollar. Though RMB depreciated in general this year and fluctuated in a wider margin than before, it still remains to be the most stable currency compared with other major currencies and currencies in other emerging markets. Objectively, RMB's depreciation is an inevitable outcome resulted from three factors.

First, international balance of payments came to a new phase, and market expectations reversed. Experience showed us that economic structure adjustment can take a long period of time during which economic slowdown is a frequent corollary. At present, China's economy is still amidst economic structure adjustment and is faced with de-capacity, de-inventory and de-leveraging tasks. Besides, investment and export lost their steam, new drivers are yet to take shape, and pre-existing market expectations propping up the economy now dissolved. In 2015, the situation of dual surplus in both current and capital accounts lasting for more than 20 years in China is changing. The capital accounts experienced a deficit and China becomes a net exporter of capital, China's ODI in 2015 ranked the third in the world. The changes in international payments of balance and the large expenditure accompanying One Belt One Road initiative changed the FX supply and demand and reversed the market expectations and caused a sell-off of RMB.

Second, the RMB follows a new floating exchange rate regime, and currencies in the basket depreciated against the U.S. dollar. The exchange rate reform on August 2015 stipulated that the market-makers will set the RMB central parity rate with reference to the closing rate and changes in the currency basket. Therefore, despite the pressure for RMB to appreciate considering China's trade surplus with the U.S. and the dollar oversupply in the FX market, as long as the weighty currencies in the CFETS basket depreciate against the U.S. dollar and depress the RMB index which is calculated based on the basket, the central parity rate of RMB will depreciate against the U.S. dollar as well. Since Brexit happened last February, uncertainties amounted in the UK market and the British pound plummeted to a record low since

1985. In particular, after Britain announced on June its decision to trigger Article 50 on March 2017, the market forecast indicated that the UK economy in Q3 2016 will suffer a hard hit and the British pound is very likely to see a further drop. Financial institutions in London, the largest international finance center with the utmost capital-mobilizing power in the world, embrace the U.S. dollar as a haven asset, making the British pound more sluggish. The Brexit event, triggered by the European refugee crisis and the EU refugee policies, and has exacerbated the situation. What's more, the prospects on European market get even gloomier with fear that Brexit could lead to a domino effect, attracting Italy to follow suits. The euro was sold off, and capital flooded into the U.S., lifting the U.S. dollar index to a new high since 2008. The U.S. economy seems to be resilient, as shown by economic indicators. The Fed is expected to raise the interest rate within this year. Emerging countries saw capital flight with arbitrages and speculations, and depreciations of the ruble, the Ringgit and the lira. Under the impact of the declining index of the CFETS RMB index, RMB also shows signs of depreciation.

Third, self-correction of the previous distorted exchange rate and technical adjustment. Since 2005, the interest rate of RMB remains higher than that of the U.S. dollar, with a 3%-5% spread. According to the interest rate parity, RMB is supposed to have depreciated against the U.S. dollar by 3%-5%. However, China's capital control constraints the free flow of short-term capital, and thus stems the arbitraging capital. In addition, with the RMB becoming the haven asset in the financial crisis and with RMB internalization process gaining steam, RMB didn't depreciate, instead, it kept appreciating at a slight pace year by year, accumulatively up by 20% in the last decade. Benefitting gains from the interest spread plus profits from the RMB appreciation, international investors received a favorable 8% rate of return, as a result, more and more arbitrage capital flooded in China. After China opened up the capital accounts in Free Trade Zones (FTZs), RMB can be used more freely than ever. In particular, since the improvement of exchange rate formation mechanism in 2015, the distorted exchange rate was corrected and the free lunch era was ended, meaning that investors can no longer expect to get risk-free benefits. After a long-term appreciation, RMB exchange rate is in need of technical adjustment to return to a reasonable level consistent with the interest rate parity theory. Such adjustment to some extent increased the expectation of RMB's depreciation, inducing speculators to jump on the bandwagon to convert RMB to foreign currencies for a quick buck. After one year for the depressing pressure to be dissolved, there is no basis for RMB to further depreciate.

4. The back-up force for RMB remains strong.

In theory, short-term exchange rate is always converging toward the long-term rate trend; deviation, if any, won't last long. The long-term exchange rate in turn depends on purchasing power, or economic fundamentals. Countries with robust economic growth usually saw a concomitant of strong currencies with higher purchasing power and long term appreciation trend. Despite the fact that the CFETS RMB index dropped by 6.5% as of October this year, indicators of the macro-economy are in line with expectation and the economic fundamentals remain in good shape, therefore, the basis backing up RMB remains sound and solid.

First, China's economy fares well so far, steadily increasing the purchasing power of RMB. At the critical juncture of economic transformation and structural reform, China takes decisive measures in optimizing the resource allocation, encouraging innovation and technology development, nurturing green industries and strategic emerging industries. By boosting consumption and increasing the investment efficiency, China maintained a medium-to-high growth rate. The growth rate of the previous three quarters in China is 6.7%, outperforming other G7 countries at the same period in which the U.S. enjoyed a 2.5% growth and the UK 2.1%. For emerging markets and economies, the growth rate is 4.3%.The IMF raised its 2017 growth forecast for China which still maintains prominent advantages compared with other developed countries and emerging markets and economies.

Second, China has improved its trade structure and maintained a steady surplus. The balance of payments in current accounts is the determining factor of long-term exchange rate. Usually, countries with trade surplus face the pressure of currency appreciation whereas countries with trade deficits are very likely to witness currency depreciation. With demographic dividends and cheap labor, China has maintained large trade surplus since 1994 when it opened up the currents accounts, with the export exceeding the import for so long a time. China even surpassed Germany and became the largest exporter in 2014. In the global context of economic slowdown and trade contraction, the U.S. and Japan saw a trade deficit in the first three quarters in 2016, whereas China's export-import value reached 17.53 trillion yuan. Though the number is 1.9% lower compared to the same period last year, the import saw a drop even further, which made for a 10% increase in trade surplus. What's more, China's competitiveness increased. High-value-added trade is increasing in share, amounting to 56% of the total trade in the first three quarters in 2016, a strong signal that China no longer serves as the cheap labor factory in the international trade chain. With the One Belt One Road initiative forging ahead, China has a broad prospect in international capacity cooperation. Industries such as high-speed

railways, electricity, telecommunication and infrastructure embrace tremendous opportunities; direct investments in countries along the belt and the road are in a rapid increase; trade led by Chinese transnational enterprises are gaining speed; the business mind and negotiating capacities of Chinese companies are improving. With these, China is shifting from a big trader to a great one. As long as China maintains the surplus in current accounts, and the capital outflows is lower than the surplus volume, the FX supply will exceed the FX demand in general, giving impetus for RMB to pick up.

Third, China is playing an increasingly prominent role in global governance, due to its rising economic strength and soft power. To mobilize the resources at home and abroad and to better utilize the home market and the foreign market, China broadened the scale of opening up. Leading by the success of FTZs in Shanghai, Guangdong, Tianjin, Fujian, China added another 7 FTZs on September 2016, exploring generally applicable practices and aligning the FTZs with international trade standard in modern manufacturing, hi-tech, commodity trade, logistics and cultural communication. In doing so, China actively participates in the making international rule that promotes global trade. At the G20 summit in Hangzhou, the participating leaders fully recognized the significance of infrastructure construction and the supply-side structural reform, and speak highly of Chinese practice and Chinese wisdom in boosting global economy. After One Belt One Road gained wide acceptance by the international community, China gained more say in global governance and global trade. The rising economic soft power strengthened China's international influence and intangible asset, and also provided political endorsement for a strong RMB.

Fourth, RMB becomes a major international currency, giving motives for foreign institutional investors to increase their RMB holdings. To increase the supply of public goods, and expedite the use of RMB, Chinese government has done tremendous work. In 2015, The first phase of Cross-border Interbank Payment System (CIPS) come into service, providing technical support for an efficient, convenient and safe settlement and payment of RMB, giving initial shape to the treasury yield curve and offering a price-setting benchmark for treasury trade, and promoting infrastructure for the internalization of RMB bond market. The exchange rate formation mechanism was also improved, enabling the rate-setting process to be in line with international practices and become more transparent, which is favorable for a reasonable market expectation and also favorable for the purchase and sale of RMB assets. After RMB's inclusion into the SDR, the State Administration of Foreign Exchange (SAFE) released a bundle of measures to expedite the two-way

flows of capital. Measures include: loosen the restrictions on FX settlement under capital accounts, allowing enterprises to settle FX for businesses; give enterprises more flexibility in borrowing foreign loans, streamlining the case-by-case verification to balance management; ease the access for foreign institutions to China's inter-bank FX market, inter-bank lending and bond markets, without threshold of trade volume. An open capital market set the precondition for the international community to increase holdings of RMB assets, and the high rate of return of RMB asset gave even more incentives for the international community to increase their RMB holdings. At present, the ECB and Japanese central bank adopt negative interest rate. Although the Fed raised the interest rate whereas PBoC decreased the reserve requirement ratio (RRR) and the interest rate for many times, the interest rate of long-term RMB treasury securities is still 1.5% higher than that of the U.S. dollar. The appeal of the highest rate of return of RMB among the SDR basket currencies further boosted the allure of currency. Another incentive for investors is China's high sovereign rating compared with other emerging markets and economies, meaning investment in RMB is at lower risks. Therefore, from a long-term perspective, investing in RMB assets is a good choice by all measure. RMB assets are gaining popularity among international investors whose further investment will add capital inflows to China and propel RMB to appreciate.

The determining factors of short-term exchange rate fluctuations vary from those of long-term fluctuations. The former is determined by capital flows and spillovers from policies of other countries whereas the latter depends on economic fundamentals. In view of China's robust growth and trade surplus, the likelihood of RMB's long-term appreciation is strong, and short-term exchange rates will be converging toward the robust long-term trend under the influence of market forces. Short-term fluctuations of the exchange rate can intensify the coupling effects of prices and contagion of risks in the FX market, currency market and capital market, but has little impact on export and import, and capital flows and other activities in real economy. Chinese government needs to maintain a balance in its monetary, financial and distributional polices, make better use of technical policy tools and keep the long-term exchange rate within a reasonable range. Once there is speculative impact, decisive intervention and capital control should be implemented on time, so as to maintain the stability of RMB exchange rate and fend off the systematic financial risks.

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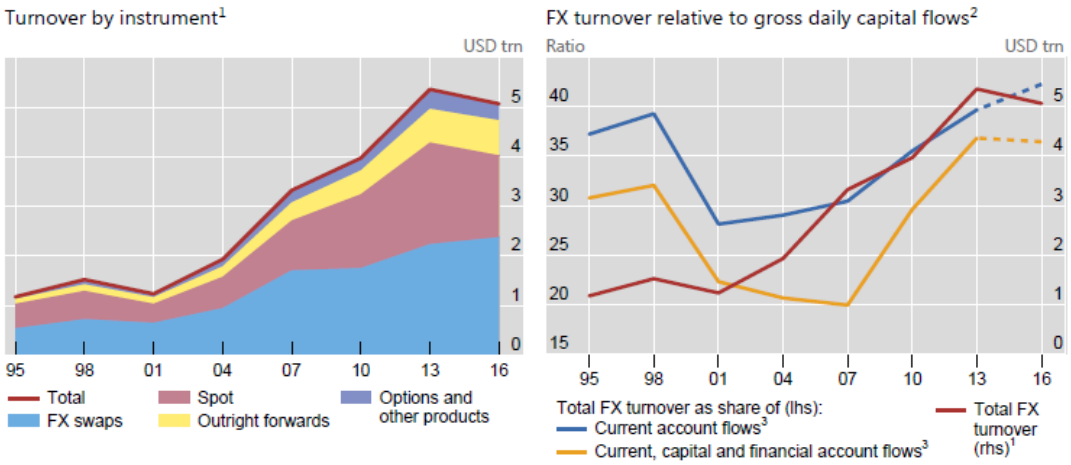
RMB – A Maturing Currency

By HERBERT POENISCH*

The Bank for International Settlements conducts a survey of foreign exchange and over the counter derivatives market activity every 3 years, the so called triennial forex survey. More than 1200 major financial institutions in 52 countries[1] and jurisdictions reported their market activities on a certain trading day in April 2016.

1. Overall result

Global foreign exchange turnover — Graph 1



[1] Adjusted for local and cross-border inter-dealer double-counting, ie "net-net" basis; daily averages in April. [2] Gross daily capital flows are estimated by dividing the annual sum of inflows and outflows by 365. [3] Current, capital and financial account flows for 2016 are estimated by extrapolating the average annual growth for 2014 and 2015.

Sources: IMF, *International Financial Statistics*; BIS Triennial Central Bank Survey; authors' calculations.

As graph 1 shows total daily market activity declined from USD5.4tr in 2013 to USD5.1tr in 2016 mainly due to the decline in spot transactions. Comparing with capital flows, financial account flows increased more rapidly since 2007 compared with current account flows. As will be seen below, the use of RMB for financial

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[1] The following jurisdictions contributed to the 2016 survey: Argentina, Australia, Austria, Bahrain, Belgium, Brazil, Bulgaria, Canada, Chile, China, Chinese Taipei, Colombia, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong SAR, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxemburg, Malaysia, Mexico, the Netherlands, New Zealand, Norway, Peru, the Philippines, Poland, Portugal, Romania, Russia, Saudi Arabia, Singapore, Slovakia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, the United Kingdom and the Unites States.

transactions has overtaken the use for current account transactions[2]. Using a currency for financial transactions is a characteristic of a mature currency which can serve as global currency before long.

A number of factors explains this decline. The BIS mentions the expectations that the FED would begin tapering its asset purchases, the wake of the Swiss Franc shock at the beginning of 2015 and measures to curb high frequency trading (HFT). All these developments had a disproportionate impact on spot trading, because market participants seek returns by taking open currency positions or, in the case of HFT, focus on the most liquid instruments[3].

By contrast, trading in forex swaps rose because of the increase in currency hedging activity by long term institutional investors, as they rebalanced their international portfolios on the back of central bank quantitative easing programmes. As money market rates and lending spreads in major currencies diverged, this also contributed to the rise in forex swap turnover[4]. Looking at instruments, the forex swaps exceed the spot transactions and other derivatives such as the forwards and options (see annex 1). The breakdown of participants in forex trade has not changed in the recent survey. Trade is still dominated in equal shares by dealers and financial institutions with the share of non-financials falling to below 10% (see annex 1), reflecting the low importance of foreign trade as determinant of forex demand and exchange rate determination.

Regarding centres of foreign exchange trade there has been a marked shift from the UK and Europe to Asian centres, notably China, Japan, Hong Kong and Singapore. Whereas the UK dominated the forex market in previous surveys with 41% of trade, its share declined to 37%. The US share remained stable at 19%. The four major Asian centres increased their share from 16% to 22%, reflecting the shift of economic gravity to Asia. China's share doubled albeit from a low basis (see annex 2).

Finally, regarding currencies, the USD remains the dominant one, present in 88% of all currency pairs[5]. The EUR declined markedly from its peak in 2010 of 39% to 31% in 2016. The other major currencies (JPY, GBP, CHF, AUD, CAD) maintained their shares, and Asian currencies among EME currencies increased their share, notably the RMB to 4%, the HKD and SGD and KRW to 2% (see annex 3).

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[2] Although forex activity is declining it is still huge, 20 times the nominal world GDP or 50 times the world trade in goods and services.

[3] Moore, Michael, Schrimpf Andreas, Sushko, Vladyslav (2016): Downsized FX markets: causes and implications. In: BIS Review, December p 38 www.bis.org/publications

[4] Moore, Michael, Schrimpf, Andreas, Sushko, Vladyslav (2016): ibid p.38

[5] The percentage given is out of a total of 200% as each currency pair has 2 currencies.

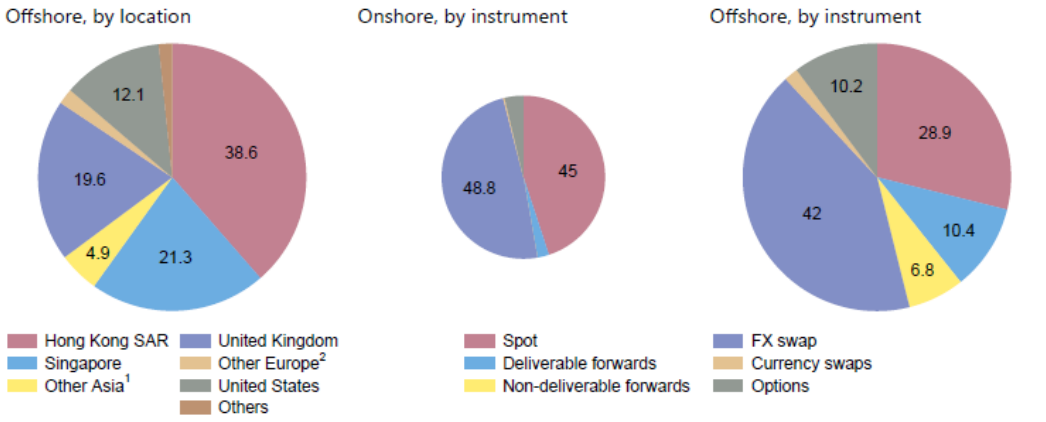
2. Performance of RMB

The share of forex trade conducted in RMB has doubled every three years. Total daily turnover has reached over USD202 billion or 4% of global forex turnover…Along with the rise in the overall trading of RMB, its use as a financial instrument and to back financial rather than trade transactions has also increased. In the past, most of the limited turnover was in spot transactions[6].

Cross-border RMB demand has increased through a number of channels. First, starting in July 2009, China allowed the use of RMB in the settlement of cross-border trade. Second, both outward and inward direct investment have grown rapidly, with a big share of RMB in the outward direction. Third, offshore RMB can also serve as a vehicle for portfolio investment in China through channels such as dim sum bond issuance (offshore RMB-denominated bond issuance) and the RMB Qualified Foreign Institutional Investor scheme (RQFII)[7]. The salient features are shown in Graph A1=2 below.

Renminbi onshore and offshore FX trading in 2016

Share of total turnover volume, in per cent — Graph A1



The sizes of the centre and right-hand pies reflect the relative volumes of on- and offshore trading.

[1] Chinese Taipei, Hong Kong SAR, India, Japan, Korea, Malaysia, the Philippines and Thailand. [2] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Norway, Portugal, Spain, Sweden and Switzerland.

Source: BIS Triennial Central Bank Survey.

RMB offshore trading is concentrated in four centres, Hong Kong, Singapore, London and US (left hand diagramme). In line with global trends, RMB swaps have become the dominant instrument, in the onshore as well as in the offshore RMB markets. This underlines the growing importance of financial transactions in the

[6] Moore, Michael, Schrimpf, Andreas, Sushko, Vladyslav (2016): ibid, box on p 43.
[7] Ehlers, Torsten, Packer, Frank and Zhu, Feng (2016): The changing landscape of RMB offshore and onshore markets. In: BIS Quarterly, December p 72 www.bis.org/publications

RMB segment.

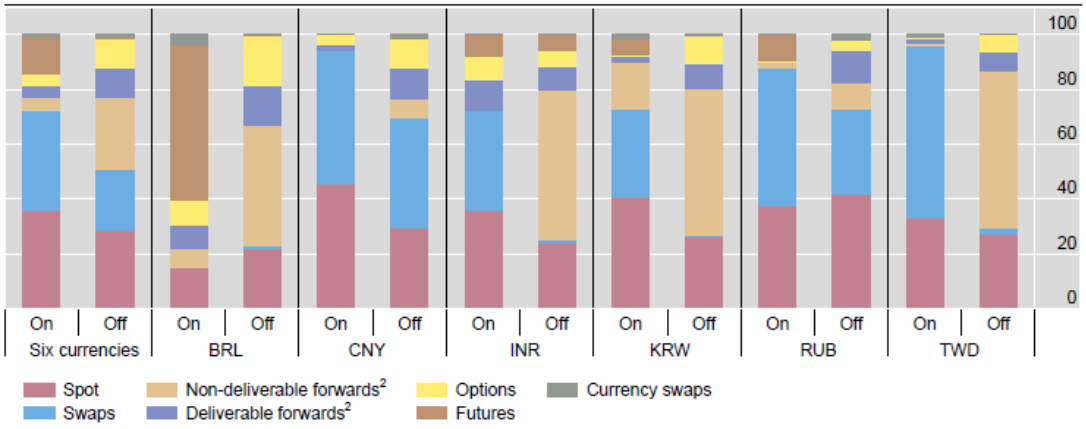
3. Financialisation of RMB

Using any currency for financial transactions without involvement of residents is a necessary condition for a global reserve currency. Both, the GBP and the USD have fulfilled this function during their heydays as world reserve currencies. In case of the USD financial engineering advanced to such a degree that use for trade transactions was dwarfed by use for financial transactions (see above).

RMB has only just started on this path of financialisation as evidenced by the 2016 forex survey. As annex 1 shows, for the first time daily RMB spot transactions of USD68 billion, which are closely linked with real transactions such as trade and FDI have been overtaken by derivatives transactions. First and foremost swap transactions of USD86bn, then outright forwards of USD28 bn and forex options of USD 18bn have documented the financial use of RMB. The financialisation has taken place not only on the offshore RMB market but also on the onshore RMB market (see graph 3 below). However, the two are still separated as residents by and large do not have access to the offshore RMB markets and non-residents do not have access to the onshore RMB market.

EME currency global trading composition by instrument: onshore vs offshore[1]

In per cent — Graph 3



On = onshore; Off = offshore.

[1] Onshore is defined as all trades executed in the jurisdiction where a currency is issued on a "net-gross" basis (ie adjusted for local inter-dealer double-counting). Offshore is calculated as the difference between total for the currency on a "net-net" basis (ie adjusted for local and cross-border inter-dealer double-counting) and onshore transactions. [2] NDF turnover is against the US dollar only (thus understating total NDFs by an average of 3%); deliverable forwards are outright forwards less US dollar NDFs and are correspondingly overstated.

Sources: Euromoney TRADEDATA; Futures Industry Association; The Options Clearing Corporation; BIS derivatives statistics and Triennial Central Bank Survey; authors' calculations.

The main difference between RMB and other emerging market currencies are the

Non-deliverable forwards (NDF). Whereas other EME currencies still have a large NDF market (notably BRL, INR, KRW, TWD), RMB and RUB have moved into the deliverable forwards (DF), particularly in the onshore segment for Chinese residents. The BIS cites the growing need for onshore hedging due to the fact most RMB bonds are held by domestic investors.

The DF for offshore RMB is possible, because 'Chinese authorities permitted within still effective (but leaky) capital controls, a pool of offshore RMB which can be freely traded and delivered. The RMB forward market is thus split into three (i) an offshore NDF market (started in the 1990s), (ii) an onshore DF market (since 2007) and (iii) an offshore DF market, known as CNH market (since mid-2010)[8]. This framework came under severe strain in January 2016 when the CNH market liquidity was drained causing a sizable gap between RMB onshore and offshore interest rates and exchange rates[9].

The displacement of NDF by DF has progressed most in offshore centres which have traded RMB the longest, such as Hong Kong, Singapore and London. NDFs have still a high share in other European centres and the US.

Conclusion

The active policy of internationalization of RMB has driven the financialisation of RMB, a key characteristics of a mature currency. Forexswaps, outright forwards and forex options in RMB onshore as well as offshore markets have allowed markets to hedge their interest rate and exchange rate exposures in RMB. These together with a market oriented exchange rate policy introduced in August 2015, have given the RMB internationalization a major push.

Risks still remain, such as shortening of offshore RMB, but a more realistic exchange rate policy which is the hallmark of an international reserve currency together with wide availability of hedging instruments has allowed residents as well as non-residents to use and hedge RMB. At the same time, the separation of residents and non-residents through capital controls continues to function by and large, but a convergence between onshore and offshore trading patterns is a clear trend[10].

[8] McCauley, Robert and Shu, Chang (2016): Non-deliverable forwards: impact of currency internationalization and derivatives reform. In: BIS Quaterly Review, December www.bis.org/publications

[9] China reacted quickly as this would have resulted in parallel currencies of CNY and CNH if this gap prevailed.

[10] Ehlers, Torsten, Pecker, Frank and Zhu, Feng (2016): ibid, p 72

Annex 1

Turnover of OTC foreign exchange instruments, April 2016

Daily averages, in billions of US dollars — Table D11.1

Instrument, currency, counterparty and country	Total	Spot transactions	Outright forwards	Foreign exchange swaps	Currency swaps	FX options
	2016	2016	2016	2016	2016	2016
Total, "net-net" basis	**5,067**	**1,652**	**700**	**2,378**	**82**	**254**
By currency						
USD	4,438	1,385	600	2,160	74	218
EUR	1,591	519	178	807	22	64
JPY	1,096	395	151	458	18	74
GBP	649	211	92	305	10	30
AUD	348	143	41	138	7	20
CAD	260	105	34	103	4	14
CHF	243	57	30	150	2	5
CNY	202	68	28	86	3	18
SEK	112	34	13	59	1	5
Other currencies	1,195	388	232	490	23	61
By counterparty						
With reporting dealers	2,121	605	189	1,205	38	84
Local	673	204	59	374	14	23
Cross-border	1,447	402	130	831	24	61
With other financial institutions	2,564	930	431	1,026	37	141
Local	901	334	158	344	13	52
Cross-border	1,664	596	273	682	24	89
Non-reporting banks	1,113	354	136	564	18	42
Institutional investors	798	290	171	278	6	52
Hedge funds and PTFs	389	200	82	66	9	32
Official sector	74	14	14	43	2	1
Other	182	68	26	72	3	13
Undistributed	8	3	1	4	0	0
With non-financial customers	382	117	80	147	7	30
Local	224	82	55	66	3	17
Cross-border	158	35	25	81	4	13
Of which: prime-brokered	887	564	119	143	3	58
Of which: retail-driven	283	60	22	178	3	19
By execution method						
Voice direct	1,410	410	258	590	29	123
Voice indirect	755	142	61	473	18	62
Electronic direct	1,666	704	227	679	17	40
Electronic indirect	1,126	373	139	574	14	25
undistributed	110	23	16	63	4	4
Total, "net-gross" basis	**6,514**	**2,054**	**830**	**3,209**	**106**	**315**
By country						
United Kingdom	2,406	784	266	1,161	53	142
United States	1,272	581	219	391	7	74
Singapore	517	122	105	248	6	37
Hong Kong SAR	437	92	44	276	12	13
Japan	399	110	63	206	6	15
France	181	23	15	137	2	4
Switzerland	156	25	8	116	0	6
Australia	121	27	10	81	3	1
Germany	116	23	6	85	1	1
Other countries	909	268	94	509	16	22

Annex 2

Turnover of OTC foreign exchange instruments, by country

"Net-gross" basis, April 1995–2016 daily averages, in billions of US dollars — Table D11.2

	1995	1998	2001	2004	2007	2010	2013	2016
Argentina	...	2	...	1	1	2	1	1
Australia	41	48	54	107	176	192	182	121
Austria	13	12	8	15	19	20	15	19
Bahrain	3	3	3	3	3	5	9	6
Belgium	29	27	10	21	50	33	22	23
Brazil	...	5	6	4	6	14	17	20
Bulgaria	...	...	...	...	1	1	2	2
Canada	31	38	44	59	64	62	65	86
Chile	...	1	2	2	4	6	12	7
China	...	0	...	1	9	20	44	73
Chinese Taipei	...	5	5	9	16	18	26	27
Colombia	...	...	0	1	2	3	3	4
Czech Republic	...	5	2	2	5	5	5	4
Denmark	32	28	24	42	88	120	117	101
Estonia	...	...	...	0	1	1	0	...
Finland	5	4	2	2	8	31	15	14
France	62	77	50	67	127	152	190	181
Germany	79	100	91	120	101	109	111	116
Greece	3	7	5	4	5	5	3	1
Hong Kong SAR	91	80	68	106	181	238	275	437
Hungary	...	1	1	3	7	4	4	3
India	...	2	3	7	38	27	31	34
Indonesia	...	2	4	2	3	3	5	5
Ireland	5	11	9	7	11	15	11	2
Israel	...	...	1	5	8	10	8	8
Italy	24	29	18	23	38	29	24	18
Japan	168	146	153	207	250	312	374	399
Korea	...	4	10	21	35	44	48	48
Latvia	...	...	...	2	3	2	2	1
Lithuania	...	...	...	1	1	1	1	0
Luxembourg	19	23	13	15	44	33	51	37
Malaysia	...	1	1	2	3	7	11	8
Mexico	...	9	9	15	15	17	32	20
Netherlands	27	43	31	52	25	18	112	85
New Zealand	7	7	4	7	13	9	12	10
Norway	8	9	13	14	32	22	21	40
Peru	...	...	0	0	1	1	2	1
Philippines	...	1	1	1	2	5	4	3
Poland	...	3	5	7	9	8	8	9
Portugal	2	4	2	2	4	4	4	2
Romania	...	...	...	...	3	3	3	3
Russia	...	7	10	30	50	42	61	45
Saudi Arabia	...	2	2	2	4	8	7	8
Singapore	107	145	104	134	242	266	383	517
Slovakia	...	...	1	2	3	0	1	2
Slovenia	...	...	0	0	0	...	...	...
South Africa	5	9	10	10	14	14	21	21
Spain	18	20	8	14	17	29	43	33
Sweden	20	16	25	32	44	45	44	42
Switzerland	88	92	76	85	254	249	216	156
Thailand	...	3	2	3	6	7	13	11
Turkey	...	...	1	3	4	17	27	22
United Kingdom	479	685	542	835	1,483	1,854	2,726	2,406
United States	266	383	273	499	745	904	1,263	1,272
Total	**1,633**	**2,099**	**1,705**	**2,608**	**4,281**	**5,045**	**6,686**	**6,514**

Annex 3

Turnover of OTC foreign exchange instruments, by currency

"Net-net" basis, April 1998–2016 daily averages, in billions of US dollars and percentage share — Table D11.3

	1998		2001		2004		2007		2010		2013		2016	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
USD	1,325	87	1,114	90	1,702	88	2,845	86	3,371	85	4,662	87	4,438	88
EUR	...	...	470	38	724	37	1,231	37	1,551	39	1,790	33	1,591	31
JPY	332	22	292	24	403	21	573	17	754	19	1,235	23	1,096	22
GBP	168	11	162	13	319	16	494	15	512	13	633	12	649	13
AUD	46	3	54	4	116	6	220	7	301	8	463	9	348	7
CAD	54	4	56	4	81	4	143	4	210	5	244	5	260	5
CHF	108	7	74	6	117	6	227	7	250	6	276	5	243	5
CNY	0	0	0	0	2	0	15	0	34	1	120	2	202	4
SEK	5	0	31	2	42	2	90	3	87	2	94	2	112	2
NZD	3	0	7	1	21	1	63	2	63	2	105	2	104	2
MXN	7	0	10	1	21	1	44	1	50	1	135	3	97	2
SGD	17	1	13	1	18	1	39	1	56	1	75	1	91	2
HKD	15	1	28	2	34	2	90	3	94	2	77	1	88	2
NOK	4	0	18	1	27	1	70	2	52	1	77	1	85	2
KRW	2	0	10	1	22	1	38	1	60	2	64	1	84	2
TRY	...	...	0	0	2	0	6	0	29	1	71	1	73	1
RUB	5	0	4	0	12	1	25	1	36	1	86	2	58	1
INR	1	0	3	0	6	0	24	1	38	1	53	1	58	1
BRL	3	0	6	0	5	0	13	0	27	1	59	1	51	1
ZAR	6	0	12	1	14	1	30	1	29	1	60	1	49	1
DKK	4	0	15	1	17	1	28	1	23	1	42	1	42	1
PLN	1	0	6	0	7	0	25	1	32	1	38	1	35	1
TWD	2	0	3	0	8	0	12	0	19	0	24	0	32	1
THB	2	0	2	0	4	0	6	0	8	0	17	0	18	0
MYR	1	0	1	0	1	0	4	0	11	0	21	0	18	0
HUF	1	0	0	0	4	0	9	0	17	0	23	0	15	0
SAR	1	0	1	0	1	0	2	0	3	0	5	0	15	0
CZK	4	0	2	0	3	0	7	0	8	0	19	0	14	0
ILS	...	...	1	0	2	0	5	0	6	0	10	0	14	0
CLP	1	0	2	0	2	0	4	0	7	0	16	0	12	0
IDR	1	0	1	0	2	0	4	0	6	0	9	0	10	0
COP	...	...	0	0	1	0	2	0	4	0	6	0	8	0
PHP	0	0	1	0	1	0	4	0	7	0	8	0	7	0
RON	...	...	...	...	...	...	2	0	3	0	7	0	5	0
PEN	...	...	0	0	0	0	1	0	1	0	3	0	4	0
ARS	2	0	...	...	1	0	1	0	2	0	1	0	2	0
BGN	...	...	...	...	...	...	0	0	1	0	1	0	1	0
BHD	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LTL	...	...	...	...	0	0	1	0	1	0	0	0	...	...
LVL	...	...	...	...	0	0	0	0	0	0	0	0	...	...
DEM	465	30	...	...	...	...	...	...	...	...	...	...	...	...
FRF	76	5	...	...	...	...	...	...	...	...	...	...	...	...
XEU	21	1	...	...	...	...	...	...	...	...	...	...	...	...
ITL	16	1	...	...	...	...	...	...	...	...	...	...	...	...
NLG	14	1	...	...	...	...	...	...	...	...	...	...	...	...
BEF	9	1	...	...	...	...	...	...	...	...	...	...	...	...
ESP	9	1	...	...	...	...	...	...	...	...	...	...	...	...
GRD	4	0	...	...	...	...	...	...	...	...	...	...	...	...
IEP	2	0	...	...	...	...	...	...	...	...	...	...	...	...
ATS	2	0	...	...	...	...	...	...	...	...	...	...	...	...
PTE	2	0	...	...	...	...	...	...	...	...	...	...	...	...
FIM	2	0	...	...	...	...	...	...	...	...	...	...	...	...
LUF	1	0	...	...	...	...	...	...	...	...	...	...	...	...
Other currencies	307	20	81	7	127	7	252	8	183	5	83	2	103	2
Total	**1,527**	**200**	**1,239**	**200**	**1,934**	**200**	**3,324**	**200**	**3,973**	**200**	**5,357**	**200**	**5,067**	**200**

IMI International Monetary Review

Weak Transmission, New Trend: The Influence of Internationalization of RMB Exchange Rate on China's Bond Market

By SUN CHAO[*] and ZHANG RUI[**]

1. The exchange rate fluctuation's influence on the China's bond market: weak transmission

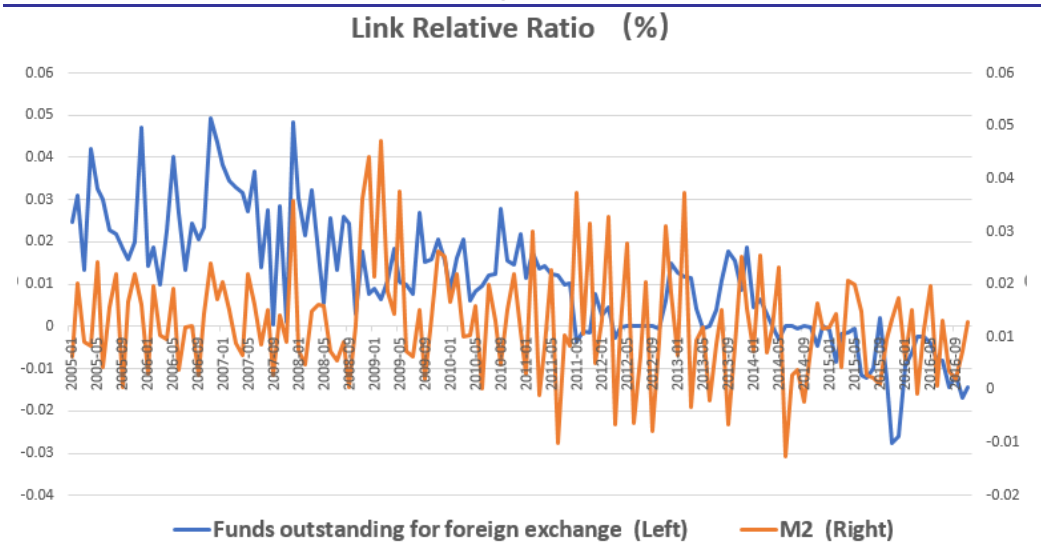
Both interest rates and exchange rates represent the prices of the financial market, which are the crucial adjusting mechanism that maintain external balance in an open economy setting. Theoretically, there should exist transmission channels between the two variables. The theory of Interest Rate Parity disentangles the impact of domestic interest rate on the exchange rate of its own currency. On the other hand, exchange rate fluctuations through influencing the direction of cross-border capital flows have a direct impact on the supply and demand of capital and thus interest rate domestically.

Historical data on China's financial market shows that exchange rate fluctuations have not been one of the dominating factors that influence domestic bond yields. In addition, through carefully analyzing recent evidence, we deduce that rapid depreciation of the RMB has not been one of the pushing factors that contribute to the increase in the bond yields that occurred during the second-half of 2016 for several reasons.

