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Herbert Poenisch

Progress in Cross Border Payments So Far and Scenarios Ahead

Zhang Ming Reversal of Globalization is Leading to Long-term Stagflation

Yu Yongding Financial Cooperation Crucial to Asia's Prosperity

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End of Tunnel Bumpy but Bright

Tobias Adrian and Vitor Gaspar How Fiscal Restraint Can Help Fight Inflation

Li Bo and Bert Kroese Bridging Data Gaps Can Help Tackle the Climate Crisis

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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.

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Special Column on Progress in Reform of Cross-Border Payments

Progress in Cross Border Payments So Far and Scenarios Ahead	Herbert Poenisch/01
Global Economy	
Exchange Rates and Inflationary Pressures	Christopher Kent/11
Managing a Turn in the Global Financial Cycle	Gita Gopinath/21
Financial Cooperation Crucial to Asia's Prosperity	Yu Yongding/31
Reversal of Globalization is Leading to Long-term Stagflation	Zhang Ming/33
Global Debt	
Frontier Economies Require New Approach to Sustainable Debt	Polina Kurdyavko/36
Riding the Global Debt Rollercoaster <i>Vitor Gaspar, I</i>	Paulo Medas, Roberto Perrelli/39
China	
QE with Chinese Characteristics	Andrew Sheng and Xiao Geng/45
End of Tunnel Bumpy but Bright	Guan Tao/48
Consumption, not Investment, Now Key to Growth	Teng Tai/50
China to Accelerate Recovery in 2023	Yao Yang/53
Easing Restrictions Builds on Past Success	Zhou Xiaoming/55
Monetary and Fiscal Policy	
The Price to Pay: How to Rein in Inflation? Central Bank and Gove	rnment Perspectives
	Alfred Kammer/58
Is Monetary Policy Still Regulatory Policy Today	Joachim Nagel/62
How Fiscal Restraint Can Help Fight Inflation To	bias Adrian and Vitor Gaspar/69
Financial Regulation	
Proportionality and Financial Inclusion: Implications for Regulation	n and Supervision
	Fernando Restroy/74
Why Bank Capital Matters	Michael Barr/77
Financial Innovation	
Anchors and Catalysts - Central Banks' Dual Role in Innovation	François Villeroy de Galhau/84
International Cooperation in a World of Digitalisation	Pablo Hernandez de Cos/88
Green Finance	
Bridging Data Gaps Can Help Tackle the Climate Crisis	Bo Li and Bert Kroese/93
Greening Economy while Achieving Inclusive Growth	Peng Wensheng/97
Working Paper	
State Common Ownership and Banks' Governance Role: Evidence	from CEO Turnovers in China
	<i>Qing He and Dongxu Li</i> /100

January 2023, Vol. 10, No. 1

Special Column on Progress in Reform of Cross-Border Payments

Progress in Cross Border Payments So Far and Scenarios

Ahead

By HERBERT POENISCH*

This special topic has been chosen because the efficient movement of money round the world is a key feature of the global economy. However, the global economy has shown cracks and fragmentation in recent years. Will recent efforts suffice to fix the existing system or need to be more comprehensive?

Improving the opaque cross border settlement system has featured prominently on the agenda of many organisations, such as the G20, Society for Worldwide Interbank Financial Telecommunication (SWIFT), the Committee on Payments and Market Infrastructure at the BIS (CPMI), the Continuously Linked Settlement Bank (CLS), OMFIF, just to mention the most prominent few.

Among the myriad of literature, this article will focus on what has been achieved so far in the first section, what still needs to be done in the second section and whether and how FinTech, such as introducing CBDC can assist the progress in cross border settlements. Special attention will be paid to how the fragmentation of global finance will affect efforts to improve a universal global payments system.

While new technologies can provide invaluable support for new payment solutions, they are subordinate to some of the basic obstacles. These are the choice between public, ie central bank money and private money for settlement, basic risk management, first and foremost foreign exchange risk, also known as Herstatt risk and liquidity risk, which is present in any payments transactions. While it is unquestionable that both these risks can be eliminated only through the

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use of central bank currencies, the main players in cross border payments, the major commercial banks have shown that these risks can be reduced substantially as most are members of a global forex settlement mechanism CLS as well as members of their national RTGS which provides final settlement in central bank currencies.

1.What has been achieved so far

The present system, basically the global commercial banks and their correspondent account network as well as the messaging system, SWIFT have been the focus of criticism, such as time consuming, lacking transparency and expensive. In addition, while there has been improvement in payments transactions, final settlement can take much longer. SWIFT has outlined its recent improvements in the OMFIF 2022 payments report.

That's no small feat when money starts moving across borders, especially when considering the myriad factors that must be taken into account, from navigating different time zones, processing approaches and domestic payments systems, to understanding compliance requirements in numerous jurisdictions. Increasingly, there's a need to consider possible new forms of value too – from central bank digital currencies to tokenised assets.

Swift sits at the heart of the cross-border payments ecosystem, ensuring payments reach their destinations quickly, securely and compliantly. Through our network of more than 11,500 institutions in over 200 countries and territories, money can be sent anywhere in the world – even to the most remote locations. And our commitment to responsible innovation means every day the experience gets faster and better while maintaining the highest levels of security, resiliency and reliability. We've made strong progress over the past two years with a strategic focus on enabling instant and frictionless processing between 4bn accounts worldwide, aligned with the G20's objectives of improving speed, cost, transparency, choice and access in the cross-border payments experience. Swift's achievements include:

Speed: Most payments over Swift today use gpi and nearly half reach their end beneficiaries within five minutes and two-thirds arrive within one hour, well on the way to achieving the G20 goal of having 75% of international payments settling within 60 minutes by 2027. Correspondent banking has been delivering secure, compliant cross-border payments and banks uses intermediaries to access the required currency within a specific jurisdiction. There has been a steady decline in the number of correspondent banks involved in a payment – today, 73.9% of all cross-border transactions involve just one or no intermediary.

Transparency: By embedding a unique tracking code in every transaction, Swift has enabled banks to have complete visibility on the status and costs of transactions with real-time tracking all along the process – just like tracking a parcel delivery. This has provided unprecedented insight into the frictions that slow down payments. We know from this data, for instance, that the biggest impact on speed comes from capital controls and domestic regulatory requirements. For banks in countries with capital controls, the time taken by the beneficiary side is nearly three times that for banks in countries without them. This issue has been recognised by the CPMI as

part of its focus on an efficient legal, regulatory and supervisory environment for cross-border payments.

Costs: One of the other frictions is incorrect beneficiary information - such as typos and transposed account numbers - that breaks automated processing and requires manual intervention to resolve. Swift has introduced an application programming interface-based pre-validation service, which allows sending banks to verify beneficiary data upfront, before executing the transaction. For banks not ready for pre-validation, Swift provides a pre-check of the account details against pseudonymised and aggregated data from more than 4bn accounts to catch errors before a payment is sent. Its deployment, which could save the industry millions each year, currently covers 70% of beneficiary accounts in major markets

Choice: Swift has not only focused on bringing these benefits to high value wholesale payments, it has also improved the experience for small businesses and consumers who send low-value payments around the world. Through Swift Go, we have established a new standard for payments under \$10,000, bringing new levels of speed, transparency and certainty for account to account transfers. In 2022, signups for the service tripled to more than 500 banks across more than 120 countries.

With digital currencies, stablecoins and other digital assets set to enter the market at scale, SWIFT needs to guarantee interoperability with existing systems that consumers and businesses rely on and that have proven their value to the economic system. Swift has always focused on interoperability. It is central to instant and frictionless payments. The importance of standardisation, too, has recently been recognised by the G20 in its reprioritised programme for cross-border payments enhancements, particularly the importance of ISO 20022. This new international standard can carry much more information than older solutions, but that data is also more structured, ensuring the efficient execution of compliance requirements for cross-border payments. Swift's new transaction management platform, set to roll-out in 2023, enables interoperability between ISO 20022 messaging and legacy messaging, thanks to an integral in-flow translation service. The platform provides new orchestration capabilities, providing banks with richer, better structured data to make use of new API-based technology for an enhanced payment execution experience. Every bank in the chain will have access to all required data for compliance requirements. Other API-based tools, such as pre-validation, help remove friction while gpi instant allows an anchor bank to provide access to the domestic instant payments system in the destination market – giving fast settlement and the immediate posting of the funds to the beneficiary account.

The benefits of payments innovation are clear. Digitalisation of payments lowers transaction costs, increases transaction speed and reduces the complexity of making payments. It allows millions of the poor and the unbanked to use their mobile phones to access financial services such as remittances that those in developed markets take for granted.

According to the IMF, in India alone, digital payment volume 'has climbed at an average annual rate of about 50% over the past five years. That itself is one of the world's fastest growth rates, but its expansion has been even more rapid — about 160% annually — in India's unique, real-time, mobile-enabled system, the Unified Payments Interface (UPI) where transactions more

than doubled, to 5.9bn, in June 2022 from a year earlier as the number of participating banks jumped 44%, to 330.' Growth of this kind is occurring throughout emerging markets, from Brazil (PIX) and Indonesia to Kenya and Kazakhstan. Open banking initiatives, which are key drivers of payment system innovation, continue to be rolled out across developing markets.

However, the extraordinary proliferation of alternative payments providers in emerging markets, combined with the many government driven digital initiatives, including cross-border payments solutions and CBDCs, create their own complexities and problems. Most significantly, the proliferation of payments platforms and ecosystems creates a hugely attractive new target for cybercriminals and digitally enabled fraudsters.

Digital payments are here now and payments platforms, accessed via mobile apps, whether built by central banks or Fintechs, are becoming the de facto money transmission infrastructure of emerging markets. This is an opportunity for the finance sector to extend good cybersecurity practices to customers and suppliers. If central banks and financial authorities put in place effective security and resilience regulations now in line with the CPMI roadmap outlined below, and banks and other financial services firms drive these standards down into their supply chains, customers and countries will be much better protected against the threats posed by cybercriminals.

2.What still needs to be done

While technology has alleviated most of these deficiencies, nationally imposed impediments still feature prominently, such as a decentralised banking system requiring more intermediation, multiple currencies, national regulations lately joined by localised data collection requirement, and capital controls which still slow down the settlement process. As far as remittances are concerned, the prevalent preference of beneficiaries for cash hampers efficiency gains. In addition, geopolitics have led to a segmentation of the global financial system where new channels of cross border settlements such as bilateral clearing between China and Belt and Road countries have partially replaced the traditional cross border settlements. The recent proposal for denomination and settlement of Saudi oil in CNY is a case in point. The main motivation for avoiding a common global system is to avoid scrutiny of payments by third parties.

As payments innovation accelerates, the cybersecurity risks inherent in the payments system will increase. Populations will become ever more reliant on a complex ecosystem of private sector platforms whose security posture will be hard to control. And central banks have one final role to play in that risk landscape.

Beyond their own security, central banks, as supervisors and overseers of banking and payments systems, are responsible for ensuring that appropriate regulations on operational and cyber risk are in place. In developed markets, for example, the Bank of England and the Federal Reserve have published detailed operational guidelines and cyber resilience expectations which are likely to develop into more prescriptive regulations on technology and security over time. Emerging market central banks must follow suit, in conjunction with other bodies responsible for the supervision and oversight of payments systems.

As the threats to financial systems grow, it may also be necessary for regulators to go further than broad guidelines and to develop more detailed and prescriptive rules around specific technologies and operational details such as testing. Given the importance of threat-led penetration testing in assessing cybersecurity, it may be that central banks and related regulators should set up testing frameworks for entities they regard as systemically important. Ultimately, central banks can only do so much to improve the cybersecurity of payments systems by themselves. However, they can call upon governments to bring forward legislation and to develop efficient and credible judicial and law enforcement systems around cybersecurity.

The most comprehensive effort to address the persistent difficulties involved in the deeper integration of cross-border payments systems is being spearheaded by the CPMI's 'Roadmap for Enhancing Cross Border Payments' initiative, overseen by the Financial Stability Board. Its objectives consist of five focus areas (below) which, together with their respective building blocks, address three cornerstone issues persisting in present cross-border payments ecosystems: payments system interoperability and extension; legal, regulatory and supervisory frameworks; and cross-border data exchange.

A. PUBLIC AND PRIVATE SECTOR COMMITMENT 1. Developing a common cross-border payments vision and targets 2. Implementing international guidance and principles 3. Defining common features of cross-border payment service levels

B. REGULATORY, SUPERVISORY AND OVERSIGHT FRAMEWORKS 4. Aligning regulatory, supervisory and oversight frameworks for cross-border payments 5. Applying AML/CFT rules consistently and comprehensively 6. Reviewing the interaction between data frameworks and cross-border payments 7. Promoting safe payment corridors 8. Fostering KYC and identity information sharing

C. EXISTING PAYMENT INFRASTRUCTURES AND ARRANGEMENTS 9. Facilitating increased adoption of PVP 10. Improving (direct) access to payment systems by banks, non-banks and payment infrastructures 11. Exploring reciprocal liquidity arrangements across central banks (liquidity bridges) 12. Extending and aligning operating hours of key payment systems to allow overlapping 13. Pursuing interlinking of payment systems for cross-border payments

D. DATA AND MARKET PRACTISES 14. Adopting a harmonised ISO 20022 version for message formats (including rules for conversion mapping) 15. Harmonising API protocols for data exchange 16. Establishing unique identifiers with proxy registries

E. NEW PAYMENT INFRASTRUCTURES AND ARRANGEMENTS 17. Considering the feasibility of new multilateral platforms and arrangements for cross-border payments 18. Fostering the soundness of global stablecoin arrangements for cross-border payments 19. Factoring an international dimension into CBDC design.

The efforts by SWIFT outlined above address mainly area C, whereas the other areas are firmly in the court of the G20 financial authorities. While countries pay lip service to implementation, the fragmentation of the global financial system witnessed in recent years puts in doubt whether they truly support the objectives. Under this new perspective and the emerging new global payment systems (NGPS) the following objectives are not generally accepted.

As far as A is concerned, attempts by China to promote internationalization of RMB with its own cross border payment system, sanctions by the West on Russia, particularly those excluding Russian banks from SWIFT, and efforts by BRICS countries to create their own payment and settlement system have questioned the 'common' in all these objectives.

As far as B is concerned, differences in regulatory frameworks have impeded progress in the past. As each new compartment of global finance gains importance, the need to align common standards recedes in favour of strengthening the prevailing practices. Data frameworks will serve national interests rather than KYC and identity sharing among payment agents. The national data localization rules have recently gained importance in countries like China, Russia and India.

But the challenge of facilitating cross-border data exchange presents a significant hurdle, undermining the potential for a fully centralised cross-border payments system with a global reach. Cross-border data flows are a crucial element to the development of any efficient multilateral payments ecosystem, but the protectionist trend reflects a world which is becoming more fragmented, undermining the globalisation of payments systems.

As far as C is concerned SWIFT has been in charge of improvements of the traditional, Western controlled payments system. However, many of these concerns, such as PvP, liquidity provision by central banks, interlinking systems are equally important for new global payment systems (NGPS) as part of the fragmentation of global finance.

As far as D is concerned, adopting a standard messaging format is still of common concern for all global payments systems, whereas harmonizing Application Programming Interface (API) protocols and unique identifiers might be determined by national requirements.

As far as E is concerned, new multilateral platforms might serve the NGPS well, introduction of CBDCs in particular the cross-border application of eCNY may become essential elements of NGPS. Multilateral platforms are exploring the use of new tools and innovations, such as distributed ledger technologies, blockchain, cloud technology and artificial intelligence. Although they are still in the early stages of the development, these potentially more 'disruptive' technologies could also have significant potential to facilitate payments system interoperability within fiat-based systems.

Stablecoins linked to any of the major currencies could allow regulation-free cross border payments for small amounts thus boosting remittances. However, a recent IMF paper points out problems of entanglement between Fintech and remittances. For large amounts the currency substitution effect might exacerbate fragilities in emerging market banking systems as they lose deposits to stablecoins, particularly if these are remunerated.

3. The need for a digital currencies, such as stablecoins and CBDC

Digital payments made through conventional systems and forms of money work reasonably well for e-commerce transactions, so it is not inevitable that new payment solutions including new currencies are needed for the metaverse. As the metaverse becomes more mainstream, existing players in financial services are already seeking ways to offer their services to a new hub of economic activity.

Banks are anticipating a world of digital economic activity in which they can offer their traditional services in new ways, providing credit and transaction services to individuals and businesses in the metaverse. Banks hold a privileged position in finance because of the regulation they are required to comply with. These risk management principles should make deposits relatively safe and, in the event of the bank failing to meet its obligations, there is state provide. Creating tokens tradeable within the blockchain that represent existing deposits will be the first stage.

Although these are conceptually similar to stablecoins, in that they are crypto-tokens designed to maintain the value of a fiat currency, they are different in that the security of stablecoins rests entirely on the quality of their collateralisation, while tokenising bank deposits allows users to trade in digital money that has the same risk profile they are used to.

Stablecoins offer a means of quickly sending money across borders. They are based on trust in the central banks underlying the issue, but not fully. But by creating a new money in the absence of a rigorous monitoring infrastructure opens too many opportunities for crime. The development of the metaverse, and the digital identity infrastructure required to serve it, might carry the institutional heft to offer a solution to this problem.

The use of CBDCs for cross-border payments could potentially have many benefits. A retail CBDC could be made available to foreign residents either conditionally, for limited purposes or without restriction. This would be similar to non-residents holding a country's currency in cash or as bank credit for travel, remittance or payments within the currency area. However, there are concerns and risks for the issuing central bank.

Cross-border settlement systems using wCBDC would have significant advantages; they could potentially simplify intermediation chains of correspondent banks, and operate a peer-to-peer settlement in bilateral or multilateral central bank currencies. Cross-border payments would be faster, cheaper and considerably reduce credit and liquidity risks as counterparty central banks would provide the implicit guarantee of settlement. For emerging market central banks this would significantly enhance their ability to manage international payments in multiple currencies and reduce their need for maintaining substantial reserves in dominant currencies. However, this requires a lot of groundwork in developing interoperability and security standards as well as cross-border governance frameworks. The project mBridge, initiated by the BIS Innovation Hub is a first test case of cross-border use of digital currencies, ie the CNY, the HKD, the THB and the UAD. The main features of this pilot project are:

Project mBridge experiments with cross-border payments using a common platform based on distributed ledger technology (DLT) upon which multiple central banks can issue and exchange their respective central bank digital currencies (multi-CBDCs). The proposition of mBridge is that an efficient, low-cost and common multi-CBDC platform can provide a network of direct central bank and commercial participant connectivity, greatly increasing the potential for international trade flows and cross-border business at large. To test this proposition, a new native blockchain – the mBridge ledger – was custom-designed and developed by central banks for central banks, to serve as a specialised and flexible platform implementation for multi-currency cross-border payments. Particular attention was paid to modular functionality, scalability, and compliance with jurisdiction-specific policy and legal requirements, regulations and governance needs.

Over the course of six weeks, the mBridge platform was put to the test through a pilot involving real-value transactions centred around the chosen use case of international trade. Significant groundwork was laid prior to the pilot, including extensive coordination within and among central banks and commercial banks, and tailored legal agreements and dress rehearsals, which ultimately led to its success. Between 15 August and 23 September 2022, 20 commercial banks from Hong Kong SAR, Mainland China, the UAE and Thailand conducted payment and foreign exchange (FX) payment versus payment (PvP) transactions on behalf of their corporate clients using the CBDCs issued on the mBridge platform by their respective central banks. The pilot advances multi-CBDC experimentation by settling real value directly on the platform and on behalf of corporate customers. Over US\$12 million was issued on the platform, facilitating over 160 payment and FX PvP transactions totalling more than US\$22 million in value.

The pilot's real-world setting also brought to light a range of policy, legal and regulatory considerations of a multi-CBDC, cross-border payments platform such as mBridge. Extending access to central bank money directly to foreign participants and conducting transactions on a shared ledger requires further exploration of policy, data privacy and governance considerations. A new, digital form of currency and a multi-CBDC platform also raise challenging legal questions that depend on each participating jurisdiction's standing rules and regulations and may require regulatory changes to achieve full legal certainty and clarity. While some of these considerations can be addressed by the platform's current design, others require further development and exploration.

4.Conclusion

This article has covered the improvements to the present cross-border and settlement by Swift, the roadmap of the G20 for jointly improving cross-border payments. Limitations to this joint effort have shown up recently in the fragmentation of the global financial system.

While new means of payment such as stablecoins have potential to offer cheaper, faster and more transparent cross border payments for small amounts such as remittances, large amounts still face regulatory and supervisory obstacles.

On CBDC, it should be clarified that a wholesale CBDC is a misnomer. It is not a digital version of money, neither as a unit of account or as a medium of exchange nor, indeed, as a store of value, although it might have some its characteristics. It is essentially a means of payment or a settlement medium. Therefore, the discussion on the utility of a wholesale digital currency (token) ought to be separated from the concept of a CBDC. Indeed, as discussed above, there are many advantages and benefits in the use a wholesale digital asset as a settlement medium among financial intermediaries in the first-tier interbank payments system. Wholesale digital assets could bring substantial progress in cross-border payments both in bilateral and multi-currency framework. Central bank cooperative initiatives in this area are particularly welcome and desirable.

That said, the so-called retail CBDC is a true replacement of fiat money in any jurisdiction. We argue that attempts to implement a universal CBDC in large economies is, at best, premature and, at worst, an irreversible transformation of monetary systems as we know them, with far-reaching consequences for the economy and society. A step not to be taken lightly, but with full understanding of its consequences.

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Global Economy:

Exchange Rates and Inflationary Pressures*

By CHRISTOPHER KENT^{*}

Introduction

Inflation is too high in most economies. This reflects disruptions to supply coupled with strong demand. There has been an unprecedented monetary response in terms of the size of policy rate increases, across a wide range of central banks in a short span of time. Graph 1 shows the average of policy rates across a selection of central banks covering about 70 per cent of the global economy. If market expectations for policy rates pan out, then by the first part of next year the average policy rate will have increased by an amount comparable to the rise seen through the mid-2000s – but while that increase occurred over four years, this increase will have taken just four quarters.



Graph 1

^{*}This speech was given at Commonwealth Bank Global Markets Conference in Sydney on 24 October 2022.

^{*} Christopher Kent, Assistant Governor of RBA (Financial Markets).

The increase in the Reserve Bank's cash rate target has also been sizeable and rapid. After raising rates by 25 basis point in May, the Board then raised rates by 50 basis points in each of the four meetings between June and September. At its October meeting, the Board raised rates by 25 basis points. The Board expects to increase interest rates further in the period ahead, given the need to establish a more sustainable balance of demand and supply and in the face of a very tight labour market. While wages growth has picked up in Australia from the low levels of recent years, it remains lower than in many other advanced economies. Indeed, wages growth is well above levels consistent with inflation targets in a number of these economies.

The size and timing of rate increases in Australia will depend on incoming data – including the response of household spending to the tightening in financial conditions that is still working its way through the system. Rate increases will also depend on the outlook for inflation and the labour market.

In my presentation today I will consider some issues related to inflationary pressures with a focus on the behaviour of exchange rates, both real and nominal.

The real exchange rate and wages

Wages growth and inflation in Australia had been low over a number of years prior to the COVID-19 pandemic. Looking at the growth of one measure – the Wage Price Index (WPI) – annual wages growth of around 2 per cent had become normal, while 3–4 per cent growth was the norm in the 15 years or so prior to the end of the mining investment boom (Graph 2).





For many years over the past decade or so, actual wages growth was much weaker than the Bank had forecast. The Bank has discussed a range of reasons for that unexpected weakness including rising participation rates, heightened global competition, changes in bargaining arrangements and technology advancements.

Another factor that contributed to the spare capacity in the labour market and affected wages growth was the long shadow cast by the end of the mining investment boom. On the back of a boom in commodity prices, mining and mining-related investment rose from around 2 per cent of GDP prior to the boom to a peak of around 9 per cent in 2012. This massive expansion in productive capacity underpinned a sizeable and prolonged increase in the demand for Australian labour. But once the new infrastructure was in place, and coincidentally the terms of trade began to decline, the demand for labour eased noticeably.

The surge in demand for labour in the boom years and the decline thereafter had significant effects on wages growth and the Australian dollar, which persisted for many years after the peak in mining investment.

To understand these effects, it's helpful to consider two margins of adjustment that enabled the resources sector to attract labour in the boom years. First, and most obvious, companies in the resources sector offered much higher wages in Australian dollar terms than those being offered elsewhere. This encouraged workers across the country to shift away from other endeavours and move into the sector.

The nominal exchange rate provided a second margin of adjustment, and helped to contain broader inflationary pressures in the face of strong growth in domestic demand. The appreciation of the Australian dollar over the years leading up to the peak of the mining investment boom pushed up the value of Australian wages in foreign currency terms. This made conditions in non-resource firms in the traded sector more difficult, and growth in investment, output, employment and wages was weak in those parts of the economy. Meanwhile, resource firms were benefitting from sharp rises in the prices of their outputs and had high expectations of future profits from the new infrastructure they were building. As such, they were willing to pay higher wages and absorb the freed up labour from the weaker sectors.

The key point was that the adjustment in the boom years was achieved with a balance of a rise in wages in Australian dollar terms and a nominal exchange rate appreciation that pushed up wages in foreign currency terms.

We can summarise the magnitude of these two margins of adjustment by comparing the nominal trade-weighted index of the exchange rate (or TWI) with the real TWI rate based on unit labour costs (Graph 3). The nominal TWI appreciated by 25 per cent over this period (from around 2003/04–2011/12). The real TWI appreciated by 45 per cent. The difference between the two is the extra growth in Australian dollar wages relative to the growth of wages for our trading partners (expressed in their domestic currencies and adjusted for differences in productivity growth). Indeed, growth in Australian unit labour costs was about 2 percentage points higher on average per annum during the boom years than prior to the boom (Table 1). The average growth of unit labour costs across our major trading partners was little changed by comparison over

these periods. Australian inflation was also higher during the boom years than prior to the boom; the average over this period was towards the upper end of the inflation target range of 2-3 per cent and at times inflation was noticeably above 3 per cent. So although the exchange rate dampened the effect of the terms of trade shock – by lessening the need for higher wages in Australian dollar terms – the economy still felt some inflationary bumps along the road.



Graph 3

Sources: OECD; RBA; Refinitiv

Table 1: Key Prices and Activity

Average annual growth (per cent)

Pre terms of trade boom Terms of trade boom Post terms of trade boom				
	(1992/93 – 2002/03)	(2003/04 - 2011/12)	(2012/13 – 2018/19)	
Exchange rate determin	ants			
Terms of trade	0.9	7.0	-0.8	
RBA Index of Commodity Prices	0.1	16.1	-3.2	
3-year yield differential (ppt change)*	-0.5	-0.3	-2.2	
Exchange rate measures	i			
Nominal TWI	0.2	2.7	-3.7	
Real TWI CPI	0.2	3.8	-3.4	
Real TWI ULC	-0.1	4.6	-4.8	
Domestic policy				
Cash rate target (ppt change)**	-0.9	-0.7	-1.7	
Wages and prices***				
Consumer Price Index	2.3	2.8	1.9	
Trimmed mean Consumer Price Index	2.5	3.0	2.0	
Wage Price Index	3.3	3.8	2.2	
Unit labour costs				
Australia	1.9	4.1	1.1	
Trading partners****	0.7	1.4	2.0	

* Australian sovereign yield less yields of the United States, Japan and Germany, weighted by GDP; absolute percentage point change in average differential between start and end of period.

** Absolute percentage point change in average rates between start and end of period.

*** Consumer price indices are adjusted for the tax changes of 1999–2000. Trimmed mean inflation excludes interest charges prior to September of 1998. **** In local currency terms, weighted by trade share. Series exclude India and several other Asian trading partners as unit labour costs data are unavailable

Note: Data not available for full 1992/93 – 2002/03 period for 3-year yield differential and Wage Price Index. Sources: ABS; Bloomberg; OECD; RBA; Yieldbroker

Once the terms of trade and mining investment declined, and the associated labour was freed up from the resources sector, this process of adjustment worked in reverse.

The nominal exchange rate depreciation that followed reduced the cost of Australian labour in foreign currency terms, helping to guide labour that was now in surplus in the resources sector back into other traded sectors. The nominal TWI depreciated by 20 per cent from the end of the boom to 2019. By itself, however, this depreciation wasn't sufficient to restore the level of competitiveness of Australian labour to its pre-boom levels and absorb all of the economy's spare capacity.

That was achieved by slower growth in the cost of Australian labour in Australian dollar terms relative to our trading partners. Indeed, there followed a long period of low wages growth in

Australia. For example, annual WPI growth dropped to rates that were 1 percentage point below pre-mining boom norms. More importantly though for competitiveness, growth of unit labour costs dropped by a similar amount. Meanwhile, inflation averaged 1.9 per cent, just under the inflation target range, from the end of the mining investment boom up to the pandemic.

It took quite a few years after mining investment had peaked for the real Australian TWI to return to be close to its pre-mining boom level. While slower wages growth contributes only gradually to adjustments in the real exchange rate, this is not true of the nominal exchange rate given it can be much more flexible. This raises the question: why didn't the flexible nominal exchange rate adjust in a way to facilitate a more rapid adjustment of the real exchange rate?

One notable feature of this episode was that the depreciation in the nominal TWI didn't start in earnest until around 18 months after the peak in the terms of trade. This may have in part reflected expectations for the terms of trade, which for a time remained at elevated levels even when the actual terms of trade had declined. It is also likely to have reflected the effect of very low interest rates globally and unconventional monetary policies adopted by the major advanced economies in response to the global financial crisis.

Meanwhile, the Reserve Bank eased monetary policy from late 2011 in response to the prevailing weaker economic conditions in Australia. However, from around 2016, the Bank was balancing the case for a faster return of inflation to the target range by lowering the cash rate further, against the medium-term risks associated with an increase in what were already high levels of household debt. The Board's decisions sought to limit the build-up of financial imbalances that can be a source of instability down the track.

Over time, however, the evidence shifted. It became clearer that, even with the easing in monetary policy that had occurred, there was still spare capacity in the economy, which was weighing on wages growth and inflation. A further easing in policy would be needed to absorb that capacity and for inflation to rise. Also, there had been a tightening in lending standards in response to the Australian Prudential Regulation Authority's earlier tightening of macro-prudential policies, lessening somewhat the concerns related to household debt. Accordingly, the cash rate was lowered further through 2019 and the Australian dollar depreciated to its lowest level in over a decade. Hence, by about the time of the pandemic, Australia's pre-mining boom level of international competitiveness had been restored.

The US dollar, the Australian dollar and inflation

Over the course of this year, the US dollar has appreciated significantly against the currencies of both advanced and emerging economies (Graph 4). The 12 per cent appreciation of the US dollar in trade-weighted terms, is consistent with the rapid rise in US interest rates relative to those of many other economies, including Australia.



Sources: Bloomberg; Board of Governers of the Federal Reserve System

The depreciation of currencies against the US dollar will add some pressure to already high rates of inflation in a wide range of advanced and emerging economies via a rise in the prices of imported goods and services. This is because much of global trade is invoiced in US dollar terms. However, leaving it at that is an incomplete assessment of the effect of the Fed's tightening of monetary policy. Two other points should also be made.

First, higher interest rates in the United States will, in time, help to stem the growth of US demand for goods and services. The US economy accounts for about 25 per cent of the global economy (based on 2021 nominal GDP in US dollar terms). So an easing in demand pressures in the United States will help to ease a noticeable portion of global demand.

Second, when most of the world's currencies depreciate against the US dollar, households and firms in those economies will not be as willing nor able to pay the same US dollar denominated prices for their imports. Hence, we could expect those prices to decline, or at least rise less rapidly, over time.

We can actually see that effect quite clearly and in very quick time with homogeneous goods like commodities that are traded on global spot markets. Take gold and oil as examples. The daily changes in the US dollar prices of those commodities typically have a strong negative

correlation with the change in the value of the US dollar (Graph 5). That is, when the US dollar goes up, prices of those commodities come down somewhat on average.



Graph 5

While this response may take more time to play out in markets for goods and services that are not as homogenous and not traded on global spot markets, the same sort of adjustment is likely to occur for a broad range of traded items.

Even so, for many emerging market economies, there is likely to be a sizeable pass-through of the depreciation of their currencies against the US dollar to domestic inflationary pressures. This reflects the tendency of emerging market economies to have a larger share of tradable goods in their consumption baskets compared with advanced economies. Also, inflation tends to be less well anchored in these economies.

A number of economies – both advanced and emerging – have experienced broad-based exchange rate depreciations. So those economies will tend to experience more notable increases in their import prices as a result. This is in contrast to economies whose currency depreciations have been more narrowly based.

The Australian dollar is in that latter camp. While it has depreciated significantly against the US dollar – falling by 14 per cent this year – in trade-weighted terms, the Australian dollar has depreciated by only 2 per cent over the same period (Graph 6).

In trade-weighted terms, the Australian dollar has moved broadly in line with its fundamental determinants. In particular, it has been underpinned in part by the elevated prices of some of our key commodity exports. Commodity prices overall have declined over the past few months, but they remain around the levels seen at the turn of the year. The decline in the Australian dollar over recent months also accords with the fall in the differential between interest rates in Australia and those of major economies. Again, much of this reflects the rapid and prospective rise in the policy rate in the United States, which is larger than for the cash rate in Australia based on market expectations.



Graph 6

The smaller depreciation of the Australian dollar in trade-weighted terms than against the US dollar is important because the TWI typically has a greater bearing on our imported inflation than any one bilateral rate. 8The Bank's models suggest the depreciation will contribute to a higher level of consumer prices in Australia. But the effect from the depreciation in the TWI that we have seen over the year to date of around 2 per cent is estimated to be relatively modest. A rough rule of thumb from our models suggests that the level of the Consumer Price Index (CPI) will be higher by only around 0.2 per cent in total over the course of a few years.

One final point on the rapid rise in US interest rates and the appreciation of the US dollar is the potential financial effects of this on other economies. Of most concern are some emerging market economies that have elevated levels of foreign debt, denominated in foreign currency terms, and unhedged. Australia's offshore debt is well hedged. Moreover, because Australian banks issuing debt offshore swap most of that back into Australian dollars, in effect they end up paying Australian interest rates on that funding, not higher US rates. In other words, the rise in US interest rates is not likely to have a significant effect on Australian banks' funding costs.

Conclusion

The long shadow cast by the end of the mining investment boom contributed to many years of lower wages growth in Australia. But, with Australia's real exchange rate based on unit labour costs having returned to levels around its pre-mining boom days, that adjustment appears to have run its course.

This year, the US dollar has appreciated noticeably as US interest rates have risen more rapidly than those in many other economies. Because much of global trade is invoiced in US dollars, this will add to the cost of imports for a time. But the rise in US interest rates will also contribute to a decline in global inflationary pressures. While the exchange rate can play an important role in inflation outcomes, the depreciation of Australia's nominal trade-weighted exchange rate over the year to date will contribute only a very modest uplift in the level of consumer prices over the period ahead.

Managing a Turn in the Global Financial Cycle *

By GITA GOPINATH^{*}

It is a tremendous honor for me to give the Martin Feldstein Lecture. Marty was an exceptional colleague at Harvard and inspired my journey from academia to the policy world. His influence in research went well beyond public finance. In fact, one of his most cited papers is a contribution to international economics, widely referred to as the Feldstein-Horioka puzzle. Marty showed empirically that most savings tended to be invested at home, which can be puzzling if international capital markets are well integrated.

In reality, capital markets have many frictions, and my lecture today focuses on the implications of these frictions for policy in emerging and developing economies. I hope to show how policy questions arise at the International Monetary Fund (IMF), the research that gets done to answer these questions, and finally, how this research influences policymaking.

It is an opportune time to discuss this topic because after two years of easy financial conditions around the world, with monetary policy rates kept at record lows to prevent a COVID-driven depression, we are witnessing a tightening in global financial conditions. Almost all central banks are raising interest rates to deal with historically high inflation because of strong demand recoveries from the pandemic, alongside disruptions to supply and elevated energy and food prices exacerbated by Russia's invasion of Ukraine.

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Figure 1

As can be seen in Figure 1, global financial conditions have tightened significantly, especially for emerging markets and developing economies, excluding China. According to Figure 2, over 30 percent of emerging markets are paying interest rates over 10 percent on their sovereign foreign-currency bonds, which is close to the levels seen during the Great Financial Crisis of 2008. In addition, as is typically the case when global financial conditions tighten, the US dollar has strengthened against a wide basket of currencies [see Figure 3], raising costs for countries that have borrowed in dollars. All of this is occurring in the aftermath of a pandemic, during which debt in emerging and developing economies has grown significantly.



Figure 2

A key policy question therefore is how emerging and developing economies should respond to this tightening cycle that is driven to an important degree by rising US monetary policy rates. The textbook answer would be to let the exchange rate be the shock absorber. An increase in foreign interest rates lowers domestic consumption. By letting the exchange rate depreciate, and therefore raising the relative price of imports to domestic goods, a country can shift consumption toward domestic goods, raise exports in some cases, and help preserve employment.





However, many emerging and developing economies find this solution of relying exclusively on exchange rate flexibility unsatisfying. This is because rising foreign interest rates come along with other troubles. They can trigger so-called "taper tantrums" and sudden stops in capital flows to their economies. In addition, the expansionary effects of exchange rate depreciations on exports in the short run are modest, consistent with their exports being invoiced in relatively stable dollar prices.

Figure 4, on the following page, depicts one such taper tantrum episode in 2013, when the US Federal Reserve signaled an end to quantitative easing and a lift-off in rates, possibly earlier than expected. This communication triggered a sharp increase in borrowing costs for emerging markets, with median spreads increasing by more than 200 basis points even though there was no meaningful immediate policy action by the United States. Figure 5, documents episodes of sudden stops with growth impact, which are defined as an abrupt stop or reversal in capital flows to emerging and developing economies that in turn generate a sharp fall in growth. These episodes capture a sudden tightening of borrowing constraints in emerging markets because of a perceived lower capacity of the country to repay. While they are less frequently observed than taper tantrums, they have larger adverse welfare implications for the country.





Consequently, several emerging and developing economies have in practice used a combination of conventional and unconventional policy instruments to deal with turns in the global financial cycle. Unlike the textbook prescription, they not only adjust monetary policy rates but also rely on foreign exchange intervention (FXI) to limit exchange rate fluctuations, capital controls to regulate cross-border capital flows, and domestic macroprudential policies to regulate domestic financial flows. This common practice, however, lacks a welfare-theoretic framework to guide the optimal joint use of these tools. This shortcoming limited the policy advice the IMF could give to several of its members. Accordingly, to enhance IMF advice, David Lipton, the former first deputy managing director of the fund, championed the need to develop an Integrated Policy Framework that jointly examines the optimal use of conventional and unconventional instruments.





Over the last few years, a large body of work, both theoretical and empirical, has been developed at the IMF. In today's lecture, I will focus on the theoretical work that I have been involved in with coauthors Suman Basu, Emine Boz, Francisco Roch, and Filiz Unsal.

There already exists an extensive literature on the various frictions in an open economy, but most of this literature focuses on a single friction at a time. In practice, multiple frictions coexist, and policy tools affect multiple frictions at the same time. Consequently, the challenge is to build a tractable model that facilitates an analytical understanding of the interaction of frictions and policy tools. This analysis is developed in two of our studies. I will share some insights from this work, and encourage you to read the papers themselves, which cover a lot more ground.

I will first describe some of the frictions that are prominent in the literature and that policymakers grapple with. After that, I will take up the motivating question of how countries should manage the current tightening in the global financial cycle. The optimal policy response will, as one might expect, depend on country characteristics and shocks.

Nominal rigidities in price setting are a key ingredient in models of the exchange rate. This friction underlies the classic Mundell-Fleming framework and Milton Friedman's argument for the optimality of flexible exchange rates. Price stickiness gives rise to the "aggregate demand externality" as formulated by Emmanuel Farhi and Iván Werning, whereby agents fail to internalize the effect of their decisions on aggregate demand. This externality creates a problem when prices are misaligned and gives rise to an aggregate demand wedge — that is, a wedge

between the marginal rate of substitution between consumption and leisure on the one hand, and the marginal rate of transformation arising from the production function on the other. If prices are too high (low) relative to their flexible-price level, households consume too little (much), lowering (raising) output and pushing employment below (above) efficient levels. In the open economy context, price stickiness also leads to a "terms-of-trade" externality. This arises because while firms internalize the fact that they have pricing power for their own product in international markets, they do not internalize the fact that the country also faces a downward-sloping demand curve. This externality leads to overproduction of domestic goods and a terms of trade that is less appreciated relative to the planner's optimum. While this externality is commonly explored in the literature, policymakers appear to disregard it in practice, and we accordingly mute this channel in our analysis.

A second friction that policymakers grapple with is the shallowness of foreign exchange (FX) markets, which can give rise to volatility in the price of domestic currency bonds as market sentiment changes. Owing to balance sheet frictions, financial intermediaries demand a premium to hold domestic currency bonds that carry currency risk relative to foreign currency bonds. This financial friction was recognized early on by Pentti J.K. Kouri, around the same time as Robert Mundell and Marcus Fleming wrote on pricing frictions, but it received less attention in the literature until recently, when work by Xavier Gabaix and Matteo Maggiori reenergized research in this area.

The shallow-market friction gives rise to what we call the "financial terms of trade externality." Firms or households that issue debt in domestic currency do not internalize the impact of their decisions on the premium charged by financial intermediaries, which varies with the overall level of debt of the country. This externality gives rise to an uncovered interest parity wedge, which is the excess return paid to intermediaries for holding domestic currency bonds. This wedge has implications for policy when financial intermediaries are foreign owned, as payments to intermediaries are a net loss of resources for the country.

In addition to shallow FX markets, another common friction in emerging and developing economies arises from borrowing constraints and so-called "currency mismatch" in households' and firms' balance sheets. The ability of domestic agents to borrow is restricted by the extent of pledgeable collateral, which is often denominated in domestic currency. As a consequence, when the exchange rate depreciates, the ability to borrow in foreign currency is reduced. Since households and firms do not internalize the impact of their decisions on the exchange rate, there is a pecuniary externality that in turn impacts the aggregate demand wedge, leading to inefficient outcomes.

I now turn to the question of how to manage a turn in the global financial cycle. We derive the optimal policy response ex ante — prior to the shock — and ex post — during the shock — as the solution to the planner's problem with commitment. The optimal policy depends on the particular frictions at play and the nature of the shock. Table 1 presents various scenarios that may apply in practice. In all cases, prices are assumed to be sticky.

	Deep FX Markets	Shallow FX Markets
Far from Debt Limit	Foreign rate increase — policy rate and exchange rate depreciation	Taper tantrum — capital control subsidy, buy local currency and sell FX, no change in policy rate or exchange rate
Near Debt Limit	Sudden stop — ex ante capital control, ex post policy rate cut and depreciation	Sudden stop — lower ex ante capital control, ex post policy rate cut and depreciation

Table 1

The upper-left quadrant represents the textbook case that characterizes a developed, small, open economy with dominant currency pricing. Such a country has deep FX markets, meaning that financial intermediaries do not require an excess return for holding the country's domestic currency bonds, and its external debt is far from the debt limit. The only friction is the nominal rigidity in prices and the associated aggregate demand externality. In this case, when the foreign interest rate rises, it reduces domestic consumption of all goods, including home goods, and opens an aggregate demand wedge. The optimal policy response is exchange rate depreciation, which increases the relative price of imports to domestic goods and thereby shifts consumption from imports toward home goods. This expenditure switching delivers the needed reduction in imports and external debt, while the country's exports and domestic consumption of home goods and domestic output remain unchanged. Exchange rate flexibility therefore suffices to close the aggregate demand wedge.

The upper-right quadrant characterizes a country whose debt is far from its debt limit, but which has shallow FX markets, resulting in an uncovered interest parity wedge. Consider here a taper tantrum shock, where noise traders — irrational or position-limited traders who buy and sell domestic currency bonds regardless of the level of returns — decide to sell their holdings of domestic currency bonds. If the country's FX markets are deep, as in the case of the upper-left quadrant, this shock would have no real effects because there would be a large pool of other investors who would buy the bonds without any effect on prices. However, if the FX markets are shallow, other financial intermediaries require a higher excess return on the country's debt to absorb the bonds offloaded by noise traders, resulting in higher borrowing costs for the country. To offset this shock, the following policies can be deployed: policy rates can be raised so that domestic bonds pay a higher interest rate, capital inflow taxes that are paid by intermediaries can be cut so that the effective return they earn increases, or policymakers can deploy FXI, whereby the central bank buys the offloaded domestic bonds and sterilizes the purchase by selling foreign currency bonds.

In the case where noise trader shocks are symmetric, it turns out that optimal policy calls for leaving the policy rate alone and relying exclusively on a reduction in the tax on capital inflows and FXI. The reason is that when the policy rate is changed, it affects the consumption decisions of domestic agents and leads to excessive deleveraging. On the other hand, the cut in capital inflow taxes benefits financial intermediaries without raising borrowing costs for domestic agents. The reason that optimal policy calls for both FXI and capital inflow tax cuts is that each instrument is costly. Cutting capital inflow taxes results in a loss of resources to foreigners, while foreign exchange intervention forgoes carry profits. The joint use of both instruments insulates the economy from nonfundamental shocks like noise trader shocks. This overturns the result of the textbook case: optimal policy calls for an unchanged policