International Monetary Review

April 2018, Vol. 5, No. 2

Name of Journal: International Monetary Review

Frequency of Publication: Quarterly

Sponsor: International Monetary Institute of Renmin University of China

Publisher: Editorial Office of *International Monetary Review*

Editor-in-Chief: Ben Shenglin

Associate Editors: Song Ke, Qu Qiang, Xia Le

Managing Editor: Herbert Poenisch

Associate Managing Editor: Dong Xijun

Assistant Editors: Chen Jiaxin, Gao Zhiyu, Huang Chaozheng, Lai Chengying, Lin Li, Liu Jiazhi, Song Chengwen, Wang Danhong, Wang Yue, Xiong Ruojie, Yan Hui, Zhang Peng, Zhang Qing, Zhou Huxing, Zhou Ke, Zhou Tong

Editorial Office:

International Monetary Institute, Renmin University of China

Room 605, No. 59 Zhongguancun Avenue, Beijing 100872, China

Tel: 86-10-62516755

Email: imi@ruc.edu.cn

Website: www.imi.org.cn

Introduction to the International Monetary Institute (IMI)

Established on December 20, 2009, IMI is a non-profit academic institution affiliated to China Financial Policy Research Center and the School of Finance of Renmin University.

Following the "general theory of macro-finance", IMI aims to become a world-class think tank, focusing on the studies of international finance, in particular the international monetary system and RMB internationalization. Despite its relatively short history so far, IMI has established itself as a leading research institution and important forum, where industry leaders, policy makers and academic experts from home and abroad share their insights and expertise.

CONTENTS

刊　　名：International Monetary Review
刊　　期：季刊
主办单位：中国人民大学国际货币研究所
出版单位：《International Monetary Review》编辑部
主　　编：贲圣林
联席主编：Herbert Poenisch
副 主 编：宋科、曲强、夏乐
执行副主编：董熙君
编辑部成员：陈佳鑫、高致宇、黄朝政、来程颖、林莉、刘家志、宋成稳、王丹虹、王悦、熊若洁、晏慧、张鹏、张晴、周护杏、周珂、周彤
编辑部地址：北京市海淀区中关村大街 59 号文化大厦 605 室
邮　　编：100872
电　　话：86-10-62516755
邮　　箱：imi@ruc.edu.cn
网　　址：www.imi.org.cn

International Monetary Review
April 2018, Vol. 5, No. 2

The NPC and CPPCC Sessions

Power to the People's Bank of China

A New Paradigm for Central Banking?

By HERBERT POENISCH*

Financial stability has been on the mind of Chinese leaders ever since episodes of instability have tarnished their image as custodians of stability. In Western countries the blame game after the GFC in 2008 led to similar recriminations. However, the policy reactions are very different reflecting the role of the financial sector, the relationship with government and governance in general[1].This article will focus on the comparative role of central banks.

This contribution will briefly cover the reasons for financial crises in the West and in China, the reaction by Western governments, the paradigm given by the Communist Party of China (CPC) to the financial sector, the recent measures to ensure financial stability adopted by the recent NPC and a conclusion for China, where the role of central banking has been redesigned.

1. Reasons for financial crises

The literature has ample analysis into their causes, the most important ones of which are: Domestically, an excessive credit expansion to prevent a downturn in economic growth. Ample credit was extended to the government (especially in the Euro Zone), the regional governments (in China through Local Government Financing Vehicles-LGFV), enterprises and households, leading to a rising debt service ratio. The monetary policy contributed to the credit bubble as historically low interest rates facilitated this credit boom. Consumer price inflation stayed benign, but asset prices escalated. These were property prices, share prices as well as bond prices. This reinforced the vicious spiral as credit was increasingly extended against inflated asset collateral.

As a result, total credit to private non-financial entities spiraled to 260% of GDP in 2017 in China, compared with 160% of GDP in the US and 145% the EURO area. Looking at the credit gap, which is defined as the deviation of the private non-financial debt over its long term trend the pictures is the same. At the beginning of 2017 China and the Hong Kong SAR were well above the trend whereas the US and Eurozone were below[2]. There are a number of indicators of financial crises, as a recent BIS study shows[3]. These are the three leading financial indicators, credit gap, debt service gap and asset price gap, which can be supplemented by others. The monetary indicator would be the expansion of broad money M2. At the end of 2017 China M2

*Herbert Poenisch, Member of IMI International Committee, Former Senior Economist of BIS.

[1] Sheng, Andrew and Xiao, Geng (2018): The Right Way to Judge Chinese Governance. In: Project-Syndicate, 26 March www.project-syndicate.org

[2] Credit-to-GDP-gap www.bis.org/statistics/c_gaps.htm

[3] Aldasoro, Inaki, Borio, Claudio and Drehmann,Mathias (2018): Early warning indicators of banking crises: expanding the family. In: BIS Quarterly Review, Marchwww.bis.org/publications

reached 300% of GDP, whereas the US was at 75% of GDP and the EURO zone close to 100% of GDP, after years of quantitative easing.

In China inadequate coordination of regulation of financial intermediation raised concerns of potential stability risks. Governor Zhou mentioned four areas in particular: shadow banking, asset management, internet finance and financial conglomerates[4].

He also mentioned that once the confidence in apparent stability broke, the so called 'Minsky moment', the asset bubble deflated, with losses on the balance sheets of financial intermediaries, and debt servicing problems by local governments, corporates and households. The phase is called financial crisis, the accumulation of a many factors.

Externally, the relevant asset price is foreign exchange. Domestic financial excesses lead to exchange rate pressures, both on the current as well as the financial account, which can be accommodated by exchange rate adjustments or preventing necessary adjustments by tightening capital controls.

2. Reaction by Western governments

The reaction to the major financial instability, the global financial crises (GFC) in 2008 was twofold. Banking regulation was tightened, such as through the Dodd-Frank Act, and central banks embarked on unconventional monetary policy through quantitative easing programmes (QE). This prevented a full blown recession but did not provide the stimulus to economic growth as expected.

This expanded central banks' balance sheets, increased the liquidity in the economy but the transmission to the real sector was still inadequate. Banks increased the quality of their balance sheets but not lending to the real sector, citing tighter regulation. Central banks willingly followed their monetary mandate, to ensure sufficient growth as inflation indicators were benign. As a result, historically low interest rates, touching the zero lower bound posed new challenges to central banks[5].

Their responsibilities for financial stability produced a different picture. Learning the lesson from the GFC, central banks paid more attention to financial stability. It was mostly emerging market central banks, such as China and Malaysia which extended the mandate of their central banks to cover financial stability. Advanced countries' central banks were more reluctant to go down this way.

There were two main arguments why they did not. Firstly, financial stability is far more difficult to define than monetary stability, and secondly, central banks should not be over burdened with responsibilities. SNB President Jordan even warned that such high expectations are exceedingly dangerous[6]. Nevertheless, there are at least three compelling reasons for central banks to play a leading role in ensuring financial stability. They are: financial stability affects the macroeconomic environment in which they operate, they act as lender of last resort and need to assess the counterparty risk, and finally they have a better understanding of the functioning of financial markets[7].

As a result, Western central banks have accepted responsibility in the area of financial stability, mostly as contribution to financial stability rather than outright ensuring stability as is the case with monetary stability. This takes into account that there are various authorities in charge of financial market regulation and monitoring. Market participants practice self-regulation or are

[4]Zhou, Xiaochuan (2017): Prospects of the Chinese economy-broad based growth. Speech at the 32nd G30 International Banking Seminar, October www.bis.org/speeches

[5]See 200th Anniversary Conference of the Austrian National Bank: www.oenb.at

[6]Jordan, Thomas J. (2014): A new role for central banks? Speech given at the Zurich Economic Society.www.snb.ch

[7]BIS (2011): Central bank governance and financial stability. A report by a Study Group (Chairman S Ingves) www.bis.org/publications

subject to specialised supervisory bodies. Central banks are directly involved in the money market, the bond market and foreign exchange market. They deal with other financial markets at arm's length. They usually do not write the rulebook for these.

Central banks monitor developments in the various financial markets and use their levers if critical developments occur over an extended period of time. The money market is a case in point, where some central banks do not intervene to smooth interest spikes, others intervene regularly and others intervene daily. Similarly, in the foreign exchange markets, daily swings do not prompt some central banks to intervene, whereas other central banks actively manage their exchange rates.

Western central banks consider a certain degree of volatility in financial markets as necessary tool for the reaction of market participants. Frequent intervention would blunt this instrument and add to the uncertainty in the market. They react to volatility only if it counters their mid-term growth and inflation targets. Transparency of their monetary target is of paramount importance, such as inflation targets.

Financial stability in the minds of central banks is narrowly defined, the banking system. Most still pursue the microprudential approach by regulating and supervising individual institutions. Central banks are well placed to conduct macro-prudential policies because they have the capacity to analyse systemic risks[8]. Macroprudential concerns, such as deflating asset bubbles, have not been broadly adopted as they lack the operational clarity. Opponents claim they don't knowwhen to intervene and by how much. Using interest rates to deflate asset bubbles has not been commonly used.

3. Chinese paradigm

The role of the financial sector is different in socialist economies. The CPC has restated it following the National Financial Work Conference on 15 July 2017. The financial sector should serve the people and as such is under the direct authority of the CPC. In order to achieve this, the Financial Stability and Development Committee has been set up in autumn 2017, presently under the chairmanship of Vice-Premier, Mr. Ma Kai.

Socialist countries never experienced financial instability as during the Soviet Union. Financial resources were allocated to the real sector and finance never took on a life of its own. The population was thus protected from any spill over from financial mismanagement until the end of the Soviet Union when hyperinflation, the reckoning from previous mistakes, wiped out the savings of the population.

The Chinese leadership, bypaying attention to the historical lessons, in particular the collapse of the Soviet Union, is attempting to protect its population from financial instability. It is putting the emphasis on preventing financial instability by designing regulations for all participants in the financial sector. These are the banks which are heavily involved in shadow banking such as through asset management, the internet finance which provides financial services to a large part of the population through cyber currencies, e-payments, crowd financing, P-2-P lending and finally through insurance products. There are also non-bank holding companies which provide financial services through one of their subsidiaries without proper supervision of the whole conglomerate.

In addition, financial markets have dynamics of their own and create risks which cannot be regulated but need to be managed. The newly appointed PBOC Governor Yi Gang is well versed in managing the inherent risks as he has ample experience from living and teaching in the US as well as attending international meetings at the IMF, BIS and other forums where financial crises in the West were analysed thoroughly since he joined the PBOC in the mid1990s.

[8]IMF Factsheet (2018): Monetary Policy and Central Banking www.imf.org

Volatility in financial markets is viewed differently in China. It is a violation of supreme harmony which has guided Chinese authorities, dynasties before and CPC leadership now. As such, volatility needs to be prevented, rather than just managed[9]. Trusting the market participants to manage and hedge volatility on a daily base is a foreign concept. How should a greater measure of market functioning, as promised by Chinese leaders without more volatility materialise, needs to be seen. In the same vein, allowing the powerful global financial markets more influence in China through less foreign exchange control needs to be seen. The Chinese reaction to volatility in the offshore RMB market in early 2016 sent a clear signal.

4. Recent Chinese measures

The pre-eminence of the CPC in the economy and finance has been stipulated during the July 2017 Work Conference, during the 19th Party Conference in October 2017 and in the recent NPC meeting in March 2018[10]. What does this mean for the financial sector? It enshrines the authority of the real economy, the welfare of the majority of the population rather than the financial sector leading a life of its own, serving only the financial elite. In this way the Marxist stipulation G-M-G (growth-money-growth) has been restored where money is neutral and only facilitates real growth. In capitalist economies this has been perverted into M-G-M' where money creates profit (M') through real growth.

The CPC, notably Vice Premier Mr. Liu He has expressed its disapproval of excessive credit growth to regional governments throughspecial financing vehicles (LGFV), to enterprises (the big private ones as well as theSOE) and most recently to households. The deleveraging process has already started. In all these cases the debt servicing capacity is a cause for concern. It has also expressed concern over asset bubbles, such as shares and property and prompted the PBOC to take measures to cool the asset markets. The PBOC istherefore authorised to apply macro-prudential measures.

In addition, the PBOC has been given the supreme power to regulate the financial sector. The two supervisory agencies for banks and insurance have been merged into one to better control financial conglomerates. The Securities Commission is also under its authority, thus covering all finance sectors.

Together, the PBOC has been made the main responsible authority under the guidance of the CPC to carry out more functions than most other central banks. The CPC oversees the work of the PBOC, notably by Vice Premier Liu He, the Committee for FinancialStability and Development and the CPC representatives inside the PBOC, notably Mr. GuoShuqing. The PBOC is responsible for promoting growth, ensure price stability, managing the exchange rate, regulate the whole financial sector as well as ensure financial stability.

An institution with so many tasks needs the tools, authority and safeguards. The PBOC has been given the authority, but complete tools and the safeguards rest with the political authorities. While it operates through reserve requirements, repo rates, medium term lending and manages the daily exchange rates, the key decision rests with political authorities. They have the power to change key interest rates, stipulate the exchange rate policy and provide safeguards for PBOC decisions.

Having such a broad mandate will prove a challenge for the PBOC. Does it have the technical expertise in all aspects of the financial markets? Does it have a superior view of the risks emerging in different segments of finance? Does it monitor Black Swan and Grey Rhino risks? Does it understand how risks are transmitted through interlinkages? Does regulation provide a

[9]The Law on the PBOC states that the PBOC shall guard against and eliminate financial risks, and maintain financial stability (article 2).

[10]The CPC is playing a more transparent role since the 19th CPC Congress.

clear picture of who holds the final risk after risk mitigation and do they have adequate provisions for these?

Risks in a modern financial systemare generated through price fluctuations as well as counterparty ability to manage risks. The primary parties have risk sharing or risk transfer instruments at their disposal. The case study of the collapse of Lehmann Brothers in 2008 has given some idea of the complexity of risk sharing in digital times. It took months to reconstruct who was implicated to what extent in the losses incurred.

5. Conclusion

Given the complexity and pervasiveness of finance in a modern economy, the recent additional powers of the PBOC take on a new dimension. While it is feasible, but demanding to close regulatory gaps in China, getting on top of financial instability altogether is a tall order, close to impossible.

Financial volatility cannot be ruled out. It can be contained and managed, but it will certainly occur in a more market driven system. If market participants are allowed a greater role, they will make mistakes or game the system. Once instability appears, herding, a deficiency of market economies, will magnify the initial impulse. The CPC has not decided yet, whether losses are basically private or should be socialised? In countries where the authorities take on overarching responsibilities for the financial sector, such as China, there is a bias for socialising losses, called moral hazard.

While the decisions of the recent meetings of the CPC and the NPC have been a great step forward, with a new paradigm for central banking, major issues are still up in the air. Is the PBOC or are market participants responsible for managing various financial risks? Are there ample instruments available for managing various risks? Are market participants, big and smallsufficiently educated to be able to manage their risks and bear the costs? How will ‘too big to fail’ be handled? The financial system needs more clarity on the red demarcation line between private and social responsibilities. In uncertain times, government bailout of loss makers, as after the stock market crash of 2015, will be the preferred rescue mechanism.

IMI International Monetary Review

What China's New Governor Should Do

Five Tips for Zhou's Successor Yi Gang*

By DAVID MARSH, ADAM COTTER AND JOHN ADAMS*

Yi Gang, the new governor of the People's Bank of China, must discharge some important unfinished business in his country – and meet additional global challenges only now emerging.

Yi, 60, takes over from Zhou Xiaochuan, retiring aged 70 after 15 years in the job, at a time when Beijing is placing greater emphasis on controlling risk in a Chinese financial system that even leading officials admit contains dangers of implosion.

At the same time, in view of a leadership vacuum in world politics and economics stemming from US unilateralism, opportunities for China from its own brand of targeted monetary internationalism are greater than ever. As a former head of the State Administration of Foreign Exchange, which manages China's $3.1tn stock of foreign currency reserves, Yi has a natural leaning towards international affairs.

Domestic preoccupations will however loom large. Concentration of political, economic and financial power is now firmly with the Communist party, with President Xi Jinping at its head. The government's control of currency and monetary policy is likely to strengthen further under the stewardship of Vice-Premier Liu He, now given wider powers as the country's supreme economic technocrat.

Although far from enjoying the independence of his western counterparts, Zhou, softly spoken and persuasive on the world stage, had been at the forefront of an unparalleled period of Chinese expansion and liberalisation.

The task now for US-educated Yi – a deputy governor since 2008 – is to continue this progress while assuring investors and policy-makers that China is a safe place to deposit assets and build businesses. He will also form part of the effort to show the US, Europe and the rest of Asia that Beijing can be entrusted with a rising share of world economic decision-making, in the absence of coherence in the US.

Here are five recommendations for Yi:

1. Intensify attempts to rein in mounting debt through strengthening watchdog activities – where the PBoC has recently been given enhanced regulatory powers – and promote financial sector reform. Zhou and other officials have often highlighted asset bubbles, dangers from shadow banking activities and high debt among corporates and households. Yi must show he can preside over effective remedial action.

2. Make a special effort over curbing hazards in public private partnerships – a fast-growing area of the Chinese economy that has expanded partly because local authorities have been trying to offload debt towards private investors. PPPs are a hidden danger for Chinese borrowers, lenders and regulators that will grow over time. Although this form of buttressing growth through new vehicles for debt and equity financing has its uses, Yi should show he is aware that it could become addictive and even lethal. Many PPP legal contracts are poorly understood and

*This article first appeared in OMIFIF on March 20, 2018.

*David Marsh is Chairman of OMFIF and Member of IMI International Committee. Adam Cotter is Head of Asia at OMFIF. John Adams is Chief Executive of China Financial Services and a Member of the OMFIF Advisory Board.

unenforceable.

3. Enhance efforts at currency internationalisation, continuing the renminbi's advance after becoming part of the International Monetary Fund's special drawing right in October 2016. Providing a framework for capital market inflows and outflows, within the constraints of China's continuing capital controls, could provide a bubble-mitigating safety valve for pent-up domestic investment demand. This would also create a way for international investors, including central banks and sovereign funds, to diversify assets.

4. Build on existing campaigns to reinforce international monetary co-operation. The sometimes-mooted idea of building a currency swap network with the US Federal Reserve seems unlikely to materialise. However, partly because of worries about US unilateralism, Japan and China appear to be trying to improve co-operation as well as bilateral portfolio investment. In line with an increase in regional trade and Asian financial collaboration, Yi could step up similar efforts elsewhere in Asia, including through the Belt and Road initiative. Some observers say this vaunted plan to expand infrastructure investment throughout Eurasia could itself become an untameable source of risk.

5. Strengthen initiatives on improving transparency and reliability of Chinese economic statistics. Under Zhou's tenure, China has made considerable strides, for example in improving Beijing's co-operation with the IMF, the Bank for International Settlements and other bodies. More could be done to heighten the credibility of mainstream economic data. Yi could support efforts to improve understanding of how central banks are holding a greater number of reserve currencies – including the renminbi – as well as gold, in line with the PBoC's own considerable reserve diversification over the past decade.

IMI International Monetary Review

The Right Way to Judge Chinese Governance*

By ANDREW SHENG AND XIAO GENG*

In a fast-changing world, governance systems must support rapid decision-making under conditions of radical uncertainty, while maintaining accountability. That – not the Western expectation of what a governance system should look like – is the standard by which we should be assessing political developments in China.

Following China's "two sessions" – the annual meetings of the national legislature and the top political advisory body – all Western observers, it seems, are discussing the removal of the two-term limit for the president. Xi Jinping, the international media insists, is consolidating power, and may even be laying the groundwork for a Mao Zedong-style personality cult. But this reading is fundamentally flawed.

The predominant Western view that Xi's growing authority represents a dangerous trend partly reflects anxiety over growing challenges to democracy in the United States and across Europe. But it makes little sense to view Chinese political developments through a Western lens, especially at a time when the world is shifting from a unipolar to a multipolar system.

Recent changes in China should instead be regarded as part of a broader process, in which competing systems of governance are emerging to cope with complex, globally connected challenges, such as disruptive technologies, geopolitical rivalries, climate change, and demographic shifts. In short, countries are trying to find their governance footing.

In a fast-changing world, governance systems must support rapid decision-making under conditions of radical uncertainty, while maintaining accountability. That – not the Western expectation of what a governance system should look like – is the standard by which we should be assessing political developments in China.

In fact, Western-style governance no longer looks like the gold standard its advocates long proclaimed it to be. Western democracies are facing serious internal threats – most notably, populist forces espousing dangerous policies like trade protectionism – that have risen largely in response to these systems' failure to manage problems such as income inequality, political polarization, rising debt, and failing infrastructure.

That failure partly reflects the short-termism that tends to dominate in Western democracies, where short electoral cycles (from about six months to four years) often compel politicians to focus on cyclical issues, rather than on structural impediments to long-term productivity gains and income growth. (Similarly, Western companies tend to base their operations on quarterly results, and thus may neglect long-term risks and opportunities.)

By contrast, when China's leaders formulate and execute policies, they tend to think in terms of decades. This is vital to enable an effective response to the structural problems – such as corruption, environmental pollution, and inequality – that more than two generations of rapid growth and development have brought.

The current bureaucracy, working within its silos, is already addressing these problems, in order to create a more equitable society that is also innovative and adaptable. Only then can

*This article first appeared in Project Syndicate on March 26, 2018.

*Andrew Sheng, Distinguished Fellow of the Asia Global Institute at the University of Hong Kong. Xiao Geng, Member of IMI Academic Committee, President of the Hong Kong Institution for International Finance, Professor at the University of Hong Kong

China escape the infamous “middle-income trap” before population aging begins to take a higher toll on economic growth.

More broadly, China’s leaders have set a 30-year target for modernizing the country’s economy and governance – a long-term goal that reflects the kind of vision that few countries have managed to articulate, let alone implement. By removing the presidential term limit, China’s leadership is improving its chances of success, by opening the way for Xi and his vice president, Wang Qishan, to go further in realizing this vision.

Xi and Wang are seasoned politicians with extensive experience dealing with crises and managing complex institutional and social challenges, from the local to the global level. Both have a strong grasp of history, as well as the charisma and will needed to confront recalcitrant vested interests. Their continued leadership is thus invaluable.

But this does not mean that accountability will be lost. On the contrary, the National People’s Congress has approved a major overhaul of China’s governance structure, creating a new National Supervision Commission to check corruption by all Chinese officials, regardless of their affiliations or status in the Communist Party of China.

The State Council has also been restructured, with ministries, commissions, and agencies consolidated and streamlined to manage reforms in a more coordinated and efficient way. For example, agriculture and rural affairs have been combined under one ministry, as have all environmental issues.

Likewise, in order to reduce financial-sector risks (including excessive leverage and shadow banking), regulation of banking and insurance have been consolidated under the new China Banking and Insurance Regulatory Commission. These sweeping institutional reforms would make China’s governance structure look functionally similar to American and European counterparts.

Like Xi and Wang, officials at these institutions are dedicated, competent, and experienced reformers. Assisting Premier Li Keqiang will be the Harvard-educated vice premier Liu He, who has spent more than 30 years in long-term development planning, and has a deep understanding of how market forces can support efficient resource allocation. Financial reforms are in the hands of People’s Bank of China Governor Yi Gang, a US-educated economist, and the chairman of the China Banking and Insurance Regulatory Commission, Guo Shuqing, an Oxford-trained economist with experience in provincial leadership, central banking, and securities regulation.

Two thousand years ago, the Chinese philosopher Han Fei argued that effective governance required three things: the rule of law, bureaucratic tools, and political will. Changing laws or honing the tools of governance is important, but they mean little without sustained and determined efforts by political leaders. China’s system has survived because its leaders have been willing to confront market failures and administrative deficiencies in a direct and consistent manner. New efforts to boost accountability – vital to reinforce legitimacy – will strengthen the system further.

China, like the US and Europe, is too big to fail. It thus has a responsibility to develop a system of governance that can deliver structural changes to its economy and society, while ensuring effective accountability. The test is whether that system adapts to long-term challenges and contributes to national and global wellbeing, not whether it adheres to Western standards.

IMI International Monetary Review

Time for a China Property Tax*

By XIA LE*

Beijing should move ahead with a real estate levy while cutting other burdens on business.

Amid talk of presidential term limits, growth targets and combating pollution and corruption, taxes have quietly emerged as a key issue for China's National People's Congress.

Premier Li Keqiang promised on Monday to cut taxes and fees for businesses. This could provide an important source of economic stimulus at a time when overcapacity reductions, deleveraging and measures to reduce financial risk are weighing on growth. Yet Beijing cannot just slash taxes. To put the real estate market on a sounder footing, it is also vital that officials move ahead with implementing a property tax after years of inconclusive discussion.

Li's pledge on business taxes was partly prompted by the recent reduction in the U.S. corporate income tax rate to 21% from 35%. In China, the standard corporate tax rate is 25% but that is compounded by value-added taxes of up to 17%.

While headline tax rates for Chinese companies may not appear too far out of line, World Bank statistics show that some 67.3% of Chinese corporate profits go to taxes. This compares with 48.3% in the U.S. and a global average of 40.5%. The heavy burden on the Chinese corporate sector is mainly due to mandatory employer contributions for employee pension funds, housing support and medical, unemployment and disability insurance.

Until now, repeated pledges to lower the tax burden have had little impact. The authorities last year promised to cut the tax burden on corporations by 1 trillion yuan, mainly through VAT reform, but VAT revenues actually rose 8%.

Li said in his address to the congress that China's three VAT brackets will be consolidated into two, with the manufacturing and transportation sectors in particular in line for cuts. He added that mandatory employer contributions will be reduced too.

While their heavy tax burden handicaps the competitiveness of Chinese companies in the global market, government subsidies complicate the picture. State-owned enterprises in particular receive large subsidies from every level of the Chinese government in the name of industrial policy. This support has prompted growing complaints from trade partners, including anti-dumping and anti-subsidy investigations by the U.S.

Beijing should consider scaling back industrial subsidies to ease trade tensions. While the details of Li's tax cut plan are unclear, the authorities should look at giving relief to all companies by lowering the top VAT rate to 13% from 17% and trimming overall mandatory employer contributions to around 30% of employee salaries from above 40% over several years. Cutting business taxes and subsidies at the same time would minimize the impact on the country's fiscal balance.

As with reduced corporate rates, the introduction of a national property tax system has long been on the official agenda. Since 2011, the cities of Shanghai and Chongqing have been collecting property taxes in pilot tests. Shanghai's tax applies to second-home purchases while Chongqing's covers just high-end residences.

Following remarks by President Xi Jinping at the Communist Party Congress in October that "houses are for living in, not for speculation," Finance Minister Xiao Jie a month later said that

*This article first appeared in Nikkei Asian Review on March 7, 2018.

*Xia Le is Chief Economist for Asia at BBVA Research and Senior Research Fellow of IMI.

the government aimed to push through property tax legislation by 2019. Premier Li affirmed on Monday that a law is under preparation.

Ballooning prices have pushed China's largest cities to the bottom of global rankings of housing affordability. Yet government resolve to tame prices has been tempered by the official obsession with economic growth, in that the property sector and related industries contribute as much as a quarter of gross domestic product.

Until now, Chinese investors have correctly bet that the authorities would not hold to tightened housing policy for too long amid slowing growth momentum. The policy pendulum has thus swung between overtightening and excessive loosening. This oscillation has encouraged, rather than dampened, speculative demand and all along, house prices have kept rising.

Past cooling measures, including direct home purchase restrictions and tightened mortgage rules, have not proved very effective. Such measures blindly impact all demand, whether from would-be occupants or speculators. Even the fine-tuning of such measures can lead to increased market volatility, given that limited supply in top markets cannot meet both the long-repressed demand of real users and the unbridled appetites of speculators.

A property tax would help to better balance end-user demand and supply. Even a flat tax on property holdings tends to exert a larger financial burden on speculators as they tend to hold more property than real users.

Many Chinese investors lock up acquired units, holding them purely for long-term capital gain and not renting them out regardless of demand. As such, a well-designed property tax should drive many such speculators to release some of their holdings onto the market, increasing effective housing supply and relieving some pressure on prices.

Although property taxes look like a good weapon to prick China's housing bubble and ensure the sustainable development of the housing market in the long run, local governments have so far strongly resisted the notion as their fiscal revenues now hinge on land sales. The worry is that implementation of a property tax could lead to large-scale market corrections, squeezing local government land revenues in the short term even though the tax should be a good source of revenue for them in the long run.

The central government seems to be signaling determination to set aside such objections and press ahead with a property tax. This is definitely a welcome step. However, many uncertainties remain. The authorities have not revealed whether the national tax system will follow the Shanghai or Chongqing models or a new one.

To meet the timetable of finishing legislative procedures in 2019, the authorities should unveil the outlines of the tax system at the NPC. This would give adequate time for the market to absorb the changes. A nationwide property tax seems to be in the works at last. The market needs to be prepared for it.

International Trade

Kudlow Must Give Trump a Lesson on Trade

New Economic Czar is Against Protectionism*

By STEVE HANKE*

Larry Kudlow, the new director of the US National Economic Council, and I go back many moons. We collaborated countless times during President Reagan's first term. Kudlow was the associate director for economics and planning at the Office of Management and Budget, and I was a senior economist at the Council of Economic Advisers.

Kudlow was always informed and effective, so when I read Yale management professor Jeffrey Sonnenfeld's assessment of his suitability for his new role, I was in agreement. The title of Sonnenfeld's interview with Patrick Gorman in Chief Executive magazine says it all: Sonnenfeld: Larry Kudlow A 'Perfect Fit' For NEC Chairman.

That said, Kudlow will have his work cut out for him, particularly when it comes to the Trump administration's views on international trade. The White House's new economic czar favours free trade. President Trump, his cabinet and his trade experts all favour protectionism, or as they euphemistically refer to it, 'managed trade'. Indeed, the Trump administration's most recent salvo was aimed at China. Trump's anti-China measures include tariffs on up to $60bn worth of annual imports. The president has also stated that he wants China to slash its bilateral trade surplus with the US by $100bn.

Trump, like most businessmen, fails to understand the most fundamental points about international trade and what causes overall trade deficits and surpluses. On international trade, Kudlow has a huge problem — one he never had with Reagan. After all, Reagan was, at least rhetorically, a free trader.

Kudlow's first tutorial with Trump will be the key. If Kudlow fails, he will fail on trade and trade wars will ensue. When that happens, regime uncertainty will increase and confidence will plunge. Game over.

The first lesson on trade Kudlow must deliver should be titled: The overall US trade balance is made in the USA, not by 'unfair' foreign trade practices. The economic identity that forms the foundation for this lesson in international trade is:

(Imports - exports) = (private investment - private savings) + (government spending - taxes)

Accordingly, the trade deficit is equal to the excess of private sector investment over savings, plus the excess of government spending over tax revenue. The counterpart of the trade deficit is the sum of the private sector deficit and the government deficit (federal + state and local). The

*This article first appeared on Forbes.com on March 15, 2018.

*Steve Hanke is Professor of Applied Economics at Johns Hopkins University and Member of IMI International Advisory Board.

US trade deficit is therefore just the mirror image of what is happening in the domestic economy. If expenditures in the US exceed the incomes produced in the US, which they do, the excess expenditures will be met by an excess of imports over exports (read: a trade deficit).

The cumulative trade deficit the US has racked up since 1975 is about $11.15tn, and the total investment minus savings deficit is about $10.44tn.

So US trade deficits are not caused by 'unfair' trade practices. They are made in the good old USA.

Kudlow should make it clear that the imposition of anti-China tariffs or the brow-beating of Chairman Xi might reduce the US bilateral trade deficit with China, but it will not alter the overall US trade deficit. Indeed, if China is forced to reduce its bilateral trade surplus with the US, then others will supply what US consumers and investors demand. Yes, others will accommodate the US overall trade deficit that is dictated by the trade identity.

The only effective way for Trump to exorcise his demon (read: the overall US trade deficit) would be for him to reduce the fiscal deficit. But ironically, Trump's policies are projected to increase the fiscal deficit, which will result in a larger trade deficit.

IMI International Monetary Review

'Trading' Blows With the U.S.*

By SUMEDH DEORUKHKAR, BETTY HUANG AND XIA LE*

Summary

Fears of a trade-war between the US and China are escalating by the day. A 'tit for tat' protectionist trade rhetoric between two of the world's dominant economies has unnerved investors and rattled financial markets amid concerns that the current trade skirmish, if it escalates into a full-blown trade war could upend global growth momentum and threaten financial stability (See Figure – 1).

That said, while the current saber-rattling and trade skirmish persists, the likelihood of a full-blown and protracted trade war between the US and China is still low. Much would depend on China's retaliatory response to US's planned tariff package and potential investment restrictions. Also, both sides are well aware of the spillover-effects of such a lose-lose trade war. China's response, so far, has been relatively measured. Meanwhile, top US officials as well as President Trump have said they are open to negotiations with China and see the current strong stand more as a pressure tactic.

In the interim, this watch examines the potential effects of US-China trade clash on the Chinese economy. At its current stage, given a trade skirmish rather than a full-blown war, the downside risk to the Chinese economy seems contained. China's has transitioned to a predominantly domestic demand driven economy today, unlike being mainly export driven in the early decades, and US accounts for only 15% of China's goods exports.

Why is the US at loggerheads with China on trade and investment?

The US has for long voiced its concern about trade and investment relationship with China. This includes the lack of reciprocity and market access, the absence of a level playing field in China for US investors and more importantly allegations of intellectual property rights (IPR) violation involving forced technology transfer of high-tech US companies in China. Trump believes that US's $375 bn annual trade deficit with China is 'out of control' and caused in large part by unfair Chinese trade practices. In this context, recent US economic literature suggests that between 1999 and 2016, increased competition from Chinese imports cost the US economy 2.65 million jobs, nearly double the 1.4 million jobs lost to automation[11]. In particular, increased trade with China has been found to have led to large job losses in the US manufacturing sector[12].

The scope and substance of US trade war with China remains in a flux.

So far, the scope and substance of US tariff package on Chinese imports remains a moving target. The US is putting together a broad-based tariff package that could affect as much as $60 bn or about 10% to 12% of annual goods imports of $506 billion from China in 2017. The US is targeting 1,300 product categories for its 25% tariff package and is expected to publish a formal listin 15 days, while US industry gets 30 days to comment on the products selected for tariffs. Recent comment by US Trade Representative suggests that US tariffs would probably target Chinese high- technology industries, aerospace, information and communication technology, and

*This article appeared in BBVA on March, 2018.

*Xia Le is Chief Economist for Asia at BBVA Research and Senior Research Fellow of IMI.

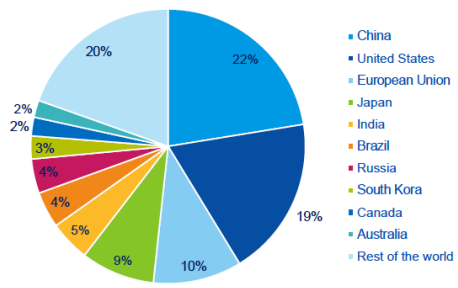
[11]Katharine G. Abraham, and Kearney, Melissa S., "Explaining the Decline in the U.S. Employment-to-Population Ratio: A Review of the Evidence,"NBER Working Paper No. 24333 (February 2018)

[12]David H. Autor, Dorn, David and Hanson, Gordon H., "The China Shock: Learning from Labor-Market Adjustment to Large Changes in Trade,"Annual Reviews of Economics, dated August 8, 2016, available at annualreviews.org

machinery. Separately, US is also mulling tighter restrictions on acquisitions by Chinese companies and technology transfers amid US allegations of Intellectual Property (IP) rights violations by China. In addition, US President Trump has also directed his officials to pursue a World Trade Organization (WTO) complaint against China for discriminatory licensing practices. This suggests that the US intends to tax Chinese technology and intellectual property the most, although it is still unclear whether the tariffs would single out one or two product categories or be broad-based. The former case would have a deeper impact on the Chinese economy.

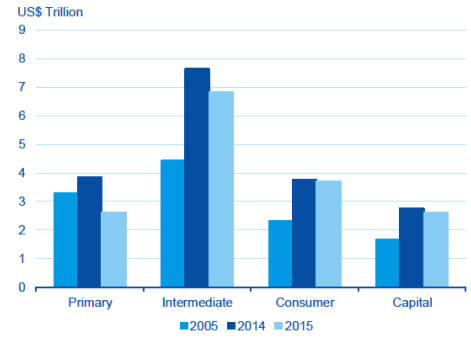
Besides the lack of clarity on US action plan, US Commerce Secretary Wilbur Ross – a key member of Trump's core team on trade issues – recently noted that he perceives the strong stand on trade more as a pressure tactic on China to bring concessions without escalating into a broader conflict. As such, before the tariffs become final, there will be a 30-day comment period. This provides a window, albeit short, for the two sides to negotiate and possibly tone down bilateral trade concerns.

Figure 1 Contribution to global GDP growth, % of world growth in 2017



Source: Haver Analytics, BBVA Research

Figure 2 World trade by stage of processing – Trade war makes little sense as most trade is in intermediate goods



Source: Haver Analytics, BBVA Research

Gauging the impact of US-China trade dispute on China

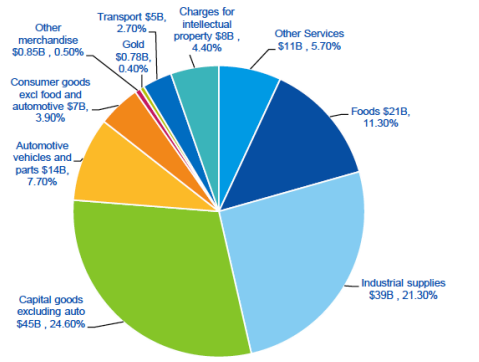
A trade skirmish rather than a full-blown trade war with the US would likely have a modest impact on China. China's trade openness, compared to a decade ago, is visibly lower today with the share of total exports to GDP declining to 19% from 35% in 2007. Having transitioned to a predominantly domestic demand driven economy, China's services sector, rather than manufacturing, has emerged as a key driver of GDP growth. While the influence of services deficit in China's trade with the US is increasing, the US accounts for only 15% of China's goods exports.

In terms of sector, Chinese consumer products companies seem most susceptible to US trade barriers. These companies depend on US companies that outsource their durable goods supply chain to China. This includes products such as apparel, toys among others. Such Chinese companies could face margin pressures while losing some business as US companies search for new suppliers elsewhere. Again, the granular details of new tariffs would be vital to ascertain whether the tariff size distinguishes between raw materials, intermediate and finished goods (See Figure – 2).

China's retaliatory response to US's planned tariff package has so far been measured. It is mulling tariffs on about $3 billion of US exports to China, a total of about 128 U.S. products, particularly targeting US agricultural and steel exports. China plans to impose 25% tariff on US pork exports and 15% tariffs on US steel pipes, fruit and wine. However, these products constitute a modest share of trade from the US (See Figure 3 & 4). Of the $129 billion that US exported to China in 2017, five major categories stood out – 1) Industry machinery (22% of total

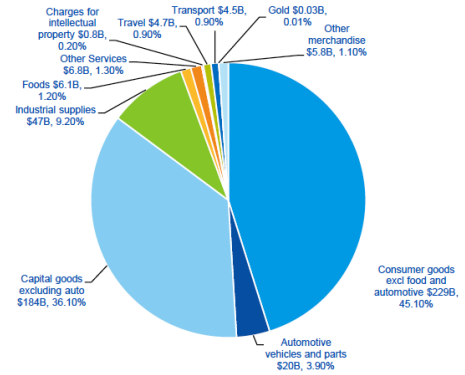
US exports to China), Metals (20%), Agriculture (13%), Commercial transport (12%) and Automotive vehicles (11%). That said, given China's initial focus on taxing US agricultural products, one must note that Chinese demand for agri-products such as soya bean is quite inelastic. China also accounts for roughly 60% of global oilseed imports. Notwithstanding

Figure 3 US exports of goods and services to China in share of total exports and $ billion ($183 billion in 2017)



Source: Haver Analytics, BBVA Research

Figure 4 US imports of goods and services from China in share of total exports and $ billion ($508 billion in 2017)



Source: Haver Analytics, BBVA Research

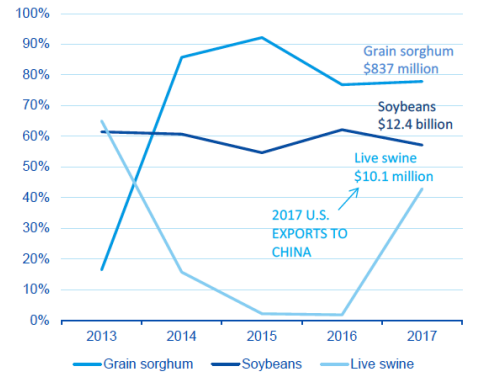
China's domestically consumed production of oilseeds, the US produces 25% of global oilseed production, followed by Brazil (21%) and Argentina (11%). In this context, China would find it hard to substitute US agri-produce (See Figure – 5), at-least in the short term, in turn posing upside risk to domestic inflation. This is more likely if the situation escalates. At under 3% yoy, China's CPI inflation currently remains well anchored within PBOC's comfort range, thus allowing policymakers enough room to sustain a respectable growth momentum despite on-going efforts to stabilise debt levels through structural reforms and a prudent monetary policy approach to stem financial fragility risks.

Meanwhile, we expect a muted impact on China from the 25% tariffs imposed by US on steel imports and 10% on aluminium imports last week. China isn't even in the top ten list of countries that export steel to the US, with nearly 53% of China's steel exports hitting Asian shores (See Figure – 6). Meanwhile, the role of Hong Kong or other foreign intermediaries in trade transactions involving the US and China could assume greater importance in light of a protracted trade dispute. Companies on either side could look to bypass trade restrictions and tariffs by choosing to route trade through such foreign intermediaries.

The timing of Trump's trade aggression towards China seems ironic

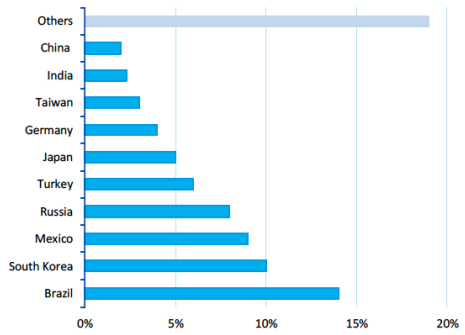
While trade and investment disputes between China and the US are nothing new, the timing of Trump's overt aggression towards China seems odd. The on-going trade clashes come at a time when policy efforts are underway in China to cut-back on excess industrial capacity, including in the metals space. In fact, since 2016, China's steel exports have nearly halved in level terms while US steel producers are currently seeing their strongest profits in a decade. The latest Beige book on the US economy noted, 'steel producers reported raising selling prices because of a decline in market share for foreign steel…'. Meanwhile, over the past year, China's top leadership, including President Xi Jinping as well as former PBOC Governor Zhou, have championed globalisation and reiterated their commitment to promoting free trade and investments and financial liberalization in China.

Figure 5 US exports to China as a share of all US exports, by product



Source: Haver Analytics, BBVA Research

Figure 6 Share of US steel imports by country, 2017



Source: UN Comtrade, IMF, Haver Analytics, BBVA Research

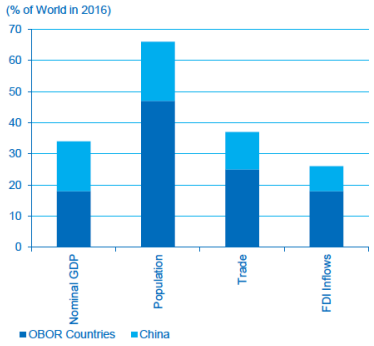
A full-fledged trade-war could put China on the backfoot.

The middle-kingdom stands to take a deeper hit in the event of a full-blown protracted trade war with the US. Imports of Chinese goods and services are about 2.7% of US GDP while exports of US goods and services to China are about 1% of US GDP. Thus, prima-facie, the US has less to lose from a trade-war with China given the massive trade imbalance. The US administration's intention of a clampdown on higher value-added Chinese imports as well as restrictions on investments by high-tech Chinese companies and technology transfer doesn't bode well with China's on-going efforts to achieve a 'new normal', leading increasingly to more service and technology-oriented economic growth.

China's One Belt One Road Initiative (OBOR) as a buffer against US protectionism

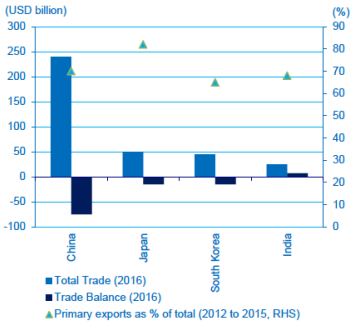
The One Belt One Road (OBOR) initiative would help cushion the impact of rising US protectionism by enabling China to better promote its financial institutions and trade integration strategy across other economies (See Figure – 7). The OBOR initiative announced in 2013 has provided an overarching framework for China to achieve its global ambitions; both at the economic as well as strategic level (See our previous two reports on OBOR-Progress and Prospects and OBOR-What's in it for Latin America?). As China's President Xi Jinping's signature move, OBOR, aims to strengthen China's economic leverage by spearheading infrastructure construction and enhancing connectivity across nearly 70 countries accounting for 33% of global GDP along the overland Silk Road Economic Belt and the Maritime Silk Road across Eurasia. China's large industrial overcapacity in the wake of on-going economic rebalance, tested expertise in infrastructure, capital account surplus and efforts to secure food and energy resources are well complemented by the need to address infrastructure and funding constraints in most recipient countries of OBOR. OBOR is rapidly expanding in scale, scope and ambition. For economies, such as those in Latin America, which are currently not a part of the initiative but could also suffer from US protectionism, the OBOR platform provides an opportunity to gain deeper access to key Asian markets (See Figure – 8).

Figure 7 OBOR countries account for close to 33% of world GDP, 25% of global foreign investment flows



Source: Haver, IMF, BBVA Research

Figure 8 Latin America's trade with major Asian economies



Source: UN Comtrade, IMF, Haver Analytics, BBVA Research

1987*

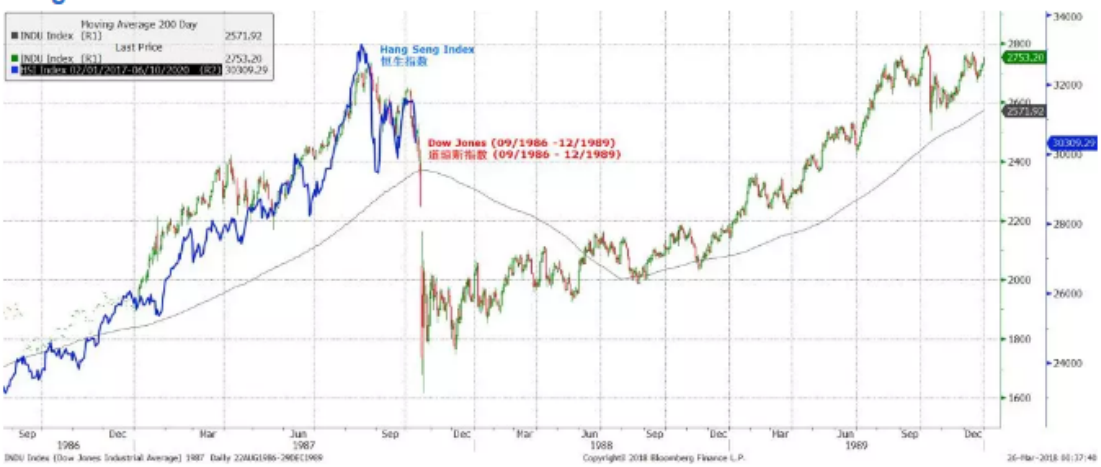
By HONG HAO*

Increasingly belligerent rhetoric; 1987 once more? Over the weekend, the propaganda in China has turned increasingly acrimonious. The People's Daily said China is "not afraid of a trade war". A senior government official postulated a scenario of levying tariffs on US soy bean at the China Development Forum. During an interview with Bloomberg, China's Ambassador to the US mentioned that "all options are considered" when asked whether China would reduce purchases of US treasury bonds. Despite the confluence of negative headlines, the US market opened higher on Friday, but sold off aggressively during the late trading session.

On the morning of July 2, 1987, Japanese viewers watched in shock nine US congressmen smashing Toshiba radio with sledgehammers on Japanese television. The showdown was because Japan violated the bilateral agreement by selling eight computer-guided multi-axis milling machines to the former Soviet Union.

This incident was largely ignored by the US press. Less than two months later, the US market peaked, and then saw an epic plunge on the Black Monday. This is the seldom-discussed catalyst of the historic stock market crash in October 1987.

Chart 1: A comparison of index movements between the Dow in 1987 and the Hang Seng now



Striking similarities between the trade disputes in 1987 and now: In the 1980s, spectacular advances by Japan in various high-tech fields, such as steel, automobiles, machine tools and semis, raised the specter of losses in the corresponding American industries. Americans' fear was aggravated by Japan's exalted progress towards an "Information Society" as a new form of nationalism.

Leading on the frontier of science and technology, the "techno-nationalism" was giving Japan some new-found confidence. After all, Japan is a nation that had long coped with a strong sense of insecurity because of its limited natural endowment of small geography, frequent earthquakes and tsunami, and post-war vulnerability due to the lack of nuclear arsenal.

*This article appeared in the author's WeChat public account(ID: Honghaochinastrategy) on March 28, 2018.

*Hong Hao, Senior Research Fellow of IMI, Managing Director and Head of Research, BOCOM International.

In 1987, Japan had risen from a protected protégé of the US to a leading creditor nation of the world. The American trade deficit was US$167 billion, of which US$58 billion was with Japan. The country was recycling the USD it received from exports to buy US treasuries, helping to depress the US treasury yield.

The US congress quickly produced a trade bill of 2000-plus pages aimed at protecting the domestic market and forcing opening markets abroad, as well as limiting Japanese investments and forcing opening Japanese markets. Reciprocity and "a level playing field" were the key themes.

Meanwhile, Japan published and then elaborated the Maekawa Report in 1987. The report called for stimulating domestic demand, reducing dependence on exports, coping with outrageously high land prices, improving housing and lowering trade barriers. Sounds familiar? Recently, even the major stock market indices, such as the Hang Seng Index, have been showing an eerily similar trajectory as the Dow in October 1987, right before the Black Monday (Chart 1).

While we concede that many a technical chart of such startling nature can be drawn, the similarities between historical precedents and stock market movements are intriguing. It is worth taking a note.

The PBoC's balance sheet growth is set to slow; RMB strength will ease. The PBoC has a new governor and a new party secretary. Consensus believes that policy continuity is thus ensured. But we think the central bank's policy depends more on the underlying business cycle than on its personnel, and tends to be counter-cyclical.

With the progress of reining in shadow banking and deleveraging, the central bank's balance sheet growth will slow, concurrent with China's three-year economic cycle. (Please see our report "A Definitive Guide to China's Economic Cycle" on 2017-03-24, and "A Definitive Guide to China's Economic Cycle Part II – New High" on 2017-08-28). Concurrently, the RMB will likely weaken, if history is a guide (**Chart 2-3**). There is a possibility that such potential cyclical weakening of the RMB can be misconstrued as an act of trade war.

Chart 2: Change in PBoC's balance sheet size vs. RMB (inverted)

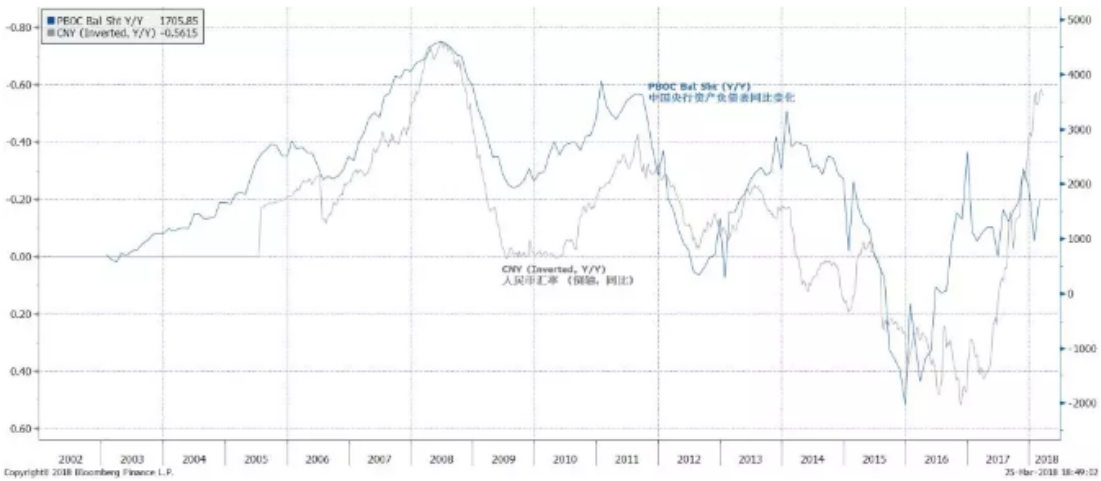
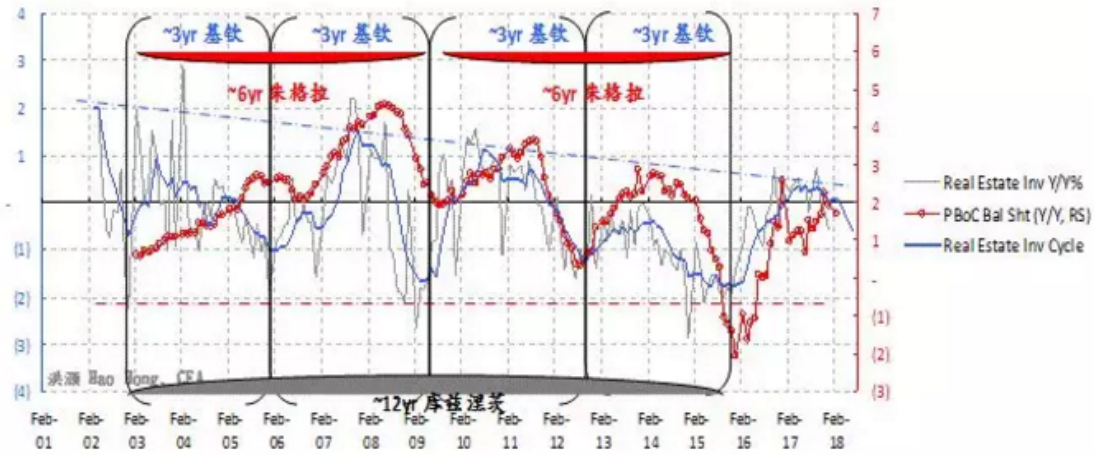


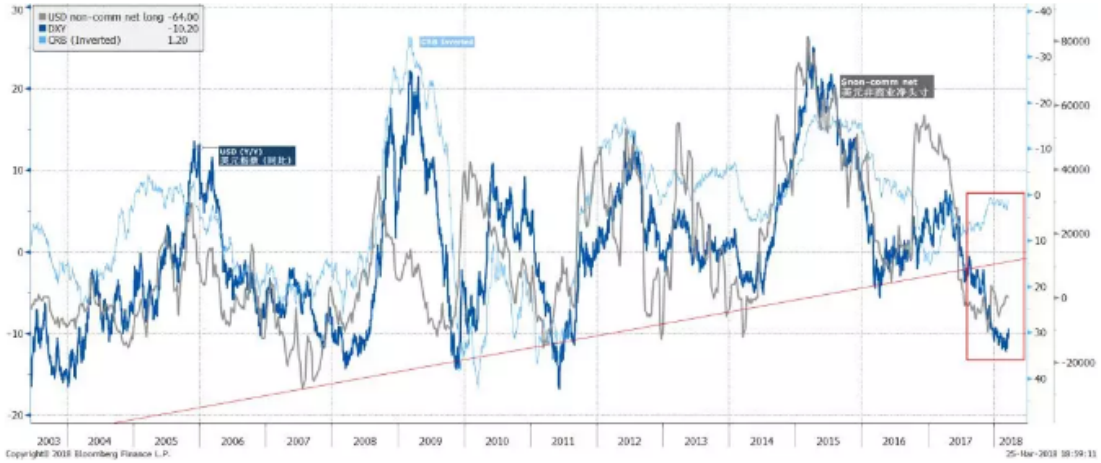
Chart 3: Even the PBoC balance sheet change roughly follows the 3-year economic cycle



Large-cap turnover approaching extreme; market still fraught with risks: While the market's pessimistic reflex may be tempting for some to bottom fish, we note that market visibility in the near term remains clouded. In our note "The Year of the Dog: Lessons from 2017" (2018-01-30), we warned of an impending market sell-off. We suggested we would wait till the volatility subsided before re-establishing our positions, and the market may have seen its high of the first half of 2018. In our follow-up note "Markets in Crisis" (2018-02-06), we cautioned against being too hasty to catch falling knives.

Despite the current weakness in the Dollar, emerging markets and commodities were still sold off during the recent market turmoil. The Dollar appears to have broken down, and its weakness is more a reflection of the US fiscal strain, rather than abundant dollar liquidity. Recent surging LIBOR, as well as the widening LIBOR-OIS spread are all hinting at the same structural problem. That is, a traditional risk haven is no longer there (Chart 4). We will consider only China's treasury bonds and gold.

Chart 4: USD weakness a reflection of fiscal concerns, rather than strong liquidity (lower panel)

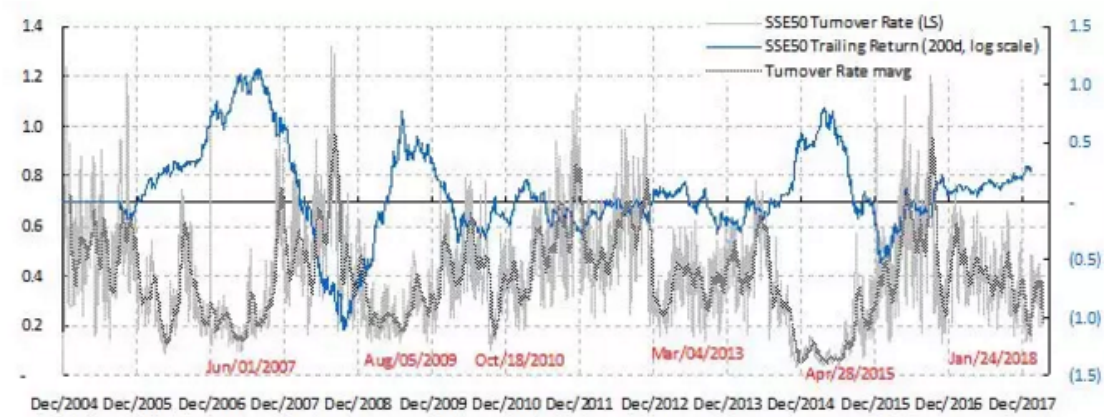


An escalation of disputes will fundamentally change the outlook of global growth, which now appears peaking, and elevate inflation pressure. If such a worst-case scenario happens, all bets are off.

Consensus is focusing on the 200-day moving average as the line in the sand of technical support. Moving averages are friends of a continuing trend, but are blind to inflection points. Large caps' turnover is once again approaching extremes that had historically portended the peak of the SSE50 index (**Chart 5**).

Consensus also points to solid US fundamentals. But in 1987, the real US GDP growth was 3.4%, and the US didn't sink into recession until 1991. In an environment with dwindling macro liquidity, the trades that used to have momentum behind their sails will likely see reversal. The stronger the momentum has been previously, the more potent and more likely the reversal now. We cannot pin our strategy on a few technical averages that are moving with hindsight.

Chart 5: Extreme turnover in SSE50 large caps suggests caution



April 2018
Vol.5, No.2

Trade in Services of China, Japan and Korea: The Way Forward*

By CHOI BO-YOUNG*

For a long time, manufacturing and international trade have been the main contributors to economic growth for the three countries of North-east Asia. However, contrary to their trade surplus in goods, they are all countries who face trade deficit in services. Also, despite its importance in the economy, the services trade of the three Northeast Asia countries seems to contribute less to their economy compared to other developed countries; while services exports account for 29.1% of total exports on average for OECD members in 2016, they only account for 7.8%, 21.5%, 15.3% of total exports for China, Japan and Korea, respectively.

Given the prevalence of global value chains, the services sector plays an increasingly important role in international trade. For instance, transport, logistics, and information and communication technology services allow countries to be efficiently linked to each other. Thus, the governments of the three countries are pursuing policies to promote trade in services, enhancing the efficiency and productivity of the service sector itself.

There are several ways to facilitate trade in services between the three countries. Korea and China agreed on further FTA negotiations to liberalizeservice and investment this year. In addition to such bilateral FTAs, China, Japan and Korea could also cooperate to lead early conclusion of the RCEP, not to mention make progress on the trilateral FTA negotiations between China, Japan and Korea that includes provisions of services trade liberalization.

Some unnecessary impediments of services trade must be considered very carefully to be removed. For instance, current Korean law requires applicants to earn 24 credits in accounting courses to take the Korean CPA examination, while credits earned from a foreign university are not recognized. Although anyone regardless of nationality, age or educational back-ground is qualified to take the Korean CPA exam, the credits requirement can be a major restriction to movement of people in the accounting service sector. For China, restrictions on cross-border mergers and acquisitions (M&A), conditions on subsequent transfer of capital and investment are regulations pointed out to have negative impacts on trade in multiple services sectors. In the case of Japan, foreign entry restrictions are relatively liberalized while its measures seem to be more subtle in exploiting barriers to competition. For instance, in the courier service sector, it appears that the designated postal operator, Japan Post Co., Ltd., receives preferential treatment during customs clearance. There is no such preferential treatment for the designated postal operators of Korea or China.

While it is clear that some regulations must be removed, many regulations have their own legitimate objectives. Only limited foreign entry is allowed in broadcasting services even in many developed countries to ensure cultural variety, while air and maritime transport are not opened to foreign investment for national security reasons. Thus, it is clear that there are cost and benefits of lifting barriers in services trade. Like non-tariff measures, this is why

*This article first appeared in KIEP Opinions on December 4, 2017.
*CHOI Bo-Young, Ph.D., Associate Research Fellow, Cooperation Policy Team, Korea Institute for International Economic Policy

establishing a cooperation mechanism to streamline the regulations across countries is important. Despite the fact that China, Japan and Korea are countries that are geographically close to each other with a high level of economic inter-dependence, there is no mechanism to discuss ways to harmonize regulations across the region. The three countries may utilize the existing Pan-Yellow Sea Rim Economy and Technology Exchange Meeting as a government-industry-academia cooperation dialogue channel. Although it is a sub-regional mechanism, this setting has its own merit as it facilitates attempts to experiment with policies as is done in special economic zones.

Global Economy

Bubbles Pervade World Economy

Global Situation More Dangerous Than in 2008*

By DESMOND LACHMAN*

In 1933 Sir John Templeton, the renowned fund manager, famously remarked that the investor who says 'this time is different' has uttered among the four most costly words in the annals of finance.

He might well have been speaking about modern policy-makers and investors, who try to convince themselves that the bubbles in the global economy will have a happier ending than previous ones. They do so despite the numerous good reasons to fear that, if the consequences of today's global bubble are indeed different from 2008, it may be because it is more dangerous.

Bubbles are much more pervasive today than in the run-up to the 2008 financial crisis, when they were contained to the US housing and credit markets. Now they can be found in almost every part of the world economy.

Years of unorthodox monetary policy by the world's major central banks have created an unprecedented global government bond bubble, with long-term interest rates plumbing historically low levels. Global equity valuations are at levels only experienced three times in the last century. House-price bubbles are evident in major economies like Australia, Canada, China and the UK, while interest rates have been driven down to unusually low levels for the high-yield debt and emerging-economy corporate debt markets.

If one had any doubt that global credit markets have lost touch with reality, all one need do is to consider some recent international bond issues. Argentina, which has distinguished itself by defaulting no less than five times in the past century, managed to issue a 100-year bond. War-torn Iraq or little-known Mongolia not only placed bonds in the market, but had them massively oversubscribed.

That the world is much more indebted than it was on the eve of the Lehman Brothers crisis aggravates matters further. High levels of Chinese non-public sector debt, Italian sovereign debt, and emerging market corporate dollar-denominated debt are especially troublesome.

Changes in leadership at the Federal Reserve and US Treasury mean neither institution has the experience to craft a swift and decisive response to the bursting of a global bubble. There is reason to fear, too, that President Donald Trump's 'America first' administration would be averse to orchestrating an international response in the event of market panic. This is particularly the case considering that Trump is not known for his depth of economic thinking, his forward planning, or his leadership skills in the international economic arena.

---

*This article first appeared inOMFIF Commentary on January 9, 2018.

*Desmond Lachman is a Resident Fellow at the American Enterprise Institute. He was formerly a Deputy Director in the International Monetary Fund's Policy Development and Review Department and the Chief Emerging Market Economic Strategist at Salomon Smith Barney.

Those who argue that this time is different for the better seem to rest their argument on the US banking system's improved regulatory system. They contend that, thanks to the Dodd-Frank Act, US banks are much less leveraged than they were before and less prone to taking on excessive risk.

While there is truth to these claims, the key point that the optimists overlook is that the major part of US credit is intermediated by shadow banks rather than regulated institutions. The collapse in 1998 of Long-Term Capital Management, the ubiquitous Wall Street hedge fund management firm, should have taught market watchers that hedge funds and other parts of the shadow banking system are highly interconnected and can be subject to the same sort of deposit runs as banks.

Long before Templeton issued his 'this time is different' warning, Leo Tolstoy wrote that 'happy families are all alike; every unhappy family is unhappy in its own way.' When analysts look back on 2018's global financial markets, they might find that Tolstoy's dictum was as relevant as Templeton's as a cautionary tale for both investors and economic policy-makers.

April 2018
Vol.5, No.2

Gaps in Global Financial Safety Net

How to Augment Large But Fragmented Reserves*

By DANAE KYRIAKOPOULOU*

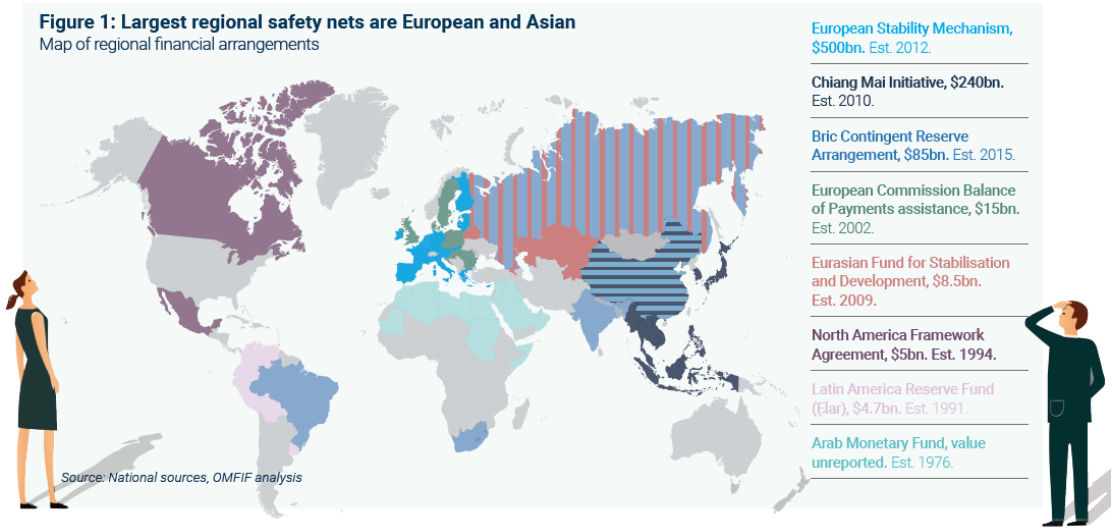
This risk of financial instability may have risen over the past decades as globalisation has intensified. This is in spite of a string of international measures to improve financial regulation and tighten surveillance over countries that follow unbalanced policies. Some elements of a 'global financial safety net' intended to protect countries against crises are in place, but large gaps remain.

Following a sharp drop after the 2008 financial crisis, global capital flows have begun to recover. Their composition has also changed. As analysed in the September Bulletin, the post-crisis regulatory wave has succeeded in curbing cross-border bank lending. However, this has been partly offset by increasing levels of direct investments. Banks' total foreign claims stood at $25.8tn in 2017, $4.6tn down from their pre-crisis peak.

Globally integrated capital markets offer important rewards to individual economies, enabling them to expand investment opportunities and diversify risk internationally, and to borrow to smooth consumption in the face of shocks. The potentialgains resulting from such international risk sharing and efficient resource utilisation can be large. But capital flows can also be volatile and unpredictable, and abrupt reversals can have damaging effects on the real economy. As developed countries' central banks navigate a period of normalising monetary policy, the global economy is entering a juncture where these risks may intensify, particularly in emerging markets.

This backdrop highlights the importance of an effectiveglobal financial safety net, defined as the collective value of countries' sources of insurance and financing. These include individual countries' reserves as well as external public financing at the regional and global level, such as central bank bilateral swap arrangements, regional financial arrangements such as regional reserve pooling, and the International Monetary Fund. These measures are intended to provide countries with insurance against crises, financing when shocks hit and incentives for sound macroeconomic policies. As shown in Figures 1&2, the elements of a potential safety net grew strongly following thefinancial crisis, as individual countries amassed more foreign reserves and BSAs and RFAs were introduced.

*This article first appeared in The Bulletin (February 2018) published by OMFIF.
*Danae Kyriakopoulou is Chief Economist and Head of Research at OMFIF.

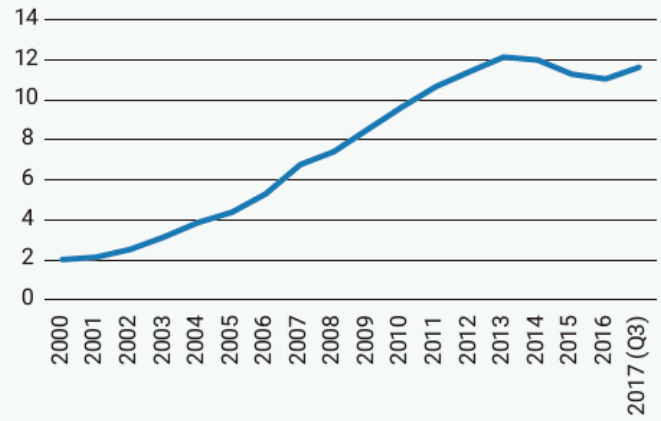


Expanding the net

But even this may not be enough. Reserves (including gold) of individual countries' central banks and sovereign funds make up the vast majority of the total, at around $20tn. Out of these, around $12tn are foreign exchange reserves held at central banks (see Figure 2). This presents several problems. Global reserves may be large, but they are also fragmented. Asia, led by China, and the Middle East, led by the oil-exporting Gulf economies, jointly hold 65% of global foreign reserves, according to the 2017 edition of OMFIF's Global Public Investor report. This uneven distribution will rarely match the global distribution of risks.

Figure 2: Reserves have risen six-fold since new millennium

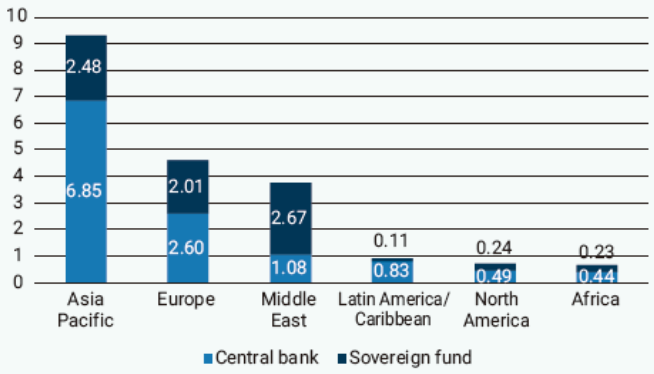
Foreign reserves excluding gold, $tn, global total



Source: International Monetary Fund, OMFIF analysis

Figure 3: Asian sovereign fund and central bank assets largest in the world

Reserves by region and type of institution, $tn



Source: OMFIF Global Public Investor 2017

Moreover, size is not always a guarantee of resilience. In times of crisis, individual countries' reserves can be depleted very quickly. Russia's reserves declined by almost 30% in just nine months in 2014-15. Reserve pooling and RFAs such as Asia's Chiang Mai Initiative and the European Stability Mechanism in the euro area can go some way to address this, but remain vulnerable to regional shocks and domestic disturbanceswith regional impact. These may create situations when individual countries want to access the regional pool at the same time. The choice of currency for regional reserve pools can also be problematic: Unless reserves are denominated in a currency that is issued by one of the central banks in the region, they run the risk of being depleted quickly in a crisis. But the alternative would only be feasible for regions with currencies that enjoy reserve status. RFAs are also politically difficult to implement. Better mechanisms to contain potential disorderly spillovers are urgently needed if they are to become effective tools.

These constraints elevate the importance of global resources held at the IMF. Quota resources at the Fund doubled as part of the 14th General Review of Quotas reform package implemented in 2016, and now stand at SDR475bn ($675bn). The Fund's lending toolkit offers multiple instruments of crisis prevention through which its members can receive financial assistance, such as the Flexible Credit Line and the Precautionary and Liquidity Line. But the stigma associated with requesting precautionary financing has constrained the extent to which the facilities have been used. In response, IMF staff proposed a new facility, the 'short-term liquidity swap' for 'members with strong fundamentals and policies', 'to provide liquidity support for potential balance of payments needs of a short-term, frequent and moderate nature'. The proposals were rejectedby the Board in December 2017, who cited worries over 'the importance to maintain incentives for strong policies, minimising moral hazard, safeguarding Fund resources and avoiding overlap and proliferation of instruments'.

These important concerns need to be addressed, andindeed the Fund insists that the proposals are not completely off the table, but rather on the shelf for now. But the alternative of a global financial safety net which never took off the ground couldbe even more problematic.

We anticipated that 'cutting the corporate tax rate is unlikely to have a stimulatory effect for those large companies already paying below the statutory rate, and may instead lead to loss of revenue from domestic firms, lowering the already weak contribution of corporate taxes to federal income.' Indeed, corporate tax revenue fell to 1.6% of GDP in 2016 from 5.9% in 1952, contributing just 9% of government revenue last year. The effect on US debt could therefore be substantial, with extensive implications for monetary policy under Jerome Powell, the incoming chair of the Federal Reserve.

In vindication of these forecasts, the S&P 500 fell on the first trading day after Trump's tax plan passed a key vote in the Senate on 2 December, closing 0.1% down. Falling share prices for the largest technology companies, including Google, Amazon and Microsoft, contributed to the drop. These movements reflect the pressures highlighted in OMFIF's report.

The reality for growth might be worse than was anticipated at the start of 2017, as other elements of Trump's proposed fiscal boost, including a large infrastructure spending programme, have not materialised. While the Russell 2000 and other domestic indices were bolstered by Trump's election, in anticipation of the improved growth prospects for domestic companies, those hopes have receded. The Russell 2000 fell around 0.3% on the first trading day after the vote.

It is becoming increasingly clear that Trump's plan will not be as stimulatory as his supporters claim. Added strain on US debt and the deficit will further complicate policy-makers' already difficult task. With monetary policy tightening, labour markets near full capacity and the post-crisis recovery entering the later stages of the business cycle, the effect of Trump's tax cuts will be muted.

April 2018
Vol.5, No.2

A 50% Chance of a Crisis in 2019

Beware Balance Sheet Dangers*

By BRIAN READING*

According to the International Monetary Fund, GDP growth almost everywhere should accelerate to a respectable rate this year and next. Owing to the UK's decision to leave the European Union, Britain will be the exception. But there is a whiff of 2007 about this – when few forecasters saw the global financial crisis coming. There is a 50% chance of a crisis in 2019.

Conventional short-term forecasts begin with leading indicators coupled with an expectation of the fiscal and monetary stance. They proceed to project growth in terms of investment multipliers (whereby an increase in investment spending has a more than proportionate positive impact on the economy) and accelerator theory, which states that when demand increases, companies tend to increase investment in order to increase production, which, in turn, attracts more investment, driving growth. What goes up, goes on going up and what goes down does likewise. Hence forecasting errors are greatest at turning points. Booms burn out in accelerating inflation, which needs to be curbed. Budget tightening and central bankers halt overheating. Accelerating growth this year is hardly questioned, but the issue is whether the recovery can be sustained in 2019.

A mild application of monetary brakes in 2007 was expected to steady growth in 2008. G7 inflation was low and stable, between 2% and 3%. Instead, growth froze in a balance sheet crisis. Most forecasters pay scant attention to private sector balance sheets, while public sector and foreign balances are endlessly scrutinised. Yet improvements in public sector deficits and debts are mostly reflected in a private sector deterioration that spells trouble. The combination of fiscal austerity with monetary laxity has been dangerous, generally restoring private sector debt to pre-crisis levels.

Strengthening recoveries are not hard to explain. Central banks are aware of the withdrawal risks as quantitative easing ends and interest rates are normalised. They are careful. Fiscal austerity is over. Tightening or easing is not measured by budget balances. Changes in structural balances, what government revenues and expenditure would be if output were at its potential level, define policy stances. In 2008, the Organisation for Economic Co-operation and Development estimated structural easing in 25 of its 35 member economies. This changed to 26 tightening in 2013. This year it is back to 25 easing.

Faster growth and a bit more inflation with only a hesitant rise in interest rates will tempt some to ease further. The primary budget balance is the budget balance excluding government debt interest payments. If it is balanced, the growth in debt equals the average rate of interest on debt. This changes slowly depending on average debt maturity. If nominal GDP grows at the same rate as the average rate of interest on debt, the debt/NGDP ratio remains stable whatever its level. Where the two differ, the primary balance to stabilise the debt ratio depends on the difference and the initial debt level. With debt levels mostly below 100% and average interest rates significantly below NGDP growth, primary deficits can reduce debt ratios. Some countries

*This article first appeared in OMIFIF Commentary on March 21, 2018.

*Brian Reading was an Economic Adviser to UK Prime Minister Edward Heath and is a Member of the OMFIF Advisory Board.

will use this opportunity to increase public spending somewhat. But negative real interest rates cannot last indefinitely.

The OECD warns of the danger of a balance sheet crisis. In its November 2017 Economic Outlook, it cites research showing that housing market and credit-related early warning indicators are highly correlated with forecasting errors. It analyses its May 2008 forecast for UK 2009 growth, which it put at 1% and which turned out to be minus 5%. The original fan chart, based on historic forecasting errors, gave a more than 90% chance that growth would be more than 1%. Using domestic early warning signs, this changed to worse than minus 4%. Adding international indicators brought the chance of minus 5% to under 80%.Given the return to pre-crisis private debt levels, I fear the chances of recession in 2019 could be as high as 50%.

China

China's Economy Has Resilience to Overcome Vulnerabilities*

By LIU JUN*

The year of the dog has dawned, but the Chinese stock market slump in early February did nothing to enhance the festive mood. Although the Shanghai and Shenzhen stock indices have bounced back somewhat since then, the sudden retreat raised jitters in some quarters that China's economy might be heading for a tumble.

But dire forebodings are overblown. The external environment has never been more favourable since the 2008 recession. The locomotive US economy combines rapid growth and low rates of unemployment, not to mention the New York stock index which, although down from its January records, has rebounded from February lows.

Similarly, Europe appears fairly robust with its debt crisis consigned to the rear view mirror and the European Central Bank considering whether to pare back quantitative easing.

In the US, a key concern is wage growth figures that come in at above expectations, eliciting fears over inflation and possible hawkish moves by the US Federal Reserves. This could create turbulence in the stock market but a crash would be unlikely because of the fundamental strength of the US economy.

These realities should convince people that there is little clear-cut evidence of a deterioration in global economic conditions. China too is enjoying a rapid phase of growth. Even though there are several grey rhinos stalking the imaginations of some investors these are all, in fact, mere phantoms.

Let's unmask them one by one. The main concerns in China's domestic economy revolves around real estate overheating, the corporate debt burden, high leverage in the financial system and non-performing assets and industrial overcapacity.

Real estate investment in 2017 was close to Rmb11tn, up 7 per cent compared to 6.9 per cent in 2016, according to the National Bureau of Statistics. The average house price by the end of 2017, according to Wind, was Rmb13,967 per square metre, 7.15 per cent up year-on-year but far below the 2016's growth rate of 19 per cent. Housing sales grew by 13.7 per cent year-on-year, much slower than 2016's 34.8 per cent. Such statistics suggest not a downward spiral but a managed slowdown.

According to the IMF, China's debt-to-GDP ratio—borrowing by governments, non-financial companies, and households from both banks and bond markets— rose to about 254 per cent in 2016, with the government debt ratio at 44 per cent, the household ratio at 44 per cent and non-financial companies' ratio at 165 per cent. However, if the national savings ratio of about 46 per cent (with corporates at 17 per cent, the government at 6 per cent and households at 23 per cent) is taken into account, the overall debt serviceability is acceptable although not healthily sustainable.

---

*This article first appeared in Financial Times on March 10, 2018.

*Liu Jun is Executive Vice-president, a member of the China Investment Corp.'s Executive Committee, and a member of IMI Academic Committee. His opinions are entirely his own.

As for the financial system's increasing leverage — brought about in particular through the issuance of off-balance-sheet wealth management products or inter-bank transactions — a resolution to this gigantic mess needs to be achieved over the long-run.

According to the Bank for International Settlements (BIS), the size of the outstanding shadow savings instruments in 2016 stood around 77 per cent of GDP or Rmb57.3tn (which is broken down into wealth management products at Rmb23.1tn, trust products at Rmb20.2tn, entrusted loans at Rmb13.2tn and P2P loans at Rmb0.8tn).

No matter which aspect of the shadow finance problem is tackled first by regulators, there is an official consensus that this problem will take time to resolve.

Nevertheless, when compared to the overall size of China's financial system, an inherent resilience becomes clear. Total financial assets of Rmb307tn (broken down into Rmb59tn in equity, Rmb75tn in bonds and Rmb173tn in deposits, according to Wind) provide an ample buffer as regulators tighten curbs around these lightly-regulated products.

How about non-performing assets, the old Achilles heel? According to CEIC, non-performing loans (NPL) account for 1.74 per cent of a total Rmb1.7tn in lending. Some China watchers may doubt the truthfulness of the NPL ratio itself. However, the financial institutions' profit accumulation and ongoing reinforcement of their capital base can without doubt prevent old troubles from turning into new mistakes.

Last but not least comes industrial overcapacity. Transforming from a manufacturing-oriented to technology-driven economy is a long journey. A gradual improvement in profits and productivity demonstrates the wisdom in this shift toward quality-oriented growth against the previous emphasis on scale.

So, when subjected to analysis, such phantoms turn out to be largely hollow. They should then be set against an array of positive factors from which the Chinese economy is deriving strength and momentum.

The substantial strides China is making in technological upgrading and the concurrent acceleration in innovation driven by a massive research and development effort is one sterling attribute. The steadfast resolve of the central government to switch gears toward a more efficient and environmentally-friendly economic trajectory is not only fostering green industries but also reinforcing social cohesion.

The fortification of the capital bases and balance sheets of financial institutions is enabling more capital resources to be directed toward the real economy. The cooling real estate sector, with more emphasis on rental housing, is returning growth to a more rational plane.

A powerful initiative to embrace digitalised and AI-enabled industrialisation is set to drive the development of a new generation of products. In short, China's economy is set to continue its development in the global economy guided by market economy principles. It is most unlikely that it will fall off a cliff – a prospect that would throw the whole world into jeopardy.

April 2018
Vol.5, No.2

Opportunities and Challenges for China's Bond Market Opening in the New Era

By E ZHIHUAN*

In 2017, the Ministry of Finance (MoF) issued USD 2 billion and RMB 14 billion sovereign bonds in Hong Kong, with an aggregate annual issuance at about RMB 28 billion. The issuance of dollar sovereign bonds in Hong Kong will increase the types of bonds in offshore markets, providing more high quality asset varieties to international investors. In the meantime, the issuance of dollar bonds facilitates the establishment of pricing benchmarks for foreign currency-denominated bond issuance and optimizes the yield curve, providing references to Chinese enterprises which raise funds in global financial markets. It would be conducive to developing multi-level capital markets, as mentioned in the 19th CPC National Congress Report, by maintaining adequate issuance of multi-currency bonds in offshore markets, making the bond market the main battlefield for further financial opening.

I. Significant progress in China's bond market

Fixed income is the most sizable asset class in global financial markets, and bonds are very important investment assets. As of the end of 2016, global bond market capitalization was approximately USD 100 trillion, compared with global equity market capitalization of USD 67 trillion.

As of end-September 2017, bonds in custody in China amounted to RMB 71.9 trillion, of which interbank bond market amounted to RMB 63.7 trillion. China's bond market is the third largest in the world, following the US and Japan. Both issuanceand transaction amounts in the interbank bond market account for almost 90% of the entire Chinese bond market. In 2016, bond issuance in the interbank marketamounted to RMB 32.2 trillion with annual transaction amount of RMB 127 trillion. In the first nine months of 2017, issuance and transaction amounts were RMB 28.1 trillion and RMB 73.8 trillion, respectively.

In terms of relative scale, China's bond market capitalization only accounted for 85% of GDP in 2016, far lower than the ratio of 210% for the US.

The market capitalization and transaction activity of China's interbank bond market have approached or reachedthe levels in major markets in Europe and the US. Nevertheless, the market is still immature. It is necessary to open the market at a faster pace by attracting offshore investors and issuers, optimizing market functions and enhancing the efficiency of allocation of funds, in order to better support the real economy.

II. Analysis on bond market opening

1. Offshore markets take a leading role in China's bond market opening

At the initial stage of RMB internationalization, central banks, sovereign wealth funds and international monetary institutions around the globe mainly allocated in RMB assets in offshore markets. Before the RMB joined the SDR, nearly 30 sovereign institutions publicly announced to purchase RMB assets in offshore markets. RMB sovereign bonds issued by the MoF in Hong Kong were mainly sold to central banks overseas. Moreover, the UK Government and the British

*E Zhihuan is a Member of IMI Academic Committee, Chief Economist, Bank of China (Hong Kong).

Columbia Provincial Government of Canada have issued RMB bonds in offshore markets, respectively. Offshore markets once took a leading role in China's bond market opening, paving the way for RMB internationalization.

The scale of RMB-denominated international bonds expanded after the RMB joined the SDR in 2016. The issuance of Panda bonds in onshore markets surged, whereas the issuance of Dim Sum bonds declined. The issuance of Dim Sum bonds in 2016 came in at merely half of the size in the previous year.

2. Onshore bond market opening has great potential

China's bond market opening has deepened since 2005. The Chinese Government progressively authorized international development institutions to issue RMB bonds in the onshore market, allowing Qualified Foreign Institutional Investors (QFII) and Renminbi Qualified Foreign Institutional Investors (RQFII) to invest in the interbank bond market, expanding the scope of eligible offshore institutional investors to various financial institutions such as commercial banks, insurance companies, etc. and other medium-to-long term investors authorized by the People's Bank of China (PBOC). In July 2015, the PBOC authorized overseas central banks, supranational institutions and sovereign wealth funds to enter the interbank market after registration. They could conduct bond trading, bond repos, bond lending, forward bond agreements, interest rate swaps, forward rate agreements, etc. without limitation on investment scale.

China's bond market capitalization is more than USD 10 trillion, but the holding of RMB bonds by offshore institutional and retail investors was RMB 974.145 billion, accounting for 1.3%. This proportion was far below the ratio of 39% for the UK, 45% for Germany and 28% for Malaysia. The share of offshore investors in China's bond market still has room for growth.

3. New progress in mutual bond market access

The Bond Connect was officially launched on July 3, 2017, providing a convenient platform for offshore investors accessing the onshore market. The Bond Connect helps attract additional capital inflows to Hong Kong while furthering China's bond market opening and the degree of internationalization.

Under the Bond Connect model, offshore investors can directly place orders with authorized price-quoting institutions in China through global bond trading platform such as Tradeweb. The need for linking investors is now replaced by the connection between platforms. The Bond Connect adopts international law and regulatory standards, making overall transactions more convenient. Under the current mechanism, the operations of funds settlement and bond custody take place in Hong Kong. The Central Moneymarkets Unit (CMU) of the Hong Kong Monetary Authority (HKMA), being a nominee holder of the bonds, represents overseas investors to complete the procedure of funds settlement and custody through the nominee holding arrangement. Such operation simplifies the procedure of investing in the onshore interbank bond market for offshore investors, as they do not have to open bond custody accounts or funding accounts in China. The Bond Connect enhances the attractiveness of bond markets in Hong Kong and China. For one, it is able to meet the demand for bond market opening in China. For another, it solves the problem of different transaction approaches by offshore investors, promoting the development of the two financial markets consistently and steadily.

Investors of the Bond Connect are institutional investors, including overseas central banks, financial institutions, etc. They invest in all types of bonds available in China's interbank bond market (CIBM) without limitation on quota. Compared with the existing approach of offshore institutional investors participating in CIBM, the review period under the Bond Connect can be

shortened with lower transaction costs. The increasing demand for RMB assets by offshore investors can be satisfied following the simplification of relevant procedures in the onshore bond market, expanding the scope of investment assets and issuers, improving financial infrastructure such as cross-border clearing and custody system.

According to data from Shanghai Clearing House, in July 2017, settlement through the Bond Connect was RMB 1.4 billion with 32 transactions per week on average. Trading from offshore institutions was active. In August, offshore institutions increased holding on interbank deposits by RMB 27 billion through the Bond Connect, accounting for 40% of the entire increment. At present, nearly 60% of interbank deposits are conducted through traditional channels, such as CIBM and the QFII.

III. New opportunities for China's bond market opening in the New Era

1. A new phase of China's economic development provides tremendous room for bond market opening

China's economy is entering a new phase of development, focusing on changing growth model, optimizing economic structure, transforming economic driving forces, establishing a modern economy, shifting from high rate of growth to high quality economic development, emphasizing quality and efficiency of economic development and macro policies, converting the focus of reform to improving intellectual property system and liberalization of production factors. The National Financial Work Conference has initiated to develop multi-level capital markets, as well as assigning an important role to direct financing. Against this backdrop, the bond market becomes more important in China's financial system.

The development and opening of the bond market are crucial to optimizing financial market structure and strengthening competitiveness of China's capital markets. Moreover, such moves helpexpand the direct financing channels for enterprises and the real economy, converting the social financing structure which relies heavily on the banking system. It is able to solve some problems, such as rapid accumulation of debts and vulnerable financial systems, to a certain extent. In addition, the transmission of policy effects on the real economy can be more efficient.

2. RMB internationalization needs support from bond market opening

Historical experience reveals that successful currency internationalization is supported by a sizable economy and merchandize trade volume, as well as robust and well-functioning financial markets. Following the inclusion in the SDR in October 2016, RMB internationalization is driven by domestic market developments. To enhance the global reserve currency function of the RMB, it is essential to be supported by offshore financial markets and matured onshore capital markets, providing international investors with more varieties of financial assets, convenient transaction channels and ample market liquidity in the onshore market.

Holdings of the RMB by central banks around the globe keep increasing. As of the third quarter of 2017, the claims in the RMB were USD 107.94 billion, up 18.9% from the end of 2016. The RMB's proportion of global foreign-exchange reserves was 1.1%, which was largely stable compared with the previous quarter.

3. The Belt and Road Initiative provides new opportunities for China's bond market opening

The 19th CPC National Congress Report mentioned promoting market opening in both inward and outward directions, innovating approach on overseas investment and facilitating collaboration in global production with the Belt and Road Initiative as an entry point. The Belt and Road Initiative plays an important role in formulating a comprehensive market opening.

The Belt and Road countries have great demand for funds. The Asian Development Bank estimated that cumulative investment for infrastructure projects in 5 ASEAN countries along the Belt and Road, China, Kazakhstan and Pakistan would be USD 5.7 trillion between 2010 and 2020. According to a report by Baker McKenzie, a law firm, and Silk Road Associates, the Belt and Road-related projects are estimated to be worth USD 350 billion over the next 5 years.

The existing financing model is insufficient to support economic development, given low saving rate in some countries along the Belt and Road, immature financialmarkets, etc. As a result, it is essential to expedite the development of financial markets along the Belt and Road countries. Supranational institutions such as the Asian Infrastructure Investment Bank, the Silk Road Fund, etc., have providedfinancial supports to projects along the Belt and Road countries. Major financialinstitutions, such as Bank of China, are also rapidly developing a financing network. They supported the construction of local projects by providing syndicated loans. Furthermore, the degree of bond market development is crucial for promoting the usage of funds along the region.

IV. New Challenges for China's bond market opening

1. Offshore investors remain sceptical about entering China's bond market

For the time being, major investors in China's bond market include commercial banks, credit unions, securities firms, investment funds, insurance companies, non-financial institutions, etc. In terms of bond holdings, commercial banks take the lead with over 60% of market holdings, while other types of institutions have relatively low shares.

As RMB internationalization progresses, offshore investors are becoming important participants in the bond market. The holding of bonds and equities by non-residents is responsive to the degree of China's capital account opening. Asset holdings by offshore investors will increase following the ease of relevant policies. It will be more convenient for overseas investors to increase their holdings of RMB assets with more investment channels.

However, offshore investors have three concerns about entering China's bond market. The first concern is about the free movement of funds. The second concern is about insufficient secondary market liquidity due to the lack of depth of the bond market. The third concern is about an incomprehensive credit rating system, as credit agencies do not completely meet international standard. For example, the credit ratings for corporate bonds cannot fully reflect the implied risks.

2. The progress of market opening in both directions is affected by capital outflow pressure and expectation of RMB exchange rate

Financial risk control is a priority as mentioned in the Central Economic Work Conference, to ensure the prevention of systemic risks. The RMB's exchange rate has stabilized since 2017, given the weak dollar, expectation management by the PBOC, the improving Chinese economy and supports from macro policies.

The RMB is expected to be stable and the condition of capital outflow is manageable. Against this backdrop, the bond market could open further by expanding the Bond Connect from Northbound Trading to Two-way Trading in due course. For one, the Northbound Trading corresponds to the principle which encourages capital inflow and controls capital outflow at the same time. For another, the introduction of the Southbound Trading will be determined by a number of factors, such as changes in the balance of payments, capital flows between onshore and offshore markets, etc.

3. The bond market's lack of depth and breadth constrain the progress of market opening

Capital market opening in both directions can shortenthe review period with lower transaction costs. Moreover, it can attract different offshore investors, making a breakthrough in product diversification and primary market development in China's capital markets. In addition, it can enhance the adaptability to regulatory environment, taxation and legal framework. The bond market depth and breadth can be enhanced given simplifying procedures in onshore capital markets, expanding the scope of investment assets and issuers, improving financial infrastructure such as cross-border clearing and custody system, which satisfies the increasing demand for RMB assets by offshore investors.

IMI International Monetary Review

Why There Is No "Beijing Consensus"*

By ANDREW SHENG AND XIAO GENG*

China observers can't seem to agree on the underlying logic of the country's development model. But, with faith in the West's long-dominant Washington Consensus breaking down, both sides may be in a similar position – a reality that could facilitate cooperation to deliver global public goods.

Four decades would seem to be plenty of time to identify the underlying logic of China's development model. Yet, 40 years after Deng Xiaoping initiated the country's "reform and opening up," a "Beijing Consensus" – that is, a Chinese rival to the Western neoliberal Washington Consensus – has yet to be articulated.

Over the years, China has worked to transform its closed, planned economy into a more open, market-based system. Industry and, increasingly, services have replaced agriculture as the main drivers of growth, and the country has gone from technological copycat to global innovator. Meanwhile, China has tackled several difficult challenges, from excessive debt and overcapacity to severe pollution and official corruption.

This has been a highly complex process. According to China Academy of Social Sciences economist Cai Fang, it can be understood only in the context of the country's unique history, demography, and geography, not to mention broader technological and global trends. All of these factors have, after all, helped to shape China's governance and institutions.

Yet the veteran China watcher Bill Overholt – one of the first to predict China's rise – argues in his latest book, China's Crisis of Success, that the country's reforms were driven by "fear and simplicity." The same factors, he asserts, drove East Asia's post-1945 development.

Other observers – including the World Bank, the OECD, and think tanks like Harvard's Fairbank Center for China studies – can't seem to agree on who is right. They are not accustomed to assessing an economy whose primary influences – including historical legacies, values and ideologies, and institutional and governance traditions – differ so profoundly from those of the West.

Consider governance. Western economic dogma holds that the state should intervene in markets as little as possible. Yet, for China's leaders, it is not clear whether the state can even be separated, conceptually or operationally, from the market.

For thousands of years, state control was China's default governance strategy, with a strong central government overseeing stability and preventing regional and factional rivalries from causing chaos. So when China wanted to increase its leaders' accountability, for example, it focused not on creating a market-based, much less democratic, system, but rather on introducing regulations to curb abuses of power and facilitate the flow of products, capital, people, and information.

Within the constraints of this paternalistic approach, the experimentation and adaptation that have been so crucial to China's growth had to be carried out by local governments, which have

*This article first appeared in Project Syndicate on February 27, 2018.

*Andrew Sheng, Distinguished Fellow of the Asia Global Institute at the University of Hong Kong. Xiao Geng, Member of IMI Academic Committee, President of the Hong Kong Institution fot International Finance, Professor at the University of Hong Kong.

enjoyed considerable, albeit uncertain, authority to do so. The idea was that, by using local-government (and market) expertise, China could generate growth without disturbing social cohesion or compromising national integrity.

Yet Chinese governance has not exactly been beyond reproach. When it comes to the quality of market competition, questions about the state sector's dominance, as well as the effectiveness of regulations and adherence to international laws, standards, and practices, have persisted. And while China's government has proved adept at providing "hard" infrastructure, such as highways, railroads, and airports, it has far to go in developing soft infrastructure, such as that related to education, health care, energy, the environment, and finance.

So China continues to grapple with the question of how to balance the state and the market, in order to ensure accountability, market competition, and adequate provision of public goods for one-fifth of the world's population. Compounding the challenge are rapid technological change, globalization (and the backlash against it), and geopolitical considerations.

But it is not as if the West has proved definitively that its free-market approach works. The state's role – measured according to the public sector's share of GDP, for example, and the depth and complexity of laws governing private activities – has been expanding in almost every economy since the beginning of the twentieth century.

The United States, in particular, provides a useful benchmark. Like China, it is a continental economy. But it also represents the global gold standard in many fields, including technology, defense, and research and development.

Contrary to China's statist legacy, America's historical experience has instilled in citizens and leaders a devotion to liberty, including free markets, and local autonomy. The US federal government's size and power grew only very slowly until the 1930s, when the New Deal – which included federal programs, public works projects, and financial reforms and regulations – was implemented in response to the Great Depression.

The US federal government expanded again during and after WWII, reflecting the country's new global hegemony and the prosperity of its middle class (created in no small part by the New Deal's support for unionization and home ownership). The government assumed a larger role in areas ranging from defense and foreign policy to health care and social security.

But even as the federal government increased regulation in some areas, the US remained highly reliant on the market, resulting in rising inequality, the deterioration of public infrastructure, and an unsustainable fiscal deficit and debt. The global recession triggered by the 2008 financial crisis intensified growing doubts about the Washington Consensus.

So some of America's most fundamental challenges – such as reducing inequality, supporting stable fiscal and financial conditions, and ensuring environmental sustainability – are the same as China's, and neither country has a clear and proven "consensus" to guide it. Against this background, cooperation to deliver global public goods – including peace – should be possible.

The key is for the two sides to work toward common goals, while agreeing to disagree on certain ideological tenets. Here, the US needs to recognize that global cooperation is not a zero-sum game, and that China's rise need not be viewed as a threat. On the contrary, China – along with other emerging economies, such as India – can contribute to a global rebalancing that actually strengthens economic and geopolitical stability.

IMI International Monetary Review

Japan-China Financial Co-operation

Leaders Urge Greater Economic Integration in Asia*

By ADAM COTTER AND DAVID MARSH*

Enhanced financial and monetary co-operation between China and Japan, the world's second and third largest economies, is likely to be one of the prime trends to follow in the next 12 months.

There remain considerable strains in the bilateral relationship, not least reflecting differences over territorial claims and China's increased military presence across eastern Asia. Yet Chinese President Xi Jinping and Japanese Prime Minister Shinzo Abe have reinforced their domestic political power bases in the last few months. For both leaders, US President Donald Trump's shift towards unilateralism is an incentive to identify shared interests and improve ties in regional trade and finance.

China is Japan's largest trading partner, while Japan is China's second largest. Japan, benefiting from China's outbound tourism boom, welcomed around 5m Chinese visitors in 2017, more than from any other country.

Although the Japan-US security pact will continue to dominate Japan's foreign policy, both countries' engagement with the US to curb the nuclear ambitions of North Korean leader Kim Jong-un could be another factor in improving collaboration. This could spread to spheres such as bilateral currency co-operation and monetary back-up for Asian countries suffering capital outflows because of higher US interest rates.

Multilateral co-operation with the 10 countries in the Association of Southeast Asian Nations is an important focus. This has intensified in the last two decades, with a greater commitment to East Asian economic co-operation under the so-called Asean Plus Three grouping, which includes China, Japan and South Korea. While Sino-Japanese political disputes have occasionally raised alarm in the rest of Asia, the rivalry has also benefited the region, since countries play the two economic giants against each other to gain better deals.

Asean accounts for only around 10% of the region's GDP, while the 'Plus Three' represents 90%. Competition between China and Japan has been one reason for sub-optimal co-operation among the Plus Three, but this could change.

Xi is urging further regional economic integration and greater efforts on trade and investment. Aside from the Beijing-backed Regional Comprehensive Economic Partnership, he is proposing further talks on a free trade agreement between China, Japan and South Korea that does not include the United States.

At the same time, almost 70 countries have signed up to China's cross-border Belt and Road infrastructure initiative. Although it would be politically difficult, Japan's greater involvement in the Belt and Road would be a major boost for the region. This could mirror the extended co-operation between the Asian Development Bank, in which Japan plays a major role, and the China-led Asian Infrastructure Investment Bank, from which both the US and Japan are absent.

---

*This article first appeared in OMFIF Commentary on January 17, 2018.

*Adam Cotter is OMFIF's Head of Asia. David Marsh is Member of IMI International Committee and Chairman of OMFIF.

For all the strength and wealth Beijing and Tokyo accumulated, since 1800 neither has been powerful enough to claim regional dominance. Japan's failed bid for east Asian hegemony during the second world war, its destruction and subsequent economic reconstruction has been a development no less significant than China's renewal under communism and its more recent capacity to influence global financial markets.

As Chinese and Japanese interests become progressively aligned in technology, finance and industrial development, they might be able to reconcile and work together towards greater regional co-operation. Setbacks along the way are probable – but the future path seems increasingly clear.

IMI International Monetary Review

Tokyo Rethinks Renminbi Co-operation*

By ADAM COTTER AND DAVID MARSH*

Japan's two-year period of relative economic buoyancy combined with yen weakness and worries about US unilateralism are both factors behind the apparent rethinking in Sino-Japanese attitudes on currency co-operation.

Following the renminbi's inclusion in October 2016 in the special drawing right, the International Monetary Fund's composite currency unit, Japan has been conspicuously absent from the general fanfare relating to the renminbi's internationalisation. Prominent Japanese financial figures stated, in private at least, that the currency's SDR inclusion was premature.

However, in the light of the renminbi's stability against the dollar over the last 12 months, coupled with Japan's weaker yen policy as part of Prime Minister Shinzo Abe's bid to break out of deflation, the mood seems to be changing.

With Chinese financial markets gaining depth and liquidity, a shift appears underway towards enhanced co-operation, including on maintaining a stable bilateral monetary and financial relationship.

The changing attitude is reflected in four key areas. In the first, the two sides are showing greater interest in joint work on currency internationalisation. As a result of Japan's prolonged economic stagnation, the yen's internationalisation slowed abruptly in recent years, while China has been making greater efforts to increase the use of renminbi.

Moves now appear under way to harmonise the two sides' approaches, driven by mutual awareness of the negative repercussions for each other's economies of problems in their business and financial environments. One such example was an appreciation of the yen and falling Japanese stock prices when Chinese capital outflows increased in mid-2015, leading to tighter Chinese exchange controls.

Worries about possible dollar liquidity shortages as the US pursues monetary policy normalisation are another factor encouraging both countries to take steps to lower over-dependence on the dollar. This ties in with a general desire for both yen and renminbi internationalisation to match the increase in regional trade and in Asian financial co-operation.

Bilateral portfolio investment represents a second area of enhanced interaction. Japanese portfolio investors are stepping up trading on Chinese stock markets, and are looking to increase access to China's bond market, the third largest behind the US and Japan. Financial authorities in Tokyo and Beijing have agreed on a framework for Japanese companies to issue renminbi-denominated bonds in China.

Third, both countries are enhancing co-operation over swap lines with other central banks. China and Japan are logical commercial and financial partners. In view of a shared sense of economic and financial vulnerability, they have responded with regional initiatives like the Asia Bond Markets Initiative, Asian Bond Fund and Chiang Mai initiative multilateralisation, all of which work to deepen economic and financial integration in the region.

China and Japan are the largest contributors to the CMIM, through which members of the Association of Southeast Asian Nations and 'Plus Three' grouping, which includes Japan, China and South Korea, have agreed to extend swap lines and credits to one another. Most of these

*This article first appeared in OMFIF Commentary on January 31, 2018.

* Adam Cotter is OMFIF's Head of Asia. David Marsh is Member of IMI International Committee and Chairman of OMFIF.

arrangements are specified as swaps of local currencies for dollars, but four (China-Japan, China-Philippines, China-South Korea, and Japan-South Korea) involve the partners' local currencies. The bilateral swap line between Japan and the Philippines enables the Philippines to swap its local currency against yen, in addition to dollars.

Fourth, Japan, initially reluctant to take part in the Beijing-led Asian Infrastructure Investment Bank and in the cross-border Belt and Road initiative, has in recent months indicated it is ready to co-operate with these projects. Abe stated that Japan may consider joining the AIIB under certain conditions.

A visit to Xiamen in December by the secretaries general of Japan's ruling coalition parties illustrates the progress being made in Sino-Japanese relations. Following meetings with Chinese officials, the representatives issued a joint proposal that their countries should seek ways to co-operate on substantive projects, including environmental and infrastructure initiatives. If Asia's two largest economies are able to collaborate in this way, the entire region will feel the benefits.

IMI International Monetary Review

China Downgrades Treasuries

Global Markets Ignore US Debt Risks*

By HERBERT POENISCH*

China's surging global influence is like the rising tide: barely noticeable but steady. However, once it reaches fundamental structures, such as US Treasuries, the lynchpin of the financial system, western policy-makers should pay attention.

The western view of the rating of Treasuries has been rather benign. The Big Three rating agencies have awarded Treasuries top grades, with only one reducing this rating by one notch because of concerns that the US was approaching its debt ceiling, the total amount the government is authorised to borrow. However, western and eastern ratings are increasingly at odds. China's most prominent rating agency, Dagong Global, downgraded Treasuries to BBB+, with a negative outlook, in early 2018.

In its justification, Dagong states that the US administration has difficulty focusing on the management of the economy, federal debt is escalating and recent tax cuts reduce the government's ability to service its debt. The growing gap between government revenues and the debt means the US government is badly prepared to face the next crisis. It cites weakening repayment ability as one reason for the negative outlook.

It seems as if global financial markets are ignoring warnings that the credit risk of US government liabilities is not being assessed properly. Renegotiation of Treasuries is not a prime concern, but there will be large ramifications for the financial system if their value is reassessed. There will be direct losses for those who hold Treasuries, but they also serve as collateral for myriad other financial transactions. According to the rules of the Securities and Exchange Commission, the US regulator, Treasuries can cover up to 95% of any borrowing.

For the moment, China is a lone voice, but Dagong is determined to take on the complacent Big Three. Global financial markets have not heard enough alternative views, particularly on credit markets.

The largest holders of Treasuries might take a direct hit from the deteriorating credit risk. Out of a total of $6tn, China held close to $1.2tn and Japan $1.1tn at the end of 2017. Hong Kong holds a sizable $200bn. In addition, most countries added to the stock of US Treasury securities in 2017.

Most creditors of the US Treasury agree that the dollar has to be replaced as the world's dominant reserve currency in the long term. In the short term there are a few options. Given that US interest rates are likely to increase and the country will need to borrow more, returns will inevitably have to rise, perhaps also reflecting the deteriorating credit rating. Holding higher yielding securities offers some relief, but they are still paid in the same depreciating currency.

If US creditors were to look for real value, it is an option to purchase resources anywhere in the world for dollars. China is already doing this. It is buying real assets around the globe, ranging from mines to ports.

Those wanting to dump Treasuries might explore swapping US debt for US equity, where the Committee on Foreign Investment in the United States permits. If more holders of Treasuries go

*This article first appeared in OMFIF Commentary on April 5, 2018.

*Herbert Poenisch is a Member of IMI International Committee and Former Senior Economist of BIS

down this road, the committee might become overburdened with approval requests. If the promised US recovery materialises, it might be a better choice to target real returns rather than illusory financial ones.

IMI International Monetary Review

Nation Must Invest More in the Future*

By QU QIANG*

The European Union recently issued its 2017 research and development scoreboard. According to this, China had the fastest-growing investment in R&D, compared with traditional international front-runners like the United States, the European Union and Japan. This is not surprising, given China's growth in the past four decades. Technology, the most important driving force of a modern economy, and the related investment, is playing a vital role in this process, as the country's demographic bonus and low-cost advantage gradually fade away. There is a significant nationwide consensus that being more tech-savvy makes China a more important and sustainable economic heavyweight, leaving aside the fact that technology provides probably the only solution to all of our potential long-term concerns.

Therefore it is understandable that among the most enthusiastic tech investors there are not only high-tech internet companies like Tencent, Alibaba and Baidu, but also State-owned giants such as PetroChina, China Railway and Shanghai Automobile - with on average 1.5 billion euros ($1.8 billion) spent on R&D by the top 10 Chinese players last year. China has become home to the world's largest internet market and high-speed railway network, renewable energy application and competitive space technology, served by the country's leading corporations.

It did not achieve this overnight, but zigzagged a long way before eventually catching up. Before the 2000s, the country's economic surge greatly relied on its large reserve of natural resources, its enormous young and low-cost workforce and institutional liberalization. However, as its economy reaches a new stage, younger, better-endowed competitors are rising, and China's old ways do not pay off like before. China, more than ever, has realized that only by grasping core technology and groundbreaking innovation can it leap to new heights. Hence, about 20 years ago, some Chinese companies, mostly internet and manufacturing players, started their unique pilgrimage toward innovation, copying then improving - finding a foreign best-seller and reinventing some of its features and functions to make it a better fit in China. The success of these products and the companies' later IPOs brought them their first bucket of gold, paving the way for the true, independent, yet money-burning R&D of the future.

This doesn't just apply to businesses. The government of China is the most important funder of R&D, especially fundamental research. In the past five years, the government's average expenditure on R&D has reached more than 1.3 trillion yuan ($206 billion; 168 billion euros) annually. The funding gap is getting smaller between China and other leading countries. Moreover, in specific areas, such as computer chips and artificial intelligence, China's public and private funding together are already taking the lead in the international arena. The Chinese government and businesses are learning to play smart, leveraging international capital to help with R&D through joint ventures and inter-government projects.

Besides funding, talent is also a key factor. Education has been at the top of the national agenda since the late 1970s, with special attention being paid to science. With more than four decades of development, China has accumulated one of the largest teams of professional talent. Since 2004, China has graduated the largest number of engineering students in the world - more than the United States, the EU, Japan and India.

---

*This article appeared in China Daily European Weekly on February 16, 2018.

*Qu Qiang is a Research Fellow of IMI and Beijing Foreign Studies University. The views do not necessarily reflect those of China Daily.

China not only has the largest talent reserve but it also competes at the highest level. In the hottest areas such as deep learning, Chinese effective research papers rank No 1 in the world, and their Chinese authors are world-renowned experts. It has also become a trend for China to show more interest in international talent. An increasing number of the world top-class researchers are coming to China. More R&D cooperation is also on the way between China, the US and Europe, led by their governments and universities.

Beyond funding and talent, China also has the upper hand in other areas, such as research infrastructure, data and technology transfer. In many Chinese universities and research institutions, the equipment used in experiments is second to none. With a large market and user base, Chinese businesses are able to acquire more data to feed their deep-learning models, to improve their calculation methods, which in return gives them an advantage against international competition.

However, we also need to be clear that China, although growing fast, still lags a long way behind some global champions.

According to the EU's report, the world's top five companies, including Volkswagen and Microsoft, have annual R&D budgets that average more than 12 billion euros. Only one Chinese company, Huawei, is able to rub shoulders with the big boys in the 10-billion-euro club. Next comes Alibaba, which only invests 2.3 billion euros a year.

Most Chinese R&D is concentrated in the area of information and communications technology, manufacturing and industrial engineering, but industries that require larger and longer investment and carry with them more uncertainties and risks - such as pharmaceuticals and medical research - remain under funded.

We remain not fully involved in the international R&D community. In the past 20 years, we followed and got closer. Now it is time to think about going beyond.

IMI International Monetary Review

China's Supply-side Structural Reforms for Sustainable Growth in the New Normal Era*

By HYUN SANG BAEK*

One of the key words of the Chinese economy in 2018 is "supply-side structural reform" (SSSR). China's economic growth rate reached 6.9% in 2017, rebounding for the first time since entering the New Normal (新常態) era of China, and climbing higher than previous forecasts by international institutes. The Chinese government held a briefing on how SSSR is one of the main causes of good performance, and presented to implement SSSR as one of its key tasks in 2018 at the Central EconomicWork Conference, held in December 2017.

Supply-side structural reform is an unfamiliar term not found in economics. It refers to one of the macroeconomic policies of the Xi Jinping administration that have been employed since November 2015. China's supply-side reform largely differs in their background and implementation from Reaganomics, which was based on the supply-side economic policies carried out by the United States in the 1980s.

The background of SSSR is related with the Chinese economic development model and its macroeconomic policy. After the reform and opening up, the Chinese economy was able to achieve rapid growth by playing the role of the global manufacturing factory, producing and exporting low added-value products by combining the low wage labor force of China and foreign capital and technology. Also, the Chinese government faithfully carried out fiscal and monetary policies to adjust aggregate demand, based on the theory of Keynesian economics. However, while the global factory model and macroeconomic policies to adjust aggregate demand may be beneficial to the quantitative growth of the economy, the elements of qualitative growth — such as the enhancement of corporate technology and competitiveness, human capitalization of labor force, and creation of new growth engines — have failed to achieve great development.

In response to the global financial crisis in 2008, the Chinese government implemented large-scale expansionary monetary and fiscal policies. At this time, the capital released on the market came to be concentrated on state-owned enterprises (SOEs) in real estate and infrastructure, which do not contribute to the qualitative development of the Chinese economy, thus exacerbating structural problems. In this process, overcapacity in some sectors, such as the steel and coal industry and real estate, has created a transmission mechanism from serious overcapacity, drop in yield, surging debt and finally to financial risk that seems to threaten the national economy. These developments have led to Western economies raising the view that the Chinese economy is likely to fall into a middle-income trap, and this pessimistic view of a Chinese economic crisis has spread.

Under these complex and difficult circumstances, the Chinese government needed to reestablish its economic policies for the New Normal era, and it became necessary to propose a solution to the middle-income trap, as referred to by Western economists. The Chinese government recognizes that an economic stimulus package focused on aggregate demand will further deepen the existing structural contradictions, such as expansion of the inefficient

*This article first appeared in KIEP Opinions on February 14, 2018.
*Hyun Sang Baek, Ph.D., Research Fellow, China Team, Korea Institute for International Economic Policy (KIEP).

state-owned sector, expansion of real estate stocks and overlapped investment in infrastructure. In addition, the Chinese government acknowledged that it has entered the era of New Normal, referring to the medium-speed growth it has seen from 2012, and declared that it would not use artificial stimulus measures, while emphasizing that state-owned sectors including SOEs, local governments, and state-owned commercial banks were needed to adapt to the medium-speed growth era, and in this process SSSR was proposed.

According to economics theory and experience from the Western countries, on the supplyside there are few macroeconomic policy tools implemented by the government. Since the main players in supply are the households and firms, the government plays an indirect and long-term role, such as tax reduction, deregulation, education and R&D policies. In contrast, the Chinese government can control the public sector, which plays a leading role in the Chinese economy. In other words, the distribution of production factors such as land, resources, capital, technology and institution can be distributed according to the directions and strategies of the Chinese government. In this sense, SSSR is a macroeconomic policy frame created by the Chinese government based on the Chinese economic reality, which was not foreseen in any existing economic theory.

The objective of SSSR is to reduce ineffective and low-end supply, and expand effective and middle-high end supply to meet the market demand through improvements in productivity realized by the efficient allocation of production factors. This allows China to shift from a factor input-driven model to an innovation-driven growth model and preventing the transfer of real sector problems to financial risks. To achieve these goals, all measures related to the improvement of supply productivity can be included in the contents of SSSR such as monetary and fiscal policy, real estate, population, education, R&D, financial system reform, administrative simplification and corporate cost reduction.

As such, there is a wide range of content related to SSSR, regarding which the Chinese government has placed priority on the urgent fields that have a big impact on the macroeconomic economy or are likely to transfer to financial risks. From 2016 to 2017, China implemented supply-side reform, focusing on its five main tasks (3 去 1 降 1 補), which are cutting overcapacity, destocking property inventory, corporate deleveraging, lowering corporate costs, and improving weak links. As the supply-side reforms have been successful in reducing overcapacity and destocking property over the past two years, the main tasks in 2018 are adjusted into three tasks (破立降), which are eliminating ineffective supply (破), creating new growth engines (立) and lowering real-sector costs (降). Specific details of supply-side reform will be adjusted in accordance with the progress and economic situation in the future.

To simplify, the supply-side reform will proceed in two stages. In the short term, it is likely to focus on reducing inefficient supply such as eliminating zombie companies through cutting overcapacity and corporate deleveraging. These problems are also related with transfer into financial risks. In the long term, the focus will be more on expanding efficient supply such as tax reduction for lowering corporate cost, deregulation and creation of new growth engines, which are in line with supply-side economics like Reaganomics.

So far, the Chinese government's diagnosis of the Chinese economy and prescriptions for short-term issues in the new normal era seem appropriate. And as the second five-year term of President Xi Jinping has started, it is expected that SSSR will be carried out more intensively. However, the reforms of SSSR over the past two years have been used by the Chinese government in the past to solve overcapacity of SOEs, real estate problems, and SOE reform. The key to success or failure of SSSR is whether the global competitiveness of SOEs is enhanced, whether the efficiency of production factors is enhanced and whether new growth engines are created. Furthermore, the mass unemployment problem in the process of eliminating

zombie companies, and the ability to attract the cooperation of SOEs and local governments, seems to be a real challenge for SSSR. If supply-side reforms proceed appropriately, China's economy in the new normal era will take another leap forward, which will provide an opportunity to shift from a catch-up strategy to an innovative leading country.

April 2018
Vol.5, No.2

RMB Internationalization

The Resumption of High-Quality RMB Internationalization and the Financial Risk Control

By E ZHIHUAN*

At the beginning of 2018, spillover effects of monetary policies from major economies triggered simultaneous fluctuations in global financial markets. Persistent systemic risks revealed the intrinsic drawbacks under the existing global monetary system led by the US dollar. Diversification of global monetary system should proceed at a faster pace. Meanwhile, RMB internationalization has entered a new stage of development. In January 2018, the People's Bank of China (PBOC) improved and optimized policies for cross-border RMB business. The policies sent out positive signals, which would support cross-border RMB settlement by enterprises, facilitate foreign institutional investors to use the RMB for direct investment, and promote RMB business for individuals. Control measures on cross-border fund flows, especially some temporary administrative measures, are likely to ease gradually given receding depreciation pressure on the RMB. This will provide favorable conditions for the resumption of RMB internationalization.

Financial risk control determines the potential of RMB internationalization

With deepening integration with the global financial system, China's financial markets will engage complex global market environment directly and be subject to a variety of external shocks. As a result, risk control plays a crucial role in financial market opening.

While external risks escalate, financial risks in China's economic development are becoming more prominent. Total debt to GDP ratio climbed to 284% in 2017 from 277% in 2016. It requires tremendous efforts to reduce leverage ratio, while risks of shadow banking, property finance and internet finance continue to accumulate. Against this backdrop, there is urgent need to prevent and resolve financial risks through controlling leverage ratio, enhancing the adaptability of financial structure, increasing the capability of financial services to support the real economy, strengthening the development of mandatory constraint system and controlling systemic risks. The PBOC improved macro-prudential policies on cross-border fund flows and conducted counter-cyclical adjustments on capital flows. Moreover, the PBOC continued to deepen reform of the RMB fixing mechanism, based on market supply and demand dynamics and a basket of currencies, as well as adopting a managed floating exchange rate regime. Consequently, the RMB would be more determined by market factors with flexibility and maintain its stable status in the global monetary system.

Apparently, China's capability of controlling external and internal financial risks determines the potential of RMB internationalization. During the second half of 2017, market sentiment turned neutral with the RMB approaching equilibrium, and the central bank adjusts policy timely by relaxing a series of "temporary" and "transitional" cross-border macro prudential management measures, including removing the risk reserve ratio of foreign exchange and the requirement for foreign banks to set aside reserves for offshore RMB deposits in China. In 2018,

*E Zhihuan is a Member of IMI Academic Committee, Chief Economist, Bank of China (Hong Kong).

the expectation of RMB depreciation has reversed. The PBOC adjusted the counter-cyclical coefficient incorporated in central parity fixing model accordingly. The RMB fixing mechanism would be more liberalized, with more weight on market supply and demand dynamics. Theoretically, this would be favorable for promoting businesses related to RMB internationalization.

If systemic shocks occur in global financial markets, the stability of the RMB will be under new pressure, and the pace of RMB internationalization will be adjusted accordingly.

Four takeaways on the roadmap of RMB internationalization

First of all, RMB internationalization is a long-term strategy. Theory innovation and exploring the way of implementation are necessary regarding major topics on developing a modern economy. A theoretical framework should be built underpinned by macroeconomics and finance perspectives with a comprehensive and open approach. The basic roadmap of RMB internationalization is to persist in liberalization reform in foreign exchange market, maintain the RMB's stable status in the global monetary system, resolve the systematic drawbacks under existing global monetary system led by the US dollar, provide an alternative option and new public goods from emerging markets, and offer a Chinese solution in order to promote a more robust and fair global monetary system.

Next, create room for RMB internationalization, following the trend of China's financial market opening, driven by policy while guided by markets. Technically, increasing the RMB's proportion in global exchange reserves and foreign exchange market cannot be realized in a short period of time. Instead, it is necessary to explore from multiple perspectives, such as cross-border trade and investment, encouraging third-party usage, etc. Consequently, the collaborating development of merchandise trade, investments and financial transactions will help formulate an effective roadmap for RMB internationalization.

In addition, demand for global asset management by domestic entities is likely to rise for an extended period of time. In China, the holding of foreign financial assets by private sector amounts to 27% of GDP. The ratio is significantly lower than 129% for the US and 147% for Japan. Therefore, the scale and structure of capital flows will continue to adjust and optimize, and the factors affecting RMB internationalization will be more diverse. A bottom line mindset with core value of controlling financial risks is needed. In-depth analysis on relevant policies and potential market impacts should be taken when making major policies.

Finally, RMB internationalization is a major topic of global monetary system. The objective of RMB internationalization implies that China will take more responsibility on maintaining the stability of global financial system and play a proactive role in globalfinancial governance. Accordingly, policy collaboration between domestic and foreign markets, taking into account the interests of domestic and foreign entities, should be emphasized in order to promote RMB internationalization progressively.

Advancing RMB Internationalization*

By XIA LE*

Progress of the Chinese currency is inevitable, and advantage should be taken of the current situation to further the cause

After a couple years of stagnation following the renminbi's unexpected devaluation in August 2015, the internationalization of the Chinese currency has recently gained momentum in tandem with the country's strong growth recovery.

A number of encouraging signs have surfaced. First, foreign investors' renewed interest in "Dim Sum" bonds, the RMB-denominated bonds issued in offshore markets, has lured more issuers to raise money in the niche bond market. Some new issuers of Dim Sum bonds are from other emerging markets, such as the Philippines and India, suggesting that the authorities' push for RMB internationalization has attracted increasing attention from advanced economies as well as China's emerging market peers.

Second, the total value of RMB deposits in Hong Kong has seen a gradual but steady recovery since it hit a six-year low in March last year. As of the end of 2017, it stood at 560 billion yuan ($88.9 billion; 72.7 billion euros), registering the first annual growth in the past three years. The recovery trend is significant, given that the value of offshore RMB deposits has long been regarded as an important indicator to gauge the extent of the internationalization of the Chinese currency. The resumed growth of offshore RMB deposits will largely boost foreign investors' sentiment.

Last but not least, Germany's central bank said in mid-January that it will include the RMB in its currency reserves, giving the Chinese currency's international stature a boost. Indeed, the European Central Bank already holds the yuan as a reserve currency, and the International Monetary Fund approved its inclusion in the Special Drawing Rights Basket in 2016. The German move has reflected the increasing acceptance of other countries' public sectors toward the RMB, which will sequentially encourage its use in the private sector worldwide.

Lurking behind the recent progress of RMB internationalization is the strong performance of the currency. Due in part to the unexpectedly sluggish dollar, the yuan has gained almost 10 percent over the past year. In the meantime, the Chinese authorities' clampdown on illegal capital flight and effective implementation of certain tightening measures under the capital account have turned outflows of China's balance of payments into inflows again. Moreover, the ongoing domestic financial deleveraging process has pushed up the level of market interest rates. As such, funds have been lured to flow back to China from other major economies where the zero policy rate can only offer modest returns for investors.

That said, the RMB seems to be in a sweet spot nowadays. The stabilized expectation of the exchange rate attracts funds to domestic financial markets for higher returns. Consequentially, fund inflows boost demand for the currency in the foreign exchange market and further anchor exchange rate expectations.

The tail wind from the stabilized exchange rate is welcome but past lessons told us to keep a cool head. Indeed, the momentum of RMB internationalization was even stronger in the period of 2010-15 when the currency's one-way expectation of appreciation spawned strong speculative

*This article appeared in China Daily European Weekly on February 16 2018.

* Xia Le is chief economist for Asia at BBVA, and a senior research fellow of IMI. The views do not necessarily reflect those of China Daily.

demand for RMB assets in the onshore and offshore markets alike. However, after exchange rate reform in August 2015, this expectation largely gave way to two-way movement. Suddenly, dampened speculative demand evaporated market liquidity for the RMB and gave rise to several rounds of market turmoil. RMB internationalization was stuck in the doldrums in the following years until its recent rebound.

We firmly believe that the RMB still has a long way to go before it becomes a global currency in a real sense. The cyclical moves of the exchange rate could lead to variations in the progress of the RMB internationalization. But there is no reason for people to oscillate between states of excessive optimism and excessive pessimism. A crisis should never be wasted, and neither should a tail wind. The current benign external environment, in particular the combination of a weak dollar and strong global recovery, provides a new window to push forward some institutional changes so as to lay solid foundations for RMB internationalization on a sustainable basis. Moreover, some existing strategies of RMB internationalization need to be fine-tuned in parallel with the external environment.

First of all, despite other central banks' and sovereign funds' renewed interest in RMB assets, there remains great room for the currency to grow its market share in global foreign reserves. The IMF COFER database reports that RMB-denominated assets grew from the equivalent of $91 billion at the end of 2016 to $107 billion in the third quarter of 2017. Accordingly, the share market of RMB-denominated assets grew from 0.78 percent to 0.96 percent of the global total of foreign reserves. However, such a figure is not only below its designated weight in the Special Drawing Rights Basket (10.92 percent), but also lower than the shares of some non-SDR currencies, such as the Australian and Canadian dollars.

On the flip side, China's authorities can further the opening of the domestic financial market to accommodate the increasing global demand for its currency. In particular, the opening of the domestic bond market is crucial as other countries' appetite for the RMB-denominated assets mainly focuses on liquid "safe assets", such as bonds, rather than equity products. In this respect, Chinese regulators have already opened the domestic bond market to foreign institutional investors, including central banks, sovereign funds, insurance companies, pension funds, commercial banks and the like. Moreover, regulators on the Chinese mainland and in Hong Kong have recently launched a China Bond Connect program, which will provide an additional channel for global investors to invest in China's domestic bond market through Hong Kong, the prime offshore RMB business hub.

However, given the strong exchange rate and increasing appetite for the RMB-denominated assets, the one-way opening of domestic financial markets to global investors could introduce excessive appreciating expectations, which could further take a toll on the competitiveness of the export sector. Therefore, it is desirable for the authorities to relax some restrictive measures under the capital account to allow for capital outflows in certain forms so as to balance capital outflows and inflows for the purpose of exchange rate stabilization.

Second, China's authorities should take advantage of this opportunity to overcome some institutional constraints in the process of internationalizing the RMB. One conspicuous example in this respect is that the dollar continues to be the major denomination currency of the global commodity trade. Over the past decade, China has become the largest consumer of energy and commodities including copper, iron ore, aluminium, lead, zinc, nickel and rubber. However, for historical reasons, all major commodities are still settled in dollars, which hampers the use of the RMB in China's commodity trade with other partners.

To a certain extent, the current weak dollar has enabled the RMB to erode the greenback's market share in denominating commodities. The stable exchange rate of the RMB is expected to

arouse the interest of commodity exporters in accepting it as a settlement currency. As such, the process of RMB internationalization is expected to be injected with new impetus.

In the same vein, RMB internationalization can also benefit from China's launch of the Belt and Road Initiative. The stable value of the currency will make it much easier for China's Belt and Road partners to use it in their project financing and trade settlement, which will further boost the market share of the RMB in the international monetary system.

It is only a matter of time before the "redback" gains global currency status. The authorities should deploy measured strategies to advance the currency's internationalization process and carefully guard against risks.

Digital Economy

Digital Economy Offers Exciting Prospects*

By BEN SHENGLIN AND CHEN XUERU*

From China's experiences, less-developed countries can see how technology changes lives and transforms societies

The digital economy is usually defined as economic growth that has been driven by innovation of information technologies. So the digital economy could be shown in the information industry and digital industry development that are brought by technology innovation in basic telecommunication service, software services and internet technologies.

To a larger extent, the development of the information industry and digital industry also bring new growth modes for other sectors, including agriculture, industry and services.

The digital economy is large and the key to global economic growth. By the end of November, seven of the world's top 10 listed companies that had the highest market value belonged to the digital economy. Tencent and Alibaba, two representatives of China's rapid growth in the digital economy, were among the top 10.

From a global perspective, China, as the second-largest country in terms of the size of its digital economy, has been growing rapidly in this sector. In the past 20 years, China's digital economy has grown by 25.1 percent annually - about three times the growth rates of the United States, Japan and the United Kingdom.

After 20 years' development, China has become the global leader in many sectors of the digital economy and has rich innovation experience. In 2015, Chinese online retailers' trade value was less than 1 percent of that of the whole world. By now China's online retailers' trade value accounts for about 42.4 percent of the global total. In the mobile payment sector, China in 2016 surpassed $790 billion (647 billion euros), which is about 11 times that of the US. In the financial technology sector, Chinese investors' total investment volume exceeds $7.1 billion, compared with the US' $5.4 billion.

The development of the digital economy has also gradually changed our lifestyles. During the Singles Day in 2017, online sales revenue topped 250 billion yuan, and about 91 percent was paid through mobile phones. Behind these huge figures are the development and innovation in payment technology. Chinese technology companies have used strong technology innovation and data processing abilities to push forward the development of the digital economy. A big group of Chinese technology companies, including Alibaba, Tencent, Huawei and Xiaomi, also went abroad.

Undoubtedly, in the digital economy and related areas, China has great opportunities and exciting prospects, due to such factors as the big Chinese market, technological progress, rich capital from China and overseas, and the great ecosystem for innovation in the past few years.

---

*This article appeared in China Daily Africa Weekly on January 19, 2018.

*Ben Shenglin is executive director of IMI and founding dean of Zhejiang University Academy of Internet Finance. Chen Xueru is a PhD student at the School of Management of Zhejiang University. The views do not necessarily reflect those of China Daily.

In the future, data will become the most important resource, and China's large population and market will also present advantages in data resources. Moreover, an increasing number of new scenarios of digital economy will come into our daily lives, with digital retailing, digital social networking and digital finance more profoundly affecting lifestyles and social progress, and China will definitely play a leading role in this sector.

While helping countries and regions involved in the Belt and Road Initiative to realize digital transition, the training of digital skills and construction of infrastructure are of equal importance. Only when digital skills of people in these countries and regions have increased will smartphones and other digital devices be able to function there. Although the infrastructure of India is relatively poor, the payment software Paytm nonetheless has rapidly gained more than 200 million users. Kenya's infrastructure is also bad, but it also has advanced technology in the mobile payment sector. Experience shows that digital finance is very likely to be developed in the less-developed regions and will develop on a large scale once the opportunities arise.

The digital economy has led us into a new age, and China's experiences in the digital economy sector show that digital economy can change our lives and offer opportunities for less-developed countries to overtake other countries in this sector. In the future, China will definitely innovate more in this sector, and fintech enterprises and digital economy companies should seize the opportunities and take the challenges to make breakthroughs.

IMI International Monetary Review

Fintech Requires New Ways of Thinking*

By YANG ZAIPING *

Regulation will be needed in the brave new world of finance - but flexibility is essential to gain the full advantages of technology

Finance has a huge impact on the development of real economy. It can serve society, constantly improve people's livelihoods, activate microeconomics and stabilize macroeconomics.

The history of the development of the finance sector has involved continuous innovation. Financial innovation is highly related to technological development. From the historical perspective, the finance industry has always firstly adopted the latest achievements in information technology, and it is always an industry with high-tech content. Every innovation development in the finance sector is related to technological development. If we look at methods of payment, from establishments providing bodyguards to escort transactions for a fee, to bank notes, to checks, to bank cards, to ATMs, to POS machines, to internet finance, to mobile payments and Wechat payments ... every step has been closely driven by technology, especially the development of information technology.

Fintech, internet finance, big data, cloud computing, blockchain and artificial intelligence - technologies that have been widely discussed - could be technologies that affect financial development. In 2016, there were 504 investments in the global fintech area, and total financing revenue in 2015 was $19.1 billion. In 2016 that reached $113.5 billion. In 2016, the financing revenue of Chinese fintech companies accounted for more than 50 percent of that of the global fintech companies, and for the first time surpassed that of the United States.

Whether fintech will replace traditional finance is an issue that has drawn wide attention from the global financial sector. Bill Gates once said: "In the 21st century, the traditional commercial banks would become a group of extinct dinosaurs." I think traditional financial institutions that reject fintech will become history, while the new finance bodies that has adopt fintech will become the new players.

The essence of finance is the cross-space trading of values. In the best cases, finance can help cross-space resources to be allocated in the most efficient way. But in the real life, cross-space resource allocation is not done in the most efficient way, and barriers mainly lie in factors such as space restrictions, incomplete information, information asymmetry, high risks and high cost. The advantage of fintech is in breaking the barrier of time and space, enabling information to be better shared, reducing costs and recognizing risks.

So new finance should make best use of fintech and bring about a comprehensive transformation of traditional finance.

However, some people think if they register with some websites or build online platforms they will be able to work in the financial business, which is a fantasy. If they think new finance doesn't have to follow the rules of financial sector and can grow wild that may not be finance. As for activities that are using internet for illegal fundraising or fraud, they are definitely illegal and should be banned.

---

*This article first appeared in China Daily on January 26, 2018.

*Yang Zaiping is member of IMI Academic Committee and the secretary-general of the Asia Financial Cooperation Association, and former deputy president of the China Banking Association. The views do not necessarily reflect those of China Daily.

In the best finance, where risks are regulated, the cross-space trading will boost the effective allocation of resources and make maximum profit. It will require the best financial solutions, financial tools, financial products, financial markets and financial organizations to help realize that goal.

So workers in the financial sector should understand the essence of best finance, follow the rules of the industry and then have freedom in this business.

However, new finance that is integrated with fintech faces a dilemma of regulation. On the one hand, workers in new finance would like the risk regulators to grant them credit and adopt them as an official part of the financial sector, but they are not used to the many rules and restrictions and tend toward barbarous growth. On the other hand, the risk regulators might either ignore the risks inside new finance, or strictly stick to the current rules without making adjustments. So at the beginning, there has been a lack of regulations and wild growth in new finance, which has caused many financial fraud issues, such as in the online peer-to-peer lending sector. Since 2016, regulations have been tightened but too-strict regulations could also restrict the longterm development of the fintech and new finance.

So both sides should work together to push forward the boosting of new finance. Risk regulation is needed to protect consumers' rights and to fight against financial fraud. Workers in new finance should follow the rules of the financial industry and accept regulations, rather than trying to avoid them.

Meanwhile, financial risk regulation should be more professional, scientific and effective, otherwise it cannot help fintech to be used to be best advantage in the financial sector or maximize the potential of this industry.

Risk regulators should put fintech under regulation. They cannot ignore it, or only see parts of it. They should also research the characteristics of fintech, learn about its rules and then make new regulating solutions based on its features and development rules. The regulators should recognize and encourage mature technologies to be applied in the financial sector, such as blockchain. They should also tolerate unsystematic risks in the early stages, and encourage industry associations to practice self-discipline and self-regulation.

All in all, new finance will require the regulators to adopt and tolerate new technologies such as fintech, which is an important trend. Both workers in financial industry and risk regulators should be aware of that and work together to boost the development of new finance.

IMI International Monetary Review

Working Paper

Changing Patterns of China's Growth*

By JUAN CARLOS MARTINEZ OLIVA*

This paper analyzes the sectoral shifts which occurred in China in the period 1980-2015. This is done by highlighting the main features in the patterns of growth and productivity of the Chinese economy. The analysis, based on Chinese official statistics, points to the fact that China's transition from the stage of deep industrialization towards a growth pattern based on the services sector is under way, but might take long to complete. However, it is argued, the process might be shorter than expected in view of the broad scope for expansion in financial services, and of China's extraordinary track record as a fast reformer.

Keywords: China; growth; productivity; sectoral analysis

1. Introduction

The reform process started in 1978 by China's leader Deng Xiaoping paved the way to a broad structural transformation in the Chinese economy. Rural liberalization initially encouraged the establishment of local entrepreneurship activities and the beginning of migration towards the new "special economic zones", and state enterprises. Growing flows of mostly young workers from the countryside later started to migrate from rural areas to the cities starting from early nineties. The transformation of China into a market economy, and its progressive integration within the world economy demanded larger and larger proportions of workers engaged in industrial activity. That unprecedented mass migration of workers from less to more productive activities contributed to the rise of aggregate growth and productivity[13].

As a result of labor reallocation China's economic transition was a striking success. In 1978 China represented 2.2 percent of the world's GDP. That figure recorded an eightfold increase to more that 16 percent in 2016, a performance never recorded by a rising economic power in previous historical experience.

The transition of Chinese economy from an emerging to a developed economy is still in progress. This paper aims at assessing the situation in the light of the most recent trends, and in view of the task, reiterated by authorities in recent years, to make the service sector the main driver, led by consumption, of the Chinese economy. This is performed by analyzing the sectoral shifts occurred in China in the period 1980-2015, by using a number of tools aimed at

*IMI Working Paper No. 1801 [EN].

*Juan Carlos Martinez Oliva, Senior Director for Economics, Statistics, and Research, Bank of Italy, Member of IMI International Committee. The author wishes to thank Gemma B. Estrada, Jesus Felipe, Yasuyuki Sawada, and other participants in a seminar at Asian Development Bank where this work was first presented on June, 26, 2017, for helpful remarks. The opinions expressed are those of the author and do not necessarily reflect the views of the Bank of Italy or of the Eurosystem. All errors are the author's.

[13]The positive net contribution to China's growth coming from the reallocation of workers from agriculture to non-agriculture has been estimated to be around 1.4 percent per year. (Ercolani and Wei, 2011)

highlighting the main features in the patterns of growth and productivity of the Chinese economy. The narrative that can be drawn from the official statistics points to the fact that China is already transitioning from the stage of heavy industrialization and manufacturing activity towards a growth model led by the services sectors. The data suggest that there is still a long way to shift to a service-led pattern of growth; but if one looks at the broad scope for expansion in financial services, and to the active policies undertaken in China to enlarge the opening of the economy, broaden the financial and currency markets, foster global communication, finance world infrastructures, then the transition might take shorter than expected.

2.GDP Decomposition in Supply Side Components

We start the analysis by decomposing GDP according to the following identity:

$$Y = \frac{Y}{L} \times \frac{L}{F} \times \frac{F}{P} \times P$$

Where Y is GDP; L is the number of workers (employment); F is the labor force; and P is population.

If we apply logarithms on both hands of the above expression, and differentiate we get:

$$\Delta Y / Y \quad \Delta \frac{Y}{L} / \frac{Y}{L} + \Delta \frac{L}{F} / \frac{L}{F} + \Delta \frac{F}{P} / \frac{F}{P} + \Delta P / P$$

The expression above represents the percentage change of GDP as the sum of the percentage changes of: productivity; the employment rate; labor participation; population.

Table 1a shows that labor productivity has been the main driver of GDP growth in 1980-2015. The employment rate (1-unemployment rate), can be disregarded, as it is a cyclical component. Participation rates, which grew at very high rates during the eighties, have stabilized in the 2000s. The rate of growth of population has declined from yearly rates close to 1.5 percent, to 0.5 percent, as an effect of the one-child-policy introduced in 1980 and scrapped in 2015.

Table 1a

China's real GDP growth decomposition in supply side components

Year	Y	Y/L	L/F	F/P	P
1980	7,9	4,5	0,1	1,9	1,2
1981	5,1	1,8	0,3	1,5	1,4
1982	9,0	5,2	0,2	1,8	1,6
1983	10,8	8,0	0,3	0,9	1,3
1984	15,2	11,0	0,1	2,4	1,3
1985	13,4	9,6	0,0	2,0	1,4
1986	8,9	6,0	0,0	1,3	1,6
1987	11,7	8,5	0,0	1,2	1,7
1988	11,2	8,0	0,0	1,4	1,6
1989	4,2	2,3	-0,1	0,5	1,5
1990	3,9	-11,2	-0,2	5,6	1,4
1991	9,3	8,0	0,0	-0,1	1,3
1992	14,2	13,1	0,0	-0,1	1,2
1993	13,9	12,8	0,0	-0,1	1,1
1994	13,0	12,0	0,0	-0,1	1,1
1995	11,0	10,0	-0,2	0,0	1,1
1996	9,9	8,5	0,0	0,3	1,0
1997	9,2	7,9	-0,2	0,5	1,0
1998	7,8	6,6	-0,6	0,9	0,9
1999	7,7	6,5	0,1	0,2	0,8
2000	8,5	7,5	-0,7	0,9	0,8
2001	8,3	7,3	1,1	-0,8	0,7
2002	9,1	8,4	-0,2	0,2	0,6
2003	10,0	9,4	0,1	0,0	0,6
2004	10,1	9,3	0,2	-0,1	0,6
2005	11,4	10,8	-0,6	0,5	0,6
2006	12,7	12,2	0,2	-0,3	0,5
2007	14,2	13,7	0,2	-0,2	0,5
2008	9,7	9,3	-0,3	0,2	0,5
2009	9,4	9,0	-0,3	0,1	0,5
2010	10,6	10,2	-0,8	0,6	0,5
2011	9,5	9,1	0,2	-0,2	0,5
2012	7,9	7,5	0,0	-0,1	0,5
2013	7,8	7,4	-0,2	0,0	0,5
2014	7,3	6,9	-0,1	0,0	0,5
2015	6,9	6,6	-0,2	0,0	0,5

Source: National Bureau of Statistics of China and Author's calculations.

Table 1b

China's real GDP growth (constant 2010 prices) and sectoral contributions

Year	Total	Agriculture	Industry	Services
1980	7,9	1,3	4,9	1,7
1981	5,1	3,3	0,3	1,6
1982	9,0	4,4	2,7	1,9
1983	10,8	3,3	4,4	3,1
1984	15,2	3,8	5,2	6,2
1985	13,4	0,1	5,5	7,8
1986	8,9	1,1	4,7	3,2
1987	11,7	2,8	4,9	4,1
1988	11,2	1,7	5,1	4,4
1989	4,2	0,4	0,8	3,0
1990	3,9	3,0	0,1	0,8
1991	9,3	-0,3	4,3	5,3
1992	14,2	0,3	7,8	6,1
1993	13,9	0,7	9,5	3,8
1994	13,0	2,7	6,0	4,3
1995	11,0	2,3	5,7	3,0
1996	9,9	1,6	5,0	3,2
1997	9,2	0,2	4,3	4,7
1998	7,8	0,6	2,3	4,9
1999	7,7	0,1	3,0	4,5
2000	8,5	-0,1	4,0	4,6
2001	8,3	0,5	3,0	4,9
2002	9,1	0,5	3,7	4,9
2003	10,0	0,3	5,8	4,0
2004	10,1	1,9	4,9	3,3
2005	11,4	0,1	6,5	4,9
2006	12,7	0,3	6,6	5,8
2007	14,2	1,1	6,0	7,1
2008	9,7	1,0	4,6	4,1
2009	9,4	0,5	3,3	5,7
2010	10,6	0,8	5,4	4,4
2011	9,5	0,8	4,4	4,3
2012	7,9	0,7	2,4	4,7
2013	7,8	0,6	2,1	5,0
2014	7,3	0,4	2,2	4,6
2015	6,9	0,4	0,7	5,8

Source: National Bureau of Statistics of China and Author's calculations.

3. Decomposition of Aggregate Labor Productivity

The category of productivity considered here is labor productivity, i.e. output per worker. To the ends of this paper, output per worker represents a simpler and more visible indicator than total factor productivity (TFP) to measure the consequences of inter-sectoral shifts. Indeed, TFP calculation heavily depends on how capital stock is measured and assessed. The range of TFP estimates for China is so wide that the necessity has arisen to categorize them under the two broad groups of "optimistic" and "pessimistic" views. The choice between the two views clearly

relies more on individual judgement than on objective evaluation[14]. Furthermore, recent research persuasively argues that the results from TFP calculations for East Asia are affected by methodological choices that reduce the relevance of such exercises, and therefore their use for analytical or policy purposes[15].

The approach utilized in this paper is amply widespread in literature. It takes different names and formulations, but it is fundamentally based on the economic interpretation that can be given to the expression obtained from applying the difference operator to the product of two variables in mathematics (see annex). This kind of decomposition, commonly named shift-share analysis (such as in Molnar and Chalaux, 2015), proves helpful to the task of decomposing aggregate labor productivity in various effects[16]. In the literature of labor productivity decomposition it follows the observation that a simple weighted sum of sectoral productivities fails to provide a complete explanation for aggregate productivity in one national economy (Denison, 1962). In this light, shifts in labor allocation across sectors may contribute to a more thorough explanation of aggregate labor productivity change.

The working assumption in the following decomposition is that real sectoral components are additive, i.e. their sum amounts to the aggregate output of the economy[17.] Accordingly, country's GDP can be decomposed as follows:

$$Y = \sum_{i=1}^{n} Y_i$$

where the aggregate output (GDP) is equal to the sum of the output of alln sectors.

Given the property of additivity, the difference of Y from time 0 to time t can be defined as:

$$Y_t - Y_0 = \Delta Y = \sum_{i=1}^{n} \Delta Y_i$$

Dividing the above by Y, we can define the percentage change of Y as a weighted sum of all sectors' rates of percentage change:

$$\frac{\Delta Y}{Y} = \sum_{i=1}^{n} w_i \frac{\Delta Y_i}{Y_i}$$

Where the weights $w_i = Y_i / Y$ represent the relative size of each sector i on aggregate GDP.

It now follows the decomposition of the growth rate of labor productivity.

According to the above, aggregate productivity, defined as aggregate real output per worker, can be defined as:

$$\frac{Y}{L} = \frac{\sum_{i=1}^{n} Y_i}{\sum_{i=1}^{n} L_i}$$

[14]For an extensive survey of the debate see Xu (2014).

[15]See Felipe and McCombie (2017). Felipe (1999), had previously criticized the neoclassical framework as a tool for evaluating TFP in East Asia, suggesting that the theoretical problems underlying the notion of TFP are so significant that the whole concept should be seriously questioned.

[16]In the context of the analysis of international trade, it is called, constant market share analysis, and it is used to describe if the allocation of a country's exports across its trading partners is optimal.

[17]This property descends from the fact that real output is calculated at constant prices using fixed base Laspeyres quantity and Paasche price indexes at both the aggregate and sectoral levels.

If we assume that $k_i = L_i / L$ (sectoral employment over total employment) and $y_i = Y_i / L_i$ (sectoral productivity) we obtain the following expression:

$$y_t = \sum_{i=1}^{n} k_{t,i} y_{t,i}$$

If we take the difference of y

$$y_t - y_{t-1} = \sum_{i=1}^{n} \left(k_{i,t} y_{i,t} - k_{i,t-1} y_{i,t-1} \right)$$

And using the following[18]:

$$k_{i,t} y_{i,t} - k_{i,t-1} y_{i,t-1} = y_{i,t-1} \left(k_{i,t} - k_{i,t-1} \right) + k_{t,i-1} \left(y_{i,t} - y_{i,t-1} \right) + \left(k_{i,t} - k_{i,t-1} \right) \left(y_{i,t} - y_{i,t-1} \right)$$

and dividing by y_{t-1}, we get:

$$\frac{y_t - y_{t-1}}{y_{t-1}} = \frac{1}{y_{t-1}} \sum_{i=1}^{n} \left(y_{i,t-1} \left(k_{i,t} - k_{i,t-1} \right) + k_{i,t-1} \left(y_{i,t} - y_{i,t-1} \right) + \left(k_{i,t} - k_{i,t-1} \right) \left(y_{i,t} - y_{i,t-1} \right) \right)$$

that is, rearranging for convenience:

$$\frac{y_t - y_{t-1}}{y_{t-1}} = \sum_{i=1}^{n} \left(\frac{k_{i,t-1}}{y_{t-1}} \left(y_{i,t} - y_{i,t-1} \right) + \frac{y_{i,t-1}}{y_{t-1}} \left(k_{i,t} - k_{i,t-1} \right) + \frac{1}{y_{t-1}} \left(k_{i,t} - k_{i,t-1} \right) \left(y_{i,t} - y_{i,t-1} \right) \right)$$

The expression above represents the decomposition of total productivity percentage change in three separated effects.

Following Nordhaus (2001), performing the above decomposition highlights that aggregate labor output per worker can be split into three components: a pure, fixed-weight productivity term which uses fixed base-year expenditure or output weights ("pure productivity effect"); a term that reflects the difference between current weights and base-year weights, and a third term which reflects the interaction between changing weights and relative productivity levels in different sectors.

The definition of the three effects in this paper follows the mainstream naming convention in the literature of labor productivity decomposition[19].

Accordingly, Nordhaus' "pure productivity effect" will be defined as a "within-sector productivity growth effect", henceforth WSPGE. It represents the direct effect descending from changes in productivity in individual sectors.

The second term, Nordhaus' "Denison effect", consistently with Denison (1962), will be named "static structural reallocation effect" (SSRE). It shows that aggregate output per worker can increase even when sectoral labor productivities remain constant, provided that labor moves from sectors with lower towards sectors with higher output per worker.

The third term, the so-called "Baumol effect" in Nordhaus' classification, after Baumol (1967) will be here referred to as the "dynamic structural reallocation effect" (DSRE). This definition highlights the changes in productivity associated with the reallocation of employment across sectors with different productivity growth rates. The sign of this effect is positive (negative) when labor moves towards (away from) a sector with higher (lower) labor productivity growth.

To better understand the features of WSPGE, DSRE, and SSRE it is helpful to note that:

[18] This property is expressed geometrically in the Annex.

[19] Such as, among others, Felipe et al. (2007), Usui (2011), De Avillez (2012), Dumagan (2013).

(1) When sectoral productivity is constant (i.e. $y_{i,t} = y_{i,t-1}$) WSPGE and DSRE collapse to zero, and aggregate productivity is entirely explained by $SSRE = \sum_{i=1}^{n} \frac{y_{i,t-1}}{y_{t-1}} \left(k_{i,t} - k_{i,t-1} \right)$ that is change in sectoral employment share. The implication is that the net sign and size of SSRE will be determined by the way labor force moves toward the sector (s) with higher-than-average productivity.

(2) When sectoral labor shares are constant (i.e. $k_{i,t} = k_{i,t-1}$), SSRE and DSRE collapse to zero (there is no sectoral shift). The aggregate productivity is only explained by :

$$WSPGE = \sum_{i=1}^{n} \frac{k_{i,t-1}}{y_{t-1}} \left(y_{i,t} - y_{i,t-1} \right)$$

that is to a sum of sectoral productivity changes, weighted by quotas of sectoral output, over total output.

4. The Data

Since China's fast economic expansion triggered a growing interest by analysts and academic scholars in the last two decades, its official GDP figures have been subjected to close scrutiny and heavy criticism[20]. These ranged from the suspicion that official statistics might be inconsistent with the evidence emerging from alternative indicators of economic activity to the concern that the figures might be hardly comparable with the equivalent statistics of other countries that follow uniform international standards[21].

In spite of the above, recent research suggests that recently reported Chinese GDP figures are no less reliable than it is commonly observed elsewhere (Fernald et alii, 2013). Official GDP data are found to display only few and acceptable statistical anomalies, supporting the view that the National Bureau of Statistics of China is fully reliable (Holz, 2014). In sum, China's official GDP data can be viewed as similar, in quality, to those of other countries[22].

With these considerations in mind, the data in this paper have been collected from the 2016 issue of the National Bureau of Statistics of China's Statistical Yearbook. Albeit not exempt from some problems, which will be considered in the following sections, such data are trusted in this paper as providing a true and realistic representation of the Chinese economy.

When computing sectoral output in real terms for China, one is faced with a serious difficulty. In the National Bureau of Statistics of China's Statistical Yearbook for 2016, there are six base years in the National Accounts Series, namely 1970, 1980, 1990, 2000, 2005, and 2010. For the period relevant to the present analysis, 1980-2015, constant price data are based on five different benchmark years, as linking of GDP has not been undertaken so far. If one follows the procedure to link the time series of GDP at constant prices, in every rebasing year[23], the results are inconsistent, because they lose the additivity property. Moreover, there are breaks in sectoral

[20] A detailed review of the debate on the reliability of Chinese GDP figures started by the "wind of falsification and embellishment" found in 1998 is found in Holz, 2014.

[21] The interest in thoroughly analyzing the Chinese economic structure, and an evident dissatisfaction or mistrust in what concerns official statistics, has induced some authors to recalculate specific subsets of Chinese macroeconomic data, so as to be compliant with a priori assumptions or models (see, inter alia, Maddison and Wu, 2008; Wu, 2014; Cheremukhin et alii, 2015; Chang et alii, 2015).

[22] This might not be necessarily reassuring if one considers the warnings of pioneers like Kuznets and Morgenstern against the reliability of national accounts statistics for quantitative analysis purposes.

[23] This procedure is consistent with the suggestion of the National Bureau of Statistics of China to "link the time series of GDP at constant prices, in every time of rebasing, not only by the new base year constant prices, but also by the previous base year constant prices". See United Nations Statistics Division, p. 9.

quotas when moving across different base periods. For this reason, the following procedure has been followed in this paper. Sectoral quotas from current prices series have been computed and applied to the aggregate real GDP series at 2010 constant prices to derive the equivalent real output for the three sectors. This procedure implicitly assumes that relative prices in the three sectors stay constant over time, which might be clearly a disadvantage. On the positive side, it makes the series smooth and consistent, and keeps the additive properties.

Another problem with the data used for productivity calculations involves the labor force series. This is a well-known anomaly in the aggregate employment series (Maddison and Wu, 2008; Wu, 2015), consisting in a 17.3 percentage increase in the number of employed between 1989 and 1990 (from 55,707 to 65,323), whose causes as of today are still unclear[24]. In this paper no attempt is made at smoothing the above discontinuity. Since the analysis is based on annual rates of change the jump in employment series is restricted to a single year in year-by-year analysis and less visible in cumulative analysis.

5. Labor Productivity Decomposition

Calculations have been performed by using Speakeasy, a numerical computing interactive environment also featuring a powerful interpreted programming language[25], in cumulative terms. This means applying the formula to the initial and final observation on the period under exam, so as to have that $t_0 = initial$ and $t_n = final$[26].

To start with the object of the decomposition, in the period 1980-2015 aggregate labor productivity has increased from 5224 to 77883 yuan per worker, at constant 2010 prices (roughly from 765 to 11450 USD at the average exchange rate of that year), with an average yearly rate of growth of 7.58 percent (Figure 1, table 1c). This makes China an exceptional performer vis-à-vis most economies in the rest of the world[27]. Industrial output per worker has been consistently higher than in services sector, with agriculture lagging behind throughout the whole period.

[24] It has been suggested that this problem might be caused by a clash between population census-based estimates and annual estimates through a long-established data reporting system, but it is also claimed that the problem deserves further investigation. See Wu (2014); Maddison and Wu (2008).

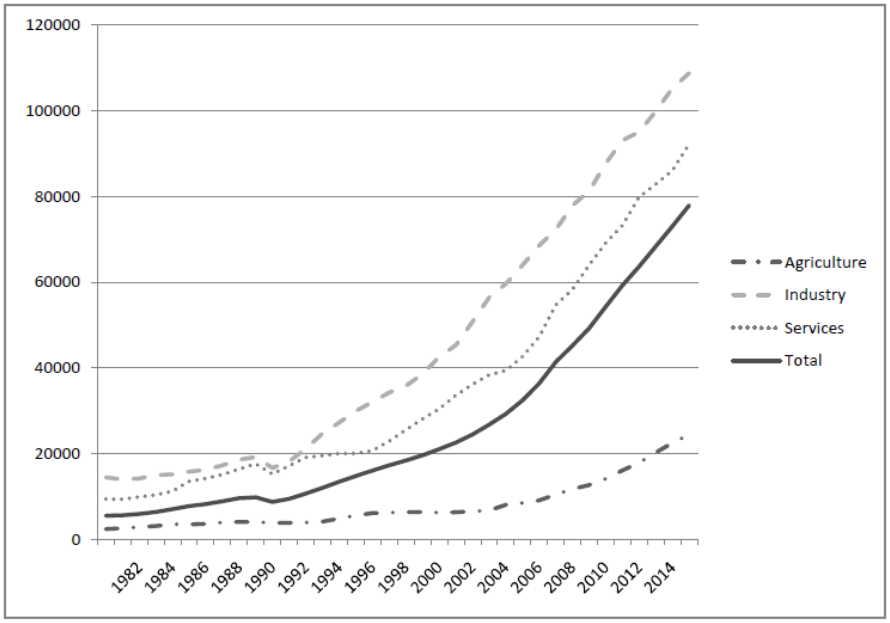
[25] A long-lasting numerical package, Speakeasy was initially developed for internal use at the Physics Division of Argonne National Laboratory by the theoretical physicist Stanley Cohen.

[26] It can be easily checked that, given the peculiar features of the disaggregation formula, the single terms cannot be summed or averaged, because the additivity property would get lost, and the analysis would thus yield inconsistent results.

[27] For a comparison see United Nations Statistics – Millennium Development Goal Indicators; growth rate of GDP per person employed, indicator 1.4 on web: *https://unstats.un.org/unsd/mdg/SeriesDetail.aspx?srid=757*

Figure 1

Labor productivity (real output per worker) in China (yuan at 2010 prices)



Source: National Bureau of Statistics of China and Author's calculations.

Table 1c

China's aggregate and sectoral output per worker (yuan at constant 2010 prices)

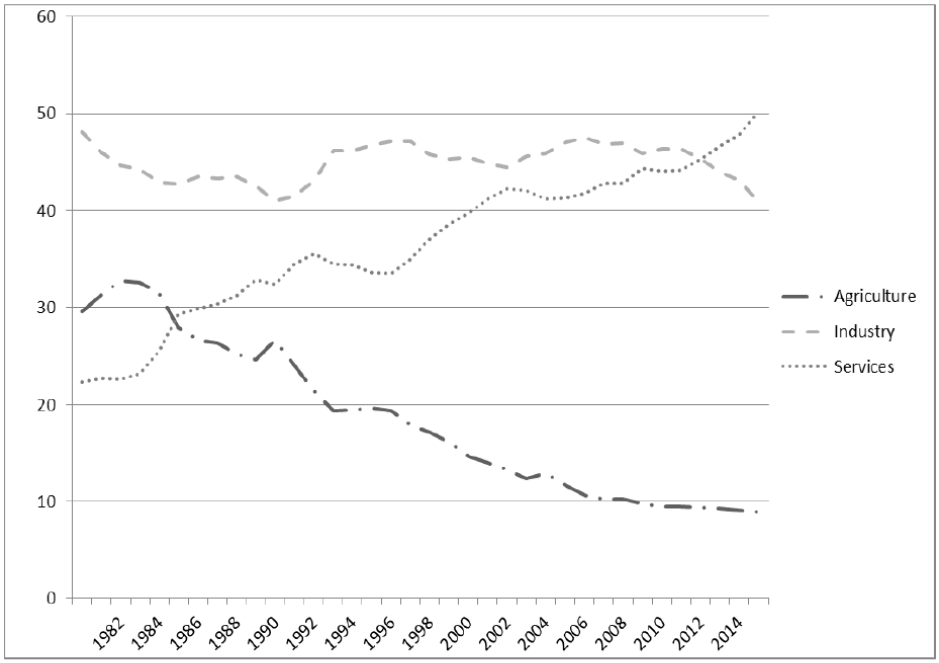
Year	Total	Agriculture	Industry	Services
1980	5457	2352	14414	9321
1981	5557	2555	13957	9282
1982	5848	2814	14162	9827
1983	6319	3068	14953	10306
1984	7013	3453	15131	11149
1985	7687	3440	15770	13462
1986	8145	3560	16205	14149
1987	8836	3877	17230	15071
1988	9547	4059	18580	16312
1989	9769	4004	19181	17553
1990	8676	3837	16635	15185
1991	9372	3773	18169	17096
1992	10598	3864	21057	19031
1993	11951	4091	24637	19457
1994	13379	4798	27209	19988
1995	14712	5523	29904	19963
1996	15964	6109	32000	20611
1997	17221	6176	34225	22834
1998	18357	6325	35776	25468
1999	19554	6270	38565	28041
2000	21011	6167	42524	30399
2001	22540	6304	45276	33543
2002	24437	6501	50759	36097
2003	26723	6721	56445	38330
2004	29217	8046	59605	39320
2005	32379	8414	63974	42624
2006	36337	9063	68578	47188
2007	41319	10414	72248	54653
2008	45161	11690	77924	58242
2009	49234	12646	81260	64004
2010	54271	14093	87735	69132
2011	59203	16050	93120	73241
2012	63618	17835	95058	79843
2013	68311	20222	99875	82854
2014	73032	22429	105279	86052
2015	77883	24437	108791	92198

Source: National Bureau of Statistics of China and Author's calculations.

As a result, the sectoral share of industry has been the largest until 2012 (Figure 2). After then industry has gained a consistent advantage, with a share nearing 50 per cent, as against 42 per cent in services and 8 in agriculture.

Figure 2

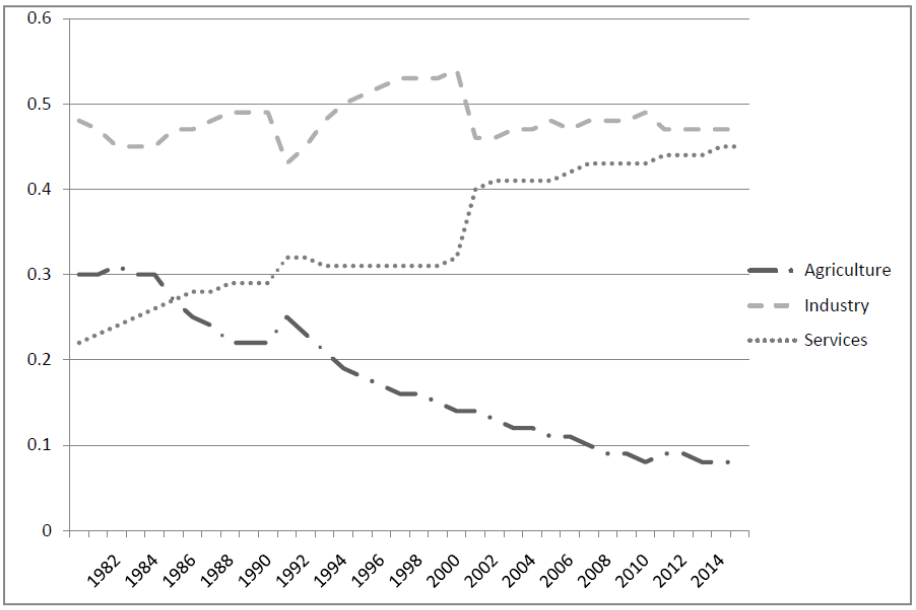
Sectoral quotas of GDP in China 1980-2015 (percentage values)



Source: China's National Bureau of Statistics and Author's calculations.

Figure 2 alt

Sectoral quotas of real GDP constant 2010 prices) in China 1980-2015 (percentage values)



Source: China's National Bureau of Statistics and Author's calculations.

Sectoral shares of labor show that at the start of the period agriculture absorbed almost 70 per cent of total employment (Figure 3). It progressively fell to move below 30 per cent in 2015. Likewise for output shares, industrial labor shares have remained roughly stable from 1980 to early 2000s. Since then industry labor share has increased by 10 percentage points nearing 30 per cent. The share of labor absorbed by services sector has steadily increased across the whole period, from around 13 per cent to around 42 percent.

Figure 3

Sectoral quotas of employment in China 1980-2015 (percentage values)

Source: National Bureau of Statistics of China and Author's calculations.

Table 2 shows the decomposition of aggregate China's output per worker into sectors and effects, calculated on the basis of the framework illustrated in the previous section. The increase in aggregate output per worker between 1980 and 2015 amounts to 13.91, equivalent to almost 14 times, consistent with a yearly growth rate of 7.58. For the whole period 1980-2015 the largest contribution comes from services sector, followed by industry. The contribution from agricultural sector appears only marginal.

Table 2

Decomposition of China's productivity growth (output per worker) in selected periods

	SSRE	WSPGE	DSRE	**Total**
		1980-2015		
Agriculture	-0.1825	2.9577	-1.7584	1.0167
Industry	0.3128	3.1922	2.1268	5.6318
Services	0.5272	2.0036	4.7284	7.2592
Total	0.6575	8.1535	5.0967	13.9078
		1980-1990		
	SSRE	WSPGE	DSRE	**Total**
Agriculture	-0.0429	0.2279	-0.0318	0.1532
Industry	0.1084	0.1761	0.0407	0.3251
Services	0.1007	0.2006	0.0904	0.3917
Total	0.1662	0.6045	0.0992	0.8700
		1990-2000		
	SSRE	WSPGE	DSRE	**Total**
Agriculture	-0.0408	0.1393	-0.0231	0.0754
Industry	0.0266	0.4294	0.0269	0.4830
Services	0.1544	0.1965	0.0923	0.4432
Total	0.1402	0.7653	0.0961	1.0016
		2000-2010		
	SSRE	WSPGE	DSRE	**Total**
Agriculture	-0.0385	0.1633	-0.0391	0.0857
Industry	0.0947	0.5022	0.1048	0.7016
Services	0.1032	0.4947	0.1324	0.7304
Total	0.1594	1.1603	0.1981	1.5178
		2010-2016		
	SSRE	WSPGE	DSRE	**Total**
Agriculture	-0.0252	0.0912	-0.0235	0.0426
Industry	0.0248	0.1555	0.0084	0.1886
Services	0.1079	0.1953	0.0475	0.3507
Total	0.1075	0.4420	0.0324	0.5819

Source: National Bureau of Statistics of China and Author's calculations.

If one looks at the decomposition of aggregate productivity increase throughout the whole period, the WSPGE, or pure productivity effect, prevails over the other effects, a result commonly found in literature. As already said before, it is the sectoral contribution to aggregate productivity "if" labor is constant.

Since this is not the case, the dynamic structural reallocation effect (DSRE) is sizeable. Looking at the DSRE by sectors, it comes out that it is particularly large for services, as one should expect by the combination of the dynamic pattern of productivity by the sector and by its fast growing share of labor. A similar pattern, but of a smaller scale, is found for industry, where productivity dynamics is slightly faster, but labor share dynamics is less pronounced. A declining labor share combined with slow productivity produces a negative DSRE, as expected.

On the contrary the contribution of SSRE is pretty small. This cannot be surprising, because the initial productivity level is relatively small, as compared with the final level. Hence, if the period of analysis is long, the dynamic effect will be prevalent as compared with the static effect.

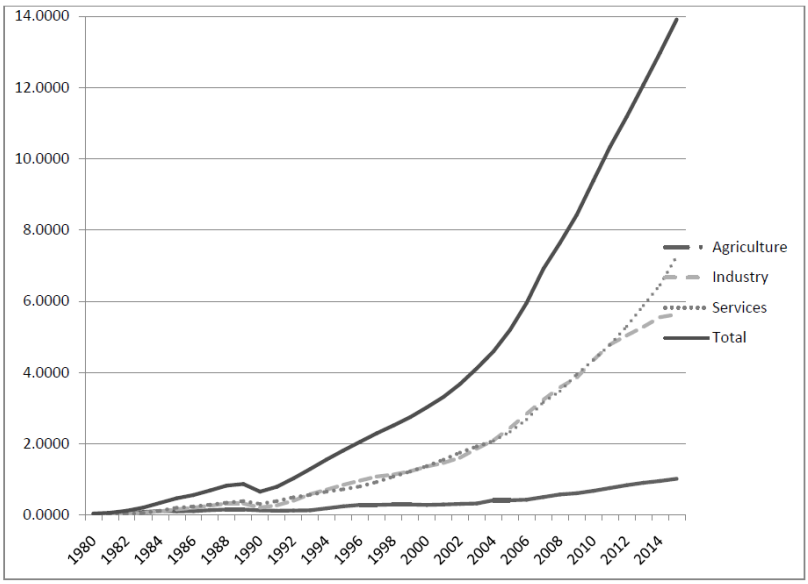
A look at different decades adds a dynamic dimension to the narrative above. Agriculture

records negative static and dynamic structural and reallocations effects, due to a continuing process of reduction in the number of agricultural workers. As a consequence its contribution to aggregate productivity shrinks over time. At the opposite side, industry and services, record a continuing process of fast productivity growth, and both contribute to the fast aggregate productivity growth recorded by the Chinese economy during the sub-periods. However, since 2000 to 2010, a decade of fast productivity growth, the contribution of services sector tends to oversize that of industry. In 2010-2015, the contribution of services becomes much larger, in terms of pure productivity growth, as well as in terms of static and dynamic sectoral reallocation. This seems to confirm a growing role of the services sector in the past few years in China.

The above is confirmed if one looks at figures 4-8 which represent, in cumulative terms the sectoral contribution to aggregate productivity growth (figure 4); the contribution of the three effects to aggregate productivity growth (figure 5); and the three effects decomposed by sector (figures 6-8).The most interesting features that can be noted are: a declining contribution to productivity by industry in recent years (figure 4); persistently high dynamic reallocation, particularly in the 2000s, as noted before; a strong divergence, starting from early 2000s in the dynamic allocation effects from industry and services. The latter display an impressive boost, mirrored by the reduction in agriculture, and some slackening in industry. This explanation of this pattern appears in line with the elsewhere observed dynamic trends in immigration flows from the rural to the urban areas. Since this has still some way to go, the potential for fast increases in GDP and productivity is viewed as very favorable for the coming years (OECD, 2015).

Figure 4

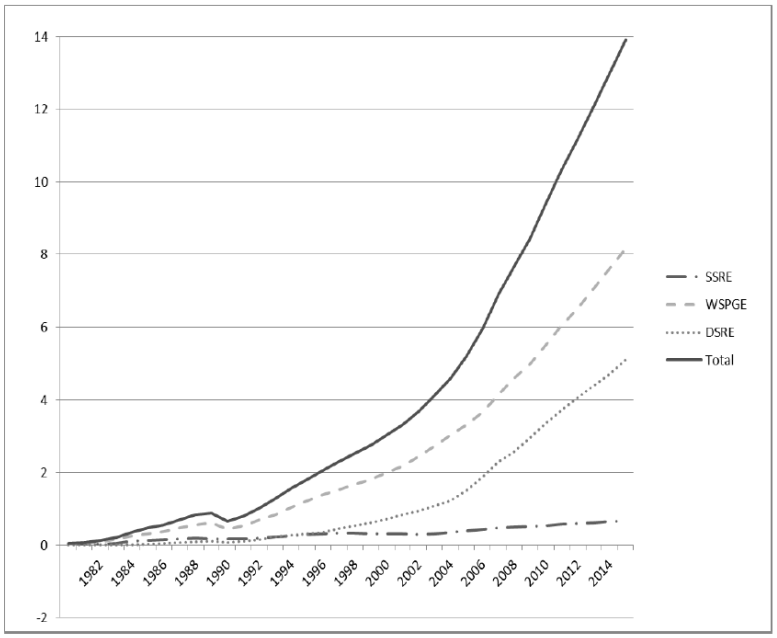
Cumulative sectoral contribution to productivity growth (output per worker) in China 1980-2015



Source: National Bureau of Statistics of China and Author's calculations.

Figure 5

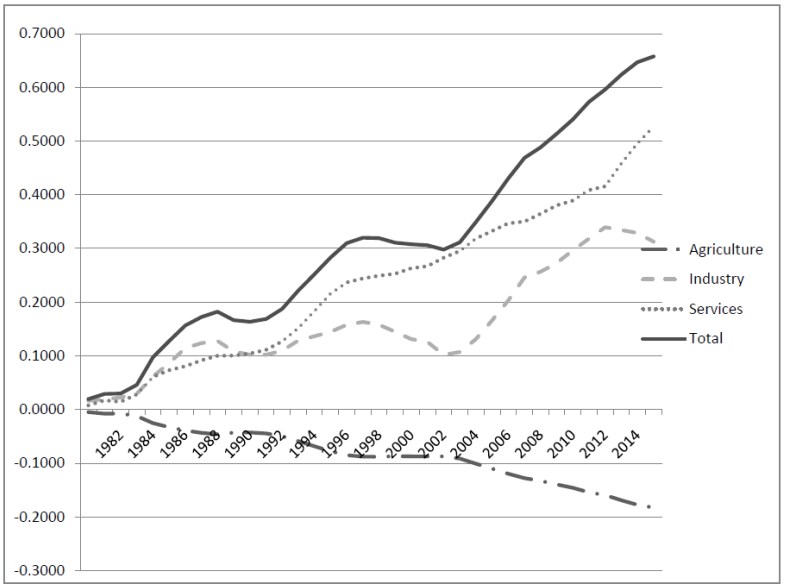
Decomposition of cumulative productivity growth
(output per worker) in China 1980-2015



Source: National Bureau of Statistics of China and Author's calculations.

Figure 6

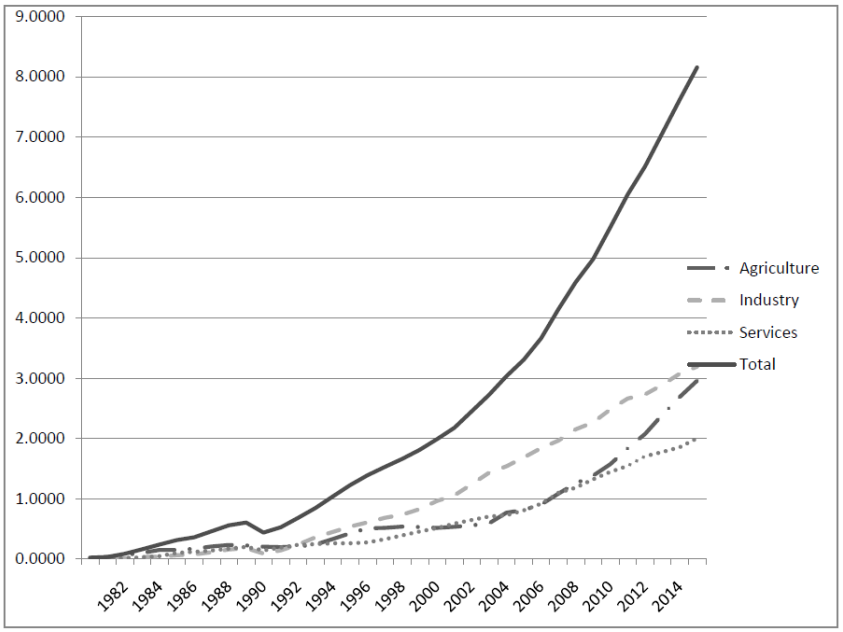
Cumulative dynamic structural reallocation effect (SSRE)
on productivity growth (output per worker) by sector in China 1980-2015



Source: National Bureau of Statistics of China and Author's calculations.

Figure 7

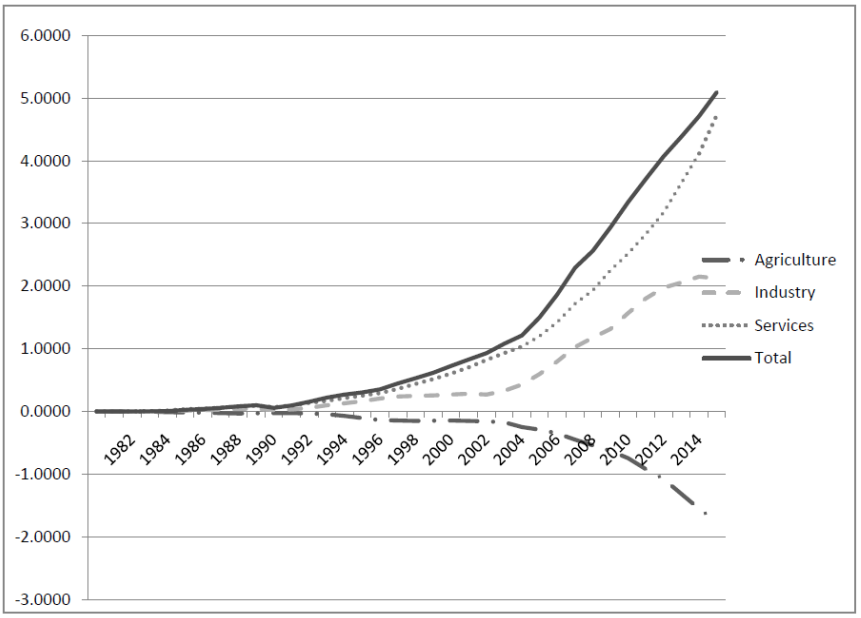
Cumulative within-sector productivity growth effect (WSPGE)
on productivity growth (output per worker) by sector in China 1980-2015



Source: National Bureau of Statistics of China and Author's calculations.

Figure 8

Cumulative static structural reallocation effect (DSRE)
on productivity growth (output per worker) by sector in China 1980-2015

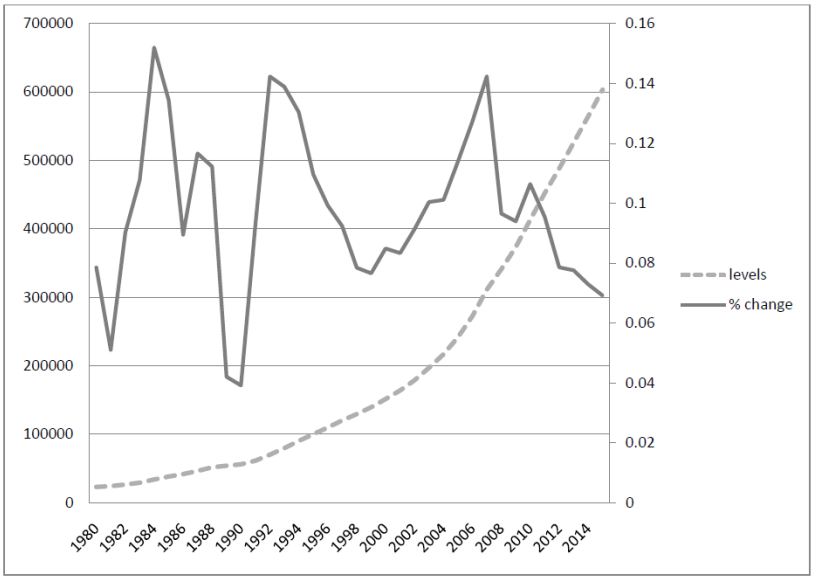


Source: National Bureau of Statistics of China and Author's calculations.

A final remark is that, looking at cumulative dynamic effects, industry sector appears the most sensitive to the cyclical profile of GDP (figure 9).

Figure 9

Real GDP levels (left scale) and yearly percentage changes (right scale) in China 1980-2015



Source: National Bureau of Statistics of China and Author's calculations. Left scale=100 million yuan

6. Sectoral Shifts and Economic Stages

Previous discussion has highlighted an ongoing shift of the Chinese economy towards services. This cannot be surprising, since the behavior of service sector share in an economy has been long debated by economists, starting from the seminal contributions of Fisher (1935), Clark (1940), Fourastier (1949), and Chenery (1960). This relevant thread of economic literature is focused on the structural transformation associated to the reallocation of economic activity across the three broad sectors (agriculture, industry and services). In this approach the relative size of sectoral quotas of employment and output across sectors follow a predetermined sequence that marks the state of development of an economy.

Following an initial stage where agriculture absorbs the largest share of labor force, with low productivity levels, workers gradually move towards industrial activity, characterized by higher productivity and higher salaries. A new shift will occur when labor force moves again towards tertiary sector and a gradual deindustrialization will occur, in favor of a broader service sector.

In order to analyze the features of the above trends for China, this section draws upon the pioneering econometric approach of Chenery (1960 and 1982), and Chenery and Syrquin (1975), which paved the way to a broad number of following contributions. In their analysis they assume that sectoral quotas of economic activity basically depend on per-capita income, a variable that simultaneously embodies those supply and demand factors which represent the foundations of development process[28]. This analysis has become the workhorse of modern studies on the patterns of structural shift in development literature.

[28] A thorough discussion of demand- and supply-side factors in explaining the interdependence between growth and structural change is found in Syrquin (1988).

The specification adopted in this paper is based on the authors' suggestion that development dynamics should be viewed as a "multidimensional transition from one structure to another with lower and upper bounds for the analyzed variables".

Since a logistic function seems to best match the above description[29], the following econometric specification has been here adopted for its convenient analytic properties:

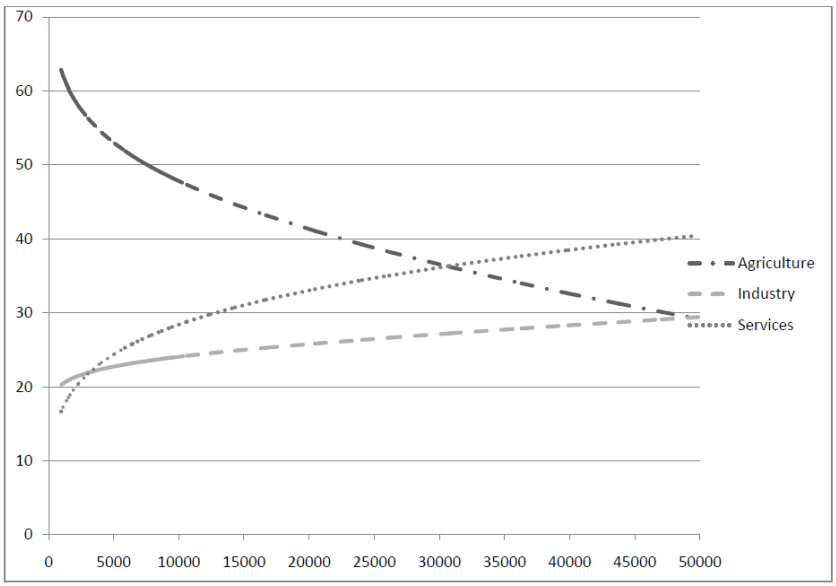
$$Ln\left(\frac{\alpha_i}{100-\alpha_i}\right) = a + bY + c\ln Y$$

where α_i is the share of output or employment of sector i and Y is aggregate per-capita income. The above logistic transformation forces calculated values of α_i to stay in a boundary of zero to 100 for any value of independent variables.

The equation above has been estimated for the period 1980-2015 both for output sectoral data and per-capita GDP. Tables 3.1 through 4.3 report the details of the estimation tests, and figures 10 and 11 report the calculated values for employment and output shares in the three sectors.

Figure 10

Per capita income (nominal yuan per head) and sectoral shares of employment in China

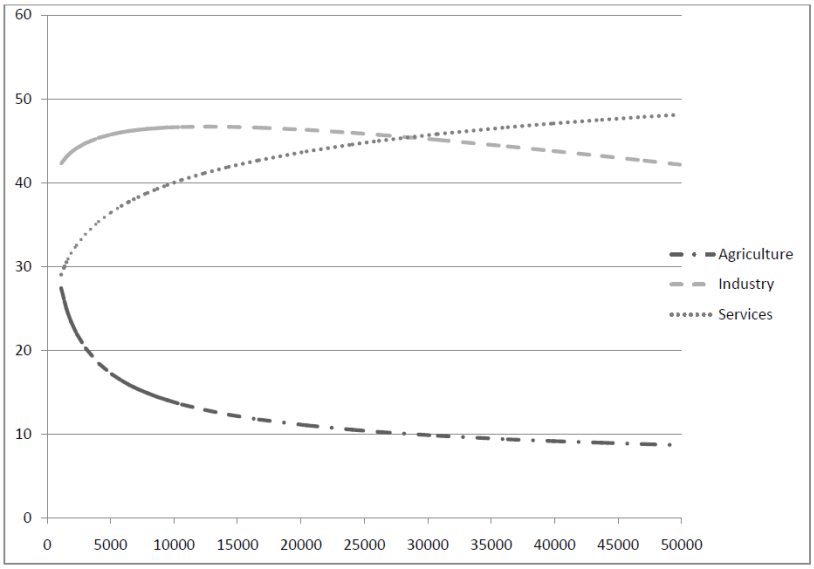


Source: National Bureau of Statistics of China and Author's calculations.

[29] As suggested also by Garrido (2014).

Figure 11

Per capita income (nominal yuan per head) and sectoral shares of aggregate output in China



Source: National Bureau of Statistics of China and Author's calculations.

Table 3.1

OLS estimation of $Ln\left(\frac{\alpha_i}{100-\alpha_i}\right) = a + bY_i + c\ln Y_i$ where α_i is the share of workers in agriculture

```
Model CHENERY :
The number of behavioral equations to be estimated in block ONE is 1.
The total number of coefficients is 3.

 Behavioral Equation DIP1  ( Block ONE )
 Estimation Technique :
     Ordinary Least Squares
     Autoregression of Order 2 (Cochrane-Orcutt procedure)


    DIP1    =    .0244
                ( .6563 )

               -  .1119      * Y
                 (-6.0904 )

               -  .2191      * LY
                 (-10.9327 )

Final Values of Autoregressive Parameters

    RHO     STD ERROR  T-STATISTIC
  1.2694    .1483        8.5589
 -.55154    .1366       -4.0362

     R-Squared                      :  .9978
     Adjusted R-Squared             :  .9975
     Durbin-Watson Statistic        :  2.0951
     Sum of squares of residuals    :  .0164
     Standard Error of Regression   :  .0234
     Log of the Likelihood Function :  84.5219
     F-statistic (  4 , 30 )        :  3454.6722
     F-probability                  :  .0000
     Mean of Dependent Variable     :  .0070
     Number of Observations         :  35
     Number of Degrees of Freedom   :  30
     Current Sample                 : 1981 1 2015 1
```

Table 3.2

OLS estimation of $Ln\left(\frac{\alpha_i}{100-\alpha_i}\right)=a+bY_i+c\ln Y_i$ where α_i is the share of workers in industry

```
Model CHENERY :
The number of behavioral equations to be estimated in block ONE is 1.

The total number of coefficients is 3.

 Behavioral Equation DIP2   ( Block ONE )
 Estimation Technique :
     Ordinary Least Squares
     Autoregression of Order 2 (Cochrane-Orcutt procedure)


    DIP2     = -  1.1860
                 (-19.5701 )

               +  .0363       * Y
                  ( 1.2354 )

               +  .0804       * LY
                  ( 2.4377 )

Final Values of Autoregressive Parameters

    RHO     STD ERROR  T-STATISTIC
  1.5057    .1350         11.1517
 -.67927    .1309        -5.18767

     R-Squared                       :  .9860
     Adjusted R-Squared              :  .9841
     Durbin-Watson Statistic         :  2.1608
     Sum of squares of residuals     :  .0167
     Standard Error of Regression    :  .0236
     Log of the Likelihood Function  :  84.1737
     F-statistic (  4 , 30 )         :  527.5609
     F-probability                   :  .0000
     Mean of Dependent Variable      : -1.1782
     Number of Observations          :  35
     Number of Degrees of Freedom    :  30
     Current Sample                  : 1981 1 2015 1
```

Table 3.3

OLS estimation of $Ln\left(\frac{\alpha_i}{100-\alpha_i}\right)=a+bY_i+c\ln Y_i$ where α_i is the share of workers in services

```
Model CHENERY :
The number of behavioral equations to be estimated in block ONE is 1.
The total number of coefficients is 3.

 Behavioral Equation DIP3   ( Block ONE )
 Estimation Technique :
     Ordinary Least Squares
     Autoregression of Order 2 (Cochrane-Orcutt procedure)


    DIP3     = -  .9431
                 (-24.2044 )

               +  .0194       * Y
                  ( 1.0111 )

               +  .2864       * LY
                  ( 13.5661 )

  Final Values of Autoregressive Parameters

    RHO     STD ERROR   T-STATISTIC
 1.1516     .1724          6.6805
-.46806     .1649         -2.8389

     R-Squared                       :   .9965
     Adjusted R-Squared              :   .9960
     Durbin-Watson Statistic         :   2.0871
     Sum of squares of residuals     :   .0230
     Standard Error of Regression    :   .0277
     Log of the Likelihood Function  :   78.5552
     F-statistic (   4 ,  30 )       :   2132.3408
     F-probability                   :   .0000
     Mean of Dependent Variable      : -1.0864
     Number of Observations          :   35
     Number of Degrees of Freedom    :   30
     Current Sample                  : 1981 1 2015 1
```

Table 4.1

OLS estimation of $Ln\left(\frac{\alpha_i}{100-\alpha_i}\right)=a+bY_i+c\ln Y_i$ where α_i is the share of output in agriculture

```
Model CHENERY :

The number of behavioral equations to be estimated in block ONE is 1.
The total number of coefficients is 3.

 Behavioral Equation DIP1   ( Block ONE )
 Estimation Technique :
     Ordinary Least Squares
     Autoregression of Order 2 (Cochrane-Orcutt procedure)


    DIP1     = -  1.8613
                 (-30.4289 )

               +  .0326       * Y
                  ( 1.0812 )

               -  .4032       * LY
                  (-12.0495 )

   Final Values of Autoregressive Parameters

    RHO     STD ERROR  T-STATISTIC
  .9082     .1665         5.4537
 -.2948     .1525        -1.9325

     R-Squared                       :  .9912
     Adjusted R-Squared              :  .9900
     Durbin-Watson Statistic         :  1.9364
     Sum of squares of residuals     :  .0874
     Standard Error of Regression    :  .0540
     Log of the Likelihood Function  :  55.2037
     F-statistic (  4 , 30 )         :  841.4319
     F-probability                   :  .0000
     Mean of Dependent Variable      : -1.5953
     Number of Observations          :  35
     Number of Degrees of Freedom    :  30
     Current Sample                  : 1981 1 2015 1
```

Table 4.2

OLS estimation of $Ln\left(\frac{\alpha_i}{100-\alpha_i}\right)=a+bY_i+c\ln Y_i$ where α_i is the share of output in industry

```
Model CHENERY :
The number of behavioral equations to be estimated in block ONE is 1.
The total number of coefficients is 3.

 Behavioral Equation DIP2   ( Block ONE )
 Estimation Technique :
     Ordinary Least Squares
     Autoregression of Order 2 (Cochrane-Orcutt procedure)


    DIP2     = -  .0424
                 (-.8125 )

               -  .0927       * Y
                  (-3.7134 )

               +  .1178       * LY
                  ( 3.8879 )

  Final Values of Autoregressive Parameters

    RHO     STD ERROR   T-STATISTIC
 .9600     .1630         5.8890
-.2306     .1434        -1.6089

     R-Squared                       :  .8172
     Adjusted R-Squared              :  .7928
     Durbin-Watson Statistic         :  1.8455
     Sum of squares of residuals     :  .0351
     Standard Error of Regression    :  .0342
     Log of the Likelihood Function  :  71.1896
     F-statistic (  4 , 30 )         :  33.5263
     F-probability                   :  .0000
     Mean of Dependent Variable      : -.2066
     Number of Observations          :  35
     Number of Degrees of Freedom    :  30
     Current Sample                  : 1981 1 2015 1
```

Table 4.3

OLS estimation of $Ln\left(\frac{\alpha_i}{100-\alpha_i}\right)=a+bY_i+c\ln Y_i$ where α_i is the share of output in services

```
Model CHENERY :
The number of behavioral equations to be estimated in block ONE is 1.
The total number of coefficients is 3.

 Behavioral Equation DIP3   ( Block ONE )
 Estimation Technique :
     Ordinary Least Squares
     Autoregression of Order 2 (Cochrane-Orcutt procedure)


    DIP3     = -  .3962
                 (-5.2662 )

               -  .0083       * Y
                  (-.2244 )

               +  .2256       * LY
                  ( 5.5226 )


  Final Values of Autoregressive Parameters

    RHO     STD ERROR  T-STATISTIC
  1.2646    .1585        7.9808
 -.53326    .1538       -3.4669

     R-Squared                      :  .9831
     Adjusted R-Squared             :  .9808
     Durbin-Watson Statistic        :  2.1192
     Sum of squares of residuals    :  .0616
     Standard Error of Regression   :  .0453
     Log of the Likelihood Function :  61.3217
     F-statistic (  4 , 30 )        :  435.4876
     F-probability                  :  .0000
     Mean of Dependent Variable     : -.5469
     Number of Observations         :  35
     Number of Degrees of Freedom   :  30
Current Sample                 : 1981 1 2015 1
```

Employment and output share for agriculture dramatically decreases, as per capita income increases. The relative position of the corresponding curves for output and employment in agriculture confirms the low productivity in the sector, as already made apparent in figure 1 and in previous analysis. The opposite occurs for industry and service sectors. Services in particular display a marked tendency to increase its relative size vis-à-vis the other sectors across the period considered. Looking at the most recent years, or higher per capita income, it appears that a visible reallocation of labor has occurred from agriculture to services; in the same period it looks like the output share of services has increased at the expenses of industry sector.

The reason for these observed shifts, and the path that labor flows, in particular, have followed when moving across sectors deserve some further investigation.

Indeed, the pattern of services sector seems to confirm, once again, the idea that the service sector, which has already represented a central source of growth and productivity in China, for its still unexploited potential can be viewed as a major engine of growth and productivity in the future. This finding appears to be in line with previous research. Herrendorf et al. (2014) have

regressed sectoral shares for a number of countries in different periods, and using different databases. *Mutatis mutandis*, the sectoral pattern followed in the countries considered in that study appear broadly similar to that found for China. Looking at the industrial countries in the period 1800-2000[30], at earlier stages, with lower per capita income, the agricultural sector absorbs the largest labor share, and produce the largest (albeit relatively smaller) output share; the two approximately range from 60 to 80 per cent and from 50 to 70, respectively, to move lower than 10 percent. At the center stage of development most countries approach 50 per cent on both employment and industry shares, to decline down to around 20 per cent in most cases. Services sector displays a steep upward trend starting in a range of 10-20 per cent to reach 80 percent or more for employment shares. For the output shares, the start is at a range of approximately 20-40 per cent to end at around 80 percent.

The above describes a story shared by many countries in East and South-East Asia, in line with the classical view of reallocation across sectors in the path to higher stages of development[31]. If China were to match the described trends, the services sector would still have a broad scope for growth from the current share of 40-50 percent. The way to go might be shorter than expected if one considers that discontinuities sometimes occur in the path of services sector takeoff, due to an observable decline in the threshold per capita income for a takeoff of services, a behavior that presumably reflects the diffusion and increased applicability of information technology (Noland, Park, and Estrada, 2012).

7. Conclusions

The example coming from advanced economies suggests that deep industrialization is only transitional, as it is invariably followed by a fast rise of the services sector share at the expenses of industry. In the most advanced stages of development process services eventually become the most relevant economic activity. In this light, the question arises of when this will happen for China.

Previous studies (Noland, Park, and Estrada, 2012) have suggested that the industrial sector has already come to maturity in many Asian countries, with the implication that industry is now displaying a reduced ability to keep a fast pace of productivity and to absorb labor. Service sector, for its being labor intensive and highly dynamic, is the answer to the question of how to increase employment and living standards in the Asian region in the coming years.

The objectives stated in 2011 and again in 2016 China's five-year Plan points to service sector and to consumption demand as the main drivers of the Chinese economy in the future. Evidence on the changing attitudes of Chinese consumers suggests that people in China are now spending larger amounts of their earnings for health care and education, as well as for travels and for entertainment. Yet, shifting demand components from investment and net exports to private consumption is a complex task, requiring careful policy planning. Keeping the pace of structural reform will prove crucial to ensure a smooth and painless transition to the "new normal"[32].

Compared with other Asian economies, China's service sector's share of output and employment appears still small but seems to be fast heading in the right direction. This paper has tried to analyze past trends of structural shifts on China, and derive insight for the future.

In this light, the first *caveat* that comes to one's mind is that conventional wisdom, policy blueprints, and the historical experience of other countries seems to be of little or no use to analyze China.

[30] These are: Belgium, Spain, Finland, France, Japan, Korea, the Netherlands, Sweden, United Kingdom, and the Unites States.
[31] See Park and Shin (2012), Estrada et al. (2013).
[32] OECD, 2015.

For its ability to successfully pursue hard-to-reach goals and to challenge commonplaces, China has often surprised analysts and practitioners. For example, the process of renminbi internationalization which has brought the yuan into the SDR basket of currencies has challenged the opinions of those who thought that a "dual track reform" was doomed to failure.

China has also displayed an extraordinary vitality and activism in creating visionary projects, such as the One Belt One Road initiative, or the AIIB, which are poised to improve promote growth and prosperity and improve lives in the regions affected. The growing use of RMB in trade and investment in Asia is fostering the activity of joint ventures and activities located in Hong Kong, the largest offshore RMB Centre, meant to finance infrastructure projects in the Asian region. There is a clear mutually reinforcing interaction between the spread of RMB across the world markets and offshore issuances of RMB bonds aimed at financing infrastructural project.

In spite of a relatively high share of economic activity compared to lower income Asian economies (Estrada et al., 2013), financial services are in China still smaller than in the largest advanced economies, and therefore with a broad potential for expansion. This suggests that there the contribution of financial services to growth in China is likely to become very relevant in the years to come.

References

Baumol, William J. (1967), "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis," American Economic Review 57, 415-26.

Chang, C. et alii, 2015. "Trends and Cycles in China's Macroeconomy". NBER Working Paper Series 21244, June.

Clark, C. (1940), The Conditions of Economic Progress. London: MacMillan & Co. Ltd. (reprinted in 1951)

Chenery, H.B., 1960. "Patterns of Industrial Growth", American Economic Review, Vol. 50, n. 4.

Chenery, H.B., 1982. Industrialization and growth : the experience of large countries. Staff working paper; no. SWP 539. Washington, D.C. : The World Bank.

Chenery H. and M. Syrquin, 1975, "Patterns of Development 1950-1970", Published for The World Bank by Oxford University Press.

Cheremukhin, A. et alii. 2015. "The Economy of People's Republic of China from 1953", NBER Working Paper No. 21397, July.

De Avillez R., 2012. Sectoral Contributions to Labor Productivity Growth in Canada: Does the Choice of Decomposition Formula Matter? CSLS Research Report 2012-09, December.

Dumagan, J. C., 2013, A Generalized Exactly Additive Decomposition of Aggregate Labor Productivity Growth. Review of Income and Wealth, 59: 157–168.

Denison, E.F., 1962, "The Sources of Economic Growth in The United States and the Alternatives Before Us". Supplementary Paper No. 13. New York: Committee for Economic Development.

Ercolani, M.G., and Z. Wei, 2011. "An Empirical Analysis of China's Dualistic Economic Development: 1965–2009", Asian Economic Papers 10:3, The Earth Institute at Columbia University and the Massachusetts Institute of Technology.

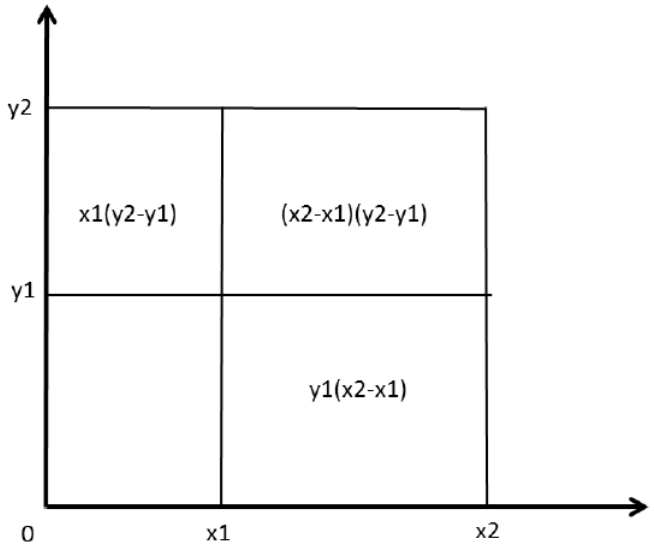
Estrada, G. et al., 2013. "The Service Sector in Lower-Income Asian Economies", ADB Economics Working Paper Series No. 347, Asian Development Bank, Manila, April.

Felipe, J., 1999, "Total Factor Productivity Growth in East Asia: A Critical Survey", Journal of Development Studies 35 (4), pp.1-41.

Felipe, J. and J. McCombie, 2017. "The Debate about the Sources of Growth in East Asia after a Quarter of a Century: much ado about nothing", ADB Economics Working Paper Series, No.

512. Asian Development Bank, Manila, May.
Felipe, J. et al., "Sectoral Engines of Growth in Developing Asia: Stylized Facts and Implications", ERD Working Paper Series no. 107, Asian Development Bank, Manila, November.
Fernald, J., Malkin, I., and M. Spiegel, 2013. "On the Reliability of Chinese Output Figures", FRBSF Economic Letter 2013-08. March.
Fisher, A.G.B., 1935. "The Clash of Progress and Security". London: MacMillan & Co. Ltd.
Fourastié, J., 1949. "Le Grand Espoir du XXe Siècle", Paris: Presses Universitaires de France.
Garrido, L., 2014. "Patterns of Development. A Review of the Literature for an Empirical Update". Paper presented at the 17th Annual Conference on Global Economic Analysis, Dakar, Senegal.https://www.gtap.agecon.purdue.edu/resources/download/ /7030.pdf
Herrendorf, B. et al., 2014, "Growth and Structural Transformation", in: Handbook of Economic Growth, Edited by Philippe Aghion and Steven N. Durlauf, Elsevier. Downloadable at: http://www.sciencedirect.com/science/handbooks/15740684
Holz, C.A., 2014. "The quality of China's GDP statistics", China Economic Review 30: 309–338.
Maddison A., and H.X. Wu, 2008. "Measuring China's Economic Performance". World Economics, Vol. 9, n. 2, April-June.
Molnar, M. and T. Chalaux, 2015. "Recent trends in productivity in China: shift-share analysis of labour productivity growth and the evolution of the productivity gap", OECD Economics Department Working Papers, No. 1221, OECD Publishing, Paris. http://dx.doi.org/10.1787 /5js1j15rj5zt-en
Noland, M., D. Park, and G.B. Estrada, 2012. "Developing the Service Sector as Engine of Growth for Asia: An Overview", ADB Economics Working Paper Series, No. 320, November.
Nordhaus, W.D., 2001. "Productivity Growth and the New Economy". National Bureau of Economic Research Working Paper 8096. Cambridge, MA. January.
OECD, 2015. "Economic Survey on China". OECD, Paris, March.
Park, D. and K. Shin, 2012. "The Service Sector in Asia: Is It an Engine of Growth?", ADB Economics Working Paper Series, No. 322, December.
Syrquin, M., 1988, "Patterns of Structural Change", in H. B. Chenery and T. N. Srinivasan, ed., Handbook of Development Economics, 2 vols., North Holland, vol. I, pp. 197-273.
Usui, N., 2011. "Transforming the Philippine economy: 'walking on two legs'.", ADB Economics Working Paper Series - No. 252, March
United Nations Statistics Division, "Review of Country Practices on Rebasing and Linking NationalAccount Series". Available via the internet: https://unstats.un.org/unsd/DA-SEA-Asia/Documents%20-%20Lao%20WS/Lao%20WS-Country%20practices%20on%20rebasing%20and% 20linking%20NA.pdf
Wu, H.X., 2014. "China's Growth and Productivity Performance Debate Revisited - Accounting for China's Sources of Growth with a New Data Set", The Conference Board Economics Program Working Paper Series, EPWP n.14-01

Annex



$z1=x1y1$; $z2=x2y2$

$z2-z1=x1(y2-y1)+y1(x2-x1)+(x2-x1)(y2-y1)$

IMI International Monetary Review

Redefining Liquidity for Monetary Policy*

By KYUNGHUN KIM, IL HOUNG LEE AND WON SHIM*

This paper proposes a monetary aggregate "Liquidity" that could serve as a useful indicator for gauging the appropriateness of monetary policy. If liquidity rises above a certain threshold, it is signaling that monetary policy is losing traction due to structural and other impediments even when the inflation gap remains open. This indicator supplements the financial cycle approach but adds value by providing a benchmark that is derived from the national account, and not based on its own trend. Over the last two decades, each time this measure rose above the threshold range, it was followed by a decline in GDP growth. The latter was greater when accompanied by a high physical asset value to GDP, e.g., an elevated property market.

Keywords: Liquidity, Monetary policy, Inflation targeting, Financial stability

JEL Classification: E52;E31;E32;G01

1. Introduction

The role of monetary aggregates in formulating monetary policy has been substantially reduced over the last two decades (Han and Lee 2012). The departure from monetary aggregates was in large part inevitable as financial innovation rendered traditional monetary measures somewhat irrelevant as policy instruments and targets. Instead, monetary authorities have focused directly on targeting inflation as is well documented in Haldane (1995). Relying critically on the Phillips curve, the gap between actual and targeted inflation is seen as containing adequate information on the output gap which, monetary authorities thought, could be closed by choosing the right level of the policy rate.

Recent experience has shown, however, that inflation remains subdued even though the output gap was closed and turned positive in some cases. Reasons why the relationship embedded in the Phillips curve have weakened vary, including the large influx of cheap labor into the global market in tandem with the expanding global value chain as well as technological innovation. Such supply side expansion was matched by exuberant demand, financed in large part by leverage. Absent from borrowing, household income has remained relatively subdued as the benefit of the economic expansion was skewed towards corporate profit. The complexity of the current situation has invited various interpretations, including the consequence of a global savings glut (Bernanke), the drag from overleverage and debt overhang (Rogoff), secular stagnation (Summers), and income inequality (OECD and G20).

Irrespective of how this episode is depicted, monetary policy stance appears to have relied too narrowly on estimated inflation and output gaps while not paying enough attention to the buildup of side effects and global factors that affect individual countries' inflation. This neglect

*IMI Working Paper No. 1802 [EN]. This is a staff paper of the Korean Institute for International Economic Policy (KIEP). The views expressed in this paper are of the authors and do not represent those of the KIEP or the Bank of Korea. The basic idea is taken from Han and Lee (2012) and for now only 12 countries have been used as sample cases.

*Kyunghun Kim , KIEP, Building C, Sejong National Research Complex, 370. Il Houng Lee, Member of Monetary Policy Board, Bank of Korea; Member of International Committee, IMI. Won Shim, Bank of Korea.

culminated in financial instability and negative economic shocks. As highlighted in financial cycle literature (e.g. Borio 2014), inflation by itself does not contain sufficient information to assess whether output is at or above its potential. Financial cycle peaks, defined as a combination of credit and property price to GDP, are followed by abrupt adjustments in financial markets and deeper business cycle recessions. Thus "sustainability" in the sense of growth without side effects (i.e., financial imbalance) gained more attention. In this vein, Drehmann et al. (2012) suggest that the output gap should be adjusted by the credit gap to ensure policy response promotes sustainable growth.

This paper argues that monetary aggregate is still a very important indicator in assessing the adequacy of monetary policy stance and financial condition. To this end, a monetary aggregate termed liquidity (L) is proposed, which is defined as "total financial liabilities held by the nonfinancial sector" inclusive of equity. L complements the financial cycle approach but adds value in that it has a threshold range tied to economic fundamentals, namely the repayment capacity. Thus, this measure does not rely on gaps obtained from its own trend like in the financial cycle approach, but on identities in the national account balance sheet. We also introduce a parallel concept on the real side, H, which measures total capital stock underlying productive capacity of an economy.

The remainder of this paper is organized as follows. Related literature is briefly discussed in Section 2. We define liquidity and show how it is derived from the national balance sheet in Section 3 and how it is related to the value of physical capital stock. In Section 4, we compare our set of indicators, which are L and its associated indicator, H with the credit gap. These indicators are then evaluated on their performance in predicting crises. Concluding remarks follow in Section 5.

2. Literature Review

Schularick and Taylor (2012) argue that we have been living in the age of credit since the World War II in which the gap between money and credit has increased due to the changes in the macroeconomics environment and financial policies. Because of the crucial role of credit, policy makers need to focus on the private sector credit-to-GDP gap, which is measured by the percentage point or percentage deviation from an ex-ante (one-sided), recursive Hodrick-Prescott trend (Borio and Drehmann 2009). While useful, it entails a weakness that the gap disappears if credit to GDP growth persists for a long time, and has no upper bound.

A number of papers argue that the financial cycle should be taken into consideration when formulating monetary policy. Ma and Zhang (2016) found evidence that financial cycles have a significant impact on business cycles, and that negative shocks to the financial cycle are the main driving force for a recession especially when financial instability is high. They suggest the finance-augmented Taylor rule, which adds financial factors to the traditional Taylor rule. This finance-augmented Taylor rule would stabilized the business cycle as well as the financial cycle. Borio (2014) also emphasizes the importance of the financial cycle to understand macroeconomic fluctuations. If the financial component is included as one of the considerations in monetary policy decision-making, economic fluctuations can be somewhat eased.

The arguments made by Juselius et al. (2016) are in line with Ma and Zhang (2016) and Borio (2014). Juselius et al. (2016) argue that financial factors play an important role in influencing medium-term economic fluctuations. Once the financial cycle is taken into consideration, the natural rate of interest rises so that US policy rates are systematically lower relative to the natural rate, the benchmark for the policy rate. Given that monetary policy has a long-lasting impact on output and real interest rates, financial cycle augmented monetary policies can dampen shocks and lead to higher long-term output growth.

Drehmann et al. (2012) examine the feature of the financial cycle using two methodologies: analysis of turning points and frequency-based filters. The financial cycle is defined as a medium-term component of fluctuations in the credit and asset price, and this financial cycle is an evidence closely related to financial market integration and changes in monetary policy. This finding is different from the traditional indicator, credit-to-GDP gap, which reflects a high frequency cyclical component.

Han and Lee (2012) suggest a notional level of optimal liquidity above which asset price increases faster than the GDP deflator. The excess liquidity creates a gap between the face value and the real purchasing value of financial assets, which in turn widens the income disparity between those with capital and those living on salaries. This eventually leads to an abrupt adjustment of financial assets with repercussions on the real sector. We further develop their theoretical framework and provide empirical support in this paper.

3. A New Set of Indicators

3.1. Definition of Liquidity and Physical Capital

For the purposes of this paper we define liquidity (L) as the sum of all financial liabilities that an economy holds, but excluding the financial sector to avoid double counting. This definition of L enables us to derive policy implications on the optimal level of liquidity that is sustainable in an economy.

The proposed concept of L is founded on a simple principle, namely that a creditor will lend only as much as the capacity of the debtor's repayment. This principle should also hold for the whole economy. Therefore, an economy's liquidity cannot exceed its productive capacity (Y_{pc}) indefinitely. Y_{pc} in turn can be measured as the net present discounted value of the expected income stream.

L is different from the traditional monetary indicators (M1, M2, etc.) which are based on the traditional transactional, precautionary, and speculative motives. L is linked to the expected income stream which is a core part of economic fundamentals. The optimal level, or more accurately the threshold level of L can be estimated by examining the impact of changes in L on Y_{pc}.[33]

Table 1 shows how L can be defined from the national balance sheet. Financial liabilities are divided into credit and equity. We define L as a concept that includes both. This is because equity has the same economic meaning as credit at the national level in the sense that it entails financial claims in the form of expected income streams. Equity is different from credit only to the extent that in the case of equity, the lender has ownership on the capital stock that is used to generate returns.

This brings us to the next indicator, H, which is a measure of total capital stock (tangible assets such as facilities and buildings). Y_{pc} in principle should reflect also productivity and labor which we exclude from our analysis. Inclusion should provide a more refined result but would not change the main thrust of this paper.

[33] The threshold of L/Y could rise in case of countries undergoing monetization and if due to precautionary motive individuals decides to hold both large financial assets and liabilities.

Table 1. National Balance Sheet and Productive Capacity

Assets	Liabilities (L)	Physical Capital (H)	NPV of Income Streams (Y_{pc})
Financial assets Non-financial assets	Financial liabilities Credit (C) Equity (E)	Value of capital stock incl. productivity (property and other capital) **Human Capital(N)**	$Y_{pc} = \sum \frac{y \cdot P_y}{(1+i)^n} = Af(H,N)$ (y: Real GDP) (P_y: GDP deflator)

3.2 Economic Implications on L, H, and Y_{pc}

Liquidity (L), credit (C), equity (E), productive capacity (Y_{pc}), and physical capital (H) can be expressed as Equation (1).

$$L = C + E \approx Y_{pc} = f(H) \quad (1)$$

The transmission of credit to the real economy can be described as shown in Figure 1 below.

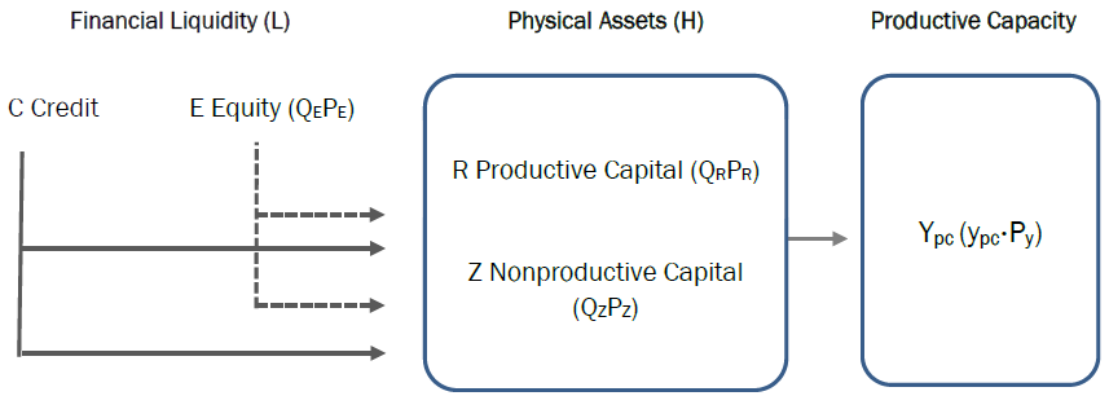


Figure 1. Transmission Channel of L

An increase in credit can be used for (Ⅰ) the purchase of financial equities or (Ⅱ) for investment in capital stock. In the case of (Ⅰ), if the amount is used for investment in capital stock (case a), then Y_{pc} will rise. If not, the additional amount will be accommodated by an increase in stock prices (case b). If unchecked, this could lead to a stock market bubble. In thecase of (Ⅱ), if the amount is invested in productive capital, then Y_{pc} will rise (case c). Hereproductive capital is defined as the part of the physical assets that are used to expand production capacity linked to actual demand. Corollary, the nonproductive capital is the part of assets that are not used to increase output, e.g., constructed housing not occupied, or new machines that are standing idle due to demand shifts. If the demand for nonproductive capital

exceed supply, then prices will rise, e.g., a housing bubble (case d). This is summarized in Table 2.

Table 2. L/Y_{pc} and H/Y_{pc} Depending on Transmission Channel of L

Case		L			H				Y_{pc}	L/Y_{pc}	H/Y_{pc}
		C	E		Q_R	P_R	Q_N	P_N			
			Q_E	P_E							
(I)	a	+	+		+				+	-	-
	b	+		+						+	-
(II)	c	+			+				+	-	-
	d	+					+			+	+
								+			

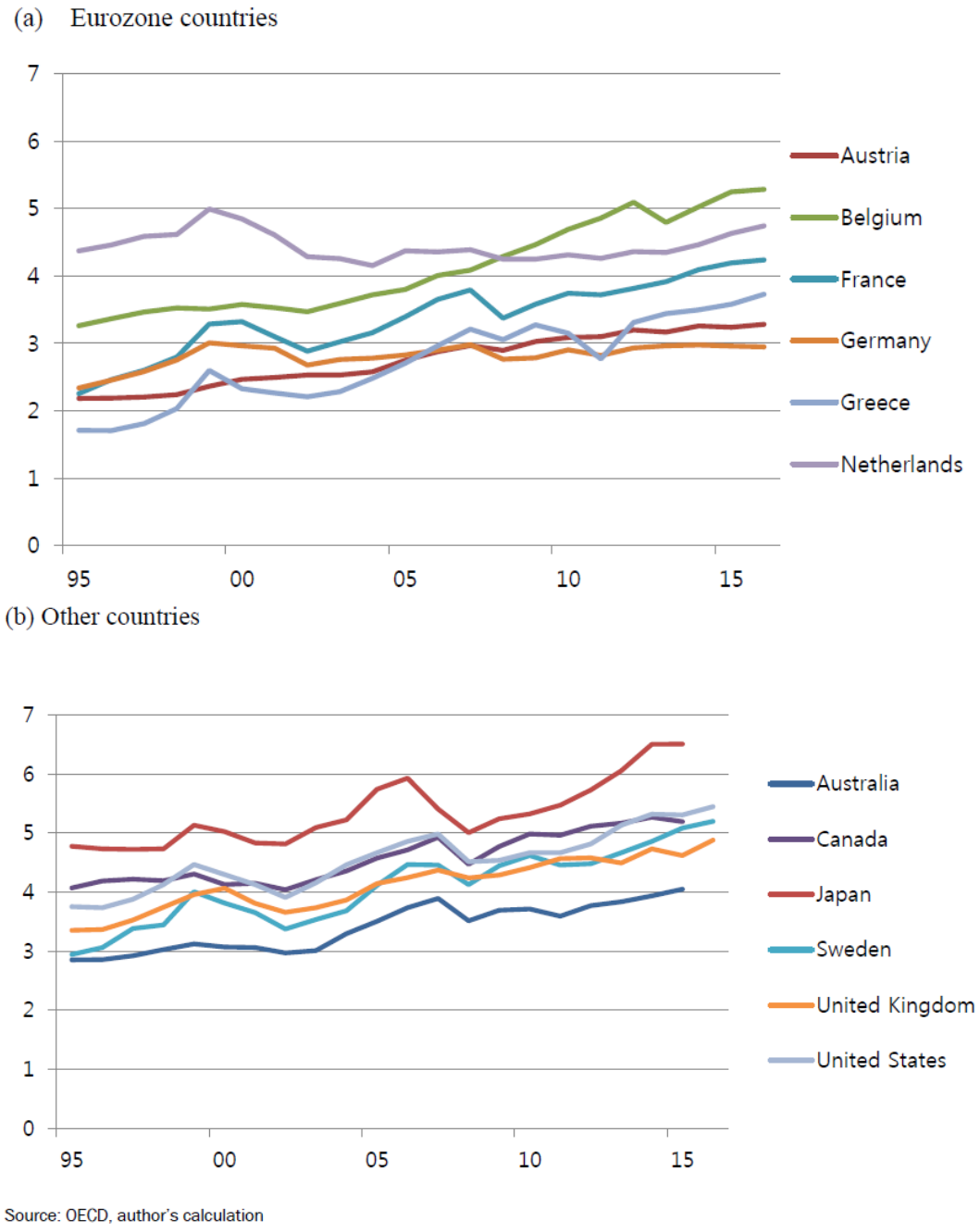
The combination of L/Y_{pc} and H/Y_{pc} provides useful information. If an increase in L is accompanied by an increase in productive physical capital, i.e. productive capacity, Y_{pc} will increase as H increases. Therefore, L/Y_{pc} and H/Y_{pc} do not undergo changes. Thus, as long as Y_{pc} increases along with L and H, the likelihood of build-up of financial imbalance is low. If L/Y_{pc} rises, but not H/Y_{pc}, an adjustment of L will take place at some point. If the increase in L is associated with speculation on a specific physical capital, L/Y_{pc} and H/Y_{pc} will rise at the same time. In this case, the financial market will adjust at some point in time, having a larger negative impact on the real economy. Obviously, if GDP deflator adjusts to ensure L/Y_{pc} is stable, the L or H do not have to decline to restore stability.

3.3 L/Y and H/Y for OECD Countries

We review the 12 OECD countries where data on the financial liabilities and physical capital is available for our analysis. These countries are Australia, Austria, Belgium, Canada, France, Germany, Greece, Japan, Netherlands, Sweden, UK, and US. First, L is calculated as financial liabilities held by the non-financial sector as mentioned above. We have chosen to use the trend of nominal GDP(Y) as a proxy variable for Y_{pc}. The reason for using trend of GDP instead of GDP is to address GDP's volatility. Finally, in the case of H, the actual capital stock data of each country are used.

Figure 2 shows that L/Y of the OECD countries is trending upwards. It rose from 3.1 times to 4.5 times of GDP during 1995-2015. The difference of L/Y from one country to another reflects the specific economic situation in each country.[34] L/Y in most OECD countries increased sharply around the year 2000, in the mid-2000s, and after 2013.

[34] L/Y is affected by financial development, capital account openness, manufacturing vs services sector weights, population density and country specific preferences.



Source: OECD, author's calculation

Figure 2. L/Y for 12 OECD Countries

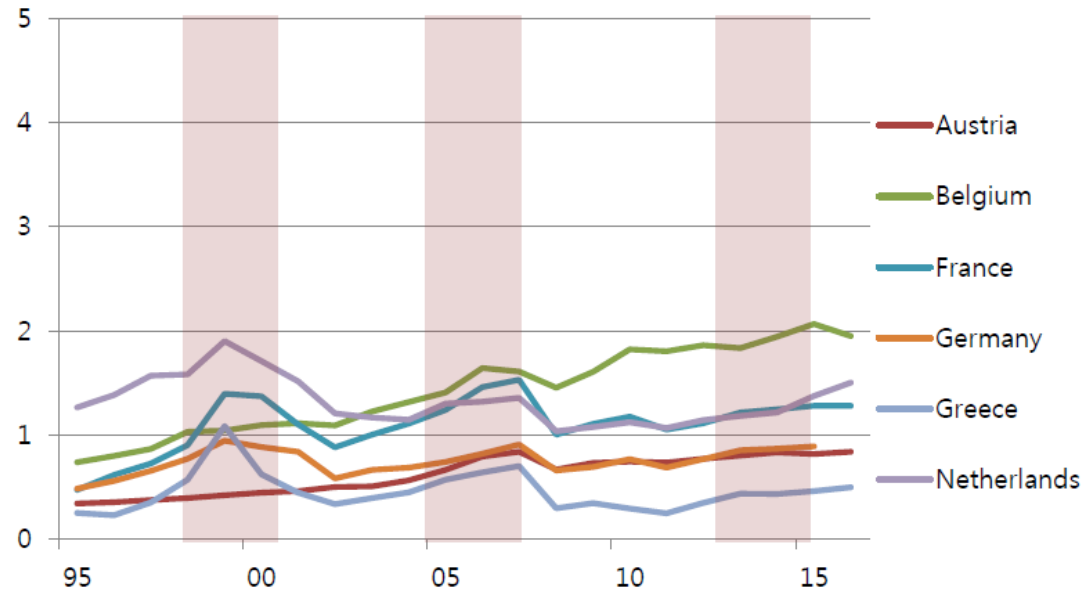
All 12 countries' L/Y exhibit mean reversion around a rising time trend. This is counter to the claim that L should be stable relative to GDP. The reason, which is more fully discussed in the Appendix, is due to financial globalization.[35]The mutual spillovers of countries' monetary

[35] See Davis and van Wincoop(2017) For positive correlation between inflows and outflows, and financial globalization.

expansion, essentially driven by the US as being the global financial center, is contributing to the rising trend of L/Y.[36] To the extent that lenders in a country will ensure (with a lag) that total lending is equal to the sum of expected income stream, this enforcement function is undermined by the increasing share of nonresident lenders. The latter are not as fully integrated into domestic financial market as resident lenders mostly due to physical distance and information asymmetry. Therefore, as L/Y continues to rise due to globalization, domestic lenders exercise prudence only over the amount they lend, leaving a gray area for the amount lent by nonresidents. Thus, only when we adjust for the spillover from foreign countries do we get stable L/Y_s. Even then, the mean reversion is still adequate in capturing vulnerability in financial system as will be explained below.

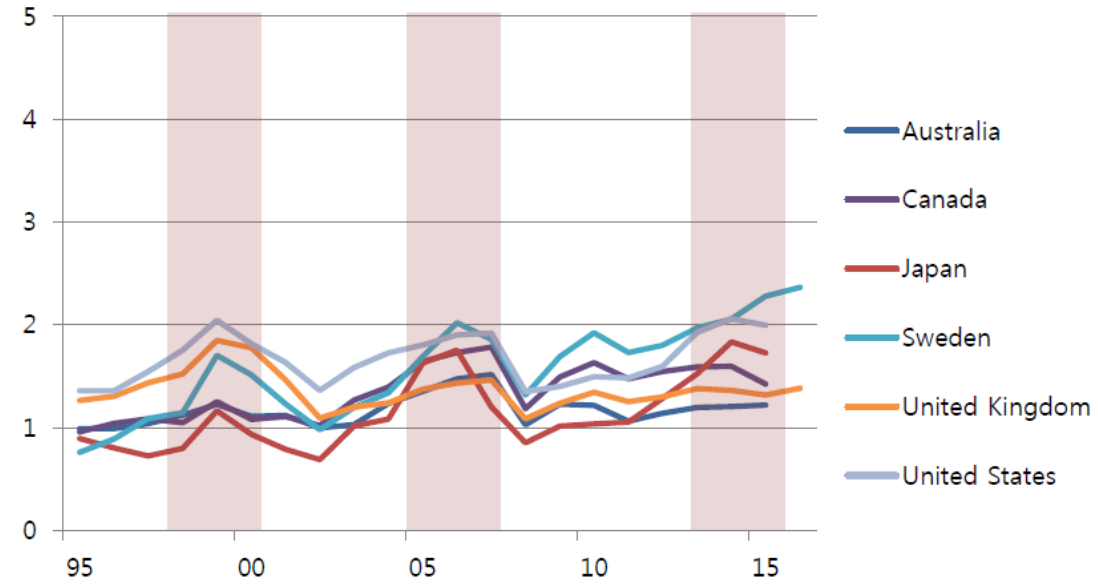
Within the two components of L, equity-to-GDP shows greater volatility (Figure 3) than Credit-to-GDP. Equity-to-GDP peaked three times since the mid-1990s, once prior to the dotcom crisis, then prior to the global financial crisis, and still rising now even exceeding the previous peaks. Credit-to-GDP has picked up speed since the first half of 2000s (Figure 4), as already explained above, due to globalization, and facilitated by quantitative easing in major financial centers. Currently, stock market overheating and the high credit to GDP ratio in major economies is a major risk to the global financial market.

(a) Eurozone countries



[36] If L/Y would have been stable in the US, the magnitude of the spillover to other countries would also have been smaller or insignificant as this would have limited the scope of outflows from non-US countries.

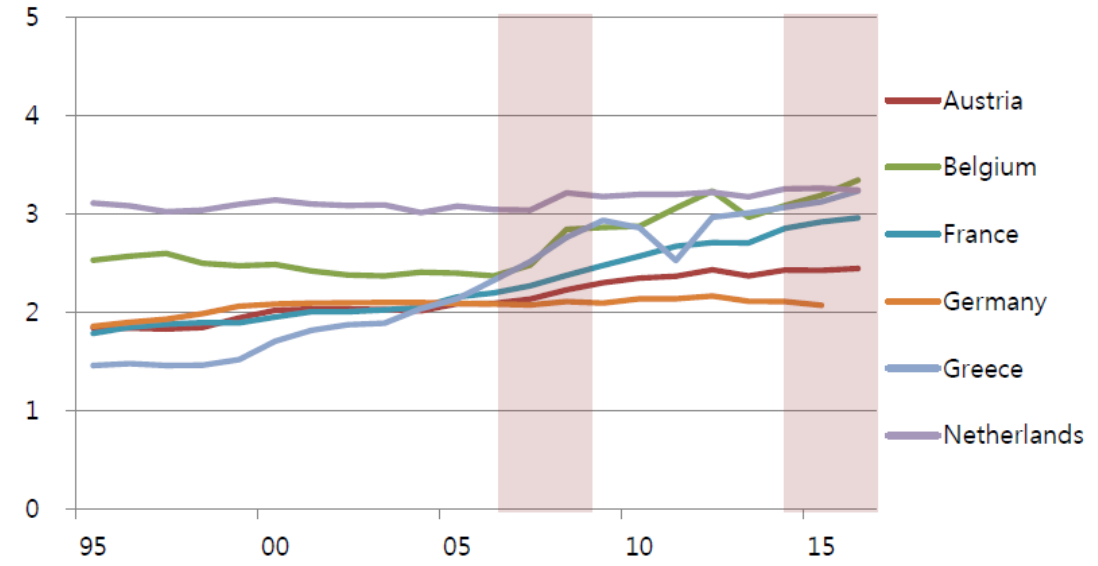
(b) Other countries



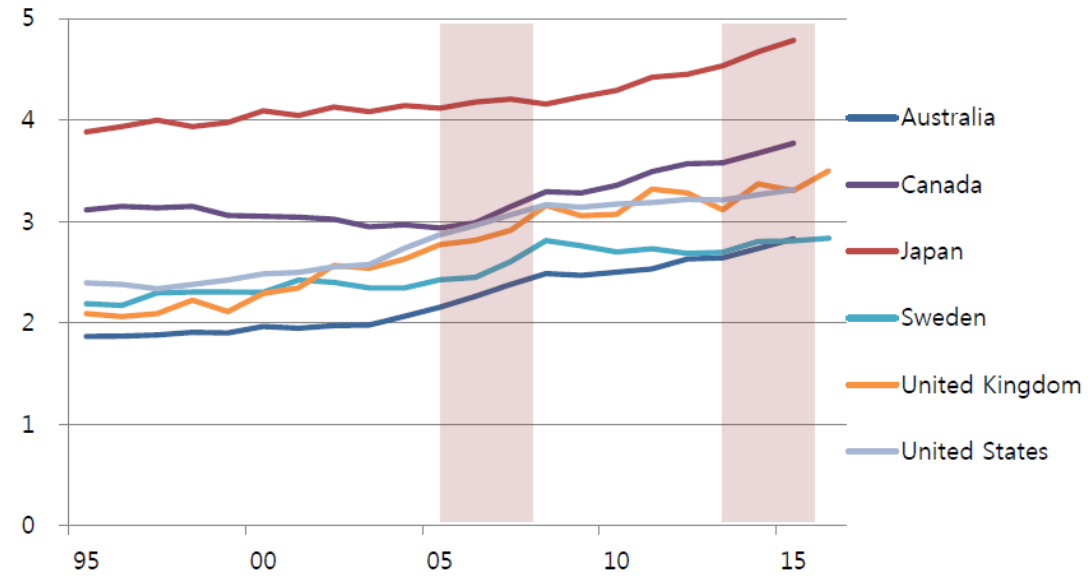
Source: OECD, author's calculation

Figure 3. Equity-to-GDP Ratio for 12 OECD Countries

(a) Eurozone countries



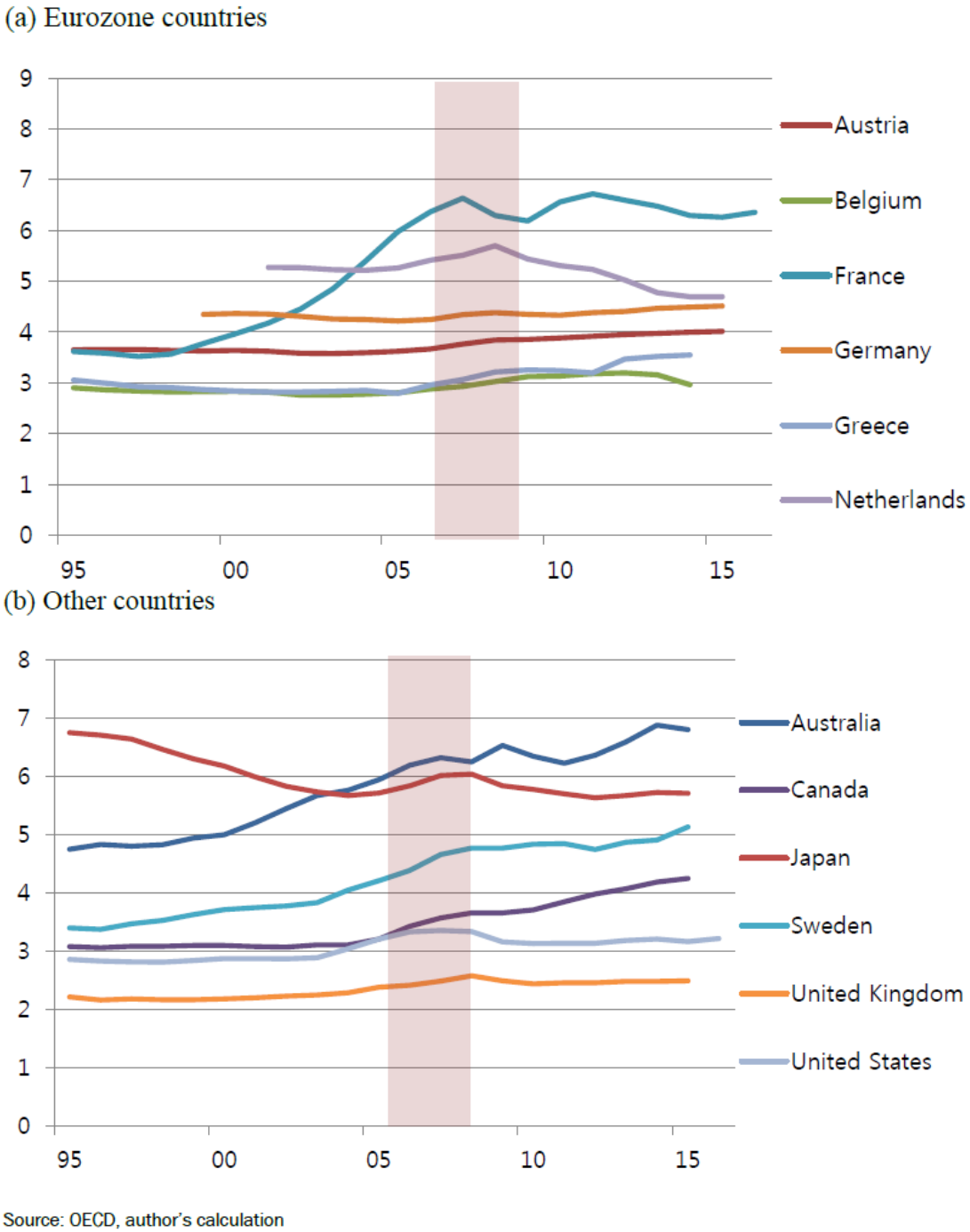
(b) Other countries



Source: OECD, author's calculation

Figure 4. Credit-to-GDP Ratio for 12 OECD Countries

On the other hand, H/Y is somewhat more stable than L/Y (Figure 5). Yet, we see in most non-Eurozone countries a similar pattern of H/Y as credit to GDP ratio. This suggests that investment in physical capital that is not being converted to productive stock continues to pile up.



Source: OECD, author's calculation

Figure 5. H/Y for 12 OECD Countries

3.4 Implications from Monetary Policy Perspective

The transmission channel through which monetary policy affects inflation can be divided into three stages. First, the policy rate has an impact on the financial market, i.e. L. Secondly, the

financial market affects the real economy (H and Y). In the last stage, the real economy, i.e., the output gap affects inflation. If L/Y or H/Y rises due to an accommodative monetary policy well above the threshold level, monetary policy is likely not effective (lacking traction), and only the negative side effects will widen, i.e., the second stage of the transmission is not working. If L/Y and H/Y are broadly stable in response to an increase in L and H but with no notable impact on inflation, the third step of the transmission from output gap to inflation is not effective, i.e., a flat Philipps curve.

In assessing the appropriateness of monetary policy, it is critical to understand the regulatory or structural impediments that might hinder proper transmission of the policy intentions to the real economy. Current structural challenges that impede the effectiveness of monetary policy could include, for example, the gap between actual and targeted savings despite the already high savings ratio on account of rapid aging, large liquidity, and/or debt overhang that raise expectations of higher taxes in the future, and a worsening income/wealth inequality that subjects a large part of the population to tight budget constraints.

The relative values of L, H, and Y can be used as a major inputs to monetary policy formulation. Specifically, they could supplement the use of the unobservable natural rate, inflation and output gaps. For example, a neutral interest rate is defined as a level at which it is neither inflationary nor deflationary and output is growing at its potential (Laubach and Willams 2003). However, recent studies have shown great uncertainty on whether there was a structural shift around the time of the global financial crisis. Given the model uncertainty, e.g., random walk model or structural model, studies (Luo and Startz 2014, Chan and Grant 2017), output gap estimations could be grossly off—a key indicator of estimating the neutral rate. Furthermore, some empirical studies by BIS show that inflation gaps in respective economies are influenced more by global rather than domestic factors such as the global output gap (Borio 2016).

These external factors, along with structural uncertainties suggest the need to add other indicators of financial stability to output and inflation gaps in formulating monetary policy, i.e., L/Y and H/Y. These indicators are useful for gauging the degree of financial imbalance, or equivalently an indicator that monetary policy is losing traction. Monetary accommodation has to be scaled back even when there is still an inflation gap if the financial imbalance worsens.

4. Impact of Excess Liquidity and Physical Capital on GDP Growth Rates

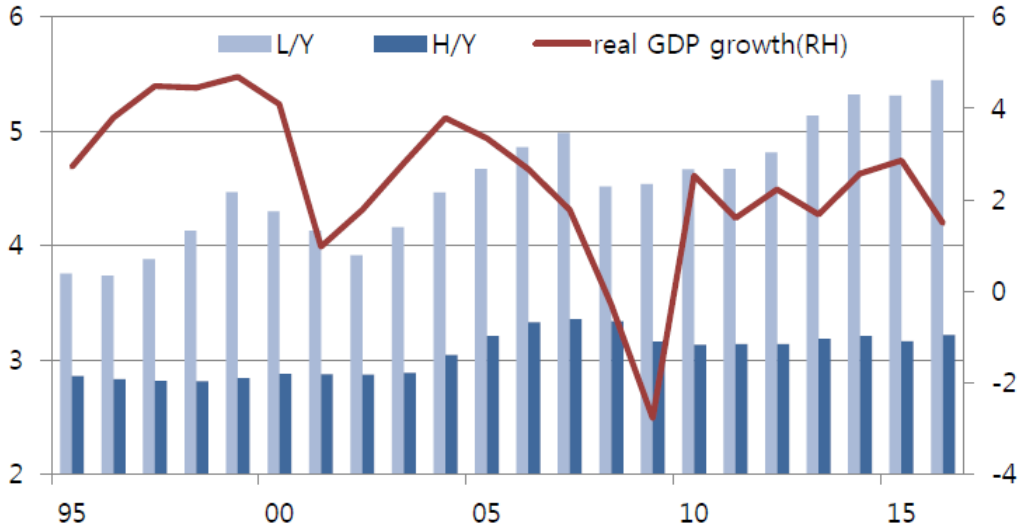
In section III, we show that L/Y and H/Y cannot continue to increase indefinitely and eventually has to adjust back to a level that is consistent with fundamentals. Such adjustments will accompany a decline in real GDP. In particular, the higher the L/Y and H/Y, the steeper the downturn of real GDP. In this section, we first review briefly such a relationship using the US case[37] as an illustration, and then examine more formally whether L/Y and H/Y are useful indicators relative to other indicators, e.g., credit to GDP gap.

Figure 6 shows L/Y, H/Y, and real GDP growth rates in the US from 1995-2016. L/Y evolves around an increasing trend reflecting the cumulating excess liquidity from accommodative policies in the 2000s and subsequent quantitative easing. As already noted in the case of OECD countries, three peaks in L/Y are observed; one that is associated with the dot com bubble in 2000, the global financial crisis in 2008, and the present situation. There is only one peak for H/Y although it has remained at that elevated level since the peak, i.e., around the time of the global financial crisis. During the dot com bubble, H/Y was low compared with the level during the global financial crisis.

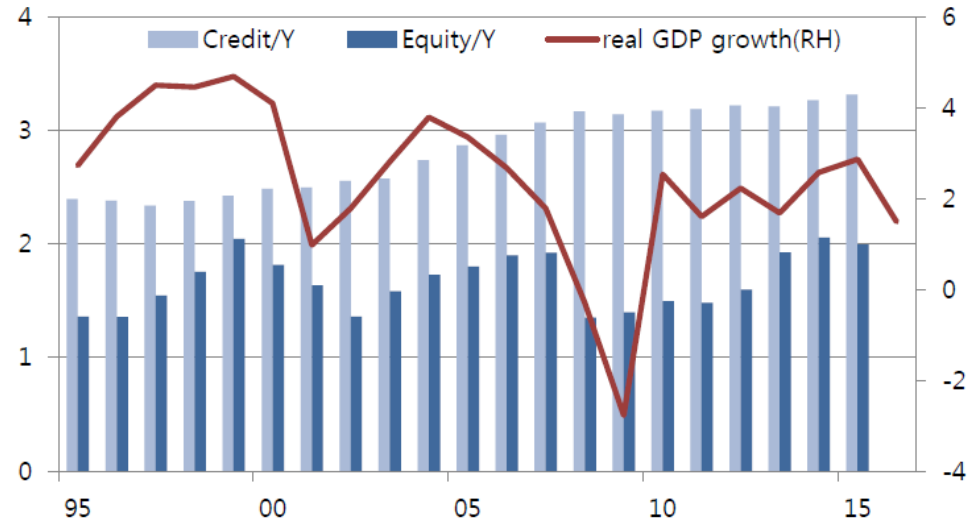
[37] We have also reviewed other major OECD countries but only report the US case here. The results are almost exactly the same as that of the US case shown here.

Two observations are noteworthy. First, as L/Y and/or H/Y revert back to the mean (or trend), it is indeed associated with a negative shock in GDP growth. Second, the negative shock is larger if both L/Y and H/Y were elevated.

(a) L/Y, H/Y, and Real GDP Growth in the U.S.



(B) Credit/Y, Equity/Y, and Real GDP Growth in the U.S.



Source: OECD, author's calculation

Figure 6. L/Y, H/Y and real GDP growth in the US

We now compare L/Y and H/Y against the credit to GDP gap indicator. We use the signal extraction method developed by Kaminsky and Reinhart (1999) to calculate the thresholds of liquidity (L) and its associated indicator, physical capital (H) for each individual country. We test whether our set of indicators are useful in forecasting economic recessions (the degree of which itself is measure of the scope of the financial imbalance preceding the recession). We compare

its performance with the credit-to-GDP gap indicator.

4.1 Data and Methodology

Our dataset includes 12 countries[38] and the sample period covers from 1995 to 2014, a 20-year annual data. Table 3 shows the summary statistics of our set of indicators, L/Y and H/Y. Mean and percentage changes in our indicators for 12 individual countries are reported as well as the mean credit-to-GDP ratio. The long-term levels of L/Y and H/Y (20-year averages) are diverse across countries though the fluctuations in those indicators are quite low over the sample period. In order to de-trend L and find stable thresholds of normalized indicators over time, we introduce the simultaneous equations model (Appendix A). We find that L/Y and H/Y are stable after excluding external liquidity spillovers form the financial center, the US.

Table 3. Summary Statistics (Mean) of L/Y and H/Y from 1995 ~ 2014

	L/Y	% Δ in L/Y	H/Y	% Δ in H/Y	Credit/GDP gap
Australia	3.37	0.02	5.74	0.02	2.11
Austria	2.70	0.02	3.73	0.00	-0.30
Belgium	3.99	0.02	2.93	0.00	7.72
Canada	4.54	0.01	3.41	0.02	0.42
France	3.30	0.03	5.25	0.03	3.09
Germany	2.80	0.01	4.13	0.02	-2.83
Greece	2.64	0.04	3.06	0.01	11.83
Japan	5.28	0.02	6.01	-0.01	-13.21
Netherlands	4.43	0.00	4.54	0.02	-2.36
Sweden	3.96	0.03	4.17	0.02	5.98
United Kingdom	4.02	0.02	2.34	0.01	-1.40
United States	4.44	0.02	3.04	0.01	0.09
Total	3.79	0.02	4.03	0.01	0.93

Note: L/Y and H/Y denote liquidity and physical capital normalized by GDP, respectively. Credit/GDP are measured as deviations from one-sided Hodrick-Prescott trends.

Source: author's calculation

The crises are defined by the two standard deviations from the trend of the GDP (Crisis 1) or the 25% deviation from the trend of the GDP (Crisis 2).

[38] These are the countries which have the complete set of indicators, liquidity (L) and physical capital (H).

Table 4. Country List and Economic Crises Since 1996

Country	ISO	Crisis 1	Crisis 2
Australia	AUS	**2000**	**2000**, 2008, 2009,
Austria	AUT	**2009**	2001, 2002, 2003, **2009**, 2013, 2014
Belgium	BEL	**2009**	1996, 2001, 2003, 2008, **2009**, 2012, 2013
Canada	CAN	**2009**	1996, 2001, 2003, 2008, **2009**
France	FRA	**2009**	1996, 2002, 2003, 2008, **2009**, 2012, 2013
Germany	DEU	**2009**	1996, 2002, 2003, 2005, **2009**, 2012, 2013
Greece	GRC	**2011, 2012**	2005, 2008, 2009 2010, **2011, 2012**, 2013
Japan	JPN	**2009**	1998, 1999, 2001, 2002, 2008, **2009**, 2011, 2014
Netherlands	NLD	**2002, 2009**	**2002**, 2003, **2009**, 2012, 2013
Sweden	SWE	**2008, 2009, 2012**	1996, 2001, 2002, **2008, 2009, 2012**, 2013
United Kingdom	GBR	**2009**	2008, **2009**
United States	USA	**2001, 2009**	**2001**, 2002, 2008, **2009**

Note: Crisis 1 is defined by the 2 standard deviations from the trend of the GDP. Crisis 2 is defined by the 25% deviation from the trend of the GDP.

Source: Author's calculation

Equation (2) shows the signal extraction method where the indicators are L/Y and H/Y,which are liquidity (L) and physical capital (H) normalized by the trend of GDP (Y),respectively. The signal is turned on when both indicators are above thresholds. The signal isturned off when any one of two indicators are below the thresholds.

$$S_t = \begin{cases} 1 \; if \; L/Y \geq (L/Y)^* \; and \; H/Y \geq (H/Y)^* \\ 0 \; otherwise \end{cases} \tag{2}$$

There are two types of errors in the prediction of the crisis. It is defined by the type 1(T_1) error if no signal is issued but a crisis occurs. It is defined by the type 2 error (T_2) if a signal is issued but no crisis occurs. We find the thresholds of L/Y and H/Y ((L/Y)∗ and (H/Y)∗) simultaneously that minimize the combination of the type 1 and 2errors. There are three loss functions (LF) that reflect different ways of combining type 1 and 2 errors and the loss function depends on the indicators, L/Y and H/Y, and the crisis (C ∋ {Crisis 1, Crisis 2}).

$$LF1(L/Y, H/Y, C) = \min_{(L/Y)^*, (H/Y)^*} \{\alpha T_1 + (1-\alpha) T_2\} \tag{3}$$

$$LF2(L/Y, H/Y, C) = \min_{(L/Y)^*, (H/Y)^*} \left\{\frac{T_2}{1-T_1}\right\} \tag{4}$$

$$LF3(L/Y, H/Y, C) = \min_{(L/Y)^*, (H/Y)^*} \left\{\frac{T_2}{1-T_1} | (1-T_1) \geq x\right\} \tag{5}$$

LF1 is the loss function that minimizes the weighted average of type 1 and 2 errors, and the weighting coefficients of type 1 error and type 2 error are α and (1 − α) , respectively. As α increases, policy authorities become more concerned about the type 1 error. LF2 is the loss function that minimizes a noise-to-signal ratio defined by type 2 error/{1 − $oyte$ 1 $eeeoe$}.[39] LF 3 is also the loss function that minimizes the noise-to-signal ratio, but it is given that the minimum predicted probabilities are at least 60% or 75%.

4.2 Thresholds of Indicators and Its Performance

[39] Terms in curly brackets represent predicted probability.

Given our set of indicators, we can obtain the thresholds of L/Y and H/Y for each country with different loss functions, parameters (α and x), and definition of the crisis (Crisis 1 and Crisis 2). In order to compare the performance of our set of indicators in predicting the crisis, we take the averages of the indicators across 12 countries in our dataset and then compare those with the conventional indicator, credit gaps.

Table 5 (a) shows that compared to the credit gaps, our set of indicators, L/Y and H/Y, perform well as a 1-year leading indicator predicting the crisis 1. Though we cannot say that the performance of our indicators is always dominant over that of the conventional indicators with respect to all the different α and x, it gives us a predicted probability as high as the conventional indicators with low noise-to-signal ratios (LF3). Similar performances can be seen in (2) where crisis 2 is used. Overall our set of indicators performs as well as the credit gap.

Table 5. Performance Comparison (in-sample): L/Y & H/Y vs. Credit-to-GDP Gap

(a) Thresholds, Predicted Probability, Type 1 & 2 Errors, Noise/Signal using Crisis 1

	LF1				LF2	LF3	
	α = 0.1	α = 0.25	α = 0.5	α = 0.75		x ≥ 60%	x ≥ 75%
L/Y and H/Y							
(L/Y)*	4.33	3.91	3.79	3.79	3.87	3.79	3.79
(H/Y)*	4.60	4.42	4.22	4.22	4.26	4.22	4.22
Predicted %	0.21	0.83	1.00	1.00	0.89	1.00	1.00
Type 1 error	0.79	0.17	0.00	0.00	0.11	0.00	0.00
Type 2 error	0.01	0.16	0.26	0.26	0.20	0.26	0.26
Noise/Signal	0.04	0.18	0.26	0.26	0.21	0.26	0.26
Credit-to-GDP ratio gap							
(Credit/GDP)*	13.58	10.24	5.88	3.94	7.03	4.47	3.94
Predicted %	0.31	0.68	0.96	1.00	0.89	0.97	1.00
Type 1 error	0.69	0.32	0.04	0.00	0.11	0.03	0.00
Type 2 error	0.06	0.15	0.30	0.37	0.27	0.36	0.37
Noise/Signal	0.09	0.23	0.31	0.37	0.30	0.36	0.37

Note: Crisis 1 is defined by the 2 standard deviations from the trend of the GDP. $(L/Y)^*$ and $(H/Y)^*$ are the averages of thresholds of liquidity and physical capital (normalized by GDP) across countries, respectively. Predicted % = percentages of crises predicted, Type 1 error = no signal is issued and a crisis occurs, Type 2 error = a signal is issued but no crisis occurs, Noise/Signal = $type\ 2\ error(T_2)/\{1 - type\ 1\ error(T_1)\}$.

(b) Thresholds, Predicted Probability, Type 1 & 2 Errors, Noise/Signal using Crisis 2

	LF1				LF2	LF3	
	$\alpha = 0.1$	$\alpha = 0.25$	$\alpha = 0.5$	$\alpha = 0.75$		$x \geq 60\%$	$x \geq 75\%$
L/Y and H/Y							
$(L/Y)^*$	4.22	4.10	3.65	3.34	3.98	3.55	3.50
$(H/Y)^*$	4.45	4.47	4.12	3.63	4.37	3.94	3.83
Predicted %	0.34	0.41	0.74	0.99	0.49	0.84	0.89
Type 1 error	0.66	0.59	0.26	0.01	0.51	0.16	0.11
Type 2 error	0.01	0.02	0.24	0.56	0.08	0.38	0.42
Noise/Signal	0.02	0.05	0.32	0.57	0.17	0.44	0.47
Credit-to-GDP ratio gap							
$(Credit/GDP)^*$	13.24	11.65	2.23	-3.49	10.94	0.02	-2.21
Predicted %	0.22	0.30	0.75	0.99	0.31	0.83	0.94
Type 1 error	0.78	0.70	0.25	0.01	0.69	0.17	0.06
Type 2 error	0.04	0.06	0.32	0.62	0.10	0.42	0.58
Noise/Signal	0.14	0.16	0.44	0.63	0.25	0.49	0.61

Note: Crisis 2 is defined by the 25% deviation from the trend of the GDP. $(L/Y)^*$ and $(H/Y)^*$ are the averages of thresholds of liquidity and physical capital(normalized by GDP) across countries, respectively. Predicted % = percentages of crises predicted, Type 1 error = no signal is issued and a crisis occurs, Type 2 error = a signal is issued but no crisis occurs, Noise/Signal = $type\ 2\ error(T_2)/\{1 - type\ 1\ error(T_1)\}$.

4.3 Evaluation for 12 OECD Countries

Using the signal extraction method proposed by Kaminsky and Reinhart (1999), we obtained the thresholds of L/Y and H/Y i.e., $(L/Y)^*$ and $(H/Y)^*$ for the 12 OECD countries. We compare these thresholds to actual levels of L/Y and H/Y in 2014 to investigate whether the recently increased L and H exceed the thresholds or not. Thresholds can vary depending on the type of loss function (LF1-3), type of crisis (crisis 1 or 2), and parameter values. We set the benchmark thresholds where the loss function is LF3 which minimizes the noise-to-signal ratio with the 75% minimum prediction probability ($x \geq 75\%$).

Table 6 shows the actual values in 2014 and thresholds of L/Y and H/Y for each OECD country. Countries of which L and H are both above thresholds are Australia, Austria, Canada, France, Germany, Greece, Sweden, and United States. The number of countries in which the signal (S_t) is turned on is 8 out of 12 countries. Many OECD countries are placed at a dangerous level that can be accompanied by rapid adjustments with a high probability according to the indicators proposed in this paper.

Table 6. Thresholds of L/Y and H/Y and Actual Values in 2014

	L/Y in 2014	H/Y in 2014	$(L/Y)^*$	$(H/Y)^*$	S_t
Australia	3.937162	6.874074	3.12	4.92	1
Austria	3.247009	3.992396	2.88	3.84	1
Belgium	4.924387	2.963627	4.32	3.02	0
Canada	5.267187	4.184285	4.46	3.65	1
France	4.070254	6.299971	3.37	6.27	1
Germany	2.959941	4.487432	2.76	4.37	1
Greece	3.484384	3.543851	2.77	3.2	1
Japan	6.504883	5.720743	4.99	6.04	0
Netherlands	4.465267	4.692713	4.24	5.27	0
Sweden	4.784382	4.906312	4.11	4.64	1
United Kingdom	4.864128	2.484426	4.15	2.58	0
United States	5.323817	3.206303	4.28	2.87	1
Average	4.486067	4.446344	3.79	4.22	0.67

Note: L/Y and H/Y denote liquidity and physical capital normalized by GDP, respectively. Thresholds of $(L/Y)^*$ and $(H/Y)^*$ for each OECD country are taken from Appendix where LF3 and $x \geq 75\%$.

Source: author's calculation

5. Conclusion

Structural changes in the global economy over the last two decades have weakened the transmission mechanism of monetary policy. Lower interest rates, including a flatter yield curve through quantitative easing, have had only gradual, if not little, impact on consumption and investment. Instead, a prolonged accommodative monetary policy is creating financial imbalance. Central banks under inflation target regimes have little choice but to keep policy rates low even when it is becoming obvious that they face a flattened Phillips curve.

A monetary aggregate that can gauge financial imbalance would be useful. The BIS-proposed financial cycle is in the right direction in that it tries to incorporate financial stability concerns in shaping monetary policy. Yet the weakness of this approach is that the credit gap, a key indicator, has to rely on a benchmark which is its own trend and lacks economic rationale. A prolonged smooth credit/GDP expansion reduces and eventually eliminates the credit gap even when the ratio goes to infinity and thereby undermines the seriousness of the cumulating size of excess liquidity or financial imbalance.

The proposed L addresses this weakness by constructing a threshold, i.e., a measure with a limit based on the national balance sheet. It rests on a simple principle that a person will lend only to the extent that it expects to be repaid and ultimately a society as a whole cannot have liabilities that exceeds its capacity to meet this expected repayment obligation. Thus, if the total lending in an economy starts to exceed the total value of the discounted stream of income, the situation becomes unsustainable. Either the amount of goods and services has to increase or lending has to decline. The net present value of the expected income stream, excluding the labor share, should be equivalent to the value of productivity embedded in the capital stock, H. Equivalently, this should be equal to the value of the total physical capital in the economy.

Based on the combination of L/Y and H/Y, the global economy has again accumulated too much liquidity since the global financial crisis. In fact, the degree of financial imbalance is more severe now than before the GFC. To some extent, it was a price that had to be paid in order to avoid a severe recession that could have followed after the global financial crisis. However, the monetary policy framework that narrows the central banks' policy focus to the inflation gap only has resulted in tilting the balance towards excessive easing perhaps not so much in the scope as much as in duration. There should thus be a tightening bias with somewhat less weight given to inflation gaps. While the reason for the persistent inflation gap cannot yet be fully explained, the cost of the current policy, potentially a financial adjustment and a negative GDP shock, appear to outweigh the benefit of closing the inflation gap.

References

Borio, C., 2014. The financial cycle and macroeconomics: What have we learnt? Journal ofBanking & Finance, 45, pp.182–198.

Borio, C. and Drehmann, M., 2009. Assessing the risk of banking crises–revisited. BISQuarterly Review.

Borio, 2016. Monetary policy, the financial cycle and ultra-low interest rates. BIS workingpapers No 562.

Drehmann, M., Borio, C. and Tsatsaronis, K., 2012. Characterising the financial cycle: don'tlose sight of the medium term! BIS Working Papers.

Haldane, A.G., 1995. Targeting Inflation: A Conference of Central Banks on the Use ofInflation Targets Organised by the Bank of England, 9-10 March 1995, Bank of England.

Han, L. and Lee, I.H., 2012. Optimal Liquidity and Economic Stability. IMF Working Paper.

J. Scott Davis and Eric van Wincoopz, 2017. Globalization and the Increasing Correlationbetween Capital Inflows and Outflows. NBER WP No.23671

Joshua C. C. Chan and Angelia Grant, 2017. Measuring the Output Gap Using StochasticModel Specification Search. CAMA Working Paper No. 2/2017

Juselius, M. et al., 2016. Monetary policy, the financial cycle and ultralow interest rates. BISWorking Papers, No 569.

Kaminsky, G.L. and Reinhart, C.M., 1999. The Twin Crises: The Causes of Banking andBalance-of-Payments Problems. American Economic Review, 89(3), pp.473–500.

Laubach, Thomas; and John C. Williams. 2003. Measuring the Natural Rate of Interest. TheReview of Economics and Statistics.

Ma, Y. and Zhang, J., 2016. Financial Cycle, Business Cycle and Monetary Policy: Evidencefrom Four Major Economies. International Journal of Finance & Economics, 21(4), pp.502–527.

Schularick, M. and Taylor, A.M., 2012. Credit Booms Gone Bust: Monetary Policy, LeverageCycles, and Financial Crises,1870——2008. The American Economic Review, 102(2), pp.1029–1061.

Sui Luo and , Richard StartzIs, 2014. Is it one break or ongoing permanent shocks thatexplains U.S. real GDP? Journal of Monetary Economics.

Appendix

A. Foreign Liabilities for 12 OECD Countries

Financial liabilities from nonresidents are rising steadily in most OECD countries (Figure A1) as a consequence of financial globalization. At the core of this process has been the rapid expansion of US$ liquidity in the global market in the form of spillover to other countries. Since

outflows from the US induced similar inflows from other countries, including from emerging market economies, most countries in OECD has been experiencing rising L/Y.

We show below that the spillover from the financial center, i.e., the US, can explain a large part of this increasing trend in individual countries. We find that L/Y and H/Y are stable after excluding external liquidity spillovers form the financial center, the US. We introduce the simultaneous equations model.

In order to check on whether or not the thresholds of normalized indicators ($(\boldsymbol{L/Y})*\boldsymbol{aaa}$ $(\boldsymbol{H/Y})*$) are stable, we introduce the simultaneous equations model. The set of equations is given by

$$(1)\ (L/Y)_{i,t} = \alpha_1(H/Y)_{i,t} + \alpha_2 GDPPC_{i,t} + \alpha_3 \Delta GDP_{i,t} + \alpha_4 R^l_{i,t} + \alpha_5 Manu_{i,t} + \alpha_6 KA_{i,t} + \alpha_7 \mu_i + \alpha_8 (L/Y)_{US,t} + \alpha_9 crisis_t + \varepsilon_t^{(L/Y)}$$

$$(2)\ (H/Y)_{i,t} = \beta_1 GDPPC_{i,t} + \beta_2 \Delta GDP_{i,t} + \beta_3 R^l_{i,t} + \beta_4 Manu_{i,t} + \beta_5 INV_{i,t} + \beta_6 REER_{i,t} + \beta_7 \mu_i + \beta_8 trend_t + \beta_9 crisis_t + \varepsilon_t^{(H/Y)}$$

where subscript i represents country i, and t denotes time t. L/Y and H/Y are liquidity and physical capital normalized by GDP(Y), respectively. GDPPC is a real GDP per capita, ΔGDP is a real GDP growth rate, R^l is a long-term interest rate (15~20-year bond yield), Manu is a manufacturing value added (% of GDP), KA is a summation of capital inflows and outflows[40] divided by GDP, INV is a total investment (% of GDP), REER is a real effective exchange rate, μ_i is a country fixed-effect, trend_t is a time trend, crisis_t is Reinhart-Rogoff (RR) financial crises (banking, currency, domestic and external default or restructuring, and inflation)[41], and $(L/Y)_{US,t}$ is L/Y for the US, which is included to control for the common trend in Equation (1). The regression result is given by Table A1.

[40] Capital flows include portfolio investment(debt and equity) and direct investment.

[41] http://www.carmenreinhart.com/data/browse-by-topic/topics/7/

Table A1: Regression Result of Simultaneous Equations Model

Dependent Variable:	$(L/Y)_{i,t}$			
	(1)	(2)	(3)	(4)
Methods	3SLS	3SLS	GMM	GMM
$(H/Y)_{i,t}$	0.160**	0.142*	0.149*	0.142*
	(0.0795)	(0.0808)	(0.0851)	(0.0795)
$GDPPC_{i,t}$	2.80e-06	-1.09e-05	6.03e-06	-8.88e-06
	(1.24e-05)	(1.11e-05)	(1.40e-05)	(1.29e-05)
$\Delta GDP_{i,t}$	-0.00617	0.00655	-0.0137	0.00385
	(0.00953)	(0.0100)	(0.0126)	(0.0117)
$R^l_{i,t}$	-0.0244	0.00576	-0.0356	0.00303
	(0.0203)	(0.0107)	(0.0235)	(0.0107)
$Manu_{i,t}$	-0.0523***	-0.0923***	-0.0490**	-0.0951***
	(0.0177)	(0.0148)	(0.0217)	(0.0171)
$KA_{i,t}$	-0.0925***	-0.0795***	-0.112***	-0.0907***
	(0.0149)	(0.0104)	(0.0137)	(0.0103)
Country FE	O	O	O	O
Trend	O	O	O	O
RR Crisis	O	X	O	X
GFC	X	O	X	O
Observations	153	208	153	208
R-squared	0.945	0.940	0.946	0.939

Note: Three-stage least squares (3SLS) and two-step GMM are implemented respectively. For the GMM results, robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10, 5, and 1-percent levels, respectively.

Given the coefficient estimated in Table A1, we obtain fitted values of L/Y. After excluding external liquidity spillovers, which is $(L/Y)_{US,t}$ from the fitted values of L/Y, we find that L/Y and H/Y are stable. (Figure A1).

This raises the question as to why L/Y should rise if this measure is tied to economic fundamental, namely the repayment capacity in each country. Another way of posing the same question is as to why domestic market forces do not ensure that L/Y is stable, or return to its stable rate after deviation.

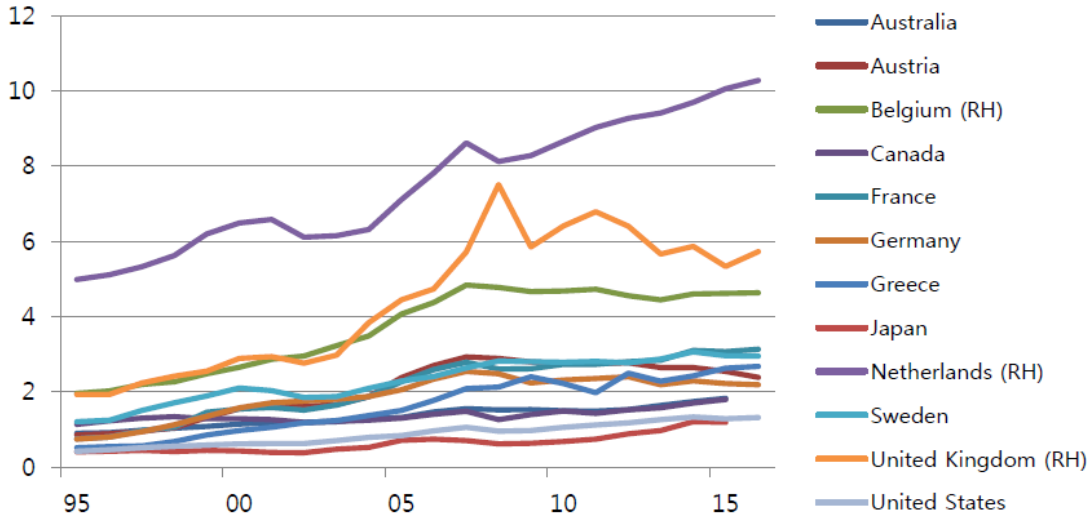


Figure A1. Foreign Liabilities to GDP ratio for 13 OECD Countries

The simple response is that this may be because source countries have incomplete information about the indebted counties, so they may be providing credit exceeding the production capacity of the recipient countries. The other side of the coin is that the lenders in each country are concerned on whether they will be repaid, but not fully factoring in obligation to nonresidents.

Consider country A and B below. The nonfinancial sector in country A holds financial assets in other countries as shown in Table A2. Investors may not have full information on country B to ensure that total financial claims in Country B, i.e., b+b' is equal to country B's productive capacity. The larger the b', the more likely it is that financial claims in country B exceed its productive capacity.

Table A2. Thresholds of L/Y and H/Y for 12 OECD Countries

	Nonfinancial sector in country A		Nonfinancial sector in country B		Total liabilities by country
	Control over volume	No control over volume	Control over volume	No control over volume	
Financial liabilities in country A	a			a'	a+a'
Financial liabilities in country B		b	b'		b+b'
Total holding by assets	a + b		a'+b'		

B. Thresholds for Each OECD Country

Table A3. Thresholds of L/Y and H/Y for 12 OECD Countries

(a) Thresholds of L/Y and H/Y using Crisis 1

Loss Function			AUS	AUT	BEL	CAN	FRA	DEU	GRC	JPN	NLD	SWE	GBR	USA
LF1	$\alpha = 0.1$	$(L/Y)^*$	3.94	3.25	5.07	5.27	4.07	3.01	3.48	4.99	4.61	4.78	4.15	5.32
		$(H/Y)^*$	6.87	3.99	3.20	4.18	6.72	4.49	3.54	6.04	5.27	4.91	2.58	3.36
		Predicted %	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.50	0.00	1.00	0.00
		Type 1 error	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.50	1.00	0.00	1.00
		Type 2 error	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00
		Noise/Signal	NaN	NaN	Inf	NaN	NaN	NaN	NaN	0.11	0.00	NaN	0.00	NaN
	$\alpha = 0.25$	$(L/Y)^*$	3.94	2.88	4.32	4.46	3.37	2.76	2.77	4.99	4.61	4.11	4.15	4.50
		$(H/Y)^*$	6.87	3.84	3.02	3.65	6.27	4.37	3.20	6.04	5.27	4.64	2.58	3.33
		Predicted %	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	0.50
		Type 1 error	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.50
		Type 2 error	0.00	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.00	0.24	0.00	0.06
		Noise/Signal	NaN	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.00	0.24	0.00	0.11
	$\alpha = 0.5$	$(L/Y)^*$	3.12	2.88	4.32	4.46	3.37	2.76	2.77	4.99	4.24	4.11	4.15	4.28
		$(H/Y)^*$	4.92	3.84	3.02	3.65	6.27	4.37	3.20	6.04	5.27	4.64	2.58	2.87
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
		Noise/Signal	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
	$\alpha = 0.75$	$(L/Y)^*$	3.12	2.88	4.32	4.46	3.37	2.76	2.77	4.99	4.24	4.11	4.15	4.28
		$(H/Y)^*$	4.92	3.84	3.02	3.65	6.27	4.37	3.20	6.04	5.27	4.64	2.58	2.87
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
		Noise/Signal	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
LF2		$(L/Y)^*$	3.12	2.88	4.32	4.46	3.37	2.76	2.77	4.99	4.61	4.45	4.15	4.50
		$(H/Y)^*$	4.92	3.84	3.02	3.65	6.27	4.37	3.20	6.04	5.27	4.64	2.58	3.33
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	0.67	1.00	0.50
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.33	0.00	0.50
		Type 2 error	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.00	0.18	0.00	0.06
		Noise/Signal	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.00	0.26	0.00	0.11
LF3	$x \geq 60\%$	$(L/Y)^*$	3.12	2.88	4.32	4.46	3.37	2.76	2.77	4.99	4.24	4.11	4.15	4.28
		$(H/Y)^*$	4.92	3.84	3.02	3.65	6.27	4.37	3.20	6.04	5.27	4.64	2.58	2.87
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
		Noise/Signal	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
	$x \geq 75\%$	$(L/Y)^*$	3.12	2.88	4.32	4.46	3.37	2.76	2.77	4.99	4.24	4.11	4.15	4.28
		$(H/Y)^*$	4.92	3.84	3.02	3.65	6.27	4.37	3.20	6.04	5.27	4.64	2.58	2.87
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50
		Noise/Signal	0.53	0.26	0.26	0.26	0.32	0.16	0.22	0.11	0.22	0.24	0.00	0.50

Note: Crisis 1 is defined by the 2 standard deviations from the trend of the GDP. Predicted % = percentages of crises predicted, Type 1 error = no signal is issued and a crisis occurs, Type 2 error = a signal is issued but no crisis occurs, Noise/Signal = $type\ 2\ error(T_2)/\{1 - type\ 1\ error(T_1)\}$.

(b) Thresholds of L/Y and H/Y using Crisis 2

Loss Function			AUS	AUT	BEL	CAN	FRA	DEU	GRC	JPN	NLD	SWE	GBR	USA
LF1	α = 0.1	(L/Y)*	3.89	3.15	4.78	5.27	3.70	3.01	2.77	6.06	4.61	4.78	4.15	4.50
		(H/Y)*	6.32	3.95	3.18	4.18	6.59	4.49	3.06	5.67	5.27	4.91	2.49	3.33
		Predicted %	0.33	0.33	0.29	0.00	0.43	0.00	0.86	0.13	0.20	0.00	1.00	0.50
		Type 1 error	0.67	0.67	0.71	1.00	0.57	1.00	0.14	0.88	0.80	1.00	0.00	0.50
		Type 2 error	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.06	0.00
		Noise/Signal	0.00	0.00	0.00	NaN	0.00	NaN	0.09	0.00	0.00	NaN	0.06	0.00
	α = 0.25	(L/Y)*	3.89	3.15	4.78	5.27	3.70	2.76	2.77	4.83	4.61	4.78	4.15	4.50
		(H/Y)*	6.32	3.95	3.18	4.18	6.59	4.37	3.06	5.98	5.27	4.91	2.49	3.33
		Predicted %	0.33	0.33	0.29	0.00	0.43	0.43	0.86	0.50	0.20	0.00	1.00	0.50
		Type 1 error	0.67	0.67	0.71	1.00	0.57	0.57	0.14	0.50	0.80	1.00	0.00	0.50
		Type 2 error	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.08	0.00	0.00	0.06	0.00
		Noise/Signal	0.00	0.00	0.00	NaN	0.00	0.18	0.09	0.17	0.00	NaN	0.06	0.00
	α = 0.5	(L/Y)*	3.12	2.45	3.27	4.46	3.70	2.76	2.77	4.72	4.24	3.61	4.15	4.50
		(H/Y)*	4.92	3.57	2.90	3.56	6.59	4.37	3.06	5.98	5.01	3.70	2.49	3.33
		Predicted %	1.00	1.00	0.71	0.40	0.43	0.43	0.86	0.75	1.00	0.86	1.00	0.50
		Type 1 error	0.00	0.00	0.29	0.60	0.57	0.57	0.14	0.25	0.00	0.14	0.00	0.50
		Type 2 error	0.47	0.57	0.23	0.33	0.00	0.08	0.08	0.25	0.40	0.46	0.06	0.00
		Noise/Signal	0.47	0.57	0.32	0.83	0.00	0.18	0.09	0.33	0.40	0.54	0.06	0.00
	α = 0.75	(L/Y)*	3.12	2.45	3.27	4.04	2.26	2.34	2.48	4.72	4.24	2.94	4.15	4.10
		(H/Y)*	4.92	3.57	2.83	3.06	3.62	3.35	2.85	5.67	5.01	3.39	2.49	2.87
		Predicted %	1.00	1.00	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.47	0.57	0.46	0.93	0.69	0.69	0.23	0.83	0.40	0.85	0.06	0.56
		Noise/Signal	0.47	0.57	0.54	0.93	0.69	0.69	0.23	0.83	0.40	0.85	0.06	0.56
LF2		(L/Y)*	3.89	3.15	4.78	4.46	3.70	2.76	2.77	4.83	4.36	4.45	4.15	4.50
		(H/Y)*	6.32	3.95	3.18	3.56	6.59	4.37	3.06	5.98	5.01	4.64	2.49	3.33
		Predicted %	0.33	0.33	0.29	0.40	0.43	0.43	0.86	0.50	0.40	0.43	1.00	0.50
		Type 1 error	0.67	0.67	0.71	0.60	0.57	0.57	0.14	0.50	0.60	0.57	0.00	0.50
		Type 2 error	0.00	0.00	0.00	0.33	0.00	0.08	0.08	0.08	0.13	0.15	0.06	0.00
		Noise/Signal	0.00	0.00	0.00	0.83	0.00	0.18	0.09	0.17	0.33	0.36	0.06	0.00
LF3	x ≥ 60%	(L/Y)*	3.51	2.45	3.27	4.04	2.88	2.67	2.77	4.72	4.26	3.74	4.15	4.10
		(H/Y)*	6.23	3.62	2.90	3.06	4.17	4.25	3.06	5.98	5.01	3.70	2.49	2.87
		Predicted %	0.67	0.83	0.71	1.00	0.86	0.86	0.86	0.75	0.80	0.71	1.00	1.00
		Type 1 error	0.33	0.17	0.29	0.00	0.14	0.14	0.14	0.25	0.20	0.29	0.00	0.00
		Type 2 error	0.24	0.43	0.23	0.93	0.54	0.54	0.08	0.25	0.27	0.38	0.06	0.56
		Noise/Signal	0.35	0.51	0.32	0.93	0.63	0.63	0.09	0.33	0.33	0.54	0.06	0.56
	x ≥ 75%	(L/Y)*	3.12	2.45	3.27	4.04	2.88	2.67	2.77	4.72	4.26	3.61	4.15	4.10
		(H/Y)*	4.92	3.62	2.83	3.06	4.17	4.25	3.06	5.98	5.01	3.70	2.49	2.87
		Predicted %	1.00	0.83	0.86	1.00	0.86	0.86	0.86	0.75	0.80	0.86	1.00	1.00
		Type 1 error	0.00	0.17	0.14	0.00	0.14	0.14	0.14	0.25	0.20	0.14	0.00	0.00
		Type 2 error	0.47	0.43	0.46	0.93	0.54	0.54	0.08	0.25	0.27	0.46	0.06	0.56
		Noise/Signal	0.47	0.51	0.54	0.93	0.63	0.63	0.09	0.33	0.33	0.54	0.06	0.56

Note: Crisis 2 is defined by the 25% deviation from the trend of the GDP. Predicted % = percentages of crises predicted, Type 1 error = no signal is issued and a crisis occurs, Type 2 error = a signal is issued but no crisis occurs, Noise/Signal = $type\ 2\ error(T_2)/\{1 - type\ 1\ error(T_1)\}$.

Table A4. Thresholds of Credit-to-GDP Gap for 12 OECD Countries

(a) Thresholds of Credit-to-GDP Gap using Crisis 1

Loss Function			AUS	AUT	BEL	CAN	FRA	DEU	GRC	JPN	NLD	SWE	GBR	USA
LF1	$\alpha = 0.1$	Credit/GDP*	18.10	7.20	18.41	15.30	8.37	8.20	25.60	3.80	15.20	18.47	11.90	12.40
		Predicted %	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	0.67	1.00	0.00
		Type 1 error	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.33	0.00	1.00
		Type 2 error	0.05	0.05	0.11	0.05	0.11	0.05	0.06	0.05	0.06	0.06	0.05	0.06
		Noise/Signal	Inf	Inf	0.11	Inf	0.11	Inf	Inf	Inf	Inf	0.09	0.05	Inf
	$\alpha = 0.25$	Credit/GDP*	18.10	1.16	18.41	4.06	8.37	8.20	21.37	-4.28	9.46	18.47	11.90	7.68
		Predicted %	0.00	1.00	1.00	1.00	1.00	0.00	0.50	1.00	0.50	0.67	1.00	0.50
		Type 1 error	1.00	0.00	0.00	0.00	0.00	1.00	0.50	0.00	0.50	0.33	0.00	0.50
		Type 2 error	0.05	0.32	0.11	0.26	0.11	0.05	0.22	0.26	0.11	0.06	0.05	0.22
		Noise/Signal	Inf	0.32	0.11	0.26	0.11	Inf	0.44	0.26	0.22	0.09	0.05	0.44
	$\alpha = 0.5$	Credit/GDP*	1.72	1.16	18.41	4.06	8.37	-10.62	13.89	-4.28	9.46	12.09	11.90	4.34
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
		Type 2 error	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.11	0.18	0.05	0.39
		Noise/Signal	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.22	0.18	0.05	0.39
	$\alpha = 0.75$	Credit/GDP*	1.72	1.16	18.41	4.06	8.37	-10.62	13.89	-4.28	-13.81	12.09	11.90	4.34
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.89	0.18	0.05	0.39
		Noise/Signal	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.89	0.18	0.05	0.39
LF2		Credit/GDP*	1.72	1.16	18.41	4.06	8.37	-10.62	21.37	-4.28	9.46	18.47	11.90	4.34
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	0.50	0.67	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.33	0.00	0.00
		Type 2 error	0.53	0.32	0.11	0.26	0.11	0.84	0.22	0.26	0.11	0.06	0.05	0.39
		Noise/Signal	0.53	0.32	0.11	0.26	0.11	0.84	0.44	0.26	0.22	0.09	0.05	0.39
LF3	$x \geq 60\%$	Credit/GDP*	1.72	1.16	18.41	4.06	8.37	-10.62	13.89	-4.28	-13.81	18.47	11.90	4.34
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00
		Type 2 error	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.89	0.06	0.05	0.39
		Noise/Signal	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.89	0.09	0.05	0.39
	$x \geq 75\%$	Credit/GDP*	1.72	1.16	18.41	4.06	8.37	-10.62	13.89	-4.28	-13.81	12.09	11.90	4.34
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Type 2 error	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.89	0.18	0.05	0.39
		Noise/Signal	0.53	0.32	0.11	0.26	0.11	0.84	0.50	0.26	0.89	0.18	0.05	0.39

Note: Crisis 1 is defined by the 2 standard deviations from the trend of the GDP. Predicted % = percentages of crises predicted, Type 1 error = no signal is issued and a crisis occurs, Type 2 error = a signal is issued but no crisis occurs, Noise/Signal = $type\ 2\ error(T_2)/\{1 - type\ 1\ error(T_1)\}$.

(b) Thresholds of Credit-to-GDP Gap using Crisis 2

Loss Function			AUS	AUT	BEL	CAN	FRA	DEU	GRC	JPN	NLD	SWE	GBR	USA
LF1	$\alpha = 0.1$	Credit/GDP*	18.10	5.36	20.20	15.30	8.20	8.20	23.00	2.51	15.20	18.47	11.90	12.40
		Predicted %	0.33	0.33	0.14	0.00	0.43	0.00	0.29	0.13	0.00	0.29	0.50	0.25
		Type 1 error	0.67	0.67	0.86	1.00	0.57	1.00	0.71	0.88	1.00	0.71	0.50	0.75
		Type 2 error	0.00	0.00	0.00	0.07	0.08	0.08	0.00	0.08	0.07	0.08	0.06	0.00
		Noise/Signal	0.00	0.00	0.00	Inf	0.18	Inf	0.00	0.67	Inf	0.27	0.11	0.00
	$\alpha = 0.25$	Credi/GDP*	18.10	5.36	20.20	15.30	4.38	8.20	23.00	2.51	6.43	12.09	11.90	12.40
		Predicted %	0.33	0.33	0.14	0.00	0.71	0.00	0.29	0.13	0.40	0.57	0.50	0.25
		Type 1 error	0.67	0.67	0.86	1.00	0.29	1.00	0.71	0.88	0.60	0.43	0.50	0.75
		Type 2 error	0.00	0.00	0.00	0.07	0.15	0.08	0.00	0.08	0.13	0.15	0.06	0.00
		Noise/Signal	0.00	0.00	0.00	Inf	0.22	Inf	0.00	0.67	0.33	0.27	0.11	0.00
	$\alpha = 0.5$	Credit/GDP*	11.61	1.16	2.79	4.06	4.38	-3.72	7.39	-22.38	6.43	3.97	6.70	4.34
		Predicted %	0.67	0.67	1.00	0.40	0.71	0.57	1.00	0.75	0.40	0.86	1.00	1.00
		Type 1 error	0.33	0.33	0.00	0.60	0.29	0.43	0.00	0.25	0.60	0.14	0.00	0.00
		Type 2 error	0.12	0.21	0.62	0.27	0.15	0.46	0.46	0.50	0.13	0.38	0.28	0.31
		Noise/Signal	0.18	0.32	0.62	0.67	0.22	0.81	0.46	0.67	0.33	0.45	0.28	0.31
	$\alpha = 0.75$	Credit/GDP*	1.72	-5.54	2.79	-8.17	-0.84	-12.50	7.39	-27.88	-13.81	3.97	6.70	4.34
		Predicted %	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.86	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00
		Type 2 error	0.47	0.93	0.62	0.87	0.62	0.92	0.46	0.75	0.87	0.38	0.28	0.31
		Noise/Signal	0.47	0.93	0.62	0.87	0.62	0.92	0.46	0.75	0.87	0.45	0.28	0.31
LF2		Credit/GDP*	18.10	7.20	20.20	4.06	8.20	-3.72	25.60	2.51	6.43	18.47	11.90	12.40
		Predicted %	0.33	0.17	0.14	0.40	0.43	0.57	0.14	0.13	0.40	0.29	0.50	0.25
		Type 1 error	0.67	0.83	0.86	0.60	0.57	0.43	0.86	0.88	0.60	0.71	0.50	0.75
		Type 2 error	0.00	0.00	0.00	0.27	0.08	0.46	0.00	0.08	0.13	0.08	0.06	0.00
		Noise/Signal	0.00	0.00	0.00	0.67	0.18	0.81	0.00	0.67	0.33	0.27	0.11	0.00
LF3	$x \geq 60\%$	Credit/GDP*	11.61	1.16	2.79	-2.54	4.38	-12.50	16.49	-22.38	-13.81	3.97	6.70	4.34
		Predicted %	0.67	0.67	1.00	0.60	0.71	1.00	0.71	0.75	1.00	0.86	1.00	1.00
		Type 1 error	0.33	0.33	0.00	0.40	0.29	0.00	0.29	0.25	0.00	0.14	0.00	0.00
		Type 2 error	0.12	0.21	0.62	0.47	0.15	0.92	0.23	0.50	0.87	0.38	0.28	0.31
		Noise/Signal	0.18	0.32	0.62	0.78	0.22	0.92	0.32	0.67	0.87	0.45	0.28	0.31
	$x \geq 75\%$	Credit/GDP*	1.72	-5.54	2.79	-8.17	2.47	-12.50	13.89	-22.38	-13.81	3.97	6.70	4.34
		Predicted %	1.00	1.00	1.00	1.00	0.86	1.00	0.86	0.75	1.00	0.86	1.00	1.00
		Type 1 error	0.00	0.00	0.00	0.00	0.14	0.00	0.14	0.25	0.00	0.14	0.00	0.00
		Type 2 error	0.47	0.93	0.62	0.87	0.38	0.92	0.38	0.50	0.87	0.38	0.28	0.31
		Noise/Signal	0.47	0.93	0.62	0.87	0.45	0.92	0.45	0.67	0.87	0.45	0.28	0.31

Note: Crisis 2 is defined by the 25% deviation from the trend of the GDP. Predicted % = percentages of crises predicted, Type 1 error = no signal is issued and a crisis occurs, Type 2 error = a signal is issued but no crisis occurs, Noise/Signal = $type\ 2\ error(T_2)/\{1 - type\ 1\ error(T_1)\}$.

IMI News

- On January 6, the lists of Fintech Leaders Top 10 and Fintech Rising Stars Top 10 were announced in Beijing. This is the second running since the lists were created. The lists are jointly created by Global People of People's Daily and IMI. After thoroughly evaluating 200 fintech companies, we selected 10 leaders and 10 rising stars in china's fintech industry.
- On January 7, Macro-Finance Salon (No. 89) was held in Room 801, Mingde Main Building of Renmin University of China. Zhou Yueqiu, director of the Urban Financial Research Institute of ICBC, deputy director of GFC, Secretary General of China Urban Financial Society, delivered a keynote speech about the financial layout after the 19th CPC National Congress.
- On January 10, the 2018 Finance Development Summit and 2017 China Top Finance Awarding Ceremony was held in Beijing. This event was organized by The Paper with special support from IMI. The Summit focused on new trends of economic development and new challenges in the financial sector, and discussed many interesting hot topics, including the Belt and Road Initiative, FinTech, inclusive finance, wealth management, economic cycles, etc.
- On January 14, Symposium on the Construction of Datong National Green Finance Reform & Innovation Pilot Zone was held at Renmin University of China. Cui Jizhe, former vice president of Xinhua News Agency, Li Junru, former vice president of Party School of the Central Committee of CPC, Yang Chaofei, former chief engineer of Ministry of Environmental Protection, Wei Benhua, former deputy administrator-in-bureau of the State Administration of Foreign Exchange, Xu Heping, director of Zhongguancun Xinhua New Energy Industry Research Institute, former director of the Department of Science and Technology, Wei RuSheng, deputy director of Shanxi Provincial Development and Reform Commission, Jing Hui, director of Shanxi Finance Office, Zhu Jinwei, director of Shanxi Insurance Regulatory Bureau and Wang Zhigang, deputy director of Shanxi Banking Regulatory Bureau were present. Ma Anquan, deputy mayor of Datong City presided over the symposium.
- On January 21, 10th Anniversary Celebration of the Roundtable on Money and Finance and the IMI 2018 New Year Forum was held successfully in the Run Run Shaw Auditorium of RUC. Managed by the School of Finance of RUC and China Financial Policy Research Center, the meeting was organized by IMI, and co-sponsored by Sichuan Tianfu Bank Co., Ltd (TFB), Xiamen International Financial Technology Co., Ltd (XFinTech), China FinTech 50 Forum (CFT50) and Cross-border Finance 50 Forum (CBF50).
- On March 11, Tao Xiang International Finance Lectures (No. 12) was held in Renmin University of China. Yu Yong, Senior Product Manager, Financial Market Department, Bank of China Qingdao Branch, gave a lecture on "Risk Management of Multinational Banking - Chinese Banking Industry under the Belt and Road Initiative". The lecture was presided over by TuYonghong, Deputy Director of IMI.
- On March 17, the Seminar on Sichuan Free Trade Zone serving the Belt and Road Initiative and Renminbi Internationalization was held in Beijing. The seminar was jointly co-hosted by the Finance Bureau of Sichuan Province and IMI, sponsored by Sichuan Financial Holding Group Co., Ltd.

- On March 24, the Macro-Finance Salon (No. 90) was held in Renmin University of China. Wang Wensong, deputy director general of Planning Department at China Development Bank, delivered a keynote speech on “New Trends in China and the US’s Economy”. Zhang Zhixiang, former IMF executive director for China and Academic Committee member of IMI, chaired the salon.
- On March 28, Minutes of Macro-Finance Salon (No. 91) was held at Renmin University of China. The salon invited Dr. Wang Jian, chief analyst of banking industry from GuotaiJunan Securities Research Institute, IMI researcher. Dr. Wang gave a speech with the title of “The Logic and Framework of Money Analysis”.
- The Seminar on Fintech Regulation: UK-China Collaboration to Promote Financial Innovation was held on March 28 at Renmin University of China. The seminar was co-hosted by the British Embassy in China, Zhejiang University Academy of Internet Finance (AIF), and the Cambridge Centre for Alternative Finance (CCAF), organized by IMI and supported by Zhejiang University Institute of Data & Risk (IDR).
- On March 31, Tao Xiang International Finance Lectures (No. 13) was held in Renmin University of China. Zhang Weiwu, General Manager of the International Department of ICBC, gave a speech on the "Internationalization of Chinese Banks and Financial Support for the Belt and Road Initiative". The lecture was chaired by Prof. TuYonghong, Deputy Director of IMI and assistant director of Sichuan Provincial Bureau of Financial Work.

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

General rule: Submitted manuscripts should be double-spaced texts in 10.5 point font, and formatted for paper of standard size with margins of at least 20mm on all sides. Pages should be numbered, and an abstract (of no more than 200 words), as well as keywords and complete author affiliations, should be included in the paper in the title page. A regular article should not exceed 50 pages.
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.
Tables: Tables should be numbered consecutively throughout the article. Each table must include a descriptive title and headings to columns. Gather general footnotes to tables as "Note:" or "Notes:", and use a, b, c, etc., for specific footnotes. Asterisks * and/or ** indicate significance at the 5 percent and 1 percent levels, respectively, if used.

Reference style

Please follow the EPS Style Guide when preparing your article.
http://eps.ruc.edu.cn/UserFiles/File/EPS%20Style%20Guide.pdf

Further considerations

- Manuscript has been spell-checked and grammar-checked
- References are in the correct format for this journal
- All references mentioned in the reference list are cited in the text, and vice versa
- Permission has been obtained for use of copyrighted material from other sources

Submit your article

Manuscripts can be submitted via e-mail to imi@ruc.edu.cn


INTERNATIONAL MONETARY INSTITUTE OF RUC
中国人民大学国际货币研究所