Firstly, the transmission of RMB fluctuations on China's money market liquidity has been weak thus far. Despite the fact that depreciations trigger outflows of capital, leading to a reduction in the quantity of domestic interbank reserves, the sheer level of foreign reserves enables the PBOC to manage those fluctuations and hedge their impact on money market liquidity conditions. What is more, the PBOC has other monetary policy tools such as open market operations that prevent instability in monetary base caused by exchange rate fluctuations. This is highlighted in this year's Central Economic Work Conference. As continuing decrease in funds outstanding for foreign exchange becomes the "New Normal", the new way of supplying monetary base needs to be adopted (Figure 1).

[*] Associate Research Fellow of IMI
[**] Ph.D., Changjiang Securities

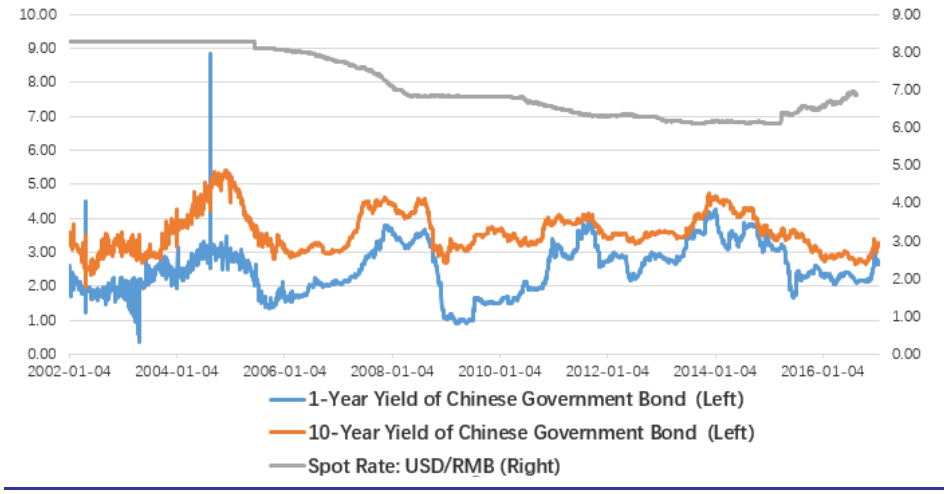
Figure 1



Source: WIND

Secondly, when considering the impact of exchange rate on the yield of government bonds, we find that the RMB's exchange rate is not a major factor that influences the bond market. In the logic chain of "exchange rate-inflation", the bulk stock's price is an important intermediary variables. When a country's currency depreciates, the cost of imports increases so that it will push the cost of living higher. Under the background of domestic supply-side structural reform which has already led to price increases in some raw materials, the growth of emerging market recovers so that the fall in international commodity price are smaller than the currency's devaluation in magnitude. This re-bounce of global commodity prices has already pushed up the domestic inflation rate (2.5%) and may continue. In the future, this transmission may strengthen (Figure 2).

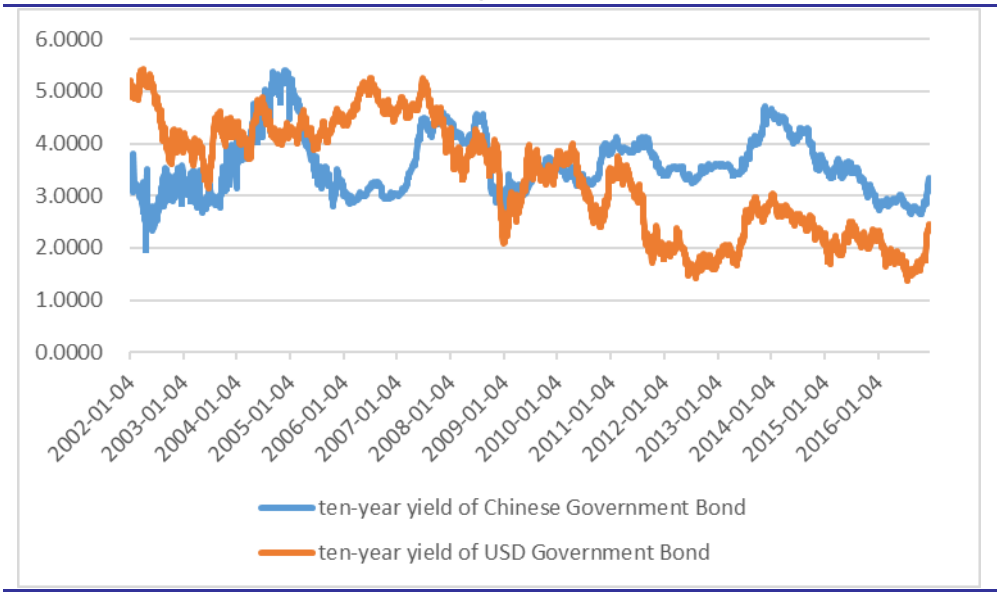
Figure 2



Source: WIND

Despite of a large scale QE, there is still no domestic de-leveraging occurred in the US, which means that the cost of borrowing dollars is extremely low. Meanwhile, China generates demand for capital due to the "4 trillion" fiscal stimulus program of 2009. Besides, return on assets on Chinese market is higher due to higher interest rate caused by higher economic growth rate. As a result, borrowing dollars and investing in China becomes profitable and so that "dollars liquidity" is generated. Because of the existence of the cross-border arbitrage of capital, we can see a strong relationship between China and US government bond yields from 2008. Looking forward, with US interest rate gradually increases, the difference in interest rate is expected to narrow, which will lead to a reduction in capital inflows and thus put pressure on China's bond market (Figure 3).

Figure 3



Source: WIND

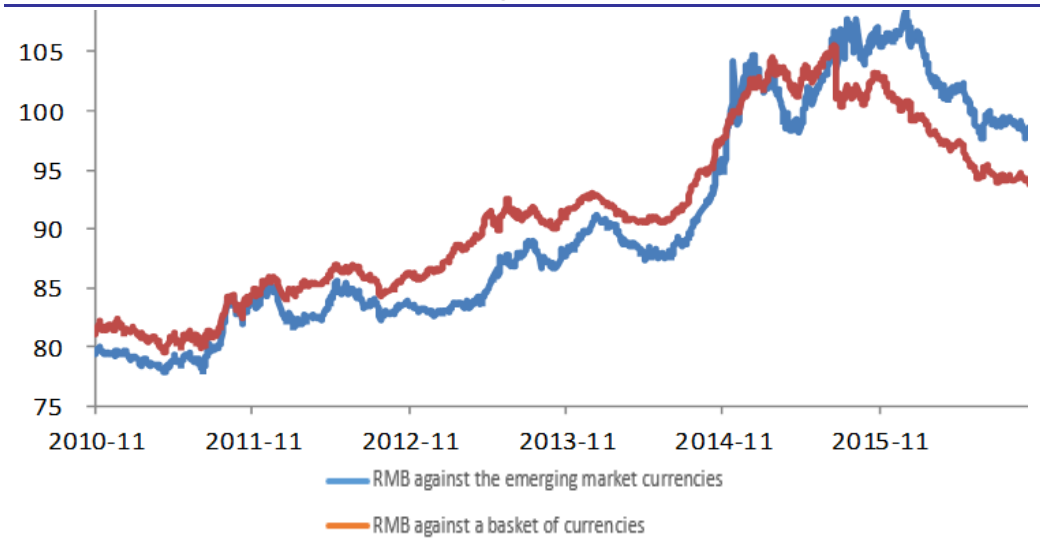
Thirdly, the impact of RMB depreciation on the credit spread on domestic corporate bond has been limited thus far. This is because currently the overall level of debt denominated in dollar of the Chinese firms is relatively low. However, we find that household appliances, transportation and light manufacturing are industries that have comparatively high level of debt ratio denominated in dollar. Since they are pro-cyclical industries, they are also prone to exchange rate fluctuations caused by the fundamentals of the Chinese economy apart from the recent unilateral appreciation of the dollar, leading to variations in the credit spread. It is also a trend that firms in the real estate industry increasingly raise capital through issuing foreign debt due to various restrictions on bank loans and debt-issuance domestically, increasing the exposure of those firms to exchange rate fluctuations. The capital outflows and the fall in the prices of risky assets may also cause potential shock to the real estate sector and leading to higher credit risk of real estate firms. Overall, credit spread on corporate bonds of some industries may widen due to the increase in the level of debt denominated in foreign currencies.

2. Forecast of RMB exchange rate in 2017: slow depreciation

The accumulated depreciation pressure of the RMB began in 2014, when the economic and the monetary conditions of China and the United States have shown a double - cycle deviation. As a result, the RMB, which at that time was to a large extent pegged to the USD, appreciated passively. In 2014, the US economy showed sign of recovery and therefore expectation of exiting the Quantitative Easing

program arose. As a result, the currency got into a strengthening cycle. Meanwhile, the Chinese economy faced significant slow-down, and monetary policy was loose. There is a clear fundamental deviation in the economy and monetary cycle of China and the US, but due to the lack of flexibility in the exchange rate system, RMB has appreciated by nearly 16% against a basket of emerging market currencies. At present, the depreciation pressure has been effectively released. One crucial aspect is that most of the distortions which the RMB against the emerging market currencies index have been released. Due to the exchange rate reform over the past year, the RMB against a basket of emerging market currencies index has fallen to 10.9%. Taking into account the relative performance of the Chinese economy against that of the other emerging market economies over this period, it is reasonable to conclude that exchange rate distortions have largely been corrected. When looking at the index of the RMB against a basket of currencies, it has returned to the level back in September 2014, when expectation of US monetary tightening strengthened, a level that is likely to be proved sustainable in the long run (Figure 4).

Figure 4



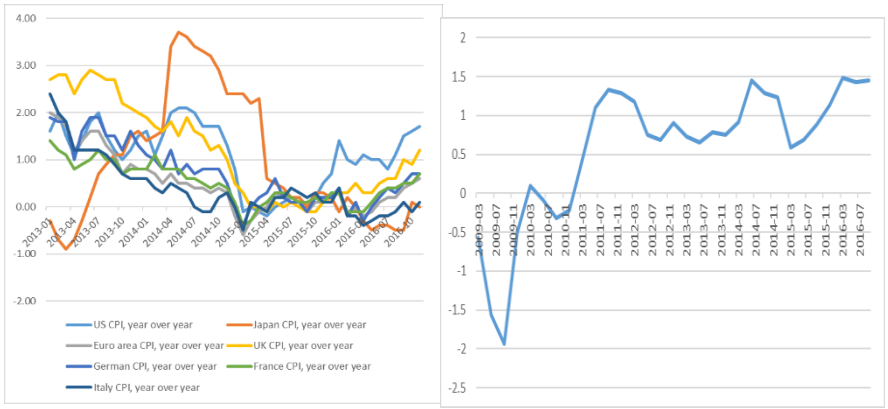
Note: 100=December 31, 2014

Source: WIND

Economic data shows that US CPI growth has kept ahead among world's leading economies. Meanwhile, the US unemployment rate is close to the natural rate of unemployment. Based on our calculations by the Taylor rule, the implied Federal Fund rate is around 1.45%.Even if we consider the crowding-out effect of Trump's fiscal stimulus on investment, inflows of capital and the uncertain prospect of the global economy, the implied rate should be at around 1.2%. The current federal

funds rate, however, remains at 0.45%.This implies that after the rate-rise in December 2016, the Federal Reserve is likely to raise rate about 2-3 times in 2017. The implications of this in 2017 include further capital inflows in to the US, thus bringing depreciation pressure on the RMB (Figure 5).

Figure 5: The developed economies CPI and the predicted federal funds rate of Taylor rule model



Source: WIND, author's calculation

From a global prospective, 2016 is a year of global political and economic events that were hardly expected by mainstream policymakers, businesspersons and academics alike. Both Brexit and Trump winning the General Election in the US marked a decadency of globalization since the cold war era. The driving force behind these events is the unequal nature of globalization process. In this round of "creative destruction", lower-middle class has benefited the least from globalization, who particularly welcome the political promises of the extremist on the political right wing. The sheer size of those groups has changed the political landscape significantly and will continue to have important implications on international political economy. This long-term uncertainty in the coming year, along with the recovery of US economy and potential fiscal stimulus promoted by Trump, will further increase the returns on dollar assets.

As the current RMB exchange rate determination mechanism still places a high weight on the performance of dollar, we conclude that the RMB will still depreciate in the year to come given the above factors. The extent of depreciation, however, is likely to be limited.

We observe that Chinese economy remained stable. Firms are actively increasing the level of inventory; due to a recovery of external demand, trade surplus also widens. Both of these show that the demand side of the economy has been

recovering, and the CPI and the PPI both go up. It is also expected that the fiscal deficit will enlarge next year mainly due to the planned increased expenditure on infrastructure, which will further support the economy in 2017. The stable fundamentals imply that RMB does not have the basis for large depreciation against the dollar. With the advancement of deleveraging in the financial market and the real estate sector, and the financial asset prices are making significant adjustments, reducing asset bubbles that have already existed and thus easing the depreciating pressure of RMB.

As the economy with the largest foreign exchange reserves in the world, China has the capability of maintaining RMB stability. Recently, the PBOC's change of monetary policy stance has already reflected its intention to stabilize the pace of RMB depreciation as well as to promote deleveraging in the domestic financial market. Besides, the PBOC has sufficient capacity to smooth out the excessive volatility which coming from the outflows. To sum up, we believes that the RMB exchange rate will depreciate slowly in 2017. In the short term, there may be fluctuations, but the market expectations will eventually stabilize after this overreactions mostly due to the sentiments on the fiscal and monetary policy in the US. When coming to the impact of the RMB exchange rate on domestic bond yields, the depreciation of RMB is more likely to affect the market sentiment rather than bringing significant economic transmissions.

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Commentary

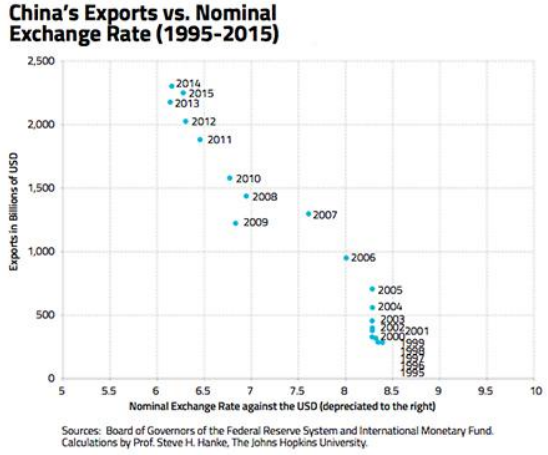
The Twists and Turns of the Greenback*

By STEVE H. HANKE*

At a monetary conference in Vienna back in 2014, the distinguished Frenchman, friend, and occasional collaborator Jacques de Larosière proclaimed that the current world monetary order should be termed an "anti-system." He has a point — an important point. Among other things, such an anti-system invites an enormous amount of instability, as well as uninformed loose talk that influences public opinion and policy.

The Chinese yuan has been at the center of much of the recent misinformation and disinformation about currencies. During the first presidential debate between Donald Trump and Hillary Clinton, Trump fingered China as the world's best practitioner of currency devaluations — devaluations that Trump claims power China's exports. Clinton didn't object to Trump's thesis. Indeed, she boarded the same train.

The facts are that Chinese exports have steadily risen since 1995, but they have not been powered by a depreciating yuan. In fact, the yuan has slightly appreciated in both nominal and real terms. The accompanying chart tells that story.



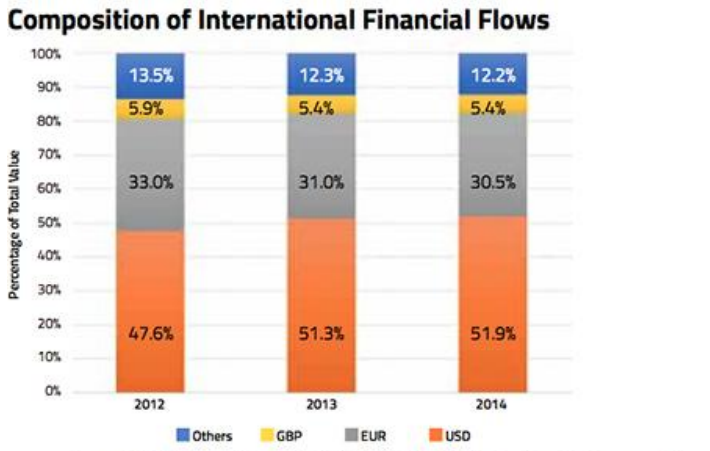
*This article appeared in the November 2016 issue of Globe Asia.

* Member of IMI Advisory Board, Professor of Johns Hopkins University

So, what was said about the yuan during the debate is untrue. But, that yuan story is not a debate slip. It is disinformation spread by unions, mercantilist of all stripes, and politicians: Republicans and Democrats alike.

Shortly after the first presidential debate, the yuan entered the International Monetary Fund's Special Drawing Right (SDR) basket of top-tier currencies. With that, the Chinese boasted that the yuan was now in the same league as the other SDR currencies: USD, euro, Japanese yen, and the British pound. As part of China's yuan promotion campaign, it declared that the yuan would be a serious challenger to the greenback as the world's premier currency. While the yuan's international use has grown rapidly, it started with a base of zero.

The dollar is King, and when it comes to currencies, Kings are difficult to dethrone. Even after the introduction of the euro in 1999, the USD has maintained its top spot as the currency held as official reserves, accounting for 63 percent of the total. When it comes to foreign exchange trading, the dollar is even more dominant, accounting for almost 88 percent of the turnover. Dollar notes are widely used internationally, too, with as much as two-thirds of all the greenbacks in circulation circulating overseas. In terms of the transactions handled by the Society for Worldwide Interbank Financial Telecommunication (SWIFT), the outfit that moves "money" among banks, the U.S. dollar has increased its dominance over the past few years, accounting for almost 52 percent of the total transactions (see the accompanying chart).



Sources: *"Worldwide Currency Usage and Trends."* Society for Worldwide Interbank Financial Telecommunication. December 2015. Prepared by Prof. Steve H. Hanke, The Johns Hopkins University.

As with the introduction of the euro, claims that the yuan will dethrone the King are off the mark. For the past three millennia, there has always been a dominant world currency, and it's very hard to challenge the King. This is evidenced by the

longevity of dominant currencies. On average, they've reigned for 300 years. This would suggest that the U.S. dollar, unless the U.S. government makes a big mistake or a new disruption technology enters the stage, is probably going to be on the throne a while longer. Why?

To answer that question, we borrow from the work of Nobelist Robert Mundell. In Mundell's study of the world's dominant currencies over the past three millennia, he found that there was always one currency that dominated, and that the following five characteristics were associated with each dominant currency:

1. The transactions domain was large. On this score, the U.S. clearly qualifies. Until recently, it has been the world's largest economy measured on a purchasing power parity basis. Today, its GDP accounts for 16.1 percent of the world's total. China has recently surpassed the U.S. on that measure, with 16.9 percent of the total, and the Eurozone has 11.9 percent. So, in terms of their transaction zones, both the yuan and the euro could challenge the greenback.

2. Monetary policy inspired confidence. No currency ever survived as a top international currency with a high rate of inflation or with a recurring risk of debasement or devaluation. So, unless there are significant U.S. monetary policy mistakes, challengers will face a Sisyphean task.

3. Exchange controls were absent. Exchange controls, such as those in China, are always a sign of weakness, not strength. Controls alone eliminate the Chinese yuan as a challenger to the greenback's dominance. This explains why China is working to remove controls. It is worth stressing that one of the areas where the U.S. dollar is becoming increasingly vulnerable to a challenge is the area of sanctions (read: restrictions), which the U.S. government imposes on the use of the greenback. Financial sanctions – which have been inspired by an aggressive, interventionist, neoconservative philosophy – are used by the U.S. and are administered as weapons of war by the Office of Foreign Asset Control at the U.S. Treasury (OFAC). Paradoxically, the OFAC is waging war on the U.S. dollar. Gone are the days when George Washington, in the middle of the U.S. Revolutionary War, could draw on his account at the Bank of England.

Related to exchange controls are other types of restrictions that can be placed on how people can spend and transfer the money they own. One way to restrict the use of a modern currency is to abolish it. That is just what Harvard Professor Kenneth Rogoff has proposed in his new book *The Curse of Cash*, which was recently published by Princeton University Press. And Rogoff is not alone. Another Harvard Professor, former U.S. Treasury Secretary Larry Summers, and Prof. Narayana Kocherlakota, who was formerly the president of the Federal Reserve Bank of

Minneapolis, have also advocated moving away from greenback cash. Such a move would open the gates for a challenge to King dollar.

1. Strong international currencies have always been linked to strong states. States that can defend themselves against external and internal enemies. This is a security-stability factor.

2. Until the world entered the age of complete fiat currencies, all the dominant currencies had a fallback factor. They were all convertible into gold or silver. So, today's currencies, being fiat currencies, have no fallback factor, and all are vulnerable to a challenge. Perhaps a new disruptive technology will allow for the production and efficient use of a private currency with a fallback factor. Such a currency, if deemed to be legal, could mount a challenge to the King.

When viewing the twists and turns of the greenback in Jacque de Larosière's anti-system, there is no better place to start than the Great Crash of 2008. The accompanying chart shows that the USD/€ exchange rate — the world's most important price — fell a stunning 19.13 percent over a brief four month period. Linked to the soaring dollar, two other important prices, gold and oil, collapsed by 19.08 and 57.03 percent, respectively. Not surprisingly, the annual inflation rate in the U.S. moved from an alarming rate of 5.5 percent in July to an outright deflation of -1.96 percent a year later. Contrary to the Federal Reserve's claims, the dance of the dollar and related changes in commodity prices and the level of inflation indicated that monetary policy was way too tight in late 2008. This caused massive instability that we still haven't fully recovered from.

The Great Crash of 2008

	USD/EUR Exchange Rate	Price of Gold	Price of Oil		U.S. Inflation Rate (CPI, yr/yr)
Jul. 2008	1.5759	$940.02/oz	$133.37/bbl	Jul. 2008	5.50%
Nov. 2008	1.2744	$760.66/oz	$57.31/bbl	Nov. 2008	1.10%
%Change*	-19.13%	-19.08%	-57.03%	Jul. 2009	-1.96%

*Percent changes are from July 2008 to November 2008.
Note: The lowest annual inflation since 1950 was recorded in Jul. 2009.
Sources: Bloomberg, U.S. Energy Information Administration, and Federal Reserve Economic Database.
Calculations by Prof. Steve H. Hanke, The John Hopkins University.

What can be done to reduce the instability in the current anti-system and mitigate the damage caused by the twists and turns of King dollar? The world's two most important currencies — the dollar and the euro — should, via formal agreement, trade in a zone ($1.20 – $1.40 to the euro, for example). The European Central Bank would be obliged to maintain this zone of stability by defending a weak dollar via dollar purchases. Likewise, the Fed would be obliged to defend a weak euro by purchasing euros. Just what would have happened under such a system

(counterfactually) since the introduction of the euro in 1999 is depicted in the accompanying chart.

Stability might not be everything, but everything is nothing without stability.

IMI International Monetary Review

Rerun of Dollar Unilateralism*

Trump Trepidation and European Vulnerability

By DAVID MARSH*

Donald Trump's ascent seems likely to unleash on Europe a new and damaging form of dollar unilateralism – a peril the old Continent has periodically suffered since the 1960s, but has lain dormant for much of the past 35 years.

The approaching presidency of a go-for-growth 'America-first' businessman unschooled in any kind of diplomacy poses a grave potential threat to the cohesion of Europe's economic and monetary union. In store is a probable shift in the US and Europe – disruptive rather than coordinated – to a long-championed goal of fiscal loosening and monetary tightening.

Trump's mercantilist-protectionist leanings, espousal of economic populism and promises to shake up ties with America's allies combine all the traditional ingredients for toxicity in transatlantic relations and none of the sources of stability. This could hit European exports to the US, one of the few factors supporting anaemic European growth.

If Europe is unlucky, it could be exposed to effects mirroring and even exceeding the worst past upheavals: Richard Nixon's severing of the gold-dollar link in 1971, Paul Volcker's drastic Federal Reserve tightening under Jimmy Carter and Ronald Reagan in the early 1980s, and the troubled aftermath of the 2008 Lehman Brothers bankruptcy under George W. Bush.

One of the main reasons for setting up EMU in 1999 as a culmination of a 30-year process of European currency co-operation was to protect Europe from exactly the kind of international monetary vicissitudes that now seem probable.

Europe has constructed impressive internal defence mechanisms since the European debt crisis in 2010, but large EMU imbalances remain, making the continent vulnerable to external tensions.

Europe has not been exposed to a full-scale dollar buffeting since the sharp rise in US interest rates that started with President Carter's dollar support package in November 1978. This culminated in Fed tightening under Volcker – Fed chairman

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after August 1979 – that sparked concomitant interest rate increases in Europe. The monetary squeeze depressed growth and led to the political demise of three leaders: Carter in the November 1980 election, French President Valery Giscard d'Estaing in May 1981, and German Chancellor Helmut Schmidt in October 1982. Reagan, who took over from Carter in January 1981, ushered in a policy of 'benign neglect' of the dollar that may now resurface under Trump.

Another historical parallel is President Nixon's election in 1968, which led to his naming Arthur Burns as Fed chairman in 1970 with the aim of easing conditions for growth and employment. In similar vein, Trump is expected to appoint an economic sympathiser as successor to Janet Yellen, whose four-year Fed chairmanship ends in February 2018, and whom he has already castigated as unduly complicit with President Barack Obama. Nixon's Treasury secretary John Connally told America's foreign counterparties, 'The dollar may be our currency but it's your problem' – a phrase that may reappear under Trump.

Whatever Trump's choice to head the Fed, discord between the White House and central bank seems inevitable in view of the independent nature of the rate-setting Federal Open Market Committee. The president-elect's disregard for economic orthodoxy and his willingness to run larger budget deficits to fund tax cuts and infrastructure spending are likely to generate higher inflation. Longer term, this promises a volatile dollar veering between strength and weakness. In the shorter term, it could scupper the European Central Bank's bond-buying programme at a sensitive time, shortly before the ECB decides on the next stages of quantitative easing on 8 December.

Taking pride in his non-existent experience in political office, Trump is likely to take an uncompromising line on Europe's weaknesses. Ahead of electoral tussles in the next 12 months in Italy, the Netherlands, France and Germany, Trump could lay bare fault lines among European populations similar to those that have promoted his rise in America.

Central bankers have worried for some time that an otherwise welcome international growth revival would depress inflated bond prices and confront central banks with substantial losses on government securities acquired during bond-buying sprees since 2009. Europe is particularly exposed, since the ECB started buying only relatively late, in March 2015, at a time when bond prices were already very high.

A sharp rise in sovereign yields in Europe and the US since Trump's win last Tuesday, together with an increase in euro area inflation expectations to an eight-month high, will buttress opposition on the ECB's governing council to an extension in ECB quantitative easing beyond March 2017. The Bundesbank's

anti-bond buying strictures have been reinforced by a warning on 2 November from the German government's council of economic advisers that ECB policy is 'neither appropriate for the euro area nor Germany'. A mix of Trump trepidation and higher inflation will certainly stoke conflict over ECB QE – and many still more bruising battles lie ahead.

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Mastering the Challenges of Enlarged Mandates*

Central Banks Risk Being Stripped of Their Powers

By ANDREW LARGE*

Central banks have been in the firing line lately – and the challenges will grow more severe, especially in the US, after the election of Donald Trump. In retrospect central bankers would have been wiser, upon taking on increased mandates after the global financial crisis, to be more assertive about what they could and could not achieve. They should have been firmer in pointing out where structural or governmental fiscal measures would have been preferable to monetary actions.

If central banks fail these challenges, they risk governments stripping them of their enlarged powers.

Central banks need to demonstrate some humility. Although much has been achieved in monetary policy, and since the global financial crisis in financial stability as well, there is much that neither central banks nor the rest of the world understand. Moreover, central banks need to improve their communications strategies. They must inspire confidence. To do this they should be careful only to communicate what they know they can achieve.

In democracies, there is always tension over placing power in the hands of unelected officials. This extends to the authority exercised by central banks. However, the delegation of powers has long been regarded as legitimate for the traditional central bank function of acting as lender of last resort.

In the latter decades of the 20th century, monetary policy came within central banks' remit, and was accorded political legitimacy, for two basic reasons. First, central banks could be held accountable, since the results of policy actions in terms of inflation and price stability were observable and measurable. Second, it was understood that monetary policy would improve if conducted by those with the requisite economic expertise.

The trade-off of giving central banks delegated powers, with objectives set by politicians, was seen as preferable to politicians or any other party trying to do the

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https://www.omfif.org/analysis/commentary/2016/november/mastering-the-challenges-of-enlarged-mandates/.
OMFIF is a global financial thinktank headquartered in London.

* Member of the OMFIF Advisory Board and Founding Partner of the Systemic Policy Partnership, former Deputy Governor of the Bank of England and a Member of its Monetary Policy Committee.

job. However, this consensus has come under strain in many jurisdictions including the US, the euro area, Japan, and the UK

The No. 1 reason concerns the widening of central banks' mandates. 'Too much power' raises hackles and makes central banks targets for perceived failures. Although varying across jurisdictions, policy areas now within the formal ambit of central banks include prudential regulation of a complex financial sector; conduct of both customers and markets; and, most significantly, responsibility for underpinning financial stability.

The latter requires policies for macroprudential activity designed to provide early warnings and mitigate threats; being satisfied that banks and other financial institutions and infrastructure are stronger and more resilient; and ensuring that, if there are failures, the mechanisms are in place to reduce their impact and cost.

One big problem here is that financial stability outcomes cannot be measured as price stability and inflation can. Central banks don't know if they have failed until it is too late. The costs of avoiding failure can be substantial. Additionally, where central banks are dealing with complex financial systems, the danger of confusion and policy conflict is ever-present – threatening damage to central banks' overall credibility.

A second reason for the strains is the complications stemming from interest rates at zero or below. Policy actions intended to get inflation back to target have demonstrated that central banks are finding difficulty in achieving their remit. Quantitative easing has introduced asset price distortions that have benefited some at the cost of others. Moreover, QE comes ultimately closer to a fiscal dimension which is normally the prerogative of politicians, not central banks.

Third, macroprudential policy choices inevitably have selective impact, perhaps more so than interest rates in the case of monetary policy. For example, home-buyers, or their lenders, may be selectively affected. And where people object, in the absence of hard evidence that the actions were necessary, politicians will listen.

The fourth reason is the rise of populist politics. Such movements tend to denigrate the establishment, decry its expertise, and suggest that its policies are politically motivated. Central banks with their delegated powers are not exempt from these rebukes.

One big nagging question remains: Who could do a better job? No one is suggesting that price stability, inflation and financial stability do not matter: quite the opposite. Politicians may feel that they can somehow do better, but the historical record is not on their side. So central bankers need to continue with their central

mandates, while becoming more adept at mastering the challenges that accompany their increasingly complex jobs.

IMI International Monetary Review

In Defence of Monetary Financing*

Central Banks and Fiscal Authorities must Defy Convention

By RIAZ RIAZUDDIN *

The ultimate objective of central banks is to increase the welfare of people through designing and implementing monetary and financial regulatory policies. This mandate is captured in different ways in central bank laws. Within the framework of these laws, many of which justifiably set down the doctrine of central bank independence, it's time to consider again the idea of monetary financing of government deficits. As long as this is not practiced excessively, and is carried out as part of agreed co-operation between the central bank and the fiscal authorities, monetary financing has a valid role in promoting growth and employment during downturns.

Some central banks have multiple objectives, like the Federal Reserve, which is required to 'promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates'. No matter how the objectives are written in the primary legislation, central banks must support growth and employment, even if they are primarily pursuing the objective of price stability. Maintaining a prudent balance between these objectives is difficult, shown in many countries' post-2008 experience.

Coordination between monetary and fiscal authorities is crucial, yet this has become weaker with the modern approach to central banks as independent institutions. However, independence in no way precludes such useful co-operation.

The shift to central bank independence was motivated partly by the need to set safe limits on monetary financing of deficits. Unfortunately, post-second world war thinking has progressed to the stage where all monetary financing has been labelled as an evil, to be opposed whatever the circumstances.

It is true that excessive monetary financing has caused hyperinflation in many countries: Germany and Yugoslavia in the 20th century and Zimbabwe in the 21st century are examples. Japan, on the other hand, successfully followed this path in the early 1930s to fight depression.

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* Deputy Governor of the State Bank of Pakistan.

One possible reason why quantitative easing in Europe and Japan has failed to lift inflation and growth is that the share of (non-debt-creating) monetary financing in total QE is low. In line with the current central bank role as banker to the government, monetary financing results in the accumulation of public debt. However, according to James Buchanan, 1986 Nobel Prize winner in economics, 'The efficient means of purchasing the services of unemployed resources is through inflation of the currency'. Buchanan proposed creating money without increasing the liability of a central bank. This would be controlled by the way resources are transferred to fiscal authorities for undertaking employment-generating development expenditures, and without increasing public debt.

This can be done if government becomes the issuer of currency and the central bank becomes the distributor. Under the existing system, banknotes are issued by central banks, which become their liabilities backed by financial assets like Treasury bills and government bonds that raise public debt. If governments directly issue all denominations of currency notes, these will become assets of central banks, since central banks must purchase these from governments. This mechanism will provide direct nominal seigniorage revenue to the government, instead of increasing government debt.

This approach to financing fiscal deficits is out of fashion, especially in advanced countries. But it is not new. Keynes acknowledged this in A Tract on Monetary Reform in 1923 in these words: 'The method is condemned, but its efficacy, up to a point, must be admitted.'

These important signals cannot be ignored. We need new research to estimate Keynes' 'point' up to which monetary financing is not only harmless, but beneficial. And then we need central banks and governments which are willing to defy convention and implement policies that could help promote growth and jobs at a difficult time for the global economy.

IMI International Monetary Review

Working Paper

Institutional Ownership and Private Equity Placements: Evidence from Chinese Listed Firms*

By HE QING, LI DONGXU, LU LIPING and TERENCE TAI LEUNG CHONG*

This paper examines the impact of institutional ownership on the performance of private equity placements (PEPs) in Chinese listed firms. We found that the presence of institutional investors can alleviate the information asymmetries between listed firms and the market. The participation of institutional investors in PEPs is followed by an improvement of firms' long-term performances. Moreover, independent institutional investors can better predict the long-term performance of PEPs. Finally, the paper also found that institutional investors are more effective in monitoring corporate insiders in non-state owned firms than in state-owned firms.

Keywords: institutional ownership, private equity placements, information asymmetry

JEL Classification: G23, G30, G32, G38, K22

1. Introduction

Institutional shareholders are pivotal players in the capital market. According to Hanouna et al. (2015), the value of assets managed by U.S. mutual funds management companies increased from 4.4 to 12.7 trillion USD during 2000-2014. The number of institutional investors in emerging markets also rapidly expanded. During 2008-2012, the value of total assets under the management of private equity firms and hedge funds doubled, and that of mutual funds, insurance companies, pension funds and commercial banks increased by 50%in 25 emerging economies

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(i.e. data from *International Organization of Securities Commissions*).

A mass of solid evidence suggests that institutional investors conduct progressively stronger external supervision as their ownership increases (Black and Coffee, 1994). Marciukaityte et al. (2005) provided further evidence that an increase in institutional ownership helped reduce the information asymmetries between the corporate board and the outside investors. However, the role of institutional investors becomes more complicated in emerging markets with poorly developed financial and legal systems. As corporate ownership is highly concentrated, controlling shareholders may extract private benefits at the expense of minority shareholders (Allen et al., 2005; He and Rui, 2016). Institutional investors may collude in controlling shareholders to expropriate corporate resources rather than assume an oversight function (Pound, 1988), especially in emerging economies where capital markets are still underdeveloped.

In this paper, we provide new evidence on the role of institutional investors in China in private equity placements (PEPs), which placements are a channel through which listed firms can raise external funds (Carey et al., 1993). Private equity placements (PEPs) are an important type of seasoned equity offerings (SEOs). Unlike public offerings, PEPs typically involve a small number of investors with a strong capital base. In this way, the cost of raising external capital—which necessitates only a low communication cost between the firm and investors—may be reduced. Meanwhile, issuing new equity to large shareholders may also help tie the interests of corporate insiders to minority shareholders. PEPs have gradually become the dominant financing tool for China's listed firms since the issuance in May 2006 of *"The Administration of the Issuance of Securities by Listed Companies"* by the China Securities Regulatory Commission (CSRC). The completed PEPs raised 224.66 billion RMB in 2013, accounting for 80.16% of the total funds raised in that year. This percentage was much higher than that offered through other external financing channels such as public offerings. Thus, analysis of the participation of institutional investors in PEPs will shed light on their roles in China's capital markets.

China' unique setting is well-suited to examining the role of institutional investors. First, the number of institutional investors in the country has grown rapidly in recent years in tandem with the fast economic growth in the country. The number of mutual funds increased from 50 in 2001 to 2,048 in Sep 2014, and the value of net assets under the management of mutual funds increased by nearly 30 times in the same period. Second, the adoption by Chinese firms of best practices in corporate governance has facilitated more efficient oversight of the conduct of managers and controlling shareholders. Investigating the case of China will help us better understand the role of institutional investors in similar emerging countries (He et al., 2016). Finally, since the implementation of market-oriented reform in the financial

sector in 1994[1], more and more private and foreign institutional investors obtained authorization as licensed agencies to undertake securities investing activities. A large number of non-state institutional investors has emerged and played an increasingly important role in China's capital markets. The diversification of institutional investors provides us with a valuable setting to investigate the impact of shareholders' identities on the performance of listed firms.

Using data on PEPs from the Shanghai and Shenzhen Stock Exchanges from 2005 to 2013, we found that uninformed investors reacted positively to the announcement of PEPs. Ownership by institutional investors was negatively associated with the market reaction but positively associated with *ex post* long-term operational performance. The effect on long-term performance was more pronounced when qualified foreign institutional investors (QFIIs) were involved in the PEPs. It suggests that QFIIs have a positive effect in emerging capital markets. In addition, we found that institutional investors were more effective in monitoring insiders in non-state owned firms than those in state-owned firms.

Our study contributes to the literature in three aspects. First, using data on PEPs in China, our study fills the gap in the existing literature on the role of institutional investors by providing a comprehensive investigation into the role of different types of institutional investors in emerging markets. Our results suggest that institutional investors can reduce information asymmetry and better predict future stock prices than non-institutional investors in an emerging market with imperfect financial and legal systems. Second, our study helps understand the relationship between government and institutional investors. We found that institutional investors play a more active role on monitoring private firms than state-owned entities. Finally, our research provides new insights on the long-term performance of PEPs. The existing literature documents a poor long-term performance of PEPs (Loughran and Ritter, 1995; Kang et al., 1999; Jeanneret, 2005). We add to this strand of literature by showing that institutional investors have a positive effect on a firm's long-term performance *ex post* the PEPs.

The rest of this paper is organized into sections. Section 2 describes the institutional background in China and develops hypotheses. Section 3 presents the data and empirical methodology. Section 4 reports estimation results. Section 5 provides a robustness check of our findings. Section 6 concludes the paper.

2. Institutional background and hypothesis development

2.1 Institutional background

[1] In March 2015, Xiaochuan Zhou, the Governor of the People's Bank of China, stated that "The continued expansion of Qualified Foreign Institutional Investors (QFIIs) is an important part of China's current financial reform. China will expand investment quotas for the Qualified Domestic Institutional Investors (QDIIs) and QFIIs" Relevant information can be found on the website of Xinhua News Agency, titled "China to expand quotas of QDIIs, QFIIs, Xiaochuan Zhou," posted on Nov 27th, 2013 (http://en.xinhua08.com/a/20131127/1278431.shtml).

Institutional investors are financial institutions that have a strong capital base, with a stated purpose of creating capital gains though investment activities. China has, since 2003, allowed qualified foreign institutional investors (QFIIs) to engage in investment activities in domestic stocks market. The Chinese financial authorities issued the "Guidance for QFIIs Securities Investment" in 2003, which allowed QFIIs to invest in certain stocks and bonds listed in the Shanghai and Shenzhen Stock Exchanges. There are eight types of institutional investors in the Chinese capital market: QFIIs, mutual funds, social security funds, investment banks, insurance companies, trust funds, supplementary pension funds and financial affiliations.

The number of institutional investors in China has grown immensely during the past decade. In particular, performance of mutual funds has quickly recovered from the shocks it suffered as a result of the global financial crisis.[2] Figure 1 shows that the number of mutual funds increased more than 22 times from 2004 to Sep 2014. Similarly, we can see an upward trend in the total assets under the management of mutual funds. Despite a setback during the global financial crisis, the total assets under the management of mutual funds remained about 1 trillion RMB, and this number continued to grow after the crisis.

The PEP market has expanded rapidly in China. According to the "*Administration of the Issuance of Securities by Listed Firms*" published by the China Securities Regulatory Commission (CSRC), sound profitability is not a condition for prospective issuing firms to obtain government approval. In addition, listed firms are at liberty to raise funds from their controlling shareholders or institutional investors. Moreover, PEPs could be a suitable channel for controlling shareholders to raise funds to increase a firm's asset quality and thereby improve its market prospects, i.e. In addition, the more lax disclosure requirements applicable to PEPs facilitate an effective flow of funds between investors and fund-raisers. Consequently, PEPs have become a dominant channel used by listed firms in China to raise capital. As of Nov 22nd2014, there had been 1,546 cases of successful PEPs in China, resulting in the issue of capital to the value of 2,688 billion RMB.

Given the importance of institutional investors in PEPs, there has been a significant increase in institutional ownership of PEPs involving listed firms. Figure

[2] According to survey data produced by the International Organization of Securities Commissions (IOSCO) in 2012, the compounded annual growth rate of the total assets under management reached 25.4% during 2008-2010, with 16,633 mutual fund products in total. The quick recovery coincided with a rapid economic recovery in the capital market. It indicates that the high inflow of mutual funds boosted investor confidence and probably contributed to economic growth.

2 shows that institutional ownership increased from 4.8% in 2005 to 38% in 2013. This increase was connected with a rising number of PEPs in the wake of the global financial crisis. Listed firms demanded substantial funds to recover from the global financial crisis, and the participation of institutional investors in PEPs helped raise sufficient external finance for them.

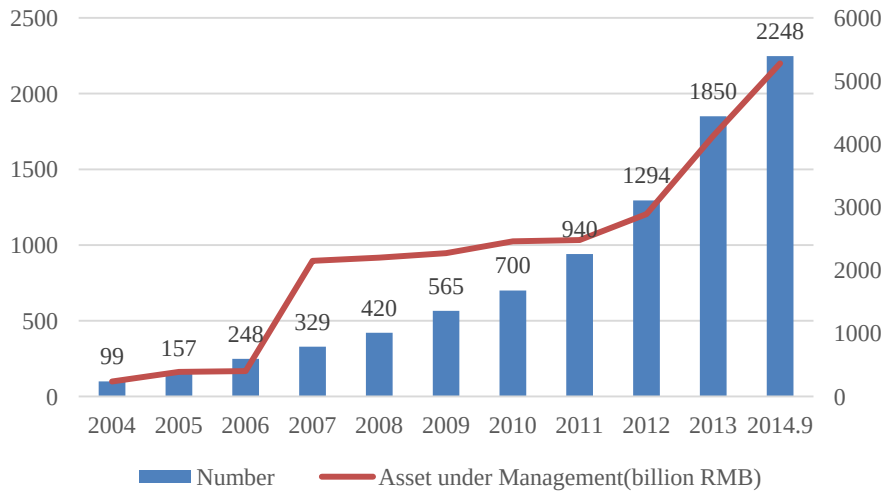

Figure 1: Development of mutual funds in China, 2004-2014.9

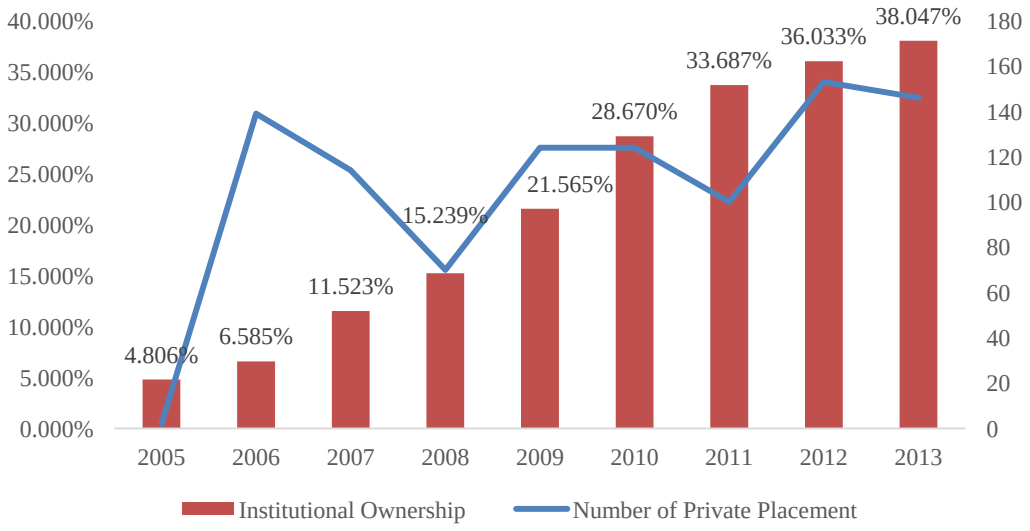

Figure 2: Institutional ownership and private equity placements in China, 2005-2013

2.2 Hypothesis development

First, we examined the effect of institutional ownership on the announcement returns of PEPs. An extensive strand of literature has documented a positive market reaction to the announcement of PEPs, e.g., Wruck (1989) reported a 4.4% average abnormal return when a PEP was announced in the US. Chemmanur and Jiao (2011) found that higher pre-offer net buying by institutional investors was associated with lower discount rates in seasoned equity offerings (including PEPs) as institutional investors had facilitated the circulation of key information on such offerings.

According to the regulation promulgated by CSRC, institutional investors and controlling shareholders are major participants in PEPs. When institutional investors subscribe for large shareholdings (or all) of new issues, they are as well-informed as a firm's controlling shareholders regarding the firm's performance and profitability. Furthermore, the advantage enjoyed by institutional investors in terms of access to proprietary knowledge manifests itself not only during the PEP announcement period, but also in the pre-offer period where certain inside information may be conveyed to these institutional investors. If institutional investors subscribe over 5% of the issued shares—without going through PEPs—their transactions require to be disclosed in accordance with the relevant regulations.[3]Institutional investors may intentionally or unintentionally reveal their proprietary information to uninformed investors on the value of new PEPs. Thus, the conduct of institutional investors before PEPs can alleviate the information asymmetry between the firm and uninformed investors, which may undermine the signaling effect of PEPs. We proposed our first hypothesis as follows:

H1: The announcement return is negatively related to institutional ownership.

Existing studies show that PEPs do not produce significant excess returns in the long-term ex post. However, Chemmanur et al. (2009) found that institutional investors could distinguish SEOs with better long-run stock returns and also that their pre-offer net buying was positively associated with a lower discount. Hence, institutional investors were more likely to select PEPs with attractive investment returns thereby achieving a better long-term performance. Given the high opportunity cost of buying shares, dedicated institutional investors closely monitor the operations of the listed firms they invest in. Furthermore, the superior knowledge

[3]See Articles 13, 14 and 16 in the "Decision on Amending Article 63 of the 'Administration Measures on Takeover of Listed Companies'" (CSRC Decree No. 56). When the equities of an investor and its concerted actor reach 5% of a listed company's total issued shares, they are required to file a report with the CSRC and make an announcement about their further transactions. The requirements vary according to different types of transactions.

of institutional investors on stock-picking can help them choose PEPs with better investment returns. Thus, we proposed our second hypothesis as follows:

H2: The long-term performance of firms increases with institutional ownership.

Bushee (1998) analysed the behaviors of institutional investors and classified them into three categories—transient institutional investors, grey institutional investors and dedicated institutional investors. Chen et al. (2007) argued that only dedicated institutional investors, i.e., independent institutions holding shares over a long period of time, have strong incentives to monitor the firm. Transient institutional investors tended to reduce their holdings in underperforming listed firms. (Collins et al., 2003). Following Bushee (1998), we classified institutional investors in China into independent and grey institutional investors according to the presence of potential business ties with PEP firms. Independent financial institutions, such as QFIIs, mutual funds and social security funds, are heavily regulated and less likely to have business ties with the listed firms they invest in. In contrast, grey institutional investors, such as insurance companies or financial affiliates of some large firms, may have potential business ties with the listed firm they invest in. Grey institutions may collude with the controlling shareholders in tunneling activities, which may end up in an underperformance ex post. Although parent firms and related parties of listed firms may also be classified as institutional investors, we restricted our analysis to institutional investors in the financial sector. Thus, we proposed our third hypothesis as follows:

H3: The presence of independent financial institutional investors is associated with a better performance of the listed firms they invest in.

Because of an absence of supervision by private shareholders, the management of state-owned enterprises (SOEs) is beset by the risk of executives acting in their own self-interest. The improvement in corporate governance practices fostered by privatization is well documented in the existing literature. For example, Qian (1996) showed that SOEs are exposed to substantial policy burdens and high agency costs as managers lack accountability. Qiang (2003) showed that the large percentage of SOE shares held by the state government in China explained their relatively poor performance.[4]Wang (2010) showed that controlling shareholders played a more important role than corporate governance practices in terms of the sensitivity of executive turnover rates to firm performance, which suggests a limited role for corporate governance. However, institutional investors may also help alleviate

4 In August 2013, a listed SOE,the BOE Technology Group (000725.SZ), issued the largest PEP at the time on the A-share market, raising 46 billion RMB. This was BOE's fourth round of PEPs since 2006. However, the company's stock returns were quite poor, with an annual return of less than 10%.

information asymmetry and further reduce the likelihood of expropriation of minority shareholders' interests by the controlling shareholders. Better corporate governance fosters conditions in which such changed patterns of behavior emerge thus enhancing post-performance of PEPs. Therefore, we propose our fourth hypothesis as follows:

H4: Improvement in corporate governance increases the sensitivity of PEPs' performance to institutional ownership in private firms, but not in SOEs.

3. Data and Methodology

3.1 Data

Our sample covered all listed firms in the Shanghai and Shenzhen Stock Exchanges that raised capital by PEPs from 2005 to 2013. Observations of firms in the finance industry were excluded from our sample due to their high sensitivity to government regulations. We disregarded firm-year observations if such had a special treatment status (known as "ST stock")[5]. We finally obtained 972 sample firms that conducted PEPs during 2005-2013. The information on PEPs and institutional shareholdings was retrieved from the WIND database, and the data on relevant firm characteristics were retrieved from the China Stock Market and Accounting Research (CSMAR) database. We drew on seasonal data on institutional shareholdings throughout the empirical testing process in order to capture more precisely changes in institutional ownership.

3.2 Research design

We estimated an OLS model of firm performance following Chemmanur et al. (2009).We examined the role of institutional investors in two ways: original institutional ownership before PEP announcements (*Institutional holding*), and participation by institutional investors in PEPs following PEP announcements (*Participation*). We also included an interaction term of Institutional holding and Participation to examine the incremental impact of original institutional investors choosing to participate in PEPs.

[5] In both the Shanghai and Shenzhen Stock Exchanges, stock identified with an "ST" or "*ST" label means a firm that has suffered losses for at least two consecutive years or a stock that is commencing delisting procedures.

$$
\begin{aligned}
Firm\ Performance &= Institutional\ holding_{i,t} + Participation_{i,t} \\
&+ Institutional\ holding_{i,t} \text{ x } Participation_{i,t} + ROA_{i,t-1} + Size_{i,t-1} \\
&+ Leverage_{i,t-1} + Collect_{i,t} + Prior\_90AR_{i,t} + Discount_{i,t} \\
&+ Prior\_90Risk + SOE + Largest + Board + Independence + Duality \\
&+ \varepsilon_{i,t}
\end{aligned}
$$

Firm Performance was measured as the short-term market reaction, long-term excess stock return, and long-term operational performance. The short-term market reaction was measured by the cumulative abnormal return over the window of [-3,+3] around the announcement date, i.e.,CAR[-3,+3].6 The long-term excess stock return was measured by the average abnormal return within 360 trading days following PEP announcements, i.e.,AAR[1,360]. The long-term operational performance was measured by one-year and three-year-average ROA following the PEPs. Definitions of the key variables are listed in Appendix 1, and all variables are winsorized at the 1stand 99th percentiles.

ROA was subsumed as a control variable to measure profitability. In addition, Firm Size and Leverage were controlled for the financial characteristics of the listed firms. Collect was the logarithm of the capital raised by the PEPs. Discount was the discount rate that the offer-taker accepted for the PEPs. To control for stock anomalies that were independent of PEPs, we included the average abnormal return for the 90 days before the event window, and to further control for volatility we included the standard deviation for the same period. The abnormal return was computed in accordance with a market model. In terms of corporate governance, we controlled state ownership of the firm (SOE), ownership of the largest shareholder (Largest), the logarithm of the number of board members (Board), the proportion of independent directors (Independence), and Duality indicating whether the CEO was also the chairman of the board.

3.3 Summary statistics

Table 1 summarizes the frequency of PEPs in China from 2005 to 2013. Since the implementation of the "Guidance for Share Issuance" in 2006,7PEPs have been a dominant type of SEOs favored by listed firms in the country. The average institutional ownership of such PEPs rose from 6.6% in 2006 to 38.0% in 2013.

[6] The results are qualitatively similar if we instead use *CAR[-1, +1]*.

[7] Before May 2006, only two PEPs took place: Dazhong Transportation Group (600611.SH) and J.S. Corrugating Machinery (000821.SZ).

Furthermore, during the PEP seasons, the numbers of institutional investors increasing their ownership of PEPs are slightly greater than those decreasing such ownership. Table 2 shows the industry distribution of PEPs. The three industries with the highest frequencies of PEPs are manufacturing (626), wholesale and retail (54), and energy (41).

Table 1: Distribution of private equity placements (PEPs) and institutional ownership. This table reports the annual distribution of PEPs events of list firms in Chinese A-share stock market from 2005 to 2013. *Institutional Ownership* represents the average proportion of institutional ownership in these PEPs listed firms. *Increase* and *Decrease* describe the number of the listed firms with PEPs, whose institutional ownership changes in each period.

Year	Number	Institutional ownership	Change of institutional ownership in PEPs			
			Increase	%	Decrease	%
2005	2	4.8%	1	100.0%	0	0.0%
2006	139	6.6%	85	61.6%	53	38.4%
2007	114	11.5%	69	61.6%	43	38.4%
2008	70	15.2%	41	59.4%	28	40.6%
2009	124	21.6%	74	59.7%	50	40.3%
2010	124	28.7%	70	57.4%	52	42.6%
2011	100	33.7%	63	64.3%	35	35.7%
2012	153	36.0%	73	47.7%	80	52.3%
2013	146	38.0%	77	52.7%	69	47.3%

Table 2: Distribution of PEPs and institutional ownership. This table reports the distribution of PEPs events of listed firms in the Chinese A-share stock market in each industry, from 2005 to 2013. *Institutional Ownership* represents the average proportion of institutional ownership of these PEPs listed firms in each industry. *Increase* and *Decrease* describe the number of the listed firms with PEPs, whose institutional ownership changes in each industry.

Industry	Number	Institutional ownership	Change of institutional ownership in PEPs			
			Increase	%	Decrease	%
Agriculture	25	20.3%	15	60.0%	10	40.0%
Mining	20	24.9%	11	55.0%	9	45.0%
Manufacturing	626	21.5%	365	58.3%	261	41.7%
Energy	41	22.2%	20	48.8%	21	51.2%
Construction	27	21.7%	13	48.1%	14	51.9%
Wholesale and retail	54	22.3%	26	48.1%	28	51.9%
Transportation	27	21.8%	16	59.3%	11	40.7%
Accommodation	3	23.8%	1	33.3%	2	66. 7%
IT	33	20.6%	21	63.6%	12	36. 4%
Real estate	33	25.8%	22	66.7%	11	33.3%

Leasing	11	21.5%	6	54.5%	5	45.5%
R&D	2	25.3%	1	50.0%	1	50.0%
Environment	7	21.4%	4	57.1%	3	42.9%
Service	2	19.9%	1	50.0%	1	50.0%
Education	1	37.6%	1	100.0%	0	0.0%
Entertainment	3	19.1%	2	66. 7%	1	33.3%
Others	28	21.8%	16	57.1%	12	42.9%

Before investigating the role of institutional investors in buying PEPs, we attempted to replicate the market reactions to the announcement of PEPs. We conducted an event study to calculate the cumulative abnormal returns (CARs) in the period surrounding the announcements of PEPs, and to examine whether the CARS were significantly different from zero. Consistent with the existing literature that the market reacts positively to private equity issuance (Wruck, 1989; Lu et al., 2011; Fonseka et al., 2014), the statistics in Table 3 show that CARs were positive and statistically significant around the announcement dates. We examined how the market reaction varied in accordance with the shareholding of institutional investors before PEPs and their subsequent holding following participation in the PEPs.

Table 3: Cumulative abnormal return around PEP announcements. This table shows the CAR in different event windows. CAR[-3,+3] is the cumulative abnormal return during the announcement period of PEPs, starting from 3 days before the event and ending 3 days after. Similarly, this table exhibits the result of CAR(0), CAR[-1,+1], CAR[-5,+5], CAR[-7,+7], CAR[-30,+30], CAR[-3,+1], CAR[-5,+1], CAR[-7,+1] and CAR[-30,+1]. T-test is conducted to show the significance of the average CAR. Z-test is conducted to show the significance of the median CAR. P value of both tests are presented with ***, **, and * indicating statistical significance at 1%, 5%, and 10% levels.

	Mean	**t-test**	**Median**	**z-test**
CAR(0)	0.018	0.000***	0.001	0.000***
CAR[-1,+1]	0.143	0.000***	0.030	0.000***
CAR[-3,+3]	0.171	0.000***	0.046	0.000***
CAR[-5,+5]	0.199	0.000***	0.050	0.000***
CAR[-7,+7]	0.212	0.000***	0.058	0.000***
CAR[-30,+30]	0.219	0.000***	0.065	0.000***
CAR[-3,+1]	0.153	0.000***	0.045	0.000***
CAR[-5,+1]	0.159	0.000***	0.047	0.000***
CAR[-7,+1]	0.162	0.000***	0.048	0.000***
CAR[-30,+1]	0.165	0.000***	0.048	0.000***

Table 4 shows summary statistics for the key variables in the model. On the one hand, the short-term market reaction to PEPs was more pronounced than the long-term excess stock returns. The average of CAR[-3,+3]was 0.171%, while the average abnormal return for the 360 trading days after the event date was0.005% (i.e.

CAR[1,360] about 0.018).On the other hand, institutional investors accounted for19.3% of the shareholdings, indicating that theywere playing an essential role in China.

Table 4: Summary statistics. This table presents descriptive statistics of the key variables employed in our model.CAR[-3,+3]is the cumulative abnormal return during the announcement period of PEPs, starting from 3 days before and ending 3 days afterwards. The event date is defined as the date on which the PEPs plan is first issued. AAR[1,360]is the sum of abnormal return for 360 trading days after the announcement of PEPs following the market model. *ROA* is the proportion of net profits over total assets. Both the *ROA* one year later and the 3-year-average *ROA* are documented. *Discretionary Accruals* is the difference between accrued profits and non-discretionary accruals following the adjusted Jones Model (Dechow et al., 1995). *Institutional holding*is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEPs plan was first announced.All variable definitions are in Appendix 1.

Dependent Variable	**Obs.**	**Mean**	**Median**	**Sd.**
CAR[-3,+3]	972	0.171	0.046	1.016
ROA[0,1]	924	0.001	0	0.039
ROA[0,3]	882	0.005	0.004	0.027
Discretionary accruals[0,3]	724	0.022	0.011	0.120
Independent Variables				
Institutional holding	28,464	0.193	0.081	0.232
Participation	28,474	0.355	0	0.478
Control Variables				
Firm size	30,273	21.687	21.520	1.366
Leverage	29,374	0.515	0.505	0.274
ROA	29,746	0.002	0.000	0.040
Collect	972	0.305	1.849	0.756
Discount	972	0.199	18.480	0.231
Prior_90AR	972	0.008	0.008	0.003
Prior_90Risk	972	0.026	0.026	0.008
SOE	30,816	0.517	1	0.500
Largest	29,473	0.385	0.369	0.162
Board	30,816	9.172	2.197	1.924
Independence	30,816	0.364	0.333	0.051
Duality	30,816	0.179	0.000	0.383

3.4 Graphic comparison

To illustrate the impact of the presence of institutional investors in PEPs, we produced a graphic comparison of market reactions to PEP announcements. We defined a firm as one where 5% of its total investors were institutional investors (Group 1); otherwise the firm was deemed to have no presence as an institutional investor or to be an institutional investor that was not a corporate insider (Group 0).

Figure 3 illustrates the CARsfor60 trading days around PEP announcements, and Figure 4 illustrates the relative trading volume for 120 trading days around PEP announcements. The abnormal return was computed from a market model, and the relative trading volume was calculated with reference to the trading volume scaled by the average trading volume during the 360 trading days before the PEP announcements. Both figures show that a significant presence of institutional investors in PEPs resulted in a more stable market reaction than those without a significant presence of such investors.

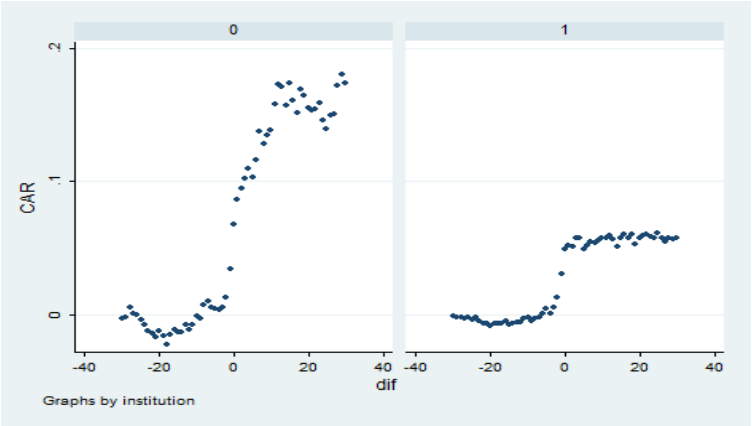

Figure 3: CAR[-30,+30] of PEPsannouncement

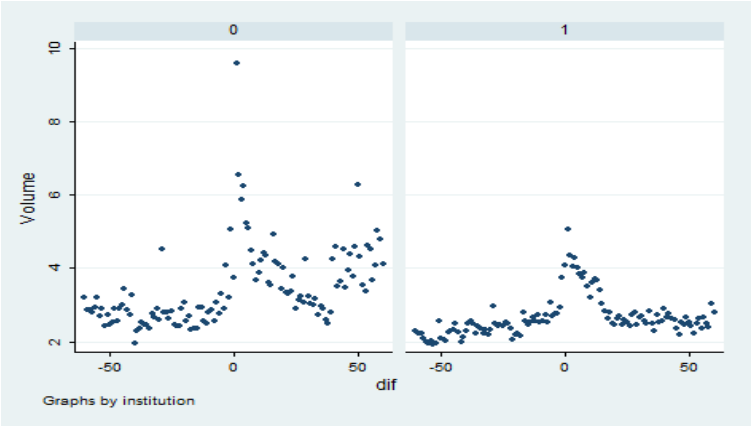

Figure 4: Relativetrading volume [-30,+30] of PEPs announcement

Note: In Figure 3 and Figure 4, "0" stands for PEPs firms without the presence of institutional investors (ownership less than 5%), while "1" represents those with institutional investors whose ownership is no less than 5%. CAR is the cumulative abnormal return computed by the market model. Relative trading volume is computed by the daily trading volume divided by the average trading volume in the recent 360 days prior to the event period, which starts from the 30th day before the PEPs announcement and ends on the 30th day afterwards.

4. Empirical results

4.1 Univariate test

To compare the effects of institutional ownership across firms possessing different performance profiles, we divided our sample into two groups; market reactions and *ROA* (Table 5). When the total institutional ownership was sorted by CAR[-3,+3], the total institutional ownership in the bottom half of the sample (32.1%) was higher than that in the top half of the sample (28.5%) and statistically significant at the 5% level. However, we did not find any significant difference in the institutional ownership between groups with high and those with low levels of long-term excess stock returns (unreported but available upon request). In addition, following PEPs, a high institutional ownership was associated with better accounting performance ex post, in terms of both 1-year and 3-year-average *ROA* (significant at a 1% level). In particular, in the bottom half of the 3-year-average *ROA*ex post, the shareholding owned by mutual funds accounted for only 4.2% of the total, whereas it was10.9% for the top half of the sample. These findings support Cuthbertson et al. (2008) on the superior stock-picking abilities of mutual funds.

Table 5: Univariate test on the impact of institutional presence on firm performance. This table shows the results of univariate mean-difference tests on the impact of the presence of institutional investors in listed firms on firm performance. Firm performance is measured through short-term market reaction, short-term firm performance, as well as long-term firm performance, respectively. We divide sample firms into two groups by the proportion of equity shares by each kind of institutional investors and then compare the average performance to get the difference.

	Bottom 1/2		Top 1/2		t-Test	
Institutional ownership	Obs.	Average	Obs.	Average	Difference	P-Value
Market Reaction (CAR[-3,+3])						
Private fund	481	0.001	482	0.001	0.000	0.446
Commercial banks	481	0.000	482	0.002	-0.001	0.084
Trust fund	481	0.002	482	0.001	0.001	0.109
Supplementary pension	481	0.000	482	0.000	0.000	0.065
Social security fund	481	0.005	482	0.006	-0.002	0.068
Insurance	481	0.005	482	0.003	0.001	0.077
QFII	481	0.003	482	0.003	0.001	0.501
Financial product	481	0.002	482	0.002	0.001	0.189
Investment bank	481	0.003	482	0.003	0.000	0.824
Mutual fund	481	0.073	482	0.080	-0.007	0.379
Total	481	0.321	482	0.285	0.036	0.014
Short-term firm performance (ROA[0,1])						
Private fund	441	0.001	483	0.001	0.000	0.207
Commercial banks	441	0.001	483	0.001	0.001	0.217
Trust fund	441	0.002	483	0.001	0.001	0.099

Supplementary pension	441	0.000	483	0.000	0.000	0.039
Social security fund	441	0.003	483	0.008	-0.005	0.000
Insurance	441	0.002	483	0.005	-0.003	0.000
QFII	441	0.002	483	0.004	-0.002	0.021
Financial product	441	0.001	483	0.002	-0.001	0.013
Investment bank	441	0.002	483	0.004	-0.002	0.019
Mutual fund	441	0.042	483	0.110	-0.068	0.000
Total	441	0.273	483	0.331	-0.058	0.000
Long-term firm performance (ROA[0,3])						
Private fund	419	0.001	463	0.001	0.000	0.369
Commercial banks	419	0.002	463	0.001	0.001	0.155
Trust fund	419	0.002	463	0.001	0.001	0.129
Supplementary pension	419	0.000	463	0.000	0.000	0.045
Social security fund	419	0.003	463	0.007	-0.005	0.000
Insurance	419	0.002	463	0.006	-0.004	0.000
QFII	419	0.002	463	0.004	-0.001	0.057
Financial product	419	0.001	463	0.003	-0.001	0.002
Investment bank	419	0.002	463	0.004	-0.002	0.012
Mutual fund	419	0.042	463	0.109	-0.067	0.000
Total	419	0.274	463	0.328	-0.054	0.000

4.2 The impact of institutional ownership on market reactions

Model (1) of Table 6 shows that a high institutional holding in the season before PEP announcements was associated with a low market reaction and was statistically significant at the 1% level. In this regard, institutional investors may have conveyed certain inside information to uninformed investors before PEP announcements and this may have led to a low market reaction. In addition, the participation of institutional investors in PEPs was also positively associated with a high CAR, which suggests that institutional investors, taking advantage of their proprietary information and investment expertise, may have provided certification for PEPs, thereby stimulating a high market reaction. The coefficient of the interaction term of institutional holding and participation was significantly positive in Model (2), which showed a high market reaction where the institutional investors chose to participate in the PEPs, thereby increasing their ownership of the firm. However, it seems that the participation of institutional investors was negatively associated with the market reaction where the ex-ante institutional holding was at a relatively low level. It suggests a possible collusion between institutional investors and controlling shareholders. We confirmed the above results in Models (4) and (5) by adding a more comprehensive set of control variables.

Table 6: The impact of institutional ownership on the market reaction to PEPs. Dependent variable CAR[-3,+3] is the cumulative abnormal return to the announcement of PEPs, starting from 3 days ahead of and ending on the third day after the event. *Institutional holding*is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEPs plan was first announced.All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	CAR[-3,+3]				
	(1)	(2)	(3)	(4)	(5)
Institutional holding	-0.246***	-0.510***	-0.366***	-0.362***	-0.377***
	(0.069)	(0.090)	(0.092)	(0.088)	(0.094)
Participation	0.050***	-0.146***	-0.087*	-0.088**	-0.125***
	(0.019)	(0.047)	(0.045)	(0.043)	(0.048)
Institutional holding x Participation		0.295**	0.200	0.287**	0.348***
		(0.133)	(0.126)	(0.121)	(0.129)
Firm size			-0.070***	-0.037***	-0.053***
			(0.012)	(0.013)	(0.015)
Leverage			0.533***	0.432***	0.492***
			(0.051)	(0.048)	(0.051)
ROA			2.242***	1.777***	1.988***
			(0.334)	(0.317)	(0.341)
Collect				0.015	0.026
				(0.027)	(0.030)
Discount				-0.001**	-0.001**
				(0.001)	(0.001)
Prior_90AR				-7.171**	-6.838*
				(3.380)	(3.827)
Prior_90Risk				-2.771*	-1.906
				(1.440)	(1.764)
SOE					0.063**
					(0.031)
Largest					-0.002
					(0.101)
Board					-0.085
					(0.088)
Independence					0.134
					(0.294)
Duality					-0.017
					(0.037)

Constant	0.153	1.260***	0.230	0.722*
	(0.145)	(0.286)	(0.315)	(0.404)
Industry, year and season fixed effects	Yes	Yes	Yes	Yes
Observation	962	941	889	746
Adjusted-R square	0.071	0.196	0.361	0.371

Institutional investors may also monitor the controlling shareholder in PEPs. To test this hypothesis, we analyzed the relationship between institutional ownership and the discount rate of PEPs. Institutional investors can reduce the discount rate, which often suffers from manipulation by the controlling shareholder (Hertzel and Smith, 1993). Table 7 shows that a higher institutional ownership in the season prior to the PEPs announcement, significantly reduces the discount rate. However, when the controlling shareholder involved in the PEPs, the sensitivity between the institutional ownership and the discount rate is weakened to a large extent. Model (4)of Table 7 shows that the controlling shareholder's incentive to increase the discount rate becomes stronger where the firm has a high ROA. These results show that institutional investors have limited power to monitor the controlling shareholder. Hence, a lower market reaction to PEPs announcement is more likely to be a result of attenuated information asymmetry due to the presence of institutional ownership.

Table 7: Monitoring of institutional investors on controlling shareholders. This table shows whether the institutional investors can restrain the controlling shareholder from manipulating the discount rate of PEPs. *Discount Rate* is the proportion of the difference between issuing price of PEPs and the benchmark over the benchmark. The benchmark is the average of stock price for 20 days before the announcement. *Institutional holding* is the proportion of equity shares held by institutional investors. *Ctrl_Participate* equals 1 if the controlling shareholder participates in the PEPs, 0 otherwise. All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	Discount Rate			
	(1)	(2)	(3)	(4)
Institutional holding	-0.148**	-0.252***	-0.161*	-0.269***
	(0.073)	(0.088)	(0.086)	(0.099)
Ctrl_Participate		-0.037		-0.038
		(0.023)		(0.023)
Institutional holding x Ctrl_Participate		0.237**		0.249**
		(0.116)		(0.117)
ROA			-0.830***	-0.821***
			(0.301)	(0.300)
Institutional holding x ROA			3.962*	3.939*

			(2.393)	(2.388)
Prior_90AR	2.240	1.882	2.518	2.166
	(3.819)	(3.816)	(3.833)	(3.829)
Prior_90Risk	3.979**	4.124**	3.891**	4.041**
	(1.605)	(1.605)	(1.631)	(1.629)
Largest	-0.155**	-0.160**	-0.154**	-0.158**
	(0.063)	(0.063)	(0.064)	(0.064)
Board	-0.077	-0.068	-0.079	-0.069
	(0.055)	(0.055)	(0.056)	(0.056)
Independence	-0.096	-0.060	-0.064	-0.029
	(0.200)	(0.201)	(0.202)	(0.202)
Duality	-0.045*	-0.044*	-0.046*	-0.045*
	(0.025)	(0.026)	(0.026)	(0.026)
Constant	0.026	0.007	-0.134	-0.151
	(0.207)	(0.207)	(0.217)	(0.217)
Industry, year and season fixed effects	Yes	Yes	Yes	Yes
Observation	741	741	724	724
Adjusted-R-squared	0.222	0.225	0.232	0.235

4.3 The impact of institutional ownership on operational performance

Table 8 shows a significantly positive relationship between institutional ownership and operational performance in terms of the *ROA*. This might be due to the superior stock-picking ability of institutional investors, who synthesize information through their financial analytical skills and select stocks with sound fundamentals and growth prospects. An alternative explanation is that institutional investors participated actively in corporate governance thus improving operational performance (1-year and 3-year-average *ROA*). Model (3) shows the impact of institutional ownership on corporate governance after PEPs. Where institutional investors increased their ownership, corporate governance practices seemed to improve as manifested by the enhanced capability of such practices to monitor the activities of the controlling shareholder. Model (3) also shows that increase in institutional ownership in the season of PEPs could moderate the magnitude of salaries earned by management, which suggests an effective monitoring role by institutional investors.

Table 8: The impact of institutional ownership on long-term operational performance. Long-term operational performance is measured by 1-year ROA, 3-year-average ROA and 3-year-average discretionary accruals after the announcement of PEPs respectively. ROA is net profits over total assets. Discretionary accruals is the difference between accrued profits and non-discretionary accruals following the adjusted Jones Model (Dechow et al., 1995). *Institutional holding* is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEPs plan was first announced. All variable definitions are in Appendix 1. White heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	Long-term Operational Performance		
	ROA[0,1]	ROA[0,3]	Discretionary accruals [0,3]
	(1)	(2)	(3)
Institutional holding	0.018**	0.029***	-0.006
	(0.008)	(0.008)	(0.031)
Participation	-0.004	0.005	0.014
	(0.004)	(0.004)	(0.015)
Institutional holding x Participation	0.009	-0.011	-0.080*
	(0.012)	(0.012)	(0.044)
Firm size	0.002	0.002	-0.010**
	(0.001)	(0.001)	(0.005)
Leverage	-0.047***	-0.026***	-0.008
	(0.005)	(0.005)	(0.018)
ROA			0.109
			(0.149)
Collect	-0.008***	-0.005**	-0.007
	(0.003)	(0.003)	(0.010)
Discount	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)
Prior_90AR	-0.091	-1.556***	-3.062*
	(0.486)	(0.464)	(1.723)
Prior_90Risk	-0.519**	-0.249	-1.005
	(0.230)	(0.220)	(0.830)
SOE	-0.011***	-0.012***	-0.012
	(0.003)	(0.003)	(0.011)
Largest	-0.003	-0.003	0.030
	(0.009)	(0.009)	(0.035)
Board	0.005	-0.014*	-0.047
	(0.008)	(0.008)	(0.030)
Independence	-0.009	-0.035	0.027
	(0.028)	(0.026)	(0.104)

Duality	0.005	0.005	-0.020
	(0.004)	(0.003)	(0.013)
Constant	-0.006	0.019	0.393***
	(0.038)	(0.036)	(0.143)
Industry, year and season fixed effects	Yes	Yes	Yes
Observation	744	693	643
Adjusted R-square	0.210	0.140	0.037

4.4 Different types of firms

Wang (2010) showed that the controlling shareholders of SOEs dominated firms' operations in China, which indicates that institutional investors may be more passive in monitoring SOEs than private firms. In this study, we examined whether the impact of institutional ownership on firm performance differed between SOEs and private firms.

Table 9 shows that ex ante institutional ownership had a smaller impact on the operational performance of SOEs than private firms. Moreover, an increase in institutional ownership in the season of PEPs undermined the marginal effect of institutional holdings on the operational performance for SOEs—but not for private firms. It suggests that institutional investors had limited monitoring effect on SOEs. For example, a severe political intervention in SOEs may have made it difficult for institutional investors to monitor the firm ex post. Increasing institutional ownership reduced the information asymmetry between the listed firm and the market, though this relationship was not significant for SOEs.

Table 9: Different types of firms.*ROA* is net profit over total assets. *Discretionary Accruals* (or *DA*) is the difference between accrued profits and non-discretionary accruals following the adjusted Jones Model (Dechow et al., 1995). *Institutional holding* is the proportion of equity shares held by institutional investors. *Participation* equals 1 if institutional ownership increases during the season when the PEPs plan was first announced. All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	ROA[0,3]		Discretional Accruals[0,3]	
	Private	SOEs	Private	SOEs
	(1)	(2)	(3)	(4)
Institutional holding	0.041***	0.018*	0.083	-0.073*
	(0.011)	(0.010)	(0.052)	(0.044)
Participation	0.007	0.015***	0.046*	-0.032
	(0.006)	(0.005)	(0.025)	(0.022)

Institutional holding x Participation	-0.018	-0.025*	-0.192***	0.039
	(0.016)	(0.014)	(0.073)	(0.058)
Firm size	-0.000	0.002	-0.015	-0.012*
	(0.002)	(0.001)	(0.009)	(0.006)
Leverage	-0.017***	-0.007	-0.008	-0.006
	(0.006)	(0.006)	(0.029)	(0.025)
ROA	0.353***	0.465***	0.032	0.028
	(0.050)	(0.042)	(0.235)	(0.185)
Collect	-0.006	0.002	-0.007	-0.004
	(0.004)	(0.003)	(0.019)	(0.012)
Discount	-0.000**	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Prior_90AR	-2.122***	-0.724	-2.216	0.884
	(0.603)	(0.566)	(2.682)	(2.346)
Prior_90Risk	0.353	0.021	-0.971	-1.456
	(0.290)	(0.261)	(1.289)	(1.076)
Largest	-0.004	-0.003	0.049	-0.021
	(0.012)	(0.011)	(0.054)	(0.046)
Board	-0.021*	0.000	-0.076	-0.025
	(0.012)	(0.008)	(0.053)	(0.035)
Independence	-0.047	0.006	-0.098	0.231*
	(0.038)	(0.030)	(0.176)	(0.128)
Duality	0.002	0.002	-0.013	-0.016
	(0.004)	(0.005)	(0.018)	(0.021)
Constant	0.081	-0.036	0.669***	0.297*
	(0.059)	(0.042)	(0.244)	(0.170)
Industry, year and industry fixed effects	Yes	Yes	Yes	Yes
Observation	338	394	318	364
AdjustedR-square	0.370	0.316	0.012	0.019

4.5 Different types of institutions

Institutions that hold shares in non-financial listed firms, such as the parent company of a financial institution or related parties with business ties, are also institutional investors. These non-financial institutions may have more proprietary information than external financial institutions. We examined the different impacts of financial and non-financial institutional investors on firm performance.

Table 10 shows that ex ante ownership by financial institutional investors had a

significant negative relationship with information asymmetries. The positive coefficient of the interaction term indicated that incremental ownership by financial institutional investors was associated with higher expected stock returns in the future. For listed firms with the presence of non-financial institutional investors, the coefficient of the interaction term was not significant, and the participation of non-financial institutional investors in PEPs incurred significantly negative market reactions. In this regard, the market may have perceived non-financial institutional investors as having greater capacity for expropriation. Besides, only the ex-ante presence of financial institutions—as opposed to non-financial institutions—was associated with higher operational performance.

Table 10: Financial institutions and non-financial institutions. *Financial* institutions include all professional institutions in finance industry with expertise in equity investment, such as mutual funds and QFIIs, etc. *Non-financial* institutions include parent companies or related parties that hold equity of the listed firm. All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	CAR[-3,+3]		ROA[0,3]	
Institutional investor type	Financial	Non-Financial	Financial	Non-Financial
	(1)	(2)	(3)	(4)
Institutional holding	-0.377***	-0.191**	0.044***	0.003
	(0.094)	(0.083)	(0.011)	(0.007)
Participation	-0.125***	-0.090**	0.004	0.001
	(0.048)	(0.044)	(0.003)	(0.004)
Institutional holding x Participation	0.348***	0.129	0.007	-0.008
	(0.129)	(0.123)	(0.015)	(0.010)
Firm size	-0.053***	-0.069***	-0.002	0.000
	(0.015)	(0.015)	(0.001)	(0.001)
Leverage	0.492***	0.514***	-0.005	-0.007*
	(0.051)	(0.051)	(0.004)	(0.004)
ROA	1.988***	1.872***	0.357***	0.378***
	(0.341)	(0.332)	(0.027)	(0.027)
Collect	0.026	0.030	-0.002	-0.002
	(0.030)	(0.030)	(0.002)	(0.002)
Discount	-0.001**	-0.002***	0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)
Prior_90AR	-49.830***	-40.729***	-0.790*	-0.704*
	(5.183)	(5.084)	(0.404)	(0.411)
Prior_90Risk	17.249***	15.257***	-0.429**	-0.407**

	(2.435)	(2.348)	(0.185)	(0.188)
SOE	0.063**	0.075**	-0.004*	-0.005**
	(0.031)	(0.031)	(0.002)	(0.003)
Largest	-0.002	-0.047	0.003	0.002
	(0.101)	(0.099)	(0.008)	(0.008)
Board	-0.085	-0.108	-0.008	-0.008
	(0.088)	(0.085)	(0.007)	(0.007)
Independence	0.134	0.311	-0.031	-0.036
	(0.294)	(0.285)	(0.023)	(0.023)
Duality	-0.017	-0.008	0.002	0.002
	(0.037)	(0.036)	(0.003)	(0.003)
Constant	0.722*	1.190***	0.095***	0.044
	(0.404)	(0.410)	(0.033)	(0.032)
Industry, year and season fixed effects	Yes	Yes	Yes	Yes
Observation	746	788	734	734
AdjustedR-square	0.371	0.330	0.328	0.306

Following the classification of institutional investors by Bushee (1998), institutional investors in China can be categorized as independent institutions (mutual funds, social security funds and QFIIs) or grey institutions (investment banks, insurance companies, supplementary pension funds, trust funds and financial affiliates). Grey institutional investors might share potential business ties with a listed firm, which creates the possibility of their gaining access to inside information. In fact, grey institutional investors can hardly prevent the controlling shareholder from expropriation. On the other hand, independent institutional investors do not have such business ties, and rely more on their knowledge and analytical skills in stock-picking. Table 11shows that the alleviation of information asymmetry comes mainly from participation by grey institutional investors. In contrast, independent institutions have stronger predictive power for long-term operational performance, which corroborates their superior stock-picking abilities.

Table 11: Independent institutional investors and grey institutions. Grey institutional investors are those which have potential business ties with the listed firms, i.e. investment banks, insurance firms, supplementary pension funds, trust funds, and finance corporations. Institutions without potential business ties are regarded as independent institutions, i.e. mutual funds, social funds and QFIIs. All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	CAR[-3,+3]		ROA[0,3]	
Institutional investor type	Independent	Grey	Independent	Grey
	(1)	(2)	(3)	(4)
Institutional holding	-0.281	-0.212**	0.067***	0.011

	(0.149)	(0.088)	(0.013)	(0.008)
Participation	-0.032	-0.091**	0.003	0.006
	(0.037)	(0.043)	(0.003)	(0.004)
Institutional holding x Participation	0.210	0.105	0.016	-0.008
	(0.188)	(0.117)	(0.017)	(0.011)
Firm size	-0.064***	-0.068***	-0.001	0.001
	(0.015)	(0.015)	(0.001)	(0.001)
Leverage	0.508***	0.512***	-0.022***	-0.025***
	(0.052)	(0.051)	(0.004)	(0.004)
ROA	1.975***	1.928***		
	(0.339)	(0.332)		
Collect	0.029	0.030	-0.006**	-0.007***
	(0.030)	(0.030)	(0.003)	(0.003)
Discount	-0.002***	-0.002***	-0.000	-0.000
	(0.001)	(0.001)	(0.000)	(0.000)
Prior_90AR	-40.104***	-39.926***	-1.015**	-0.961**
	(5.102)	(5.070)	(0.456)	(0.466)
Prior_90Risk	15.875***	14.983***	-0.386*	-0.316
	(2.347)	(2.351)	(0.208)	(0.215)
SOE	0.058*	0.078**	-0.009***	-0.011***
	(0.031)	(0.031)	(0.003)	(0.003)
Largest	-0.083	-0.056	0.005	0.002
	(0.098)	(0.099)	(0.009)	(0.009)
Board	-0.112	-0.107	-0.009	-0.009
	(0.085)	(0.085)	(0.008)	(0.008)
Independence	0.269	0.285	-0.016	-0.022
	(0.286)	(0.285)	(0.025)	(0.026)
Duality	0.001	-0.011	0.002	0.003
	(0.036)	(0.036)	(0.003)	(0.003)
Constant	1.047**	1.182***	0.097***	0.029
	(0.418)	(0.410)	(0.037)	(0.036)
Industry, year and season fixed effects	Yes	Yes	Yes	Yes
Observation	788	788	734	734
AdjustedR-square	0.325	0.331	0.146	0.101

5. Robustness test

We conducted robustness checks by alternative methods. To examine whether the presence of institutional ownership influenced the performance of PEPs, we conducted a counterfactual test. Firms with institutional ownership of no less than 5%

of the total share were the treatment group, while those with institutional ownership of less than 5% were the control group. We employed the propensity score-matching method to identify firms in the control group that had a similar probability of institutional presence. The nearest-neighbor matching technique was employed to identify the matching firms. To give an institutional presence score, we controlled specified variables: industry, year, firm size, leverage, ROA, SOE, largest shareholder, board size, proportion of independent directors, and CEO duality. To avoid selection issues for the control firms, we performed random matching 200 times. Table 12 shows that the results were not qualitatively different from our earlier regression results. The presence of institutional investors ex ante was associated with a smaller announcement effect and better long-term operational performance ex post, whereas corporate governance was not improved by institutional ownership, indicating that institutional investors did not actively engage in corporate governance.

Table 12: Propensity score matching. We employ propensity score matching method to measure the propensity of institutional presence in a PEPs firm. ATT means average treatment effect on the treatment group. The treatment group is PEPs firms with institutional ownership of no less than 5%. The control group is PEPs firms with institutional ownership less than 5%. Nearest neighboring matching is employed as the matching method.

	# of treatment	# of control	ATT	Std.dev	T-value
CAR[-1,+1]	746	147	-0.103	0.003	-35.000
CAR[-3,+3]	746	147	-0.101	0.003	-32.966
ROA[0,1]	744	141	-0.001	0.005	-0.162
ROA[0,3]	693	134	0.002	0.003	10.216

Table 13applied two alternative measures of institutional ownership in the season prior to PEP announcement. One was a dummy variable that equaled 1 if the institutional ownership was no less than 5%. The other was a dummy variable that equaled 1 if the institutional ownership of the listed firm was above the industry average. We set the benchmark of institutional presence at 5%of share ownership as the investment activities of institutional investors were heavily regulated, and thus such investors had better access to inside information and also bore a significant proportion of the cost of the shares. Table 13 shows qualitatively similar results, which substantiate the robustness of the role of institutional investors.

Table 13: Alternative proxy for institutional presence. Two proxies are used as alternative measures for *Institutional holding*. One is a dummy equals 1 if institutional ownership is no less than 5%; The other is a dummy equals 1 if institutional ownership is greater than the industry average. All variable definitions are in Appendix 1. Heteroscedasticity robust standard errors are in parentheses. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	Institutional presence		Institutional ownership >industry average	
	CAR[-3,+3]	ROA[0,3]	CAR[-3,+3]	ROA[0,3]
	(1)	(2)	(3)	(4)
Institutional holding	-0.019*	0.005*	-0.019*	0.007*
	(0.011)	(0.003)	(0.011)	(0.004)
Participation	-0.014	0.003	-0.014	0.004
	(0.012)	(0.003)	(0.012)	(0.004)
Institutional holding x Participation	0.032**	-0.001	0.032**	-0.005
	(0.014)	(0.003)	(0.014)	(0.005)
Constant	0.166	0.027	0.166	0.041
	(0.115)	(0.028)	(0.115)	(0.041)
Financial characteristics	Yes	Yes	Yes	Yes
Corporate governance	Yes	Yes	Yes	Yes
PPEs characteristics	Yes	Yes	Yes	Yes
Industry, year and season fixed effects	Yes	Yes	Yes	Yes
Observation	614	568	614	596
Adjusted R-square	0.149	0.432	0.149	0.313

6. Conclusion

This paper examined the impact of institutional investors on the performance of firms raising funds by PEPs from 2005 to 2013. We found that institutional ownership prior to the PEPs was negatively associated with market reaction to PEP announcement. However, institutional ownership prior to the PEPs was positively associated with the long-term operational performance of the issuing firms ex post, although there was no difference in the long-term excess stock return according to a presence of institutional ownership. Besides, institutional investors were able to exercise a monitoring oversight of the firm which was underperforming or experiencing financial distress. Furthermore, independent financial institutions had superior knowledge on stock selection as opposed to other non-financial institutions with potential business ties to the listed firm. In addition, the sensitivity of firm performance to institutional ownership was weaker in SOEs compared with private firms, and the monitoring role of institutional investors was efficacious only for private firms (not for SOEs). Our results cast light on the urgency of deepening the privatization of SOEs in China.

Chemmanur et al. (2009) argued that institutional investors are more sensitive to SEOs with better earnings persistence and therefore achieve higher excess stock returns by increasing their shareholdings in these firms. With participation by

institutional investors, information asymmetries between the listed firm and the market were significantly mitigated. One policy implication of our results is that independent financial institutional investors should be encouraged to participate in the stock market under the current financial reform in the country. This is particularly the case for QFIIs, which account for only less than 1% of all institutional ownership of shareholdings in the country. The presence of these financial institutions would be helpful in screening listed firms with better performance thereby leading to the enhanced efficiency of the capital markets in China.

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Appendix 1: Definitions of key variables

Variable	Definition
CAR[-3,+3]	Sum of abnormal return in during the [-3,3] window calculated with a market model
AAR[1,360]	Average abnormal return for the 360 trading days after the PPEs announcements using a market model
ROA	Net profits over total assets
Discretionary Accruals	Difference between accrued profits and non-discretionary accruals following the adjusted Jones Model (Dechow et al., 1995)
Institutional holding	Proportion of equity shares held by institutional investors
Participation	Equals 1 if institutional ownership rises after announcement, 0 otherwise
Size	Logarithm of total assets
SOE	Equals 1 if state-owned firm, 0 otherwise
Leverage	Total liabilities over total assets
Collect	Logarithm of the amount of money raised from PEPs, in RMB
Discount	Issuing price of PEPs minusthe benchmark price scaled by the benchmark price (i.e. the stock price for 20 days prior to the announcement date)
Prior_90AR	Abnormal return in 90 days prior to the PPEs announcement, i.e. the average of the actual daily return minus expected daily return following a market model for the 90 days before the announcement
Prior_90Risk	Standard error of the abnormal return in 90 days prior to PPEs announcement
Largest	Proportion of equity shareholding of the largest stock holder
Board	Logarithm of the number of directors on board
Independence	Proportion of independent directors on board
Duality	Equals 1 if the CEO also holds the chairman position, 0 otherwise

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Measuring Latin America's Export Dependency on China*

By CARLOS CASANOVA, ROMINA FERREIRA, and XIA LE *

Bilateral trade between China and Latin America has grown very quickly in the last decade. As a consequence, economic relationships with Latin America intensified tremendously, as growing demand for resources drove China into relatively unexplored frontiers. In this paper we deploy an export dependency index to identify the sectors and countries in Latin America which are most exposed to fluctuations in Chinese demand. According to our estimates, dependency on China increased overboard across Latin America for all countries and all sectors between 2008 and 2014. Absolute dependency levels were highest in Costa Rica, Colombia, Uruguay, Venezuela, Brazil, Panama, Peru, Chile, Guyana and Argentina. Of these, the largest exporters to China, namely Brazil, Argentina, Chile, Peru, Colombia, and Venezuela, featured high dependencies concentrated around just four commodities: soy in the form of soybeans and soybean oil; crude oil; copper in the form of copper ore, copper cathodes and unrefined copper; and iron ore. These four commodities, accounted for 80% of the regions total exports to China.

Keywords: Trade, trade dependency, natural resources, China, Latin America.

JEL Classification: D51, F02, F14

1. An overview of China-Latin America trade relations

1.1 Bilateral trade has grown very quickly but remains unbalanced

China's economy grew at an average annual rate of 8.8% between 2008 and 2014, fuelled by fast investment growth and high rates of urbanization, which translated as a voracious appetite for raw materials. As a consequence, economic relationships with Latin America intensified tremendously, as growing demand for resources drove China into relatively unexplored frontiers. Bilateral trade increased by an average rate of 23% during the same period and now stands at US$260 billion, but the nature of these flows remains unbalanced (Figures 1-5). First of all, Latin America has a trade deficit with China, equivalent to US$8 billion or 1% of Latin

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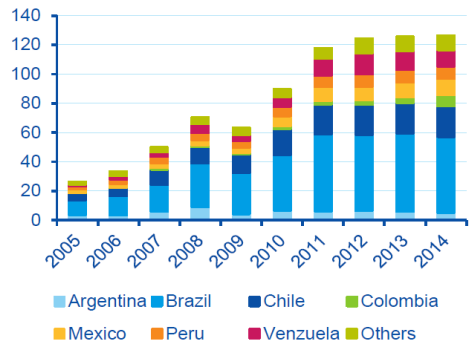
America's GDP. In addition to Latin America's trade deficit with China, bilateral trade flows remain unbalanced as the region exports commodities to China and imports manufactured goods (Garcia-Herrero and Casanova, 2014).

This pattern can be explained by the relative comparative advantages of both regions. Latin American countries enjoy rich natural resource endowments, including 45.0% of total copper reserves, 44.3% of total silver reserves, 21.0% of total iron ore reserves, 19.8% of the world's proven reserves of crude oil and 17.8% of total gold reserves. In addition, Latin America possesses 46% of the world's renewable water supply, 25% of the arable land and the biggest forest reserve in the world; which give it a comparative advantage over agricultural exports. Not surprisingly, 56% of the world's soybean production is located in Latin America, as well as 30% of the global production of beef and 36% of the global production of chicken (Manzano, 2015).

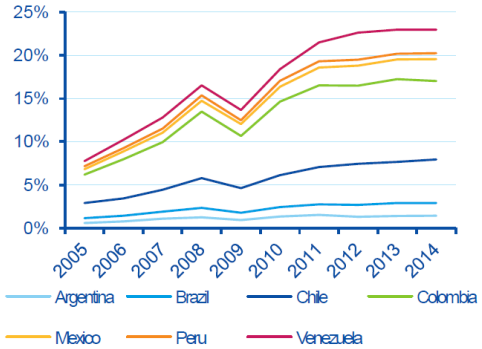
The region beats China on various fronts: it has seven times more m^3 of fresh water per capita, more than three times more km^2 of land per capita and eight times more km^2 of forests per capita than China (Garcia-Herrero, Fung and Seade, 2015). On the other hand, China enjoys higher relative labor abundance, boosting an active population which is almost four times larger than that of Latin America, as well as lower labor costs. Minimum real wages in Latin America were US$262.2 per month according to figures by the International labor organization (Marinakis, 2014); more than double those of China, which stood at US$116.3 per month (Zito, Yao and Chen, 2013).

Figure 1: Latin American imports from China (US$ billion)



Source: IMF DOT

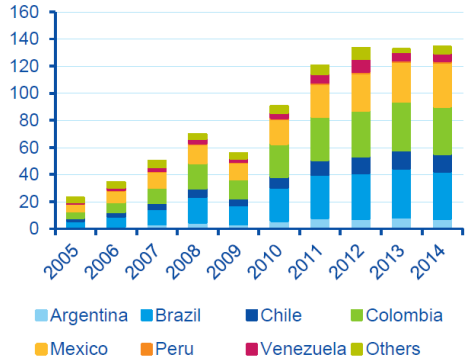
Figure 2: Latin American imports from China (% GDP)



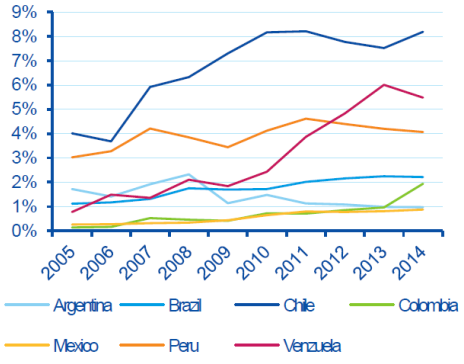
Source: IMF DOT and World Bank

Figure 3: Latin American exports to China (US$ billion)

Figure 4: Latin American exports to China (% GDP)

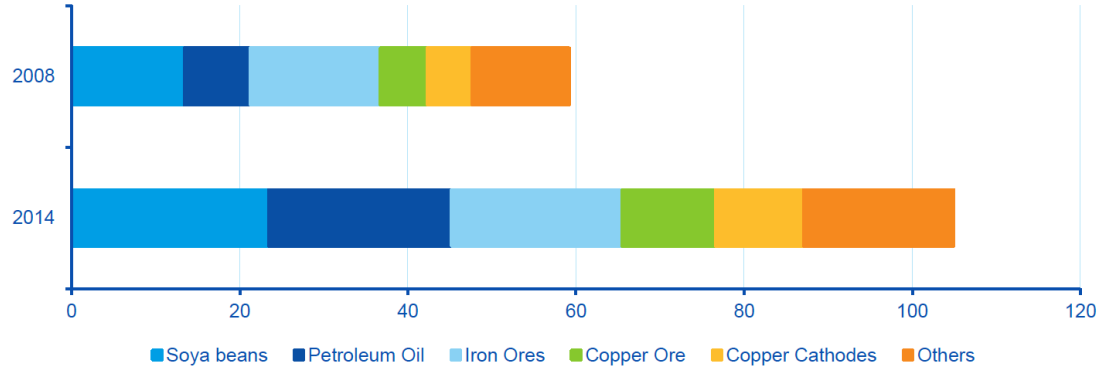


Source: IMF DOT



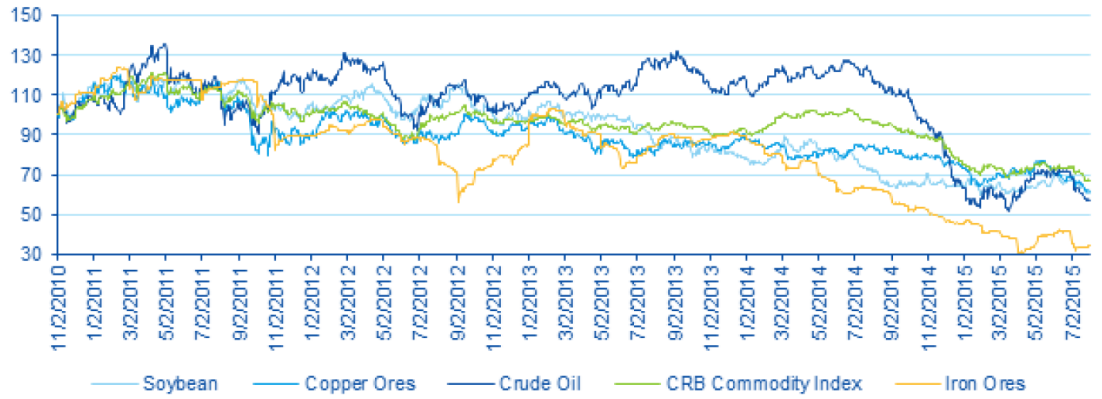
Source: IMF DOT and World Bank

Figure 5: Latin American exports to China are concentrated around a small number of commodities (US$ billion)



Source: UNCOMTRADE

Figure 6: Global commodity prices have been falling (Index: 2010 = 100)



Source: Bloomberg

The unbalanced – albeit buoyant – nature of bilateral trade flows may have played

a pivotal role in assisting countries in Latin America to weather the global financial crisis relatively unscathed by boosting exports and improving terms of trade (Garcia-Herrero and Fung, 2012). The winds have most definitely turned against them. China's economy has started to show signs of a slowdown, which has hit hard the sectors traditionally associated with fixed asset investments. As a consequence, China's demand for natural resources has decelerated, putting significant downward pressure on global commodity prices and potentially leaving a number of economies in Latin America quite exposed to exogenous shocks (Gallagher and Porzecanski, 2010; Farooki and Kaplinsky, 2012). In this Working Paper, we will attempt to quantify just how exposed Latin America's main export sectors are to shifts in Chinese demand.

1.2 Latin America's exports to China centered on a limited number of products

Before we delve further, it is important to highlight that Latin America's exports to China remain exceptionally concentrated, with four commodities accounting for almost 80% of the region's total exports to China: soya beans, crude oil, iron ore and copper (Figure 5).

China's demand for oilseeds has soared, with soybeans now surpassing crude oil and iron ore as Latin America's largest export to China. Despite export volumes of iron ores and crude oil have continued to grow in the past years, exports by value decreased on the back of falling commodity prices. But the story is also structural. Soybean products in its various forms are an important constituent of the Chinese diet. More importantly, soybeans play a major role in improving productivity in the meat sector (as a feed for livestock). Higher living standards have fuelled a dietary change towards meals rich in animal protein, leading to a fourfold increase in pork consumption in the last 30 years (Myers and Jie, 2015), and it is expected that this will continue to grow at an annual rate of 1.5% until 2020 (United States Department of Agriculture, 2014).

Soybeans are crucial to Latin America, as over 50% of the global soybean production actually originates in MERCOSUR. Furthermore, growth has been promising, with exports rising from US$75 million in 1995 to US$38 billion in 2014. They are the first export to China for Brazil, Argentina and Uruguay. Coincidentally, Paraguay – the only South American country that recognizes Taiwan – did not export soybeans to China in 2014 despite being the fourth largest producer worldwide. All in all, demand for soybeans and meat products from Latin America bodes well due to rising per capital incomes in China, particularly in cities, which coupled with fast urbanization rates (53% vs. 80% in Latin America) means that

there is plenty of room for growth.

Crude exports to China are more important for Latin America than they are for China. Imports from Latin America were just 9% of China's total crude imports in 2014 (up from 5% in 2008), which grants China a lot of bargaining power over its key crude oil suppliers in the region. The cases of Colombia and Venezuela are good examples, as we shall analyze in more detail in the following section of this paper. Both countries accounted for the overwhelming majority of Latin America's crude oil exports to China (7% of the 9%). In the case of Colombia, crude oil exports to China increased nine times in the past seven years, and China now buys 93% of its total crude oil exports. On the other hand, Argentina and Ecuador saw a fall in the quantity as well as price of crude oil exported to China.

China is a (the) dominant player in the global iron markets. Chinese imports of this commodity grew 60% in the past 6 years, with the country accounting for 77% of the iron ores consumed worldwide. For Latin America, quenching China's thirst for iron meant that its exports grew by 35% between 2008 and 2014. Brazil is the second largest exporter of this commodity to China, behind Australia, accounting for 23% of the total Chinese imports. Other important iron ore exporters in the region include Honduras Chile, Mexico and Peru.

2. Methodology: Measuring export dependency on China

To measure the degree of exposure of Latin American countries to shifts in Chinese demand, we have deployed the use of our export dependency index. (Garcia-Herrero, Nigrinis and Ferchen, 2013). The Index measures the relative exposure of Latin American exporters to shifts in demand from China and is scaled from 0 to 1 (the higher the score, the more exposed an exporter is to disruptions of trade with China).

We undertook the analysis using 6-digit trade figures from the United Nations COMTRADE database (Harmonized System 2007 nomenclature) to ensure granularity and consistency and contrasted our results across two points in time, 2008 and 2014. The analysis was very comprehensive, covering the products that accounted for 80% or more of all exports to China in 2014, for all countries in Latin America and the Caribbean. We define our export dependency index as follows:

$$\text{Index}_{x,y} = \sqrt[3]{\frac{\text{EXP}_{x,y}}{\text{EXP}_{y}} \times \frac{\text{EXP to China}_{x,y}}{\text{EXP}_{x,y}} \times \text{avg}\left[\frac{\text{IMP}_{x\ \text{China}}}{\text{IMP}_{x}} \times \left(1 - \frac{\text{EXP}_{x,y}}{\text{EXP}_{x}}\right)\right]}$$

Whereby:

$$\frac{\mathrm{EXP}_{x,y}}{\mathrm{EXP}_{y}}$$

Refers to country y's exports of commodity x as a share of its total exports. This shows how concentrated are a country exports into one commodity (x);

$$\frac{\mathrm{EXP\ to\ China}_{x,y}}{\mathrm{EXP}_{x,y}}$$

Refers to country y's exports of commodity x to China divided by its total export of that commodity. This shows how dependent the world is on China to sell a particular commodity relative to other export markets. And;

$$\mathrm{avg}\left[\frac{\mathrm{IMP}_{x,\mathrm{China}}}{\mathrm{IMP}_{x}} \times \left(1 - \frac{\mathrm{EXP}_{x,y}}{\mathrm{EXP}_{x}}\right)\right]$$

Is the average of two components: The first half refers to the share of China's imports of commodity x in the global market, while the second half is 1 minus country y's export market share of commodity x. This provides a measure of China's strength as a buyer or pricing power compared to the exporting country's strength as a seller.

As a final note of caution, it is important to mention that export dependency on China is a relative measure which examines the exposure by Latin American exporters to shifts in Chinese demand. Our index does not include exports to countries other than China, nor will look at the export dependency of countries outside Latin America and the Caribbean. A wider index, however, would probably show that the export dependency of Latin American countries is startling than it seems. For instance, emerging Asian economies rely heavily on external demand. China, Korea and Taiwan are cases in point where exports to GDP share ranges from 30% to 50%.

3. Results: Latin America's export dependency on China

3.1 Export dependency on China increased overboard

Our research reveals that dependency on China has increased overboard across Latin America for all commodity types. We computed export dependencies for the different countries based on weighted averages for all the individual export dependencies (Table 1) and find that, while levels of commodity dependency are highest amongst members of MERCOSUR, Chile, Peru and Colombia (Figure 7) the increases were highest amongst countries in the Pacific Alliance, Panama, Uruguay,

Paraguay and Nicaragua (Figure 8). A full list of export dependencies can be found in Appendix 1.

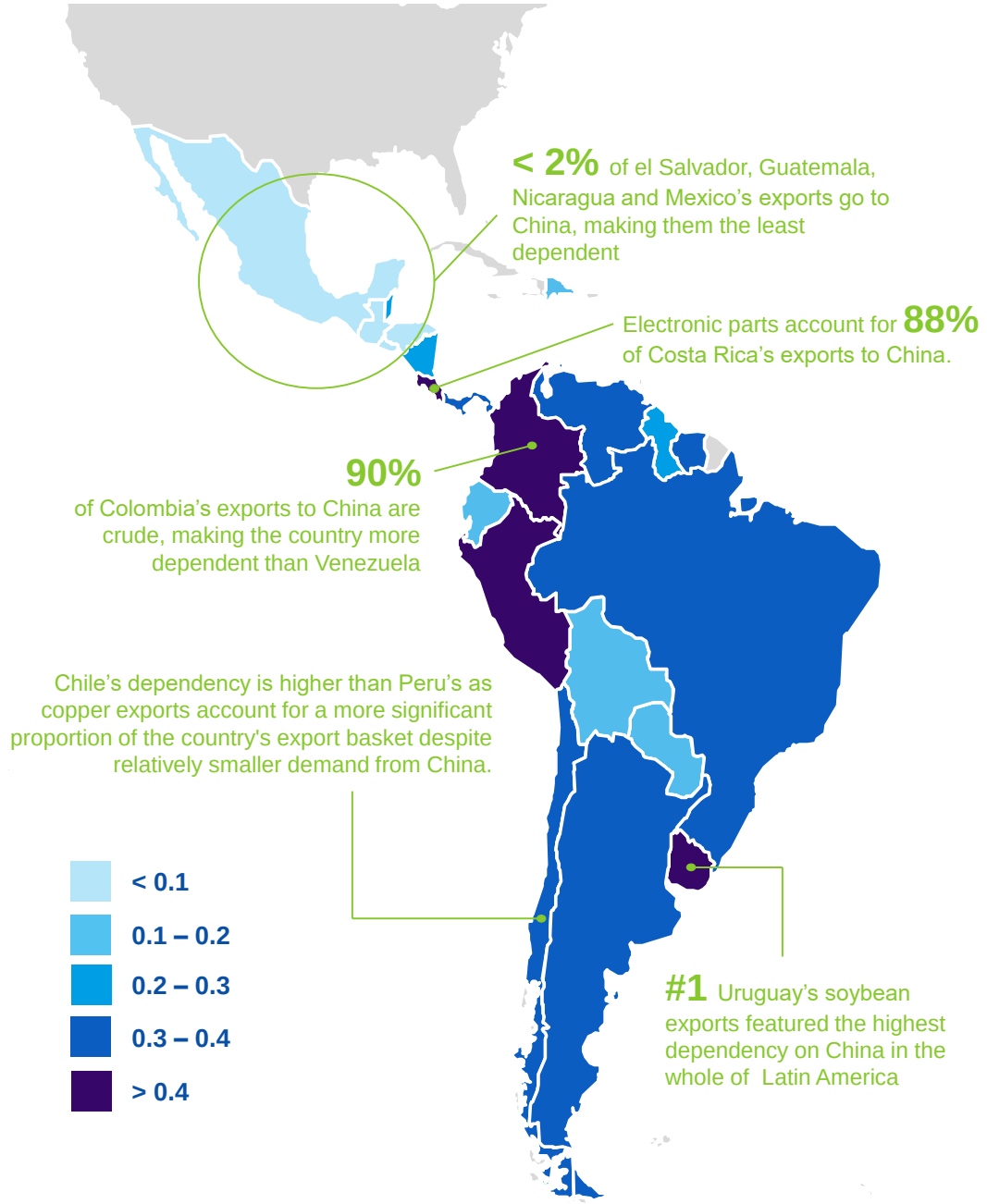
The countries with the highest absolute dependency levels tend to be important commercial partners (i.e. large commodity exporters like Chile) or strategic allies of China in Latin America. More interestingly, despite lower overall levels of export dependency, the steepest increases can be observed amongst countries which have traditionally been considered to be closer commercially and politically to the United States.

Table 1: Ranking of Latin American countries according to export dependency (Index: 0-1)

Ranking	Country	Dependency 2014	Dependency 2008
1	Costa Rica	0.43	0.45
2	Colombia	0.42	0.22
3	Uruguay	0.41	0.27
4	Venezuela	0.37	0.27
5	Brazil	0.36	0.30
6	Chile	0.35	0.30
7	Peru	0.34	0.26
8	Panama	0.32	0.02
9	Guyana	0.30	0.00
10	Argentina	0.30	0.34
11	Belize	0.25	0.02
12	Honduras	0.24	0.10
13	Suriname	0.24	0.07
14	Ecuador	0.19	0.17
15	Bolivia	0.17	0.13
16	Dominican Republic	0.16	0.04
17	Paraguay	0.11	0.06
18	Mexico	0.10	0.05
19	Nicaragua	0.10	0.02
20	Guatemala	0.08	0.04
21	El Salvador	0.07	0.03

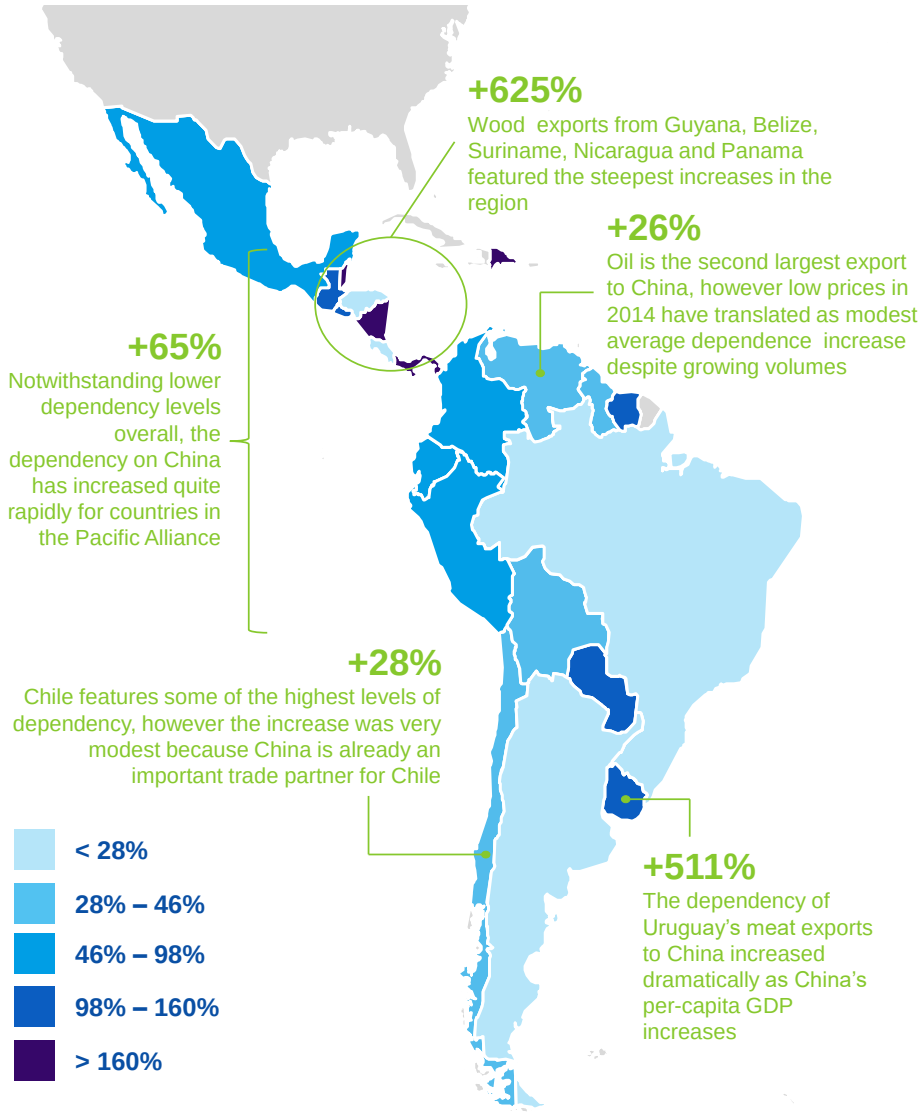
Source: UNCOMTRADE and BBVA Research

Figure 7: Export dependency by country on a trade-weighted average basis (Index: 0-1)



Source: BBVA Research based on UN COMTRADE statistics

Figure 8: Change in export dependency index between 2008 and 2014 (Δ %)



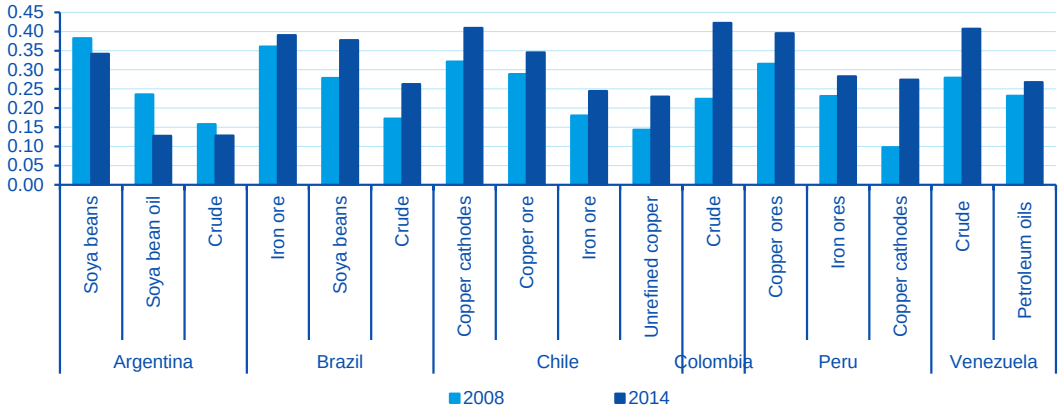
Source: BBVA Research based on UN COMTRADE statistics

3.2 Dependency for largest exporters centered on four products

Brazil, Argentina, Chile, Peru, Colombia, Mexico and Venezuela were the main exporters to China in 2014. Excluding Mexico, all of them ranked amongst the top-10 most dependent countries on China. Furthermore, their exports to China were all concentrated around four commodities, namely soy in the form of soybeans and

soybean oil; crude oil; copper in the form of copper ore, copper cathodes and unrefined copper; and iron ore (Figure 9).

Figure 9: Export dependency indexes for commodities accounting for 75-80% of total exports for LatAm-7 (ex. Mexico)



Source: BBVA Research based on UN COMTRADE statistics

Argentina

Argentina's export dependency on China actually fell by 13% between 2008 and 2014, the only country in Latin America (excluding Costa Rica) to experience a decline. Argentina went from being the second country with the highest export dependency on China in 2008, to being the tenth in 2014. This fall comes on the back of falling commodity prices as well as a drop in the country's exports to China. Despite this decline, overall dependency levels remain high compared to the average in Latin America. The message therefore needs to be understood within the context of Argentina's fragile exchange rate regime and worsening terms of trade.

Argentina's soybean exports to China represent this trend quite clearly. Argentina was the third largest producer and exporter of Soybeans in 2014. But despite the country's dominant position in soybean production, exports to China fell by 39% between 2008 and 2014 (vs. 12% worldwide). According to the USDA, Argentina's soybean stocks were 30 million tons in 2014, three times larger than China's. Argentinian producers could have been increasing their soybean stocks with the intention of selling at later date, once the exchange rate is more favorable.

Most crude oil exporters in Latin America saw an increase in their dependency on China. This is no small feat given the steep drop in global crude prices which started during the second half of 2014. Argentina was the only exception. By the same token as soybeans, the export dependency of Argentina's crude exports to China fell

by 20% between 2008 and 2014, on the back of a 58% decline in exports by volume to China as well as lower global crude prices.

Brazil

The largest country in Latin America as well as China's main trade partner in the region saw its export dependency on China increase by 27% between 2008 and 2014, making it one of the countries with the highest dependency in the region, coming in fifth place. Soybeans, iron ore and crude accounted for 80% of the country's total exports to China in 2014, or a modest but sizeable 30% of total exports to the world (Figure 10). However, with China as the main destination for these exports (Figure 11), this leaves Brazil significantly exposed to shifts in Chinese demand.

Brazil is the second producer of soybeans worldwide as well as the largest producer in Latin America. Its soybean exports feature the highest dependency on China, which can be traced back to the importance of this commodity export for the Brazilian economy (10% of total exports) as well as China's dominant market share (80% of total soybean exports). In addition dependency increased relatively rapidly, by 35% between 2008 and 2014, favored by soaring demand from China and decreasing exports from Argentina. This dependency is high even by global standards – The United States is the first exporter of soybean in the world its dependency is half that of Brazil's due to the fact that soybeans represent only 2% of its exports.

Brazil is the largest exporter of iron in Latin America as well as the second largest exporter of iron ore to China globally, behind Australia (23% of China's iron ore imports in 2014 originated from Brazil vs. 54% from Australia). This coupled with China's dominant market position, makes up for the country's high iron export dependency on China, which was higher than the non-weighted average of its Latin American counterparts (0.4 vs. 0.21). Having said this, and in contrast soybeans, Brazil's iron ore exports' feature relatively low levels of dependency compared to other global producers (Australia's was 0.53 in the same year), something which is bound to change in the future. Brazil is the home to the largest iron producer of the world, Vale. The company is planning an investment of US$16 billion ($3.6 billion by a Chinese revolving line of credit) in order to increase its output and it is expected that by 2018 it would produce more than its two main competitors BHP Billiton and Rio Tinto combined, increasing the country's dependency on China at a time when iron imports from the country are in decline.

Chile

Chile features high export dependency on China, ranking in sixth place among all countries in Latin America and increasing by 28% between 2008 and 2014. Chile's

relatively high dependency stems from the role that mineral exports, in particular copper, play for the Austral economy. Whereas copper cathodes and ores accounted for a disproportionate 70% of Chile's total exports to China in 2014, these constituted 42% of Chile's copper exports in that year, muting the impact of a shift in Chinese demand, which would have otherwise been huge. Export dependency increased modestly between 2008 and 2014, which is explained by the fact that Chile has traditionally had a high export dependency levels overall.

Colombia

Colombia is the second country on our export dependency ranking, after Costa Rica. The fact that crude is such an important export for Colombia, accounting for circa 50% of the country's total exports in 2014, coupled with China's substantial market share (26% of total crude exports go to China) are the main factors behind Colombia's high dependency. Over 80% of Colombia's exports to China are crude, which makes it the second exporter of crude to China in Latin America, behind Venezuela.

In addition, crude exports to China have more than doubled between 2008 and 2014. The United States used to be Colombia's number one crude oil export market, but the country's shift to energy independence has prompted Colombia to seek opportunities elsewhere. Colombia's crude exports' dependency on China is three times that of other exporters in Latin America – something remarkable in the context of falling global oil prices.

This increase can also be partially explained by the fact that Colombian crude oil, being heavier and harder to refine, has a cost advantage over crude oil from other regional competitors such as Brazil or major suppliers such as and Saudi Arabia. China National Petroleum Corporation (CNPC) recently completed the expansion of its Shijiazhuang plant (expanding the country's refining capacity for this type of heavy oil), which could lead to further increases in Colombia's export dependency looking forward.

Peru

It is no coincidence that Peru's export dependency on China is higher than the average in Latin America. Mineral exports to China account for 13% of Peru total exports. Peru is the third largest producer of copper in the world and, according to Fraser Institute, it ranks 2nd in its attractiveness for investments in the mining sector in Latin America. In particular, Chinese companies have been flocking to Peru in recent years, promising to increase the copper production by 20% with the mega-investments in Toromocho (2013) and Las Bambas (2014), surpassing Chile as the largest exporter of this mineral in Latin America.

Peru's copper export dependency on China outpaces that of other countries in Latin America. Copper amounts for quite a large proportion of Peru's total exports, around 20%, but more than half of these exports end up being shipped to China, exacerbating the importance of this commodity for the Peruvian economy. Similarly, Iron ore may only account for 3% of Peru's total exports, but an overwhelming 94% of these end up being shipped to China, whom enjoys a very dominant position in the market (China consumes 75% of the world's total iron ore supply).

Venezuela

Venezuela has traditionally been an important ally of China in the region, accounting for most of China's total FDI and lending between 2005 and 2014. Venezuela's heavy export dependency on China is yet another example of the important role that the Asian giant plays in the Bolivarian economy. Crude oil and petroleum oil accounted for 90% of Venezuela's total exports to the world and 97% of exports to China (74% of which were crude oil). But China accounts for only a very small proportion of Venezuela's crude oil exports to the world. Venezuela is the third supplier of refined oil to China, behind South Korea and Singapore and accounting for 13% of China's total imports of this product. Were it not for these refined oil exports, the country's export dependency on China would be significantly higher.

3.3 Mexico sets an interesting precedent for the rest of Latin America

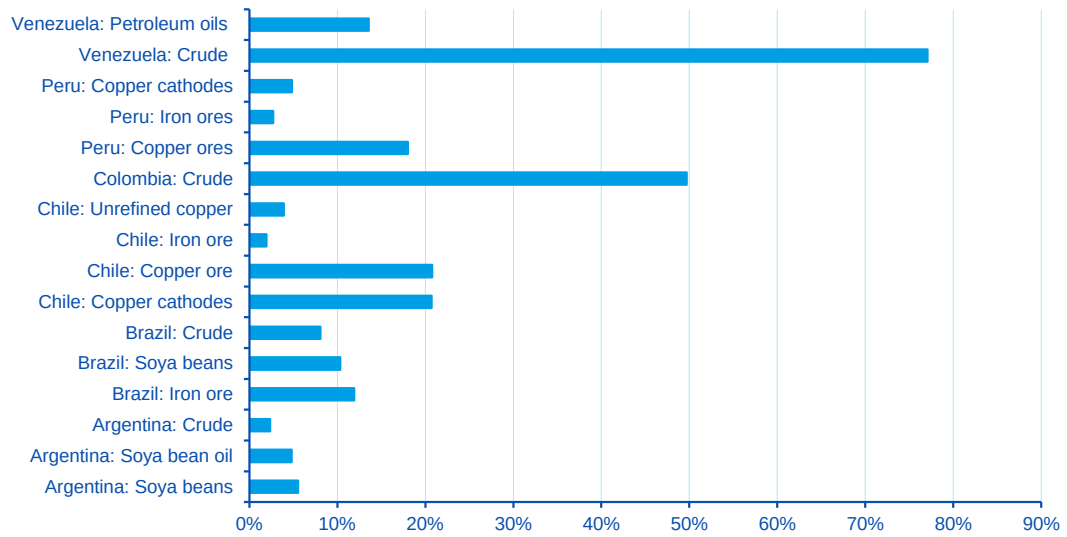
Mexico's export dependency on China grew by 95% between 2008 and 2014, slightly above the average for Latin America, which was 88%. The country is now China's second largest commercial partner in the region, behind Brazil, while China is Mexico's second largest partner worldwide, albeit far behind the US, which accounts for 70% of total exports from Mexico. But notwithstanding this steep increase, Mexico's export dependency on China is among the lowest in the region, setting it apart from the bulk of countries in Latin America.

What explains this discrepancy? To begin with, Mexico's exports to China are much more diversified than other Latin American counterparts. A total of 33 different products accounted for 80% of its exports to China (Appendix I), while the average for the rest of Latin America and the Caribbean is less than 4 products. This is related to qualitative aspects of Mexico's export dependency on China: Copper ores, vehicle parts and iron ores were the three exports with the highest dependency in 2014 – in stark contrast to other countries in the region, trade in manufactured goods and components made a star debut in the case of Mexico. Furthermore, the commodities that Mexico does export to China, namely copper ore and iron ore, feature a much lower dependency compared to the rest Latin America.

Mexico's geographic proximity to the United States means that the country has adapted its production structure to tailor more efficiently to the needs of the North American market, increasing its export dependency on the United States while neutralizing its export dependency on China. Contrary to popular belief, tailoring to the largest consumer market does not need to be a zero-sum game, and this is an area where Mexico's expanding production linkages with the United States and China, particularly in the automotive sector, have proven to be a success story which other countries in Latin America could seek to emulate (Fung, Garcia-Herrero and Siu, 2012).

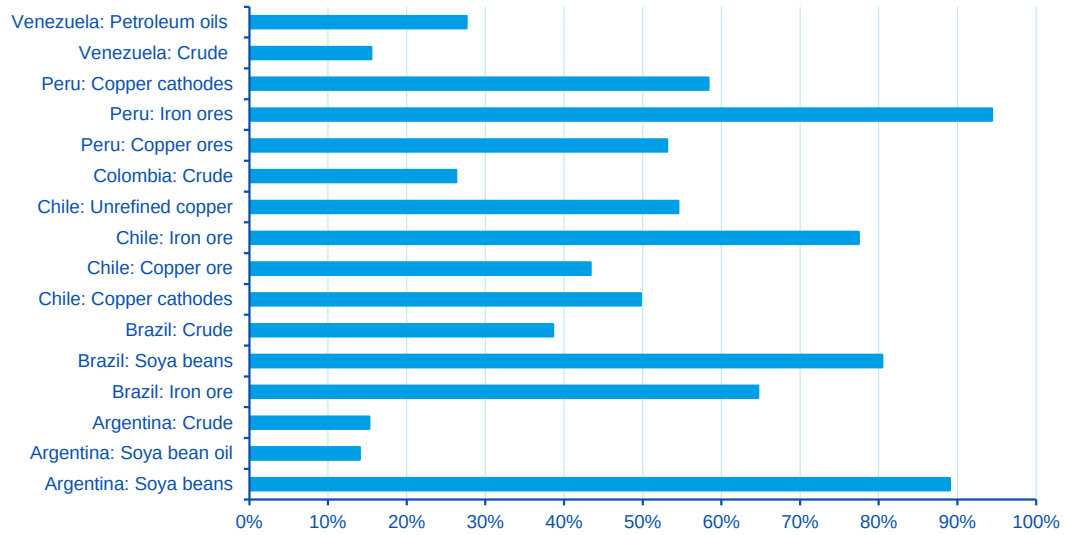
As rosy a picture as this may seem; we cannot forget that Mexico, much like the rest of the continent, still has a significant deficit with China, worth US$21 billion in 2014. Despite Mexican exports to China grew 203% between 2008 and 2014, they constitute less than 3% of its total exports, while imports from China accounted for 8% of its total imports. In 2013, during President Xi Jinping's visit to Mexico, Chinese representatives confirmed that that they were considering the establishment of a FTA with Mexico. The expectation is that this FTA will lower the costs of trade and will facilitate a further diversification of Mexico's exports to China. President Xi Jinping further attested that one of the main goals was to increase the imports of high value-added products from Mexico. An FTA – in combination with policies that facilitate foreign direct investment and the deepening of interregional links – would definitely help Mexico to further diversify its export base vis-à-vis China.

Figure 10: Country Y's exports of Commodity X as a % of total exports in 2014



Source: BBVA Research based on UN COMTRADE statistics

Figure 11: Country Y's exports of commodity X to China as a percentage of total exports of commodity X in 2014



Source: BBVA Research based on UN COMTRADE statistics

4. Conclusions

Bilateral trade between China and Latin America has grown very quickly in the last decade, but the nature of these flows remains unbalanced. Latin America has a trade deficit with China, which could be difficult to reverse given that the continent exports primarily commodities to China while importing primarily manufactured goods. Soybeans, crude oil, iron ore and copper accounted for 80% of the total exports in 2014. Furthermore, as China's economy slows, this will have repercussions on Latin American exporters, and countries could see a fall in their exports by volume as well as deterioration in their terms of trade on the back of lower commodity prices.

In this paper, we deployed an export dependency index to identify the sectors and countries in Latin America which are most exposed to fluctuations in Chinese demand. Our research reveals that dependency on China has increased overboard across Latin America for all countries and all products, with some exceptions. Levels of commodity dependency were highest amongst members of MERCOSUR, Chile, Peru and Colombia, as these countries tend to be important commercial partners (i.e. large commodity exporters like Chile) or strategic allies of China in Latin America. On the other hand, the steepest increases were found amongst countries in the Pacific Alliance, Panama, Uruguay, Paraguay and Nicaragua.

In order to rebalance trade relations with China, Latin American countries need to think beyond commodities. Leveraging their strategic geographic position in the Western Hemisphere, close to consumer markets in the United States, could help Latin America to further diversify its export base, potentially offsetting their exposure to China. Mexico's expanding production linkages with the United States and China, particularly in the automotive sector, have proven to be a success story which other countries in Latin America could aspire to emulate, wherever possible.

Furthermore, policies that facilitate trade integration, both with China but also within Latin America and the Caribbean, could also help to foster more inclusive trade links by lowering costs and entry barriers. These include things like more FTAs with China as well as measures that facilitate infrastructure investments that enhance connectivity in Latin America.

Appendix I: Latin American export dependency tables by country

Table 2: Argentina

Country	Commodity name	HS 2007 Code	2008	2014
Argentina	Soya beans, whether/not broken	120100	0.38	0.34
Argentina	Soya bean oil, crude, whether/not degummed, not chemically modified	150710	0.24	0.13
Argentina	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.16	0.13
Argentina	Tobacco, partly/wholly stemmed/stripped	240120	0.07	0.10

Source: UNCOMTRADE

Table 3: Brazil

Country	Commodity name	HS 2007 Code	2008	2014
Brazil	Soya beans, whether/not broken	120100	0.28	0.38
Brazil	Iron ores & concentrates (excl. roasted iron pyrites), non-agglomerated	260111	0.36	0.39
Brazil	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.17	0.26
Brazil	Chemical wood pulp, soda/sulphate, other than dissolving grades, semi-bleached/bleached, non-coniferous	470329	0.12	0.19

Source: UNCOMTRADE

Table 4: Chile

Country	Commodity name	HS 2007 Code	2008	2014
Chile	Cathodes & sections of cathodes, of refined copper	740311	0.32	0.41
Chile	Copper ores & concentrates	260300	0.29	0.35
Chile	Unrefined copper; copper anodes for electrolytic refining	740200	0.14	0.23
Chile	Iron ores & concentrates (excl. roasted iron pyrites)	260111	0.18	0.24
Chile	Chemical wood pulp, soda, other than dissolving grades, semi-bleached/bleached, coniferous	470321	0.16	0.19

Source: UNCOMTRADE

Table 5: Colombia

Country	Commodity name	HS 2007 Code	2008	2014
Colombia	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.22	0.42

Source: UNCOMTRADE

Table 6: Mexico

Country	Commodity name	HS 2007 Code	2008	2014
Mexico	Copper ores & concentrates	260300	0.10	0.13
Mexico	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.00	0.09
Mexico	Vehicles (excl. of 87.02 & 8703.10) principally designed for the transport of persons, with spark-ignition internal combustion reciprocating piston engine, of a cylinder capacity >1500cc but not >3000cc	870323	0.05	0.13
Mexico	Electronic integrated circuits, amplifiers	854233	0.07	0.13
Mexico	Iron ores & concentrates (excl. roasted iron pyrites), non-agglomerated	260111	0.08	0.09
Mexico	Gear boxes & parts thereof, of the motor vehicles of headings 87.01 to 87.05.	870840	0.03	0.08
Mexico	Copper waste & scrap	740400	0.04	0.08
Mexico	Processing units other than those of sub-heading 8471.41/8471.49, whether/not containing in the same housing one/two of the following types of unit : storage units, input units, output units	847150	0.04	0.07
Mexico	Other Electronic integrated circuits, other than Amplifiers/Memories/Processors & controllers	854239	0.06	0.08
Mexico	Vehicles (excl. of 87.02 & 8703.10) principally designed for the transport of persons, with spark-ignition internal combustion reciprocating piston engine, of a cylinder capacity >1000cc but not >1500cc	870322	0.01	0.07

Mexico	Silver ores & concentrates	261610	0.02	0.07
Mexico	Electronic integrated circuits, processors & controllers, whether/not combined with memories, converters, logic circuits, amplifiers, clock & timing circuits,/other circuits	854231	0.07	0.07
Mexico	Catheters, cannulae& the like	901839	0.02	0.06
Mexico	Parts of telephone sets, incl. telephones for cellular networks/for other wireless networks; other apparatus for the transmission/reception of voice, images/other data, incl. apparatus for communication in a wired/wireless network (such as a local/wide a	851770	0.07	0.06
Mexico	Lead ores & concentrates	260700	0.05	0.06
Mexico	Electrical apparatus for switching/protecting electrical circuits,/for making connections to/in electrical circuits, n.e.s. in 85.36, for a voltage not >1000V	853690	0.05	0.06
Mexico	Machines for the reception, conversion & transmission/regeneration of voice, images/other data, incl. switching & routing apparatus	851762	0.06	0.05
Mexico	Instruments & appliances used in medical/surgical/veterinary sciences, incl. other electro-medical apparatus & sight-testing instr., n.e.s. in 90.18	901890	0.04	0.05
Mexico	Transistors (excl. photosensitive transistors), other than those with a dissipation rate of <1W	854129	0.05	0.06
Mexico	Boards, panels, consoles, desks, cabinets & other bases, equipped with 2/more apparatus of 85.35/85.36, for electric control/distribution of electricity, incld. Those incorporating instruments/apparatus of Ch. 90 & numerical control apparatus, other than	853710	0.03	0.05
Mexico	Waste, parings & scrap, of plastics n.e.s. in 39.15	391590	0.04	0.05
Mexico	Parts suit. for use solely/principally with the apparatus of 85.35/85.36/85.37 (excl. of 8538.10)	853890	0.04	0.05
Mexico	Cathodes & sections of cathodes, of refined copper, unwrought	740311	0.05	0.05
Mexico	Other automatic data processing machines, presented in the form of systems.	847149	0.02	0.03
Mexico	Parts suit. for use solely/principally with spark-ignition internal combustion piston engines	840991	0.04	0.04
Mexico	Fixed electrical capacitors, other than those of 8532.10, ceramic dielectric, multilayer	853224	0.05	0.05
Mexico	Recovered (waste & scrap) unbleached Kraft paper/paperboard/corrugated paper/paperboard	470710	0.04	0.05
Mexico	Parts & accessories of the machines of heading 84.71	847330	0.06	0.04
Mexico	Parts of the electrical capacitors of 85.32	853290	0.03	0.04
Mexico	Orthopedic/fracture appliances	902110	0.02	0.04

Mexico	Other electric conductors, for a voltage not > 1,000 V, fitted with connectors	854442	0.04	0.04
Mexico	Waste, parings & scrap, of polymers of ethylene	391510	0.02	0.05
Mexico	Cotton, not carded/combed	520100	0.05	0.04
Mexico	Flours, meals & pellets of fish/of crustaceans, mollusks/other aquatic invertebrates	230120	0.00	0.04
Mexico	Fixed electrical capacitors, other than those of 8532.10, tantalum	853221	0.05	0.04
Mexico	Pigments & preparations based on titanium dioxide, containing 80%/more by weight of titanium dioxide	320611	0.03	0.04
Mexico	Multiple loudspeakers, mounted in the same enclosure	851822	0.02	0.04

Source: UNCOMTRADE

Table 7:Peru

Country	Commodity name	HS 2007 Code	2008	2014
Peru	Copper ores & concentrates	260300	0.32	0.40
Peru	Cathodes & sections of cathodes, of refined copper, unwrought	740311	0.10	0.27
Peru	Iron ores & concentrates (excl. roasted iron pyrites), non-agglomerated	260111	0.23	0.28
Peru	Flours, meals & pellets of fish/of crustaceans, mollusks/other aquatic invertebrates	230120	0.24	0.22

Source: UNCOMTRADE

Table 8: Venezuela

Country	Commodity name	HS 2007 Code	2008	2014
Venezuela	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.28	0.41
Venezuela	Petroleum oils & oils obtained from bituminous minerals (other than crude)	271019	0.23	0.27

Source: UNCOMTRADE

Table 9: Rest of South America

Country	Commodity name	HS 2007 Code	2008	2014	Δ%
Bolivia	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.15	0.21	40%
Bolivia	Tin, not alloyed, unwrought	800110	0.15	0.14	-3%
Bolivia	Silver ores & concentrates	261610	0.09	0.13	48%
Bolivia	Lead ores & concentrates	260700	0.07	0.12	66%
Bolivia	Zinc ores & concentrates	260800	0.05	0.11	110%

Ecuador	Petroleum oils & oils obt. from bituminous mins., crude	270900	0.29	0.23	-22%
Ecuador	Bananas, incl. plantains, fresh/dried	80300	0.03	0.15	399%
Ecuador	Shrimps & prawns, whether/not in shell, frozen	30613	0.00	0.13	13%
Ecuador	Precious metal ores &concentrates (excl. silver ores &concentrates)	261690	0.00	0.13	13%
Paraguay	Copper waste & scrap	740400	0.07	0.12	71%
Paraguay	Tanned/crust hides & skins of bovine (incl. buffalo)/equine animals, without hair on, in the wet state (incl. wet-blue), full grains, unsplit; grain splits but not further prepared	410411	0.03	0.10	189%
Paraguay	Sesame seeds, whether/not broken	120740	0.05	0.06	29%
Suriname	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.10	0.26	171%
Suriname	Aluminum oxide (excl. artificial corundum)	281820	0.00	0.16	16%
Uruguay	Soya beans, whether/not broken	120100	0.33	0.50	50%
Uruguay	Meat of bovine animals, frozen, boneless	20230	0.06	0.23	274%
Uruguay	Meat of bovine animals, frozen (excl. of 0202.10), bone-in	20220	0.03	0.18	511%
Uruguay	Whole bovine (incl. buffalo)/equine hides & skins, weight >16kg(fresh/salted/dried/limed/pickled/other. preserved but not tanned/parchment-dressed/further prepared), whether/not dehaired/split	410150	0.04	0.19	361%
Uruguay	Chemical wood pulp, soda/sulphate, other than dissolving grades, semi-bleached/bleached, non-coniferous	470329	0.25	0.30	19%

Source: UNCOMTRADE

Table 10: Rest of Central America

Country	**Commodity name**	**HS 2007 Code**	**2008**	**2014**	**Δ%**
Belize	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.02	0.25	996 %
Costa Rica	Electronic integrated circuits, processors & controllers, whether/not combined with memories, converters, logic	854231	0.45	0.43	-3%

	circuits, amplifiers, clock & timing circuits,/other circuits				
El Salvador	Recovered (waste & scrap) unbleached kraft paper/paperboard/corrugated paper/paperboard	470710	0.02	0.08	371 %
El Salvador	Fixed electrical capacitors, other than those of 8532.10, tantalum	853221	0.04	0.07	76%
El Salvador	Fixed electrical capacitors, other than those of 8532.10, ceramic dielectric, multilayer	853224	0.04	0.06	52%
El Salvador	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.00	0.06	6%
El Salvador	Aluminium waste & scrap	760200	0.07	0.04	-43%
Guatemala	Cane sugar, raw, in solid form, not containing added flavoring/coloring matter	170111	0.04	0.10	145 %
Guatemala	Copper waste & scrap	740400	0.05	0.08	53%
Guatemala	Recovered (waste & scrap) unbleached kraft paper/paperboard/corrugated paper/paperboard	470710	0.02	0.07	213 %
Guatemala	Coffee, not roasted, not decaffeinated	90111	0.02	0.05	247 %
Guatemala	Waste, parings & scrap, of polymers of ethylene	391510	0.04	0.06	67%
Guatemala	Waste, parings & scrap, of plastics n.e.s. in 39.15	391590	0.07	0.05	-29%
Guatemala	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.02	0.05	183 %
Guatemala	T-shirts, singlets& other vests, knitted/crocheted, of cotton	610910	0.01	0.04	433 %
Guyana	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.22	0.30	36%
Honduras	Iron ores & concentrates (excl. roasted iron pyrites), non-agglomerated	260111	0.00	0.24	24%
Nicaragua	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.02	0.13	595 %
Nicaragua	Wood(excl. of 4407.10-4407.95), sawn/chipped lengthwise, sliced/peeled, whether/not planed, sanded/end-jointed, of a thickness >6mm	440799	0.02	0.10	354 %
Nicaragua	Tanned/crust hides & skins of bovine (incl. buffalo)/equine animals, without hair on, in the wet state (incl. wet-blue), full grains, unsplit; grain splits but not further prepared	410411	0.04	0.09	143 %
Nicaragua	Boards, panels, consoles, desks, cabinets & other bases,	853710	0.00	0.08	8%

	equipped with 2/more apparatus of 85.35/85.36, for electric control/distribution of electricity				
Nicaragua	Copper waste & scrap	740400	0.03	0.08	182 %
Nicaragua	Ground-nut oil, crude	150810	0.00	0.06	6%
Nicaragua	T-shirts, singlets& other vests, knitted/crocheted, of cotton	610910	0.04	0.06	47%
Panama	Wood, in the rough (excl. of 4403.10-4403.92), whether/not stripped of bark/sapwood/roughly squared	440399	0.01	0.38	2840 %
Panama	Propane, liquefied	271112	0.00	0.25	25%
Panama	Wood(excl. of 4407.10-4407.95), sawn/chipped lengthwise, sliced/peeled, whether/not planed, sanded/end-jointed, of a thickness >6mm	440799	0.02	0.26	1221 %
Panama	Flours, meals & pellets of fish/of crustaceans, mollusks/other aquatic invertebrates	230120	0.07	0.22	229 %
Dominican Rep.	Aluminium ores & concentrates	260600	0.04	0.19	344 %
Dominican Rep.	Copper ores & concentrates	260300	0.00	0.17	17%
Dominican Rep.	Copper waste & scrap	740400	0.09	0.14	57%
Dominican Rep.	Catheters, cannulae& the like	901839	0.05	0.09	85%
Dominican Rep.	Sterile surgical catgut, similar sterile suture materials (including sterile absorbable surgical/dental yarns)&sterile tissue adhesives for surgical wound closure; sterile laminaria&sterilelaminaria tents; sterile absorbable surgical/dental/veterinary p	300610	0.02	0.08	231 %

Source: UNCOMTRADE and BBVA Research

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Social Status, Labor-Market Frictions and Endogenous Growth*

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This paper develops an endogenous growth model that incorporates wealth-enhanced preferences for social status and labor-market frictions to investigate the role of social status in determining unemployment and long-run growth. We show that the increase in the desire for social status reduces the unemployment rate, but its effect on long-run growth is unclear. We then calibrate our model to the U.S. economy and find that an increase in the desire for social status lowers the unemployment rate and enhances the economic growth rate in the long run.

Keywords: currency internationalization, distribution of currencies, gravity model

JEL Classification: E21, J64, O41

1. Introduction

Standard macroeconomic models usually assume that a consumer's utility is affected by consumption， which is positively related to wealth. However， in the real world， in addition to yielding a higher level of consumption， wealth also influences one's position within society and can directly affect such utility. This type of preferences has been interpreted as reflecting the desire for wealth-induced social status. There is a growing literature exploring the implications of wealth-induced social status on a wide range of issues， such as economic growth， the effects of monetary policy and income inequality. For example， Kurz (1968) and Zou (1994) examine how the presence of the desire for social status affects the long-run growth rate. Gong and Zou (2001) and Chen and Guo (2009) study how monetary policy influences capital accumulation and thus economic growth given that consumers desire for social status. Suen (2014) investigates the implications of this social status concern on wealth and income inequalities.

It has been well known that capital and labor are two important determinants to

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economic growth. Although there is a broad literature studying economic growth from the perspective of capital accumulation， very few studies have been conducted on the question of how labor-market performance affects economic growth. To simplify the examination，traditional growth models usually assume that there is an inelastic supply of labor and focus their analysis on the role of capital. Although some studies may allow consumers to make decisions between work and leisure， they tend to ignore the role of unemployment when determining economic growth. The fact that there are substantial informational and institutional barriers to labor search， recruiting， and job creation emphasizes the need to consider labor-market frictions when studying economic growth. For instance， Eriksson (1997) introduces labor-market frictions into an Ak-type endogenous growth model to examine how unemployment and the long-run growth rate influence each other. Based on a growth model with quality ladders， Mortensen (2005) examines the possible effects of payroll taxes and employment protection policies on unemployment and growth through innovation. More recently， Chen， Chen and Wang (2011) investigate the effectiveness of human capital policies in an endogenous growth model with labor search and human capital accumulation. While these studies have shown the importance of labor-market frictions in determining the long- run growth， the existing literature that examines how the desire for social status affects the long-run growth has made little attempt to incorporate unemployment in their studies.

Following the recent trend， in this paper， we evaluate the effect of social status in an endogenous growth model where the labor market is no longer frictionless to study how the desire for social status influences the rate of unemployment， the accumulation of capital and long-run growth. To achieve this， we add three modifications to the standard neoclassical growth model. First， we modify consumers' preferences to allow for their status-seeking motive in wealth. Second， to generate endogenous growth， we follow Romer (1986) by considering a production function where there is a positive externality effect of capital. Third， unemployment is generated due to the search and matching process in the labor market (see Diamond， 1982; Mortensen and Pissarides， 1994).

Introducing wealth-induced social status directly into consumers' preferences creates the additional benefit of accumulating capital. An increase in the desire for social status raises the motivation of capital accumulation. As the accumulation of capital increases， the marginal product of labor rises. This induces firms to create more jobs， thereby reducing the unemployment rate and the labor market becomes less tight to workers. A decrease in un- employment is beneficial to economic

growth. However, an increase in the desire for social status also causes an increase in the vacancy creation cost, which is harmful for economic growth. With these additional effects, the change in the consumption-capital ratio becomes ambiguous and the effect on long-run growth also becomes ambiguous, whereas in a similar model without labor-market frictions, the change in the consumption-capital ratio is unambiguously negative and the effect on long-run growth is unambiguously positive.

To gauge the growth effect of the desire for social status, we calibrate parameters to match the U.S. economy and then simulate the model to determine the magnitude of these effects on growth. Under the benchmark parameterization, we find that an increase in the desire for social status is beneficial to the performance of the labor market and the long-run growth rate. Furthermore, to investigate the influence of the desire for social status, we consider a 5% increase in the rate of time preference, total factor productivity (TFP), job separation rate, bargaining strength of workers or the elasticity of vacancy in job matches. We find that an increase in the TFP measure or the elasticity of vacancy in job matches increases the consumption-capital ratio, reduces the unemployment rate and raises the long- run growth rate. Our results that increasing the TFP measure can improve both labor market performance and growth rate are different from Eriksson (1997), who argues that there is a trade-off between unemployment and growth. Therefore, the consideration of consumer's desire for social status would change the interplay between unemployment and capital accumulation. This will in turn affect the long-run growth rate. Increasing the rate of time preference and the bargaining strength of workers will generate similar effects on economic performance. Both the consumption-capital ratio and the unemployment rate will increase, and there will be an overall increase in the long-run growth rate. An increase in the job separation rate reduces the consumption-capital ratio and raises the unemployment rate, resulting in an overall decrease in the growth rate.

The current study complements the previous studies by Kurz (1968) and Zou (1994) in two different ways. First, our paper explicitly considers the importance of unemployment and identifies new channels through which the desire for social status affects long-run growth. Second, while the previous studies examine qualitatively the effects of the desire for social status, this paper assesses those effects quantitatively utilizing some realistic parameter values.

The remainder of this paper is organized as follows. Section 2 presents our model, characterizes the balanced-growth equilibrium and provides the main qualitative results. Section 3 describes the calibration procedure and presents the quantitative

results for our model. Section 4 concludes.

2. The Model

The size of each household is normalized to one. Within each household， the number of members who are employed at time t is denoted by l(t). Hence, 1 - l(t) is the number of members who are unemployed and search for employment opportunities.

2.1 Household's Problem

In each period, each household derives utility from consumption and capital stock. The preferences of a household can be represented by

$$\int_0^\infty e^{-\rho t}[\log c(t) + s \log k(t)]dt \tag{1}$$

where c(t) is the household's consumption at time t, k(t) denotes the stock of physical capital owned by the household at time t, ρ> 0 is the rate of time preference, and s > 0 measures the desire for wealth-induced social status.

In each period, each household member faces uncertainty in his employment status and hence his labor income. If an agent is currently unemployed, then he faces a certain probability of finding a job. The rate at which unemployed workers find jobs is denoted by γ(t). However, if an agent is currently employed, then he faces a certain probability of becoming unemployed. The rate of job separation is assumed to be an exogenous constant θ> 0. At the household level, the number of working hours evolves according to

$$\dot{l}(t) = \gamma(t)[1 - l(t)] - \theta l(t) \tag{2}$$

Although each individual faces substantial risk in his labor income, we assume that members within a household can provide each other with complete insurance against this risk. Under this assumption, the household budget constraint in each period t≥0 is then given by

$$\dot{k}(t) + c(t) = w(t)l(t) + r(t)k(t) + \pi(t) \tag{3}$$

where ω(t) is the market wage rate for workers, r(t) is the effective rate of return from investment, and π (t) is the dividend income distributed by the firms.

A household's problem is to choose a set of time paths $\{c(t), k(t)|t \geq 0\}$ to maximize the utility function in equation (1) subject to the budget constraint in equation (3) and the initial condition k(0) > 0. Let ψ(t) be the current-value shadow price of capital. The first order conditions with respect to {c(t), k(t)} are given by

$$\frac{1}{c(t)} - \psi(t) = 0 \tag{4}$$

$$\frac{s}{k(t)} + [r(t) - \rho]\psi(t) = -\dot{\psi}(t) \tag{5}$$

The transversality condition for this problem is

$$\lim_{t\to\infty} e^{-\rho t}\psi(t)k(t) = 0$$

Combining equations (4) and (5) yields the consumption Euler equation

$$\frac{\dot{c}(t)}{c(t)} = s\frac{c(t)}{k(t)} + r(t) - \rho \tag{6}$$

This condition describes the evolution of individual consumption.

2.2 Production

There is a large number of identical .firms in this economy. To achieve endogenous growth, we will follow Romer (1986) to assume that capital has a positive externality effect on aggregate technology. Therefore, aggregate output y(t) is produced according to the following Cobb-Douglas production technology

$$y(t) = a[k(t)]^{\varepsilon}[l(t)\bar{k}(t)]^{1-\varepsilon}$$

where k(t) denotes each individual firm's capital input, l(t) denotes her labor input, $\bar{k}(t)$ denotes the aggregate holding of capital in the economy, $a \in (0,1)$ represents TFP measure and $\varepsilon \in (0,1)$ is the share of capital income in total output.

To hire workers, the representative firm needs to post some job vacancies in every period. Each vacancy costs q(t) units of output. To ensure the existence of balanced growth path, we assume that the vacancy posting cost q(t) is a fraction $\tilde{q} \in (0,1)$ of wage w(t).[1] The rate at which a posted vacancy is matched to an unemployed worker at time t is given by $\mu(t)$. Let v(t) be the number of job vacancies posted at time t. The firm's employment then evolves according to

$$\dot{l}(t) = \mu(t)v(t) - \theta l(t) \tag{7}$$

where $\theta l(t)$ is the number of job separations

Taking the factor prices as given, the representative firm chooses a set of time paths $\{k(t), l(t), v(t)|t \geq 0\}$ to maximize the present value of its future profit stream.

1 Hall and Milgrom (2008) demonstrate that the cost of maintaining a vacancy for 1 day is 0.43 day of pay. Following Pissarides (1990, Chapter 2), we assume that hiring is a labor intensive activity and thus the associated cost proportionally depends on wage rate. The same assumption has also been adopted in many related studies (among others, see Postel-Vinay (1998) and Eriksson (1997)).

Formally, this is given by

$$\max_{\{k(t),l(t),v(t)|t\geq 0\}} \int_0^{\infty} e^{-\int_0^t r(\tau)d\tau}\pi(t)dt$$

subject to the law of motion in equation (7), and

$$\pi(t) = y(t) - [r(t) + \delta]k(t) - w(t)l(t) - q(t)v(t) \tag{8}$$

The parameter $\delta > 0$ is the depreciation rate of capital. Let $\chi(t)$ be the present value shadow price of l(t). The first order conditions with respect to $\{k(t), v(t), l(t)\}$ are given by

$$a\varepsilon[k(t)]^{\varepsilon-1}[l(t)\bar{k}(t)]^{1-\varepsilon} - [r(t) + \delta] = 0 \tag{9}$$

$$\chi(t)\mu(t) - q(t) = 0 \tag{10}$$

$$a(1-\varepsilon)[k(t)]^{\varepsilon}[l(t)]^{-\varepsilon}[\bar{k}(t)]^{1-\varepsilon} - w(t) - [r(t) + \theta]\chi(t) = -\dot{\chi}(t) \tag{11}$$

Equation (9) is the usual condition that states that the rate of return from investment is given by the marginal product of capital net of depreciation rate. Equation (10) governs the firm's optimal vacancy decision. In any optimal solution, the marginal cost of vacancy q(t) must be equated to its marginal benefit $\chi(t)\,\mu(t)$. Equation (11) describes how the shadow price of employment $\chi(t)$ would evolve over time. Combining equations (10) and (11) yields

$$\frac{\mu(t)}{q(t)}\{a(1-\varepsilon)[k(t)]^{\varepsilon}[l(t)]^{-\varepsilon}[\bar{k}(t)]^{1-\varepsilon} - w(t)\} - \theta = r(t) + \frac{\dot{\mu}(t)}{\mu(t)} - \frac{\dot{q}(t)}{q(t)} \tag{12}$$

which is the law of motion for $\mu(t)$.

2.3 Matching and Wage Determination

In every period, vacant jobs and unemployed workers are randomly matched in a pair-wise fashion. The matching process is governed by a matching function that combines the total number of job vacancies v(t) and the number of unemployed workers $1 - l(t)$ to determine the number of successful job matches m(t). Following common practice, we assume that matching function takes the Cobb-Douglas form

$$m(t) = \phi[v(t)]^{\eta}[1 - l(t)]^{1-\eta}$$

The parameter $\eta \in (0,1)$ is the elasticity of vacancy in job matches, and ϕ is a positive constant.

Define the tightness of the labor market x(t) as the ratio between vacancies and unemployed, i.e., $x(t) = v(t)/[1-l(t)]$. Given the Cobb-Douglas matching function,

the vacancy-matching rate μ(t), and the job-finding rate γ(t), are defined as

$$\mu(t) = \frac{m(t)}{v(t)} = \phi[x(t)]^{\eta-1} \tag{13}$$

$$\gamma(t) = \frac{m(t)}{1-l(t)} = \phi[x(t)]^{\eta} \tag{14}$$

Following the existing literature, we assume that the wage rate w(t) is negotiated after workers and the firm meet. A negotiation between a worker and the firm results in a wage that is a combination between the worker's opportunity income and his marginal product of labor and the marginal value of the saved vacancy cost.[2] Let $\beta \in (0,1)$ represents the bargaining power of workers. The wage rate is then given by

$$w(t) = \beta\{a(1-\varepsilon)[k(t)]^{\varepsilon}[l(t)]^{-\varepsilon}[\bar{k}(t)]^{1-\varepsilon} + q(t)x(t)\}$$

By employing q(t) = q̃w(t), the wage expression is further derived as

$$w(t) = \frac{\beta a(1-\varepsilon)[k(t)]^{\varepsilon}[l(t)]^{-\varepsilon}[\bar{k}(t)]^{1-\varepsilon}}{1-\beta\tilde{q}x(t)} \tag{15}$$

To obtain a positive wage, we assume that $\beta\tilde{q}x(t) < 1$.

2.4 Search Equilibrium

A search equilibrium for this economy consists of a set of allocations for the household $\{c(t), k(t), l(t)|t \geq 0\}$, a set of prices $\{r(t), w(t)|t \geq 0\}$, aggregate inputs $\{k(t), l(t)|t \geq 0\}$, profits and vacancies $\{\pi(t), v(t)|t \geq 0\}$, and matching rates $\{\gamma(t), \mu(t)|t \geq 0\}$ such that

1. Given the prices $\{r(t), w(t)|t \geq 0\}$, the profits $\{\pi(t)|t \geq 0\}$, and the job-finding rate $\{\gamma(t)|t \geq 0\}$, the allocation $\{c(t), k(t), l(t)|t \geq 0\}$ solves the household's problem.
2. Given the prices $\{r(t), w(t)|t \geq 0\}$ and the vacancy-matching rates $\{\mu(t)|t \geq 0\}$, the aggregate inputs $\{k(t), l(t)|t \geq 0\}$ and the vacancies $\{v(t)|t \geq 0\}$ solve the representative firm's problem. For every $t \geq 0$, the profits π(t) is determined by equation (8).
3. For every $t \geq 0$, the wage rate w(t), is determined by equation (15).
4. For every $t \geq 0$, the matching rates μ(t) and γ(t) are determined by equations (13) and (14), respectively.

[2] This way of wage determination has also been adopted in other studies (among others, see Eriksson (1997)). Note that the unemployment benefit is regarded as a worker's opportunity income. In this paper, since unemployment benefit is not our focus, we then assume that unemployed workers do not receive any benefits in order to simplify our analysis.

An equilibrium de.ned above can be characterized by a system of three differential equations that governs the dynamic properties of three variables $\{\varphi(t), x(t), l(t)\}$, where φ(t) is defined as the ratio between consumption c(t) and capital stock k(t).

To derive the system, we first combine equations (3) and (8) to obtain the resource constraint

$$\begin{aligned}\frac{\dot{k}(t)}{k(t)}+\varphi(t) &= \frac{y(t)}{k(t)}-\delta-\frac{q(t)v(t)}{k(t)} \\ &= a[l(t)]^{1-\varepsilon}-\delta-\frac{\beta\tilde{q}a(1-\varepsilon)[l(t)]^{-\varepsilon}[1-l(t)]x(t)}{1-\beta\tilde{q}x(t)}\end{aligned} \tag{16}$$

Subtracting equation (16) from equation (6) yields

$$\frac{\dot{\varphi}(t)}{\varphi(t)}=(1+s)\varphi(t)-a(1-\varepsilon)[l(t)]^{1-\varepsilon}-\rho+\frac{\beta\tilde{q}a(1-\varepsilon)[l(t)]^{-\varepsilon}[1-l(t)]x(t)}{1-\beta\tilde{q}x(t)} \tag{17}$$

Plugging equation (14) into equation (2) yields

$$\dot{l}(t)=\phi[x(t)]^{\eta}[1-l(t)]-\theta l(t) \tag{18}$$

which governs the law of motion of employment in the equilibrium.

Plugging equations (15) and (13) into equation (12), we have the left-hand side (LHS) of equation (12) as

$$LHS=\phi[x(t)]^{\eta-1}\frac{1-\beta\tilde{q}x(t)-\beta}{\beta\tilde{q}}-\theta \tag{19}$$

Given that q(t) = q̃w(t), we have

$$\begin{aligned}\frac{\dot{q}(t)}{q(t)} &= \frac{\dot{w}(t)}{w(t)}=\frac{\dot{[w(t)/k(t)]}}{w(t)/k(t)}+\frac{\dot{k}(t)}{k(t)} \\ &= \frac{\beta\tilde{q}}{1/x(t)-\beta\tilde{q}}\frac{\dot{x}(t)}{x(t)}-\varepsilon\frac{\dot{l}(t)}{l(t)}+a[l(t)]^{1-\varepsilon} \\ &\quad -\varphi(t)-\delta-\frac{\beta\tilde{q}a(1-\varepsilon)[l(t)]^{-\varepsilon}[1-l(t)]x(t)}{1-\beta\tilde{q}x(t)}\end{aligned} \tag{20}$$

Hence, the right-hand side (RHS) of equation (12) is

$$\begin{aligned}RHS &= -a(1-\varepsilon)[l(t)]^{1-\varepsilon}-(1-\eta)\frac{\dot{x}(t)}{x(t)}-\frac{\beta\tilde{q}}{1/x(t)-\beta\tilde{q}}\frac{\dot{x}(t)}{x(t)} \\ &\quad +\varepsilon\frac{\dot{l}(t)}{l(t)}+\varphi(t)+\frac{\beta\tilde{q}a(1-\varepsilon)[l(t)]^{-\varepsilon}[1-l(t)]x(t)}{1-\beta\tilde{q}x(t)}.\end{aligned} \tag{21}$$

Combining equations (19) and (21) yields

$$\frac{\dot{x}(t)}{x(t)} = \frac{1}{[1-\eta+\frac{\beta\tilde{q}}{1/x(t)-\beta\tilde{q}}]}\{\varepsilon\frac{\dot{l}(t)}{l(t)}+\varphi(t)+\frac{\beta\tilde{q}a(1-\varepsilon)[l(t)]^{-\varepsilon}[1-l(t)]x(t)}{1-\beta\tilde{q}x(t)} -a(1-\varepsilon)[l(t)]^{1-\varepsilon}+\theta+\phi[x(t)]^{\eta-1}[x(t)-\frac{1-\beta}{\beta\tilde{q}}]\}. \quad (22)$$

The dynamic behavior of the economy is represented by a three-dimensional dynamic system of equations (17), (18) and (22) in φ(t), l(t) and x(t).

2.5 BGP Equilibrium

Along the balanced-growth-path (BGP) equilibrium, c(t), y(t) and k(t) grow at a common growth rate (g), while l(t), v(t) and m(t) do not grow. Therefore, the BGP equilibrium can be obtained by setting $\dot{x}(t)$, $\dot{l}(t)$ and $\dot{\varphi}(t)$ to be zero. Let $\bar{x}$, $\bar{l}$ and $\bar{\varphi}$ be the steady-state values of x(t), l(t) and φ(t), respectively. In the steady state, equation (17) becomes

$$\bar{\varphi} = \frac{1}{1+s}[a(1-\varepsilon)\bar{l}^{1-\varepsilon}+\rho-\frac{\beta\tilde{q}a(1-\varepsilon)\bar{l}^{-\varepsilon}(1-\bar{l})\bar{x}}{1-\beta\tilde{q}\bar{x}}] \quad (23)$$

Replacing $\bar{\varphi}$ in equation (22) with equation (23), we obtain

$$\frac{s}{1+s}[a(1-\varepsilon)\bar{l}^{1-\varepsilon}-\frac{\beta\tilde{q}a(1-\varepsilon)\bar{l}^{-\varepsilon}(1-\bar{l})\bar{x}}{1-\beta\tilde{q}\bar{x}}] = \phi\bar{x}^{\eta-1}[\bar{x}-\frac{1-\beta}{\beta\tilde{q}}]+\frac{\rho}{1+s}+\theta. \quad (24)$$

In the steady state, equation (18) becomes

$$\phi\bar{x}^{\eta}(1-\bar{l}) = \theta\bar{l}. \quad (25)$$

The values of $\bar{x}$ and $\bar{l}$ can be solved by utilizing equations (24) and (25). Once one derives the solutions of $\bar{x}$ and $\bar{l}$, the value of $\bar{\varphi}$ can be derived from equation (23). In the entire paper, we make the following assumption.

Assumption 1. $\eta \geq \frac{1}{2}$ and $\frac{(1-\beta)(1-\eta)}{\eta\beta\tilde{q}}\left(\frac{\phi}{\theta^{1-\eta}}\right)^{\frac{1}{\eta}} \geq \frac{sa(1-\varepsilon)^2}{1+s}$

Under assumption 1, we have the following property regarding the existence and uniqueness of the BGP equilibrium.

Proposition 1 (Existence and Uniqueness) *There exists a unique BGP equilibrium under Assumption 1.*

Proof: From equation (25), we obtain

$$\bar{x} = \bar{x}(\bar{l}) = \left[\frac{\theta\bar{l}}{\phi(1-\bar{l})}\right]^{\frac{1}{\eta}} \quad (26)$$

Equation (26) indicates that $\bar{x}$ is an increasing function of $\bar{l}$ because

$$\bar{x}'(\bar{l}) = \frac{d\bar{x}}{d\bar{l}} = \frac{\bar{x}}{\eta\bar{l}(1-\bar{l})} > 0$$

Substituting equation (26) into equation (24), equation (24) can be written as

$$f(\bar{l}) = 0 \tag{27}$$

where

$$f(\bar{l}) = \frac{s}{1+s}[a(1-\varepsilon)\bar{l}^{1-\varepsilon} - \frac{\beta\tilde{q}a(1-\varepsilon)\bar{l}^{-\varepsilon}(1-\bar{l})\bar{x}(\bar{l})}{1-\beta\tilde{q}\bar{x}(\bar{l})}] - \phi[\bar{x}(\bar{l})]^{\eta-1}[\bar{x}(\bar{l}) - \frac{1-\beta}{\beta\tilde{q}}] - \frac{\rho}{1+s} - \theta \quad .$$

Then, we can derive

$$\begin{aligned}
f'(\bar{l}) &= \frac{df}{d\bar{l}} \\
&= \frac{s}{1+s}\left\{a(1-\varepsilon)^2\bar{l}^{-\varepsilon} - \beta\tilde{q}a(1-\varepsilon)\left[\frac{\bar{x}}{1-\beta\tilde{q}\bar{x}}(-\varepsilon\bar{l}^{-1-\varepsilon} - (1-\varepsilon)\bar{l}^{-\varepsilon}) + \frac{\bar{l}^{-\varepsilon}(1-\bar{l})}{(1-\beta\tilde{q}\bar{x})^2}\bar{x}'(\bar{l})\right]\right\} \\
&\quad - \left[\phi\eta\bar{x}^{\eta-1} + (1-\eta)\frac{\phi(1-\beta)}{\beta\tilde{q}}\bar{x}^{\eta-2}\right]\bar{x}'(\bar{l}) \\
&= \frac{s}{1+s}\left\{a(1-\varepsilon)^2\bar{l}^{-\varepsilon} + \frac{\beta\tilde{q}a(1-\varepsilon)\bar{l}^{-1-\varepsilon}\bar{x}}{1-\beta\tilde{q}\bar{x}}\left[\varepsilon + (1-\varepsilon)\bar{l} - \frac{1}{\eta(1-\beta\tilde{q}\bar{x})}\right]\right\} \\
&\quad - \left[\phi\eta\bar{x}^{\eta-1} + (1-\eta)\frac{\phi(1-\beta)}{\beta\tilde{q}}\bar{x}^{\eta-2}\right]\bar{x}'(\bar{l}) \\
&< \frac{s}{1+s}\left\{a(1-\varepsilon)^2\bar{l}^{-\varepsilon} + \frac{\beta\tilde{q}a(1-\varepsilon)\bar{l}^{-1-\varepsilon}\bar{x}}{1-\beta\tilde{q}\bar{x}}\left[1 - \frac{1}{\eta(1-\beta\tilde{q}\bar{x})}\right]\right\} - (1-\eta)\frac{\phi(1-\beta)}{\beta\tilde{q}}\bar{x}^{\eta-2}\bar{x}'(\bar{l}) \\
&< \frac{s}{1+s}a(1-\varepsilon)^2\bar{l}^{-\varepsilon} - (1-\eta)\frac{\phi(1-\beta)}{\eta\beta\tilde{q}}\frac{\bar{x}^{\eta-1}}{\bar{l}(1-\bar{l})} \\
&= \frac{s}{1+s}a(1-\varepsilon)^2\bar{l}^{-\varepsilon} - \frac{(1-\beta)(1-\eta)}{\eta\beta\tilde{q}}\left[\frac{\phi(1-\bar{l})^{1-2\eta}}{\theta^{1-\eta}\bar{l}}\right]^{\frac{1}{\eta}} \\
&= \bar{l}^{-\frac{1}{\eta}}\left\{\frac{s}{1+s}a(1-\varepsilon)^2\bar{l}^{\frac{1}{\eta}-\varepsilon} - \frac{(1-\beta)(1-\eta)}{\eta\beta\tilde{q}}\left[\frac{\phi}{\theta^{1-\eta}(1-\bar{l})^{2\eta-1}}\right]^{\frac{1}{\eta}}\right\}.
\end{aligned}$$

Because $0 \le \bar{l} \le 1$ and $\frac{1}{\eta} - \varepsilon > 0$, if $\eta \ge \frac{1}{2}$, we obtain

$$f'(\bar{l}) < \bar{l}^{-\frac{1}{\eta}}\left[\frac{sa(1-\varepsilon)^2}{1+s} - \frac{(1-\beta)(1-\eta)}{\eta\beta\tilde{q}}\left(\frac{\phi}{\theta^{1-\eta}}\right)^{\frac{1}{\eta}}\right].$$

Then, $f'(\bar{l}) < 0$ if $\frac{(1-\beta)(1-\eta)}{\eta\beta\tilde{q}}\left(\frac{\phi}{\theta^{1-\eta}}\right)^{\frac{1}{\eta}} \ge \frac{sa(1-\varepsilon)^2}{1+s}$.

Furthermore, $\lim_{\bar{l}\to 0} f(\bar{l}) = \infty$ and $\lim_{\bar{l}\to \bar{l}_{\max}} f(\bar{l}) = -\infty$, where $\bar{l}_{\max}$ is $\bar{l}$ satisfying $1 - \beta\tilde{q}\bar{x}(\bar{l}) = 0$. Therefore, there exists a unique solution of $\bar{l}$ for equation (27) if

$\eta \geq \frac{1}{2}$ and $\frac{(1-\beta)(1-\eta)}{\eta\beta\tilde{q}}\left(\frac{\phi}{\theta^{1-\eta}}\right)^{\frac{1}{\eta}} \geq \frac{sa(1-\varepsilon)^2}{1+s}$. Once one derives the solution $\bar{l}$, the values of $\bar{x}$ and $\bar{\varphi}$ can be derived from equations (26) and (23), respectively. Q.E.D.

Employing equation (16), the growth rate of k(t) along the BGP equilibrium is

$$g = -\bar{\varphi} + a\bar{l}^{1-\varepsilon} - \delta - \frac{\beta\tilde{q}a(1-\varepsilon)\bar{l}^{-\varepsilon}(1-\bar{l})\bar{x}}{1-\beta\tilde{q}\bar{x}} \tag{28}$$

Equation (28) indicates that the long-run growth rate is affected by the rate of employment, the vacancy creation cost and the consumption-capital ratio.

We are now ready to study the impact of social status on the long-run economic performance.

Proposition 2 *If Assumption 1 holds, then an increase in s will raise both* $\bar{l}$ *and* $\bar{x}$.

Proof: Totally differentiating equation (27) with respect to $\bar{l}$ and s yields

$$\frac{d\bar{l}}{ds} = -\frac{a(1-\varepsilon)[\bar{l}^{1-\varepsilon} - \frac{\beta\tilde{q}\bar{l}^{-\varepsilon}(1-\bar{l})\bar{x}}{1-\beta\tilde{q}\bar{x}}] + \rho}{(1+s)^2 f'(\bar{l})}.$$

If Assumption 1 holds, then $f'(\bar{l}) < 0$ and $\frac{d\bar{l}}{ds} > 0$ indicating that an increase in s will raise $\bar{l}$. From equation (26), we derive $\frac{d\bar{x}}{ds} = \bar{x}'(\bar{l})\frac{d\bar{l}}{ds} > 0$ indicating that an increase in s will raise $\bar{x}$. Q.E.D.

From equation (28), we obtain

$$\frac{dg}{ds} = -\frac{d\bar{\varphi}}{ds} + a(1-\varepsilon)\bar{l}^{-\varepsilon}\frac{d\bar{l}}{ds} - \frac{a(1-\varepsilon)\beta\tilde{q}\bar{x}\bar{l}^{-\varepsilon-1}}{(1-\beta\tilde{q}\bar{x})^2\eta}\{1-[\varepsilon+(1-\varepsilon)\bar{l}]\eta(1-\beta\tilde{q}\bar{x})\}\frac{d\bar{l}}{ds} \tag{29}$$

The motive for social status affects the long-run growth rate through three channels as indicated in equation (29). First, the growth rate is negatively correlated with consumption-capital ratio. Second, an increase in the desire for social status enhances the motivation for capital accumulation. The increase in capital accumulation enhances economic growth and raises the marginal product of labor, leading firms to create more jobs. As a consequence, the labor market becomes less tight to workers (an increase in $\bar{x}$), and the employment rate increases (an increase in $\bar{l}$). The increase in the rate of employment is beneficial to economic growth. Third, the increase in capital accumulation induces firms to post more vacancies, resulting in a higher vacancy creation cost. Less resources are available for output production. Therefore, the increase in the vacancy creation cost hampers economic growth.

Note that existing works examine growth models with either desire for social

status or labor-market frictions, but not both. Therefore, the current analysis nests the analysis in previous studies as a special case. In particular, in the absence of labor-market frictions, the long-run growth rate would be only affected by the motive for social status through a subset of these forces, namely, the consumption-capital ratio. Similarly, in a growth model without the motive for social status, the long-run growth rate would not be dependent on consumption-capital ratio (see equation (30) below).

To study the effect of the desire for social status on the growth rate, we need to examine how it affects the consumption-capital ratio. From equation (23), we derive

$$\frac{d\bar{\varphi}}{ds} = \frac{1}{1+s}\{-\bar{\varphi} + a(1-\varepsilon)^2\bar{l}^{-\varepsilon}\frac{d\bar{l}}{ds} - \frac{a(1-\varepsilon)\beta\tilde{q}\tilde{x}\bar{l}^{-\varepsilon-1}}{(1-\beta\tilde{q}\tilde{x})^2\eta}\{1-[\varepsilon+(1-\varepsilon)\bar{l}]\eta(1-\beta\tilde{q}\tilde{x})\}\frac{d\bar{l}}{ds}\}$$

The increase in the desire for social status motives individuals to accumulate more capital and causes a reduction in consumption-capital ratio. As firms are willing to create more jobs, job vacancies increase and the rate of employment increases. The increase in the job vacancy creation cost reduces consumption-capital ratio while the increase in the rate of employment causes an increase in the consumption-capital ratio. Therefore, the effect of s on $\bar{\varphi}$ is ambiguous. Because $0 \leq \eta, \bar{l}, (1-\beta\tilde{q}\tilde{x}) \leq 1$ and $\frac{d\bar{l}}{ds} > 0$, then we obtain

$$\frac{d\bar{\varphi}}{ds} < \frac{1}{1+s}[-\bar{\varphi} + a(1-\varepsilon)^2\bar{l}^{-\varepsilon}\frac{d\bar{l}}{ds}]$$

This implies that $\frac{d\bar{\varphi}}{ds} < 0$ if $\frac{d\bar{l}}{ds}$ is small enough (that is, an increase in s causes a sufficiently small increase in $\bar{l}$).

Employing the steady-state condition described in equation (23), we can re-write the
growth rate

$$g = s\bar{\varphi} + a\varepsilon\bar{l}^{1-\varepsilon} - \delta - \rho \tag{30}$$

From equation (30), we obtain

$$\frac{dg}{ds} = \bar{\varphi} + s\frac{d\bar{\varphi}}{ds} + a\varepsilon(1-\varepsilon)\bar{l}^{-\varepsilon}\frac{d\bar{l}}{ds}$$

Because the sign of $\frac{d\bar{\varphi}}{ds}$ is ambiguous, we are not able to determine the sign of $\frac{dg}{ds}$. Because $\frac{d\bar{l}}{ds} > 0$, then $\frac{dg}{ds} > 0$ if $\frac{d\bar{\varphi}}{ds} > 0$. However, if $\frac{d\bar{\varphi}}{ds} < 0$ and such a decrease

is significantly large, then $\frac{dg}{ds} < 0$.

Due to the complexity of the system, we cannot find a simple intuitive condition to guarantee stability of the equilibrium. Therefore, we resort to numerical methods and study the local property of the dynamic behavior at the equilibrium by assigning reasonable parameter values. Because there are two jump variables (φ(t) and x(t)) and one non-jump variable (l(t)) in the model, the equilibrium is stable if there are two eigenvalues with positive real parts and one eigenvalue with negative real part. In all of the simulations conducted over a wide range of plausible parameter sets in the following section, two positive eigenvalues and one negative eigenvalues are obtained, implying that the BGP equilibrium exhibits saddle-path stability.

3. Quantitative Analysis

This section explores the quantitative implications of our model. To achieve this, we first calibrate parameters to match some data to and then simulate the model to perform numerical analysis. In the quantitative exercises, we focus on the impact of social status on the consumption-capital ratio, labor-market tightness, the rate of unemployment, and the long-run growth rate.

3.1 Parameterization

There are 10 model parameters that need to be determined: the preference parameters (ρ and s), the production parameters (a and ε), matching function parameters (ϕ and η), bargaining power of workers β, job separation rate θ, depreciation rate δ, and the unit cost of vacancy $\tilde{q}$. We assume that one period in the model economy represents one quarter, so all of the parameters are interpreted quarterly.

In the benchmark calibration, we first set ρ= 0.01 so that the annual interest rate in the steady state is approximately 4%. The share of capital income in total output ε is commonly set to 0.33. The parameter δ is taken to be 0.025. This implies that the annual depreciation rate is approximately 10%. The value of bargaining power of workers β is set to be 0.5, a value commonly employed in the literature.[3] Furthermore, the elasticity of vacancy in job matches η is 0.5 so that the Hosios' (1990) rule holds. According to Job Openings and Labor Turnover Survey (JOLTS), the average quarterly separation rate from 2001Q1 to 2015Q1 is 10.45%. Hence, we set θ = 0.1045. Hall and Milgrom (2008) demonstrate that the cost of maintaining a vacancy for 1 day is 0.43 day of pay. Hence, we set $\tilde{q}$ = 0.43.

The average quarterly unemployment rate from 1948Q1 to 2015Q2 is 5.8%. The

[3] The same value of bargaining strength has also been used in Albercht and Vroman (2002).

efficiency parameter ϕ is set to 1.1483 to match this rate in the steady state. According to equation (9), it follows that a = 0.1104. The social status preference parameter s is set to 0.0693 to match a 2% annual growth rate of output. The benchmark parameterization is summarized in Table 1.[4]

Table 1: Benchmark parameter values

Preference	$\rho = 0.01,\ s = 0.0693,$
Production	$a = 0.1104,\ \varepsilon = 0.33,$
Matching	$\phi = 1.1483,\ \eta = 0.5,$
Others	$\beta = 0.5,\ \theta = 0.1045,\ \delta = 0.025,\ \tilde{q} = 0.43.$

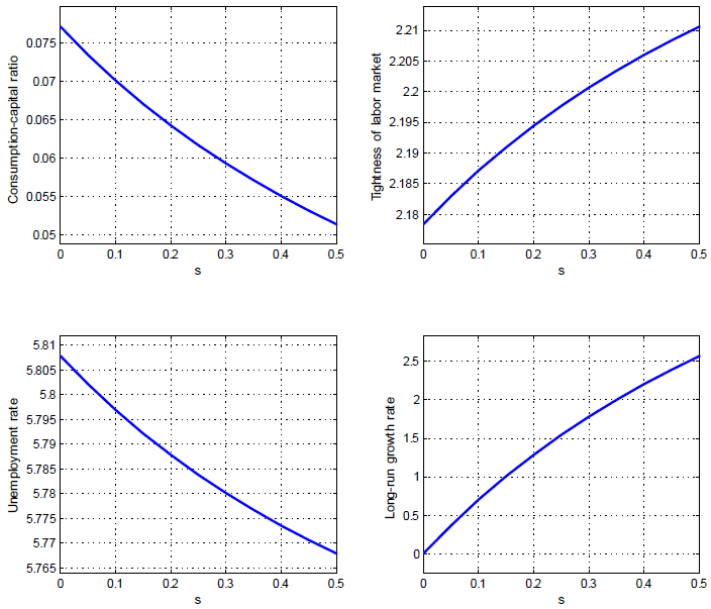
3.2 Simulation Results

Under our benchmark parameterization, the steady-state values are $\bar{l}$ = 0.942, $\bar{x}$= 2.185, $\bar{\varphi}$ = 0.0722 and g = 0.005. Figure 1 presents the effects of an increase in the desire for social status (s) from 0 to 0.5 on the consumption-capital ratio ($\bar{\varphi}$), labor-market tightness ($\bar{x}$), unemployment rate ($1 - \bar{l}$) and growth rate (g).[5] To study the stability around the equilibrium, we compute the Jacobian matrix of the dynamical system of (17), (18) and (20) evaluated at the steady state and calculate its eigenvalues. In all numerical exercises we perform, two positive eigenvalues and one negative eigenvalue are obtained. Our numerical results illustrate that an increase in the desire for social status in the preference reduces the consumption-capital ratio and unemployment rate while raising the tightness of labor market. An increase in s raises consumers' willingness to accumulate capital, inducing a decrease in $\bar{\varphi}$. This increases the marginal product of labor, leading firms to create more jobs. As a consequence, the labor market becomes less tight to workers (an increase in $\bar{x}$) and the unemployment rate falls.

[4] All of the parameterizations employed in the numerical exercises (the benchmark, Figure 1 and Table 2) satisfy the sufficient conditions for the existence and uniqueness of steady state presented in Proposition 1.

[5] Under our parameterization, the long-run growth rate when s = 0 of Figure 1 is 0. This is because under our parameterization, the interest rate equals the rate of time preference; i.e., r = ρ = 0.01. Therefore, when s = 0, the long-run growth rate is r – ρ and thus is 0.

Figure 1: Long-run effects of an increase in the desire for social status



Equation (29) indicates that the increase in the desire for social status affects the long-run growth rate by affecting the employment rate, the job vacancy creation cost and the consumption-capital ratio. The decreases in consumption-capital ratio and unemployment rate raise the long-run economic growth rate while the increase in vacancy creation cost reduces it. Under the benchmark parameterization, we find that an increase in the desire for social status could enhance the economic growth rate in the long run.

To examine the influence of the desire for social status, we perform comparative-static analysis by allowing ρ, a, θ, β, η and $\tilde{q}$ to increase by 5% under the benchmark value of s = 0.0693.[6] The results are reported in Table 2.[7] We find that for parameters ρ, θ, β, η and $\tilde{q}$, our results are qualitatively consistent with those in Eriksson (1997) based on a model without preference for social status. In particular, when the parameter of rate of time preference ρ is 5% above its benchmark value, the labor market becomes tighter to workers, and the rate of unemployment increases. Together with an increase in the consumption-capital ratio,

[6] We consider a different value of s = 0.4 and find that directions of changes of variables $\{\bar{\psi}, \bar{x}, 1-\bar{l}, \bar{g}\}$ are the same as those in the model of s = 0.0693. The results are available upon request.

[7] In Appendix A, Figures A1 – A7 present the effects of the increase in the desire for social status on $\bar{\varphi}$, $\bar{x}$, $(1-\bar{l})$ and g under different values of a, θ, β, η, ϕ, ρ and $\tilde{q}$. We find that changes in these parameter values do not change our results qualitatively.

the long-run growth rate decreases. Similar results could also be found when the bargaining power of workers (β) increases.

When we increase the job separation rate θ by 5%, the labor market becomes tighter to workers, and the unemployment rate increases. The consumption-capital ratio decreases, and there is an overall decrease in the long-run growth rate. Similar results could also be found when the vacancy posting cost (q̃) increases.

The results in Table 2 indicate that with a 5% increase in the TFP measure a, the consumption-capital ratio increases. The labor market becomes less tight to workers and the unemployment rate decreases, causing an increase in the long-run economic growth. Our findings in the labor market performance are very different from Eriksson (1997), who shows that an increase in the TFP measure will make the labor market become tighter and cause an increase in the unemployment rate in an endogenous growth model with labor-market frictions but without preference for social status. The main reason is that the results found in Eriksson (1997) rely on the condition of a sufficiently low elasticity of intertemporal substitution. With the setting of utility function as $c^{1-\sigma}/(1-\sigma)$, most of the results in his study then hinge on the assumption that $\sigma > 1-\tau$, where τ is the tax rate of capital income. Note that under his setting, the labor market performance is immune to the changes in the TFP measure when $\sigma = 1-\tau$. This implies that in the simplified model with a logarithmic instantaneous utility function (σ = 1) and zero capital income tax rate (τ = 0) employed in this paper, changes in the TFP measure will not affect labor market performance. Therefore, our results indicate that the desire for social status provides a channel for the TFP measure to affect labor market performance and its interplay with capital accumulation. The result of Eriksson (1997) demonstrates that an increase in the TFP measure would cause a trade-off between unemployment and growth. However, we show that in the presence of the desire for social status, both the labor market performance and the growth rate could benefit from the increase in the TFP measure in the long run and this result appears to be more consistent with the data that there is no long-term crowding-out effect from the technology factor to unemployment (Maddison, 1991). Table 2 also provides results for a case with no social status (s = 0). The results show that the change in a will not affect steady-state levels of labor market tightness and unemployment if the desire for social status is absent. When the desire for social status is absent, in the BGP equilibrium, equation (24) indicates that the tightness of labor market does not depend on a and hence unemployment is not affected from equation (25).

An increase in the elasticity of vacancy in job matches η by 5% causes similar effects on the performance of labor market and long-run economic growth as those

obtained in the case of an increase in the TFP measure.

Table 2: Long-run effects of some parameter changes

	percentage change in $\bar{\psi}$			percentage change in $\bar{x}$		
	benchmark	$s=0$	no friction	benchmark	$s=0$	no friction
$\rho \uparrow 5\%$	0.649	0.578	0.617	-0.027	-0.029	N/A
$a \uparrow 5\%$	4.352	4.424	4.438	0.012	0	N/A
$\theta \uparrow 5\%$	-0.403	-0.408	N/A	-0.299	-0.297	N/A
$\beta \uparrow 5\%$	0.060	0.059	N/A	-9.813	-9.826	N/A
$\eta \uparrow 5\%$	0.157	0.158	N/A	0.122	0.126	N/A
$\tilde{q} \uparrow 5\%$	-0.202	-0.201	N/A	-4.909	-4.915	N/A
	percentage change in $1-\bar{l}$			percentage change in g		
	benchmark	$s=0$	no friction	benchmark	$s=0$	no friction
$\rho \uparrow 5\%$	0.013	0.013	0	-9.355	-10.005	-9.383
$a \uparrow 5\%$	-0.006	0	0	39.353	40.000	39.384
$\theta \uparrow 5\%$	4.835	4.843	N/A	-1.802	-1.599	N/A
$\beta \uparrow 5\%$	4.977	4.985	N/A	-1.378	-1.646	N/A
$\eta \uparrow 5\%$	-1.884	-1.879	N/A	0.701	0.620	N/A
$\tilde{q} \uparrow 5\%$	2.398	2.401	N/A	-0.846	-0.792	N/A

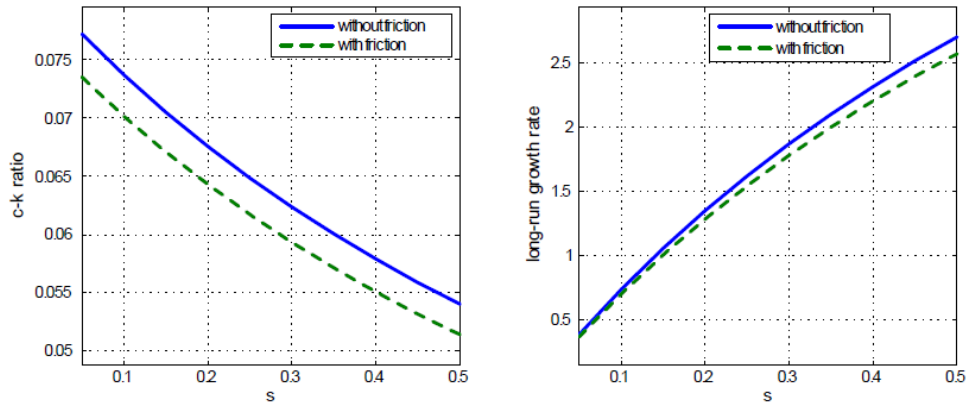
We also perform similar analysis for a case with no social status (s = 0) and a case with no labor-market frictions. The results are also given in Table 2. For the case with no social status, the magnitude and direction of the effects of a 5% increase of the parameter values are similar to those in the benchmark case, except that the change in a does not affect steady-state levels of labor market tightness and unemployment. For the case with no labor-market frictions, some parameters (θ, β, η and $\tilde{q}$) and labor market tightness are absent and full employment is restored in equilibrium.[8] The results in Table 2 show that variables such as consumption-capital ratio ($\bar{\psi}$) and long-run growth rate (g) in this case exhibit similar responses to changes of parameter values compared to the benchmark model.

Moreover, we also study the long-run effects of an increase in the desire for social status on consumption-capital ratio and long-run growth rate and compare the results with those in the benchmark model in Figure 2: According to equations (B12) and (B13) in Appendix B, for any given value of s, when labor-market frictions are absent, an increase in the desire for social status deliver theoretically unambiguous results, i.e., the change in the consumption-capital ratio is unambiguously negative and the effect on long-run growth is unambiguously positive. Furthermore,

[8] See Appendix B for the details of the model with no labor-market frictions and calibration.

according to our calculation, with no labor-market frictions, the long-run growth rate (g) is roughly overvalued by 5%. Comparing equation (28) with equation (B13) in Appendix B implies that the difference in g under the two cases is determined by three parts. First, with labor-market frictions, employment $\bar{l}$ is an increasing function of s. However, when frictions are absent, $\bar{l}$ is fixed regardless of the value of s. Second, when the labor market is frictionless, firms do not need to post vacancies and hence the third term of (28) is absent. This leads to a higher level of g. Third, the desire for social status (s) affects consumption-capital ratio ($\bar{\psi}$) differently in these two cases. Equation (23) indicates that the last term in equation (23) is absent when the labor market is frictionless.

Figure 2: Long-run effects of an increase in the desire for social status (benchmark vs. frictionless labor market)



Finally, since the bargaining power (β) used in Shimer (2005) is 0.72 and in Shi and Wen (1999) is 0.4, we then consider the cases for β = 0.72 and 0.4. The effects of an increase in the desire for social status are given in Figures C1 and C2 in Appendix C. We find that our results do not change qualitatively.

4. Conclusion

Existing studies have explored various implications of wealth-induced social status. However, the effect of social status on unemployment has not been well studied. To complement the literature, in this paper, we construct a dynamic general equilibrium model that incorporates wealth-enhanced preferences, unemployment and endogenous growth to investigate the role of social status in determining unemployment as well as long-run growth. We find that an increase in the desire for social status is beneficial to the performance of the labor market. The labor market becomes less tight to workers, and the rate of unemployment decreases. However, its

effect on the consumption-capital ratio is ambiguous. With an ambiguous change in the consumption-capital ratio and an increase in the vacancy creation cost, the long-run growth rate may not increase with the desire for social status. To determine the growth effect of social status, we simulate the model and perform comparative-static analysis. Our numerical results demonstrate that social status reduces the unemployment rate while enhancing the long-run growth rate. Furthermore, we compare the effects of a 5% increase in the rate of time preference, total factor productivity, job separation rate, bargaining strength, the elasticity of vacancy in job matches and the vacancy posting cost under different cases to examine the influences of the desire for social status or labor-market frictions.

Our paper can be extended into a variety of studies, and we point out two possible directions. First, in the literature of social status, some studies consider the relative wealth-enhanced social status in the representative household's preference formulation, i.e., replacing k(t) with k(t)=K(t) in equation (1), where K(t) represents the economy-wide capital stock. One may wonder if this change in the setting of social status would change our results. Second, by incorporating capital and wage income tax in the model, we can study the effects of fiscal policy.

Appendix A: Sensitivity Analysis

Similar to Figure 1, we draw a series of figures to examine the effects of the motive of social status s. In each figure, we consider different values of a, θ, β, η, ϕ, ρ and $\tilde{q}$, allowing them to vary by $\pm 5\%$. Results are summarized in Figures A1 to A7. We find that our results are quite robust.

Figure A1: Long-run effects of an increase in the desire for social status (different values of a)

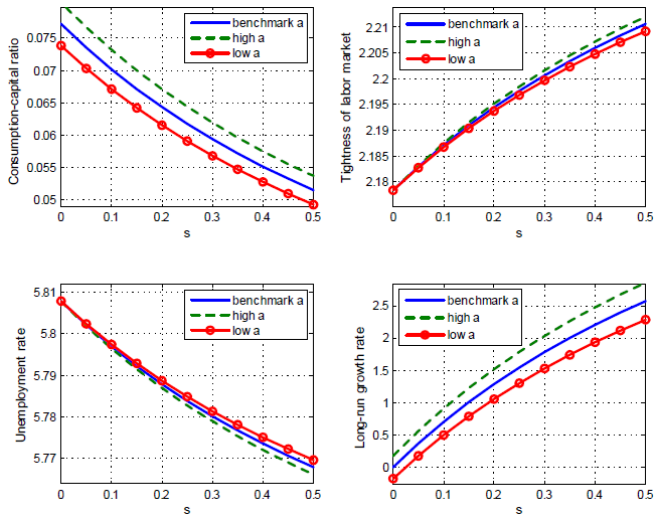


Figure A2: Long-run effects of an increase in the desire for social status (different values of θ)

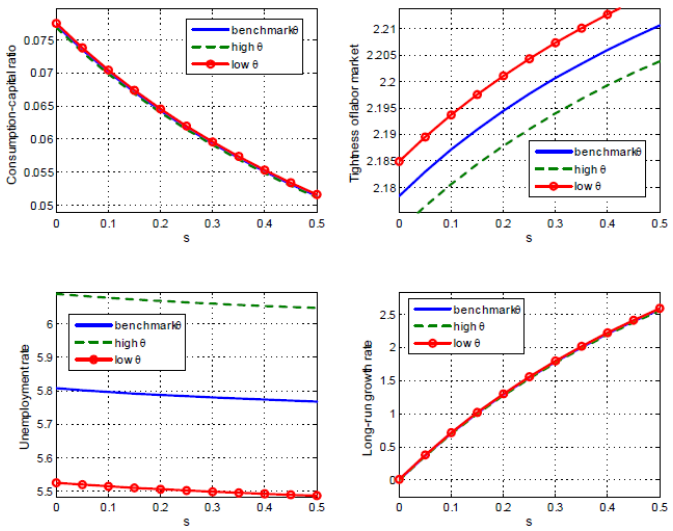


Figure A3: Long-run effects of an increase in the desire for social status (different values of β)

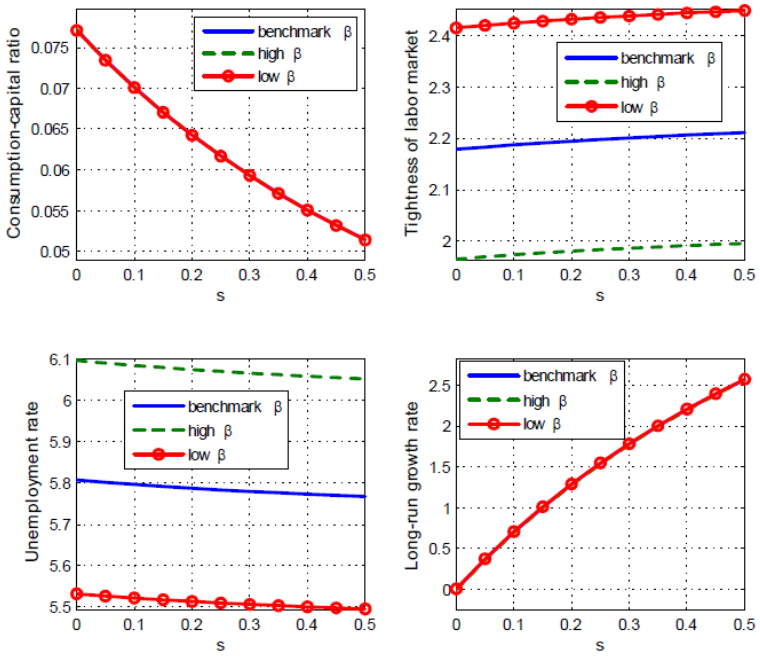


Figure A4: Long-run effects of an increase in the desire for social status (different values of η)

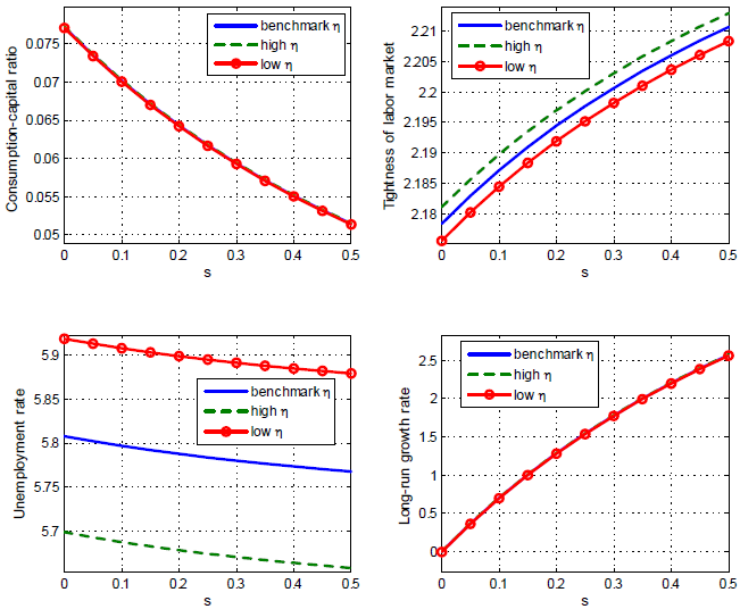


Figure A5: Long-run effects of an increase in the desire for social status (different values of □)

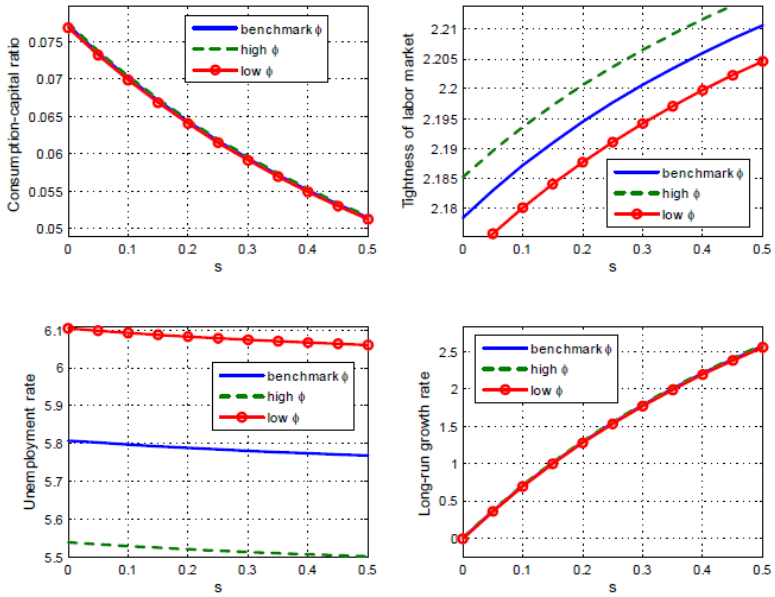


Figure A6: Long-run effects of an increase in the desire for social status (different values of ρ)

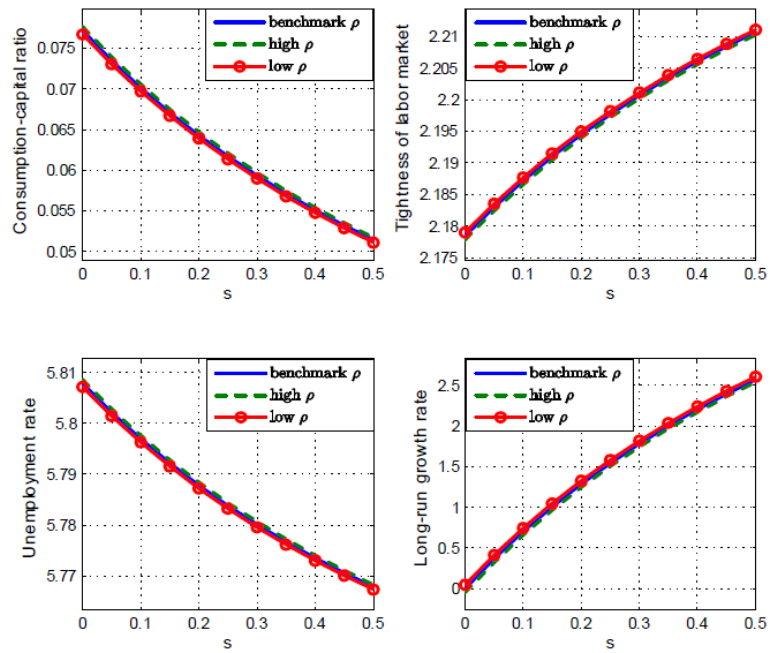
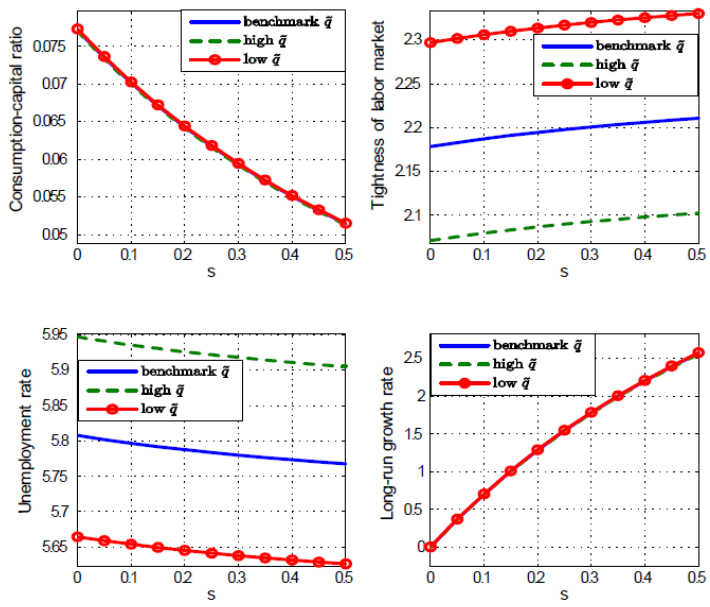


Figure A7: Long-run effects of an increase in the desire for social status (different values of $\tilde{q}$)



Appendix B: A Model without Labor-market Frictions

We use the notations as those in the main body of the paper. Following the existing literature, we assume that the preference of the representative household is given by

$$\int_0^{\infty} e^{-\rho t}[\log c(t) + s \log k(t)]dt \tag{B1}$$

The budget constraint of the representative household is given by

$$\dot{k}(t) = w(t)l + r(t)k(t) - c(t) \tag{B2}$$

where l is the measure of labor force. We assume that in each period, an individual is endowed with one unit of time which is inelastically supplied to the labor market. The household's problem is then to choose a set of time paths $\{c(t), k(t)|t \geq 0\}$ to maximize the utility function in equation (B1) subject to the budget constraint in equation (B2) and the initial conditions k(0) > 0. The consumption Euler equation is derived as

$$\frac{\dot{c}(t)}{c(t)} = s\frac{c(t)}{k(t)} + r(t) - \rho \tag{B3}$$

The production technology is

$$y(t) = a[k(t)]^{\varepsilon}[l(t)\bar{k}(t)]^{1-\varepsilon} \tag{B4}$$

The firm's problem is to choose a set of time path $\{k(t), l(t)|t \geq 0\}$ to maximize the profits given by

$$\pi(t) = y(t) - [r(t) + \delta]k(t) - w(t)l(t) \tag{B5}$$

The first order conditions are given by

$$r(t) = a\varepsilon[k(t)]^{\varepsilon-1}[l(t)\bar{k}(t)]^{1-\varepsilon} - \delta \tag{B6}$$

and

$$w(t) = a(1-\varepsilon)[k(t)]^{\varepsilon}[\bar{k}(t)]^{1-\varepsilon}[l(t)]^{-\varepsilon} \tag{B7}$$

In equilibrium, we have $\bar{k}(t) = k(t)$ and l(t)=l.

Plugging (B6) and (B7) into (B2) yields the resource constraint

$$\dot{k}(t) = ak(t)l^{1-\varepsilon} - \delta k(t) - c(t) \tag{B8}$$

Hence, it follows that

$$\frac{\dot{k}(t)}{k(t)} = al^{1-\varepsilon} - \delta - \varphi(t) \tag{B9}$$

Plugging (B6) into (B3) yields

$$\frac{\dot{c}(t)}{c(t)} = s\varphi(t) + a\varepsilon l^{1-\varepsilon} - \delta - \rho \tag{B10}$$

Hence, the consumption-capital ratio evolves according to

$$\frac{\dot{\varphi}(t)}{\varphi(t)} = \frac{\dot{c}(t)}{c(t)} - \frac{\dot{k}(t)}{k(t)} = (1+s)\varphi(t) - a(1-\varepsilon)l^{1-\varepsilon} - \rho \tag{B11}$$

In the BGP equilibrium, it follows that

$$\bar{\varphi} = \frac{1}{1+s}[a(1-\varepsilon)l^{1-\varepsilon} + \rho] \tag{B12}$$

$$g = al^{1-\varepsilon} - \delta - \bar{\varphi} \tag{B13}$$

Note that in the growth model without labor-market frictions, the motive for social status affects the long-run growth rate only through the channel of consumption-capital ratio.

In regard to calibration, we first normalize the size of labor force to 0.942, which is the steady state level of employment in the benchmark model. Following the same calibration strategy stated in Section 3.1, we set $\rho = 0.01$, $\varepsilon = 0.33$, $\delta = 0.025$ and $a = 0.1104$. The desire for social status s is calibrated to 0.0657 to match the annual growth rate of 2%.

Appendix C: Robustness Checks (Shimer 2005, Shi and Wen 1999)

We now consider the cases where $\beta = 0.72$ (Shimer 2005) and $\beta = 0.4$ (Shi and Wen 1999) as a robustness check. To make the results directly comparable, we adopt the same calibration strategy presented in Section 3.1. Specifically, we follow Shi and Wen (1999) and Shimer (2005) and set $\beta + \eta = 1$ such that the Hosios condition

is met. Therefore, when we set $\beta = 0.4$ (0.72), then we have $\eta = 0.6$ (0.28). The parameter ϕ is calibrated to match the average quarterly unemployment rate of 5.8% and the parameter s is calibrated to match the annual growth rate of 2%. We set $\rho = 0.01$, $\varepsilon = 0.33$, $\delta = 0.025$, $a = 0.1104$, $\theta = 0.1045$, and $\tilde{q} = 0.43$, which are the same values calibrated in Section 3.1. Tables C1 and C2 present the parameter values for cases of $\beta = 0.72$ and $\beta = 0.4$.

Table C1: Parameter values (β = 0.72)

Preference	$\rho = 0.01,\ s = 0.0671,$
Production	$a = 0.1104,\ \varepsilon = 0.33,$
Matching	$\phi = 1.7764,\ \eta = 0.28,$
Others	$\beta = 0.72,\ \theta = 0.1045,\ \delta = 0.025,\ \tilde{q} = 0.43.$

Table C2: Parameter values (β = 0.4)

Preference	$\rho = 0.01,\ s = 0.0710,$
Production	$a = 0.1104,\ \varepsilon = 0.33,$
Matching	$\phi = 0.8326,\ \eta = 0.6,$
Others	$\beta = 0.4,\ \theta = 0.1045,\ \delta = 0.025,\ \tilde{q} = 0.43.$

Figures C1 and C2 show the steady-state values of consumption-capital ratio, tightness of labor market, unemployment rate and long-run growth rate for a series of s under $\beta = 0.72$ or $\beta = 0.4$. Note that our results do not change qualitatively.

Figure C1: Long-run effects of an increase in the desire for social status (β = 0.72)

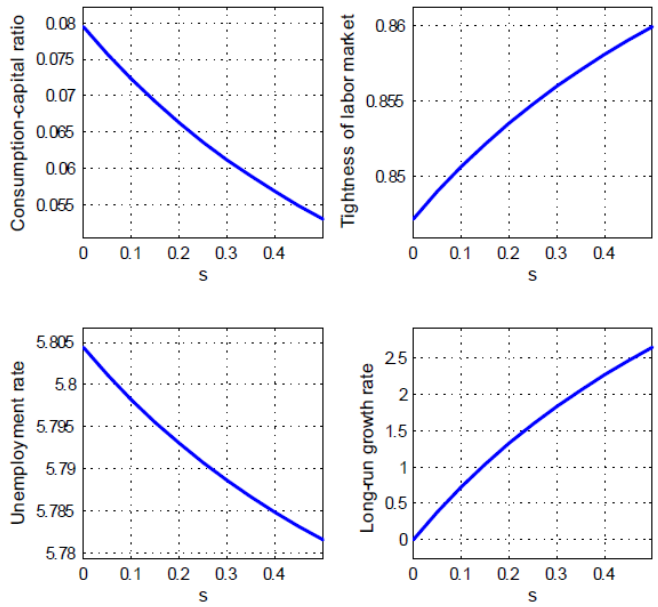
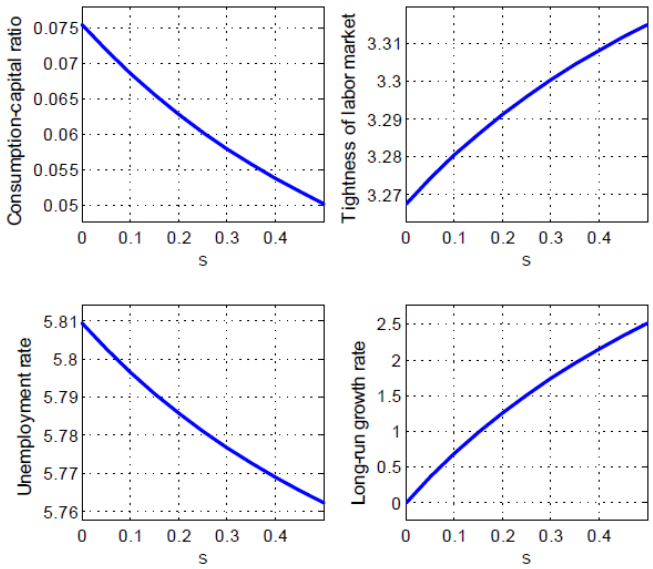


Figure C2: Long-run effects of an increase in the desire for social status (β = 0.4)



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Openness and Financial Development in China: The Political Economy of Financial Resources Distribution*

By LUO YU, ZHANG CHENGSI and ZHU YUETENG*

This paper examines the impact of openness on financial development in China. We use two sets of indicators of financial development to distinguish size and efficiency for both bank and capital market sectors as aspects of financial development in 30 provinces of China over the period from 2000 to 2009. The empirical results suggest that trade and financial openness exert positive impact on financial efficiency but negative impact on the size of financial development for both the indirect and direct financial sectors. The results confirm a mismatch problem between the distribution in the types of trading companies and the allocation of financial resources in China.

Keywords: openness, financial development, bank market, capital market

JEL Classification: F19, G29

1. Introduction

One of core functions of the financial system is allocating financial resources. Financial development is described as a process that marks improvement in size and efficiency of the distribution of scarce financial resources, particularly in developing economies. An efficient financial system with appropriate distribution of financial resources promotes economic growth (e.g. Levine, 1997; Demirguc-Kunt and Maksimovic, 1998; Beck et al., 2000; Goodhart, 2004; Darratet al., 2006). Therefore, understanding the sources of financial development becomes a prerequisite to improve the distribution of financial resources. Existing studies examine the sources of financial development from the perspectives of financial liberalization (McKinnon, 1973), legal systems (La Porta et al., 1997, 1998), government ownership of banks (Andrianovaet al., 2008), and political stability (Girma and

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Shortland, 2008).

Another branch of literature puts forward that openness is an important source of financial development[1]. These studies generally find positive links between trade/financial openness and financial development and between trade openness and financial openness across developed and developing economies. However, the findings based on the examinations of the two-variable relationships are likely to be incomplete and even misleading, as articulated in the seminal work of Rajan and Zingales (2003). Rajan and Zingales suggest an important three-variable relationship among trade openness, financial openness, and financial development. In particular, they establish that trade openness without financial openness is unlikely to lead to financial development and they verify their hypothesis using data for 24 industrialized countries for 1913–1999.

Baltagi*et al*. (2009) address Rajan and Zingales' (2003) hypothesis, utilizing data for both developing and industrialized countries. They find that both trade and financial openness are statistically significant determinants of banking sector development and that opening up either trade or finance without opening up the other could still generate gains in financial development. The empirical results pertaining to developing countries of Law (2009), nonetheless, show that the simultaneous opening of trade and capital accounts has a positive impact on financial development, which appears to support Rajan and Zingales' hypothesis. Law notes that his finding should be interpreted with caution because his sample countries are from the developing world, where the financial sector is mostly driven by the banking sector.

To enhance the understanding of the relationship between trade/financial openness and financial development in different countries, there is value in performing studies on individual countries with a diverse set of measures of financial development, when the relevant panel data for individual countries are obtainable (Zhang *et al*., 2015). In this paper, we adopt such an approach to gain insight into the dynamic impact of trade openness and financial openness on financial development in China, whose high economic growth over the recent decade has received great attention in the world and where financial development (particularly size indicators) also appears to have progressed dramatically since the mid-1990s (Zhang *et al*., 2012).

[1]The relevant literature has focused mainly on two variables relation between trade openness and financial development (Beck, 2002; Svaleryd and Vlachos, 2002; Do and Levchenko, 2004; Braun and Raddatz, 2005; Mishkin, 2009; Kim *et al*., 2010), financial openness and financial development (Levine, 2001; Chinn and Ito, 2006), and financial openness and trade openness (Aizenman and Noy, 2009).

In addition to using a unique panel data set for 30 Chinese provinces over the period from 2000 to 2009, our work contributes to the literature by considering different aspects of financial development in both banking and capital market sectors (i.e. indirect finance and direct finance sectors) and examining the effects of openness on the different indicators of financial development. The empirical results of the paper show that both trade and financial openness have positive impact on financial efficiency, but that openness has a negative impact on the size of financial development. The baseline findings are robust to alternative measures of financial development for both the indirect and direct financial sectors in China.

These findings also constitute an interesting story of political economy of financial resources distribution in China. In particular, there is a mismatch problem (negative relation) between financial development and trade openness at provincial level. The cause of this problem is that financial resource distribution and allocation has been non-market-based with notable local government interventions, whereas trade business between China and the world has been market-based with current account opening up since China's access to the World Trade Organization in 2001. The distorted financial resource distribution system may explain the repression of financial efficiency and expansion of financial size in provinces with either low trade openness or low financial openness.

The remainder of this paper is organized as follows: Section 2presents the model specification and estimation methods. Section 3 describes the data used in the empirical work and some stylized facts about openness and financial development in China. Section 4 provides the estimation results, followed by Section 5, which discusses the implications of the empirical results. Section 6concludes the paper.

2. Model and estimation method

The aim of our empirical model specification is to investigate the effects of trade and financial openness on different indicators of financial development in China. Since financial development indicators are likely to display considerable persistence, we specify a dynamic log-linear equation for financial development that includes a lagged dependent variable:

$$lnFD_{it} = \beta_0 + \gamma lnFD_{it-1} + \beta_1 lnTO_{it} + \beta_2 lnFO_{it} + \beta_3 lnrgdp_{it} + \beta_4 lngov_{it} + \beta_5 lnstate_{it} + \beta_6 lnenroll_{it} + \mu_{it} \quad (1)$$

Where *FD* is an indicator of financial development, *TO* is trade openness, and *FO* is financial openness. In addition, *rgdp*, *gov*, *state*, and *enroll* are control variables that denote the real per capita gross domestic product (GDP), government spending, the share of industrial production of state-owned enterprises (SOEs, as a percentage of

total industrial production), and the gross enrollment ratio, respectively. The specification error term μ_{it} contains cross-sectional and time-specific fixed effects:

$$\mu_{it} = \mu_i + \varepsilon_t + v_{it} \quad (2)$$

wherev_{it} is assumed to be independent and identically distributed. Model (1) postulates that financial development is determined by trade and financial openness, in conjunction with a set of conditioning variables, namely, the lag of financial development, the stage of economic development (captured by per capita income), and province-specific factors.

The inclusion of the lagged dependent variable in Model (1) implies a correlation between the regressors and the error term, since lagged financial development depends on the lagged error term, which is a function of the cross section-specific effect. Because of this correlation, a dynamic panel data estimation of Eq. (1) suffers from the Nickell (1981) bias, which disappears only if *T* tends to infinity. The preferred estimator in this case is the dynamic generalized method of moments (GMM), as suggested by Arellano and Bond (1991), which basically differences the model to get rid of cross section-specific effects or any time-invariant province-specific variable. This also eliminates any endogeneity that may be caused by the correlation of these province specific effects and the regressors.

The moment conditions utilize the orthogonality conditions between the differenced errors and the lagged values of the dependent variable. This assumes that the original disturbances in Eq. (1)are serially uncorrelated and that the differenced error is, therefore, a first-order moving average (i.e., MA(1)) with a unit root. To this end, two diagnostics are computed using the Arellano–Bond GMM procedure to test for first-and second-order serial correlation in the disturbances. We should reject the null of the absence of first-order serial correlation and not reject the absence of second-order serial correlation.

A special feature of the dynamic panel data GMM estimation is that the number of moment conditions increases with *T*. Therefore, a Sargantest is performed to test the over-identification restrictions. There is convincing evidence that too many moment conditions introduce bias at the same time as increasing efficiency. It is, therefore, suggested that a subset of these moment conditions be used to take advantage of the trade-off between the reduction in bias and loss in efficiency (Baltagi*et al.*,2009). Besides, unlike in a cross-country study, there are no obvious differences in the legal and political system across provinces in China; hence it is unreasonable to use the legal and political systems as instrumental variables, as practiced in the literature. We therefore use two lags of the right-hand side regressors (excluding the control variables, which are treated as exogenous) as instrumental variables and estimate

Model (1) by using the Arellano–Bond difference GMM estimator.

3. Data and measurement

This section describes the data for the variables used in the empirical analysis. In all, we consider two different aspects of financial development, namely, size and efficiency, and analyze the effects of trade and financial openness on these different measures of financial development in 30 provinces of China over the period from 2000 to 2009. The regression analyses also involve control variables that characterize the features of the different Chinese provinces. All our variables are measured at the provincial level. A description of the underlying data, measurement, and some stylized facts is presented below.

3.1. Measures of financial development

Several measures of financial development have been suggested by and employed in cross-country studies, including the ratio of liquid liabilities of the financial system to the nominal GDP (Levine *et al*., 2000), the ratio of deposits to the GDP (Rajan and Zingales, 2003), the ratio of credits to the private sector to the GDP (Levine *et al*., 2000), and the ratio of stock market capitalization to the GDP (Rajan and Zingales, 2003; Baltagi *et al*., 2009). Several international non-governmental organizations have also developed comprehensive indices to measure financial development among different economies, including the World Bank[2] and the World Economic Forum[3]. By definition, these measures can be broadly categorized into measurements of the size (e.g., total liabilities or total credits) and efficiency (e.g., proportion of private credit) of financial development.

To provide a comprehensive lens for financial development in China, we go further than the traditional measures of financial development used in the literature and employ two sets of indicators to capture the size and efficiency aspects of financial development. The use of different measures can capture different aspects of financial development, which is particularly important in depicting the (distorted) nature of the state-dominated financial system in China. In addition, for both the size and efficiency measures, we use several sub-indicators for each measure to ensure the robustness of the baseline results and to accommodate the alternative measures used in the literature.

Note that the financial system in China has been a bank-based system with banking sector as a dominant component. However, Chinese capital market has

[2] The financial development indicators in the Global Financial Development Database, World Bank.

[3] The financial development index in the Financial Development Report, published by the World Economic Forum.

witnessed rapid development as a direct financial intermediary since the early 2000s. Therefore, we utilize measures of financial development to cover both banking sector development and capital market development in each of the underlying 30 provinces of China.

Specifically, our first measure of financial development is the size indicator, which is measured by the following two subsets of variables. The first subset of variables is based on development of indirect finance (i.e., banking sector), which includes the following two indicators:

(1)the ratio of total loans in the financial system (including both banking and non-banking financial institutions, e.g., trust companies, credit unions, and microfinance companies, etc.) to the nominal GDP(denoted DEPT); it measures the overall depth of financial intermediation in China (Lu and Yao, 2009);

(2) the ratio of total household savings to nominal GDP (denoted SAV); it serves as a proxy for China's financial intermediary development(Guariglia and Poncet, 2008).[4]

The second subset of size indicator is based on development of direct finance (i.e., capital market). Specifically, we consider stock market development in the underlying provinces. The stock market data (including both Shanghai and Shenzhen A share markets) for each province is based on the administrative location (i.e. province) where the listed companies are registered[5]. The measures include the following three indicators:

(3) stock market capitalization as percentage of nominal GDP (denoted SMC);

(4) total value of circulated shares as percentage of nominal GDP (VCS);

(5) the number of listed firms in each province as percentage of total number of listed firms in all provinces (LFQ).

Our second measure of financial development is financial efficiency. It is widely believed that financial repression and distortion are intrinsic characteristics of the Chinese financial system, because of the predominance of inefficient state-owned banks (Allen *et al*., 2013). Hence, it is sensible to consider an efficiency measure for financial development in China. Two subsets of indicators are used in this paper. The first subset is based on the indirect finance, which includes the following two indicators:

(6) the ratio of total capital formation (i.e., fixed assets acquired plus net inventory value) to total deposits in the financial system (denoted FTD). It measures

[4]This indicator excludes corporate deposits, which may be affected by central government credit policies.

[5] Under the current regulation system in China, whether a company can be listed and how many companies can be listed is closely related to whether and how the corresponding province can obtain financial resources.

the efficiency of the transformation of savings into capital investment. Since capital remains the foundation for economic operations and savings can contribute an incremental value only when they are transformed into capital and enter production areas, a higher FTD represents higher efficiency in wealth creation.

(7) the ratio of credit allocated to private enterprises (denoted PRV) to total domestic credit (denoted PRV); this is a conventional measure of financial efficiency in the literature. In a banking-dominated financial system such as that of China, private credit is probably the most important financial efficiency indicator, because it measures the extent to which private firms have the opportunity to obtain bank loans (Baltagi *et al*., 2009) and measures the ease with which firms with sound projects can do so (Rajan and Zingales, 2003).

The second subset of efficiency indicator is used to measure the development of direct finance, including the following two indicators:

(8) the number of listed private firms in each province as percentage of total number of listed firms in the underlying province (LPF);

(9) turnover rate (weighted average) of the stocks of the firms in each province (ATR).

To summarize, the size indicators of financial development include DEPT and SAV for indirect finance sector, and SMC, VCS, and LFQ for direct finance sector; the efficiency indicators of financial development include FTD and PRV for indirect finance, and LPF, and ATR for direct finance, respectively.

3.2. Measures of trade and financial openness

Trade openness depicts the level at which countries or economies allow trade or trade with other countries or economies. In this paper, trade openness (TO) is defined at a provincial level and is measured by the ratio of total trade (i.e., exports plus imports) to the nominal GDP in each province of China.

The measure of financial openness (FO) is less straightforward than the measure of trade openness. There are two alternative measures of financial openness used in the literature, categorized as de facto and de jure, respectively. The de facto measure was developed by Lane and Milesi-Ferretti (2007) and is defined as the volume of a country's (or region's) foreign assets and liabilities as a percentage of its GDP. The de jure measure was proposed by Chinn and Ito (2006) and can be constructed from dummy variables that codify restrictions on cross-border financial transactions. Each measure of financial openness has its strengths and weaknesses. The de facto measure is less susceptible to endogeneity than the de jure measure, while the de jure measure may be better grounded theoretically (for a comprehensive discussion on the issue, see Baltagi *et al*., 2009).

Since it is difficult to determine which measure of financial openness is superior to the other, one may utilize both the de facto and de jure measures of financial openness in an analysis if the data for both measures are available. In this paper, we adopt the de facto measure of financial openness because of the availability of data. The variable is constructed as the ratio of foreign direct investment (FDI) to the GDP at the level of the Chinese provinces.

3.3. Control variables

Alongside the above variables, we include relevant control variables in the underlying model to capture the provincial features of economic performance and social development. Specifically, the control variables include the real per capita GDP (*rgdp*), the ratio of government spending to the GDP (*gov*), the ratio of the industrial output of the state-owned sector to total industrial output (*state*), and the gross enrollment ratio (*enroll*), which is calculated as the ratio of the number of individuals actually enrolled in school to the number of children who are of school age in the relevant province.

These control variables are potentially relevant to financial development. For instance, it is widely acknowledged in the financial development and economic growth literature that real economic performance (e.g., real per capita GDP) is related to financial development. In relation to this, government spending and improvements in education can enhance economic development (Dollar, 1992; Barro and Sala-i-Martin, 1995) and this, in turn, generally affects financial development. Moreover, the share of the industrial output of the state-owned sector captures features of provincial economic development that also relate to regional financial development. In particular, a high level of state ownership in a regional economy represents high financial distortion and low efficiency of the allocation of financial resources in the region (Boyreau-Debray, 2003; Guariglia and Poncet, 2008).

3.4. Data sources and statistical summary

The raw data for constructing the above variables are obtained from various sources. The data for the variables relevant to the banking and other financial sectors are taken from annual issues of China's Finance and Banking Almanac. The data for the stock market are obtained from RESSET, WIND, and CSMAR databases. The data for other variables are obtained from official publications: the China Statistical Yearbooks and Provincial Statistical Yearbooks. Note that the indicator of PRV is obtained from the National Economic Research Institute Index of the Marketization of China's Provinces 2011 report (Fan and Wang, 2011) and we use the final indexation results. Table 1summarizes descriptive statistics for the underlying variables and provides an average numerical impression of the underlying variables

(measures) used in our empirical analysis.

Table 1: Summary statistics of the variables

description		Mean	Median	Maximum	Minimum	Std.
Size (indirect finance)	DEPT	1.022	0.993	2.252	0.533	0.299
Size (indirect finance)	SAV	0.900	0.680	7.226	0.378	1.090
Size (direct finance)	SMC	0.375	0.239	2.460	0.054	0.403
Size (direct finance)	VCS	0.667	0.339	7.093	0.062	0.894
Size (direct finance)	LFQ	0.033	0.022	0.129	0.006	0.027
Efficiency (indirect)	FTD	0.740	0.705	1.920	0.350	0.239
Efficiency (indirect)	PRV	7.939	7.915	14.65	0.000	3.620
Efficiency (direct)	LPF	0.382	0.364	0.784	0.071	0.132
Efficiency (direct)	ATR	442.4	365.6	2642.8	145.5	292.5
Trade openness	TO	0.331	0.125	1.721	0.037	0.420
Financial openness	FO	0.030	0.023	0.146	0.001	0.025
Control variables	rgdp	0.154	0.146	0.478	0.021	0.066
	gov	0.163	0.149	0.450	0.069	0.066
	state	0.508	0.518	0.891	0.108	0.203
	enroll	0.991	0.996	1.000	0.816	0.015

Note: This table reports the descriptive statistics of the variables used in the empirical analysis across 30 major provinces in China for the period from 2000 to 2009.

4. Estimation results

4.1. Estimation results for the size indicators of financial development

Table 2 reports the regression results pertaining to the two subsets of size measures of financial development as dependent variables. In all, there are five regressions, corresponding to the indirect and direct financial development, respectively. Several interesting results merit discussion.

First, the lagged dependent variable in all regressions is positive and statistically significant at the 1% level, suggesting that financial development indicators indeed display considerable persistence. The persistence estimates are particularly high in the regressions for the size indicators and relatively small in the regressions for the efficiency indicators. This is unsurprising: Financial development indicators that are based on size are likely to display high persistence, since the size of the banking system at any given time, for example, is highly history dependent.

Second, the impact of openness on the different sets of indicators of financial development shows substantial differences. For indirect finance sector, in the regressions of the size indicators, both trade openness and financial openness enter

with negative and significant coefficients (except for the regression of FO on DEPT). For the direct finance sector, trade openness also negatively affects the size indicators of financial development. Interestingly, however, financial openness exerts positive impact on the size indictors of direct financial development.

Finally, the results of the diagnostic tests are generally satisfactory. The Sargan tests do not reject the over-identification restrictions in all regressions. Additionally, the absence of first-order autocorrelation is rejected in three out of four cases and the absence of second-order autocorrelation is not rejected in all cases.

Table 2: Dynamic GMM estimation results on size of Model (1)

	Indirect Finance		Direct Finance		
	(1)	(2)	(3)	(4)	(5)
	lnDEPT	lnSAV	lnSMC	lnVCS	*ln*LFQ
lnFD(-1)	0.828***	0.651***	0.374***	0.235***	0.757***
	(0.030)	(0.025)	(0.014)	(0.011)	(0.0706)
*ln*TO	-0.257***	-0.103***	-0.679***	-1.007***	-0.0271
	(0.023)	(0.019)	(0.0601)	(0.154)	(0.0254)
*ln*FO	0.004	-0.033***	0.505***	0.757***	0.0477***
	(0.016)	(0.013)	(0.042)	(0.122)	(0.0114)
*ln*rgdp	-0.006	-0.044*	0.335***	2.375***	0.0931*
	(0.025)	(0.020)	(0.130)	(0.231)	(0.0507)
*ln*gov	0.397***	0.293***	0.311*	0.360	-0.163**
	(0.043)	(0.052)	(0.166)	(0.350)	(0.0763)
*ln*state	0.061	0.130***	0.431**	0.792***	0.130***
	(0.046)	(0.018)	(0.187)	(0.270)	(0.0442)
*ln*enroll	-1.001*	-0.048	-1.002	-1.645	-0.901***
	(0.360)	(0.217)	(0.917)	(2.282)	(0.250)
Sargan test (*p*-value)	0.999	0.999	0.998	0.998	0.999
Autocorrelation test					
First order (*p*-value)	0.036	0.005	0.000	0.000	0.013
Second order(*p*-value)	0.169	0.577	0.000	0.000	0.556
Number of time periods	8	8	8	8	8
Number of provinces	30	30	30	30	30
Observations	240	240	240	240	240

Note: The table reports the Arellano–Bond dynamic GMM estimation results; the sample spans 2000–2009; standard errors are reported in parentheses; ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

4.2. Estimation results for the efficiency indicators of financial development

Table 3 reports the regression results pertaining to the two subsets of efficiency measures of financial development as dependent variables. In all, there are four regressions, corresponding to the indirect and direct financial development, respectively. First, the lagged dependent variable in all regressions is positive and statistically significant at the 1% level, suggesting again that financial development indicators exhibit significant persistence. Second, in most cases, both trade and financial development exert significantly positive impact on financial efficiency. Although the coefficient on trade openness is significantly negative in the regression of LPF as dependent variables, the coefficient estimate is quantitatively very small.

Overall, the baseline estimation results suggest that openness has different impacts on different sets of indicators of financial development in China. For the indirect finance (i.e. banking sector), both trade and financial openness negatively affect the size indicators, while they positively drive the efficiency indicators of financial development. We note that the negative impact of openness on the size indicator is in contrast to the finding in most cross-country studies of a positive link between openness and financial development in general. For the direct financial sector, although trade openness also exerts negative impact on financial development, financial openness tends to enhance financial development. Of course, the enhancement effect of financial openness on capital market development is consistent with the nature (and definitions) of financial openness and capital market development. The next section embarks on the implications of different impact of openness on the size and efficiency of financial development in China.

Table 3: Dynamic GMM estimation results on efficiency of Model (1)

	Indirect Finance		Direct Finance	
	(1)	(2)	(3)	(4)
	*ln*FTD	*ln*PRV	*ln*LPF	*ln*ATR
*ln*FD(-1)	0.784***	0.213***	0.571***	0.048***
	(0.019)	(0.005)	(0.046)	(0.006)
*ln*TO	0.222***	-0.031	-0.042***	0.170**
	(0.044)	(0.055)	(0.016)	(0.076)
*ln*FO	-0.024	0.156***	0.023	0.219***
	(0.022)	(0.041)	(0.019)	(0.055)
*ln*rgdp	0.001	1.115***	0.133***	1.652***
	(0.059)	(0.118)	(0.021)	(0.120)

*ln*gov	0.027	-0.957***	-0.071*	-0.175
	(0.121)	(0.216)	(0.037)	(0.210)
*ln*state	-0.113	-0.509***	0.034	0.152
	(0.099)	(0.145)	(0.023)	(0.210)
*ln*enroll	0.628	4.498***	-0.297	0.438
	(0.466)	(0.557)	(0.343)	(1.231)
Sargan test (*p*-value)	1.000	1.000	1.000	0.999
Autocorrelation test				
First order (*p*-value)	0.001	0.313	0.029	0.000
Second order(*p*-value)	0.989	0.241	0.551	0.014
Number of time periods	8	8	8	8
Number of provinces	30	30	30	30
Observations	240	240	240	240

Note: This table reports the Arellano–Bond dynamic GMM estimation results; the sample spans 2000–2009;standard errors are reported in the parentheses.

5. Implications

This section discusses the implications of the different impacts of openness on the different indicators of financial development in China. We provide explanations of the impact of openness on the size indicator first and then the efficiency indicators in China. In each case, we distinguish between the roles of trade openness and financial openness in regard to financial development.

5.1. The impact of openness on financial size

5.1.1 The impact of trade openness on financial size

The impact of trade openness on both credit and capital market is negative。The finding that trade openness has a negative impact on the size indicator of financial development is in contrast to the existing studies. For example, Ginebri *et al*. (2001), Beck (2002), Svaleryd and Vlachos(2002), Aizenman(2008), and Mishkin(2009) all find a positive link between trade openness and financial development. Our finding may indicate that, in the short run, greater exposure to competition, technology, and changes in the prices of factors and products during trade openness results in higher uncertainty and less investment and thereby slows down a country's financial development. This implication is consistent with the finding in Kim *et al*. (2010).

The negative impact of trade openness on the size of financial development is attributed to the mismatch between the distribution of the types of China's trading companies (in terms of ownership) and the allocation of financial resources over the past decade(Zhang *et al*., 2015). To be clear, the distribution of trading companies refers to the proportion of each type of firm taking a share in China's foreign trade

and the distribution of financial resources refers to the proportion of financial (credit) resources distributed to or obtained by different types of firms.

Table 4 illustrates the distribution of China's export trading companies for the different types of firms during the period between 2000 and 2009. It shows that foreign-invested enterprises (FIEs) maintained the highest shares of exports (above 50%) during the entire period of the last decade, while collectively owned enterprises (COEs) had the lowest shares of exports over most of the sample period. More interestingly (importantly), the roles played by state-owned enterprises (SOEs) and private firms (PREs) in Chinese exports have switched since 2006:Since 2006,PREs have contributed more than SOEs to total exports.

The changes in the structure of China's exporting companies in terms of firm ownership imply that PREs have greater export competitiveness than SOEs. Although the PREs are usually short in national policy support and fiscal subsidies and are inferior to SOEs in regard to capital accumulation, technological levels, and other initial conditions, they have more flexible operational mechanisms, faster reactions to external demand, and a better structure of production factors that fit China's factor endowment structure.

Table 4: Shares of China's exports by firm ownership: 2000–2012 (%)

	SOEs	FLEs	COEs	PREs
2000	46.73	47.93	4.24	1.10
2001	42.54	50.06	5.34	2.05
2002	37.73	52.21	5.79	4.26
2003	31.49	54.83	5.73	7.95
2004	25.89	57.07	5.36	11.69
2005	22.15	58.30	4.79	14.76
2006	19.75	58.18	4.24	17.83
2007	18.46	57.10	3.85	20.59
2008	18.01	55.34	3.83	22.82
2009	15.89	55.94	3.37	24.79

As trade openness rises, the PREs become more active than the SOEs in export activities and, as a result, may demand more financial resources. However, it is well known that financial repression and distortion are widespread across China's financial system. It has been very difficult for PREs to obtain bank credit support or financial resources or, more generally, financial resources through formal financial channels. There is an apparent mismatch with the rising involvement of private firms in Chinese exporting activities. This mismatch may be the result of government

control over financial institutions, which leads to a misallocation of financial capital between PREs and SOEs (Boyreau-Debray and Wei, 2005).

Most private firms in China are small or medium sized and intrinsically have a higher risk of default than SOEs (which are too big to fail). Therefore, it may be unsurprising to observe that banks discriminate against private firms and are reluctant to lend to them. As a matter of fact, the prevailing view of banks in China is that lending to PREs is far riskier than lending to SOEs, because of the short credit history of PREs and their lower chances of being bailed out by the government in turbulent times. According to a report on the development of small and medium-sized enterprises in China conducted by the All-China Federation of Industry and Commerce in 2012, about 90% of the PREs questioned were unable to obtain loans from banks. Over the three years prior to the date of the report, 62% of the funds for these firms came from private lending.

To compare the financial resources (loans) obtained by PREs with those obtained by SOEs, we calculate the allocations of total loans to all types of domestic enterprises in China in 2010 and 2011 (subject to data availability). The results summarized in Table 5show that loans allocated to private firms are indeed much smaller than those distributed to state-owned firms are. The percentage of loans made to SOEs is above 66%, while the percentage of loans to PREs is below 25%. There appear to be subtle changes in the proportion of loans distributed to SOEs and PREs over time. In 2010, for example, the percentage of loans obtained by SOEs is about 3.3 times that obtained by PREs. In 2011, however, the percentage of loans obtained by SOEs decreased to 2.75 times that obtained by PREs.

Table 5: Distribution of total loans to domestic enterprises in China (%)

	2010	2011
SOEs	69	66
PREs	21	24
COEs	5	5
Others	4	4

Note: This table reports the distribution of total loans from all financial institutions in China (including foreign-funded institutions).The raw data are obtained from China Financial Year Book."Others" refer to Hong Kong, Macao, and Taiwan, and foreign-holding enterprises in China.

Despite the notable changes in the proportions of loans obtained by SOEs and PREs over time, SOEs occupy the dominant position in obtaining financing resources in China. This dominant position of the SOEs in finance does not match the changing distribution of trading companies in terms of firm ownership, discussed above. To put it bluntly, the PREs are starting to play a more important role in exporting activities, while the SOEs remain dominant in obtaining financing resources. This is equivalent to saying that there will be fewer financing resources

(i.e., the size of financial development will decrease) when China's trade is more open, since PREs will only obtain a small proportion of the financing resources. This mismatch between the distribution of China's trading companies and the allocation of financing resources over the past decade goes a long way toward explaining the negative link between trade openness and the size indicator for financial development in China.

From the perspective of direct finance, our results suggest that trade openness exerts negative impact on capitalization of real economy (i.e. market value of stocks as percentage of GDP). This finding indicates that provinces with higher level of trade openness have lower capitalization. This is not surprising because the distribution of capital market resource is not in line with the level of trade openness of individual provinces in China. Because private firms constitute a larger proportion of trade sector than state-owned enterprises, the provinces with higher level of trade openness generally have more private firms than the provinces with lower level of trade openness.

5.1.2 The impact of financial openness on financial size

The impact of financial openness on the credit market is negative, whereas the impact of the financial openness on the capital market is positive. In terms of the impact of financial openness on financial development in China, we believe that the negative impact of financial openness on the size indicator in credit market reflects the substitution effect of foreign capital for domestic capital. Against the background of financial repression in China, many enterprises, especially non-SOEs, undertaken very high financing costs from domestic banks. They will therefore increase their financial dependence on foreign capital while decreasing their dependence on domestic capital. Therefore, increasing financial openness is likely to reduce the amount of domestic finance.

In terms of the positive impact of financial openness on capital market, we believe that financial openness brings more foreign capital inflows to Chinese capital market. Indeed, a sizable number of studies have shown that financial openness can promote domestic capital market development. Although China implements regulations on its capital account and Chinese financial market is, to a large extent, not open to foreign investors, there are still notable amount of short-term capital inflows which eventually invest in the capital market.

5.2. The impact of openness on financial efficiency

5.2.1 The impact of trade openness on financial efficiency

For efficiency indicator, the impact of trade openness on credit market is positive, while that on the development of capital market is uncertain. Two points are related

to this finding. First, higher trade openness means that more and more enterprises are involved in the production, processing and relevant services in foreign trade industry, most of which are small and medium-sized private enterprises. With the increase of their importance in the economy, financial institutions have to pay close attention to their financing needs by initiatively offering credit service to those with good qualification. On the other hand, because of the large ratio that import and export trade contributes to the economy growth, government gradually pays closer attention to the financing needs of small and medium-sized foreign trade enterprises by requiring financial institutions to support their loan demands. Therefore, not only state-owned big banks create some trade based financing products, small and medium-sized banks together with small loan companies also start to provide credit services to small and medium-sized enterprises. All of these changes enhance the allocative efficiency of financial resources in China. Second, the impact of trade openness on the development of capital market is uncertain, and the coefficient and significance level both reflect the weak impact. Therefore, trade openness is not enough to enhance the development of capital market.

5.2.2 The impact of financial openness on efficiency indicator

First, in both credit market and capital market, the impact of financial openness on efficiency indicator is positive. The positive link between financial openness and the efficiency indicator may be related to the positive spillover effect of foreign capital inflows. Indeed, Levine (2001) finds that liberalizing restrictions on international portfolio flows tends to enhance stock market liquidity and allowing for greater foreign bank presence tends to enhance the efficiency of the domestic banking system. In the case of China, foreign capital inflows increase the amount of capital formation and financial efficiency as measured by the ratio of total capital formation to total deposits in the financial system (i.e. FTD).

Second, with the growth of FDI, the foreign institutions which provide financial service to foreign institutional investors (e.g. transnational corporations) access to Chinese financial markets. For instance, in year 2000, there was 191 foreign banks providing financial services in China and the total asset was 344.34 US dollars. In year 2009, the number of foreign banks increased to 338 and the total asset climbed to 1,975.11 US dollars (data source: Almanac of China's Finance and Banking, 2001&2010). Because of the inferiority in competing with local banks for some traditional quality customers, foreign financial institutions focus more on taking the advantages of their own products and service to offer private departments with credit services, and they even cultivated some potential quality customers. This increases

competition between local and foreign banks in striving for customers in private departments, which enhances bank efficiency as a whole.

Third, private firms are inferior to state-owned firms in obtaining capital market resources in the current apply-and-approve stock public offering system in China. Therefore, only the outstanding private enterprises have the eligibility to be listed in the stock market. Financial openness, i.e. international capital flows, enhances the ratio of private enterprises to be listed in the stock market. This is because international capital flows, e.g. FDI, improve corporate governance of local firms. In most of the cases, companies who have upstream and downstream cooperation with transnational companies, most of which being private companies, will improve management strategies by communicating with advanced transnational companies. In some situations, foreign capital will become a shareholder of domestic enterprises and offer them with advanced management experience, which increases the likelihood of being listed in the stock market for local firms.

Finally，financial openness also has positive impact on the turnover rate of stock market which reflects the attention of stock market participants pay on the listed firms. It may be noted that the effect of financial openness on turnover rate is indirect. Through spillover effect of openness, for example, companies at growing stage can obtain more capital and higher technology and increase their capabilities of corporate governance. Once listed in the stock market, these companies at growing stage will draw much attention from investors, which boots the development of direct finance.

6. Conclusions

Recent studies of financial development create a new frontier in the field of openness and financial development and provide an important contribution to understanding the nexus between openness and financial development across countries. However, empirical studies using data from a pool of both developing and industrialized countries seem to provide mixed results. The mixed evidence is unsurprising because the nature of the nexus between openness and financial development may vary between different countries and empirical studies with multi-country data cannot fully capture the diversity of historical experiences, cultural norms, and financial contexts in different countries. In addition, the financial systems in different sample countries may be driven by very different sectors, so that the measurement for financial development needs to cover these differences.

This paper investigates the impact of trade and financial openness on financial

development in China. We use panel data for 30 provinces of China over the period from 2000 to 2009 to account for cross-province differences in and the time series variation of financial development in China. More importantly, we distinguish size and efficiency aspects of financial development in both indirect and direct financial sectors. The empirical results suggest that trade openness and financial openness are generally positive determinants of financial efficiency, but that openness has a negative impact on the size of financial development.

The empirical results reinforce the mismatch problem between the distribution of China's trading companies and the allocation of financial resources. In essence, it is the result of a misallocation of financial credit and the financial distortion in the Chinese financial system, which is dominated by the state-owned banks. A positive breakthrough, among many other things, could be the introduction of market-based interest rates and a more flexible exchange rate system, through which the Chinese financial system may better cater to the needs of the private sector, which will be the backbone of the Chinese economy in the foreseeable future.

Overall, the paper shows a typical story of openness and financial development in the largest transitional economy. In particular, in such an economy where trade sector is liberalized but financial sector is under liberalized, financial development is likely to be hindered. Therefore, financial development and reform in Chinese economy must be multifaceted. Apparently, liberalization and more generally openness of financial sector, including both capital account and capital market, remains an open issue for policy-makers in China.

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IMI News

- On October 11, Sino-German Workshop on RMB Internationalization after Its Inclusion into SDR Basket—Roundtable on Money and Finance • Autumn 2016, co-organized by IMI, the Sino-German Center of Finance and Economics (SGC), PBoC, Deutsche Bundesbank, and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and sponsored by Bao Shang Bank (BSB), was successfully held at Renmin University of China. The meeting was chaired by Prof. Ben Shenglin, executive director of IMI and dean of the Academy of Internet Finance of Zhejing University.
- On October 12, the Launch Meeting of IMF World Economic Outlook 2016, co-organized by IMI and IMF China, was held at Renmin University. Mr. Wei Benhua, former deputy administrator-in-bureau of SAFE, Mr. Alfred Schipke, IMF Senior Resident Representative for China, Mr. Esteban Vesperoni, Mr. Marcos Poplawski-Ribeiro and Mr. Lian Weicheng, three economists from the research department of IMF, attended the meeting and delivered speeches. Mr. Zhang Zhixiang, former director-general of the International Department of PBoC, presided over the meeting.
- On October 15, Tao Xiang International Finance Lectures (No.6), co-organized by IMI and School of Finance of Renmin University, was held at RUC. Sun Jianlin, senior researcher in Risk Management Department of CITIC Bank, made a keynote speech on controlling credit granting risk of commercial bank. The meeting was chaired by Prof. Tu Yonghong, deputy director of IMI.
- On October 16, the Macro-Finance Salon (No.37) was held at RUC. Cao Fengqi, a professor and doctoral supervisor of the Guanghua School of Management, director of the Finance and Securities Research Center in Peking University, gave a keynote speech on China's financial reform and innovation. The meeting was presided over by Zhang Chengsi, the assistant dean of school of Finance of RUC and the director of the Finance Department.
- On October 22, McKinnon Lectures (No. 7) was held at RUC. Mr. Yu Yongding, academic member of Chinese Academy of Social Sciences, researcher and PhD supervisor at the Institute of World Economics and Politics, the president of China Society of World Economics, member of the Committee for Development Policy at the UN, made a keynote speech on the present and future of China's exchange rate policy and regime. The meeting was chaired by Prof. Song Ke,

deputy director of IMI.

- On October 29, Symposium on Cross-Strait Financial Cooperation and Press Conference of Cross-Strait Financial Reform Studies was held by IMI and Bank SinoPac (Taiwan) in Huairou, Beijing. The conference mainly centered on the comparison of financial systems between mainland China and Taiwan and prospects of cross-strait collaboration. Many famous experts and scholars from government sectors, academia and financial industry from both mainland China and Taiwan attended the symposium and delivered speeches. The symposium was also attended by numbers of media including China Financial Publishing House, Xinhua News Agency, People's Daily and China Daily, etc.
- On November 1, Macro-Finance Salon (No. 38), co-organized by IMI and Research Center of China's Foreign Policy of RUC, was held successfully. The salon centered on US presidential election and USD interest rate hike. Bob Holden, former governor of Missouri, the chairman of Midwest US-China Association and David Oppedahl, an economist at the Federal Reserve Bank of Chicago, delivered keynote speeches. The salon was chaired by Di Dongsheng, researcher of IMI and deputy director of the Research Center of China's Foreign Policy.
- On November 3, Macro-Finance Salon (No. 40) was jointly held by IMI, Brookings Institution-Tsinghua University and Penn-Wharton China Center. Eswar Prasad, a senior researcher at the Brookings Institution, former China director of IMF, and professor of Cornell University, made a keynote speech on the trend and international status of RMB. Prof. Ben Shenglin, founder of executive director of IMI, Prof. Tsai Wan-Tsai and Prof. Marshall W. Meyer from Wharton School at the University of Pennsylvania participated in the discussion. This salon was chaired by Guan Xin, the anchor of CCTV-NEWS.
- On November 5, Macro-Finance Salon (No. 39) was held by IMI. Guan Qingyou, vice president of Minsheng Securities and dean of Minsheng Securities Academy, gave a keynote speech on supply-side reform, idle liquidity and assets allocation. Zhao Xijun, associate dean of School of Finance, and IMI deputy director Tu Yonghong joined discussion. This salon was chaired by Qu Qiang, assistant director of IMI.
- On November 12, Macro-Finance Salon (No. 41) was successfully held at Mingde Main Building of Renmin University. Dr. Fan Xiwen, CRO of China-Latin America Cooperation Fund, delivered a keynote speech on the past and present of CDS and its application in China. The Salon was chaired by Prof.

Song Ke, deputy director of IMI.

- On November 19, 2016, the 8th China International Asset Management Conference was held in Hangzhou. It was hosted by China Asset Management Research Institute and jointly organized by IMI and China Forex Investment Research Institute. Under the theme of "Monetary Asset Management after RMB's Inclusion in the SDR", the conference studied the opportunities and challenges faced by the asset management industry in the new economic landscape after the RMB joined the SDR basket. Prof. Song Ke, IMI deputy director, delivered a speech on the conference.
- On November 20, Macro-Finance Salon (No.42) was held at Renmin University of China. Mr. Ying Jian, the senior research fellow of Bank of China (Hong Kong), delivered a keynote speech on latest changes in offshore RMB market and hotspot issues. The meeting was presided over by Prof. He Qing, the deputy director and professor of Department of Finance of Renmin University.
- On November 27, McKinnon Lectures (No. 8) was held in Renmin University of China. The lecture was chaired by Su Zhi, senior researcher of IMI and professor of School of Statistics and Mathematics of Central University of Finance and Economics.
- On November 26, Tao Xiang International Finance Lectures (No. 7), co-organized by IMI and the School of Finance of Renmin University, was held at RUC. Mr. He Xiaobo, senior trader from Global Markets Department of Bank of China Head Office, discussed about the practice of RMB foreign exchange transaction and some related hot issues. The lecture was chaired by Wang Fang, senior research fellow of IMI and associate professor from the School of Finance of RUC.
- On November 28, representatives of Continuous Linked Settlement (CLS) Asia visited IMI including Racheal Hoey, head of Asia; Luo Fengyi, director of Regulatory Affairs; and Chen Zhijin, deputy director of Market Development, Hong Kong Office. Assistant director Qu Qiang warmly received CLS on behalf of IMI. Ms. Hoey expressed her willingness to cooperate with IMI more deeply.
- On December 1, McKinnon Lectures (No. 9) was held at Mingde Main Building of Renmin University. Mr. Edmond Alphandery, member of IMI Advisory Board, Chairman of the Euro50 Group, and former French minister of the economy, gave a keynote speech on "The Eurozone outlook in the new global environment: Brexit, Trumponomics, Japan and China". The lecture was chaired

by Mr. Wei Benhua, member of IMI Academic Committee, former deputy administrator-in-bureau of SAFE.

- On December 10, McKinnon Lectures (No. 10) was held successfully in Renmin University. Xiao Geng, professor of Practice in Finance and Public Policy, School of Business and Faculty of Social, University of Hong Kong and president of Hong Kong International Finance Society, delivered a keynote speech themed on historical opportunities and responsibilities of RMB, HKD and SDR. Prof. Tu Yonghong, deputy director of IMI, presided over the lecture.
- On December 15, the Macro-Finance Salon (No.43) was held at RUC. Xie Yaxuan, IMI researcher, head of macroeconomic research, Research & Development Center, China Merchants Securities, Co. Ltd., gave the keynote speech titled "Strong Dollar is a Double-Edged Sword". Discussants include IMI researchers Lin Nan, Peng Yuchao, Xiong Yuan, Xiu Jing, Jiang Nan and Jing Linde. The meeting was presided over by Qu Qiang, assistant director of IMI.
- On December 17, Macro-Finance Salon (No. 44) was successfully held in Renmin University of China. Dr. Hua Ercheng, chief economist of BSB, delivered a speech on world economy and China. The salon was hosted by Qu Qiang, assistant director and researcher of IMI.
- On December 22, Macro-Finance Salon (No. 45) was held at Room 801, Mingde Main Building, Renmin University of China. Sun Lujun, board member of CNIC Corporation Limited, delivered a keynote speech on issues concerning RMB exchange rate. This salon was presided over by Tu Yonghong, the deputy director of IMI.
- On December 18, Global People Annual Grand Ceremony and Press Conference of Top20 FinTech Leaders was held in Beijing. The conference released the list of the Top20 FinTech Leaders which is one of the lists of Global Leaders jointly initiated by Global People and IMI. The conference was attended by Xie Xiang, editor-in-chief of Global People; Ben Shenglin, dean of the Academy of Internet Finance of Zhejiang University and executive director of IMI; Greg Gibb, CEO and co-chairman of Lufax; Wan Zhe, chief economist of China Gold Group; Cao Tong, Chairman of XFinTech; Guo Zhenzhou, the founder and CEO of Quark Finance; etc.
- On November 22, the Macro-Finance Salon (No. 46) was held at Room 605 of Culture Square, Renmin University of China. IMI researcher Peng Yuchao delivered a keynote speech on Enterprise Financialization, Real Estate and Economic Fluctuation. The meeting was presided over by Su Zhi, IMI senior

researcher and professor of School of Statistics and Mathematics, Central University of Finance and Economics.

- On December 29, Macro-Finance Salon (No.47) was held in RUC. The Salon invited Mr. Wu Zhifeng, senior researcher of IMI, and Wu Qing, researcher of the Development Research Center of the State Council, to deliver keynote speeches on the influence of Trump's team and other political forces on his economic policy. The meeting was presided over by Prof. Su Zhi, senior researcher of IMI and professor of the School of Statistics at Central University of Finance and Economics.

Call for Papers

International Monetary Review

International Monetary Review is an internal academic magazine sponsored by International Monetary Institute. Following the principle of including both Chinese and western merits with precise and practical academic spirit, International Monetary Review focuses on the cutting-edge theoretical researches in internationalization of RMB, reform of international monetary system, regional monetary and financial cooperation, China's international financial strategies, and other macro-financial theories and policies.
We welcome submissions by scholars, experts and practitioners in financial industry. Papers and articles should center on key financial issues and follow academic standard and scientific methodology. We welcome quality articles based on data analysis and theoretical model and other insightful articles with standard writing.

Prepare your article

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Mathematics: Equations must be identified by consecutive Arabic numbers in parentheses on the right. Expressions should be aligned and compound subscripts and superscripts clearly marked if there is any potential for confusion.
Figures: Figures must be of professional quality and ready for reproduction. They should be numbered consecutively. Black-and-white versions of figures are required for printing purposes, but color figures can also be supplied for online dissemination.
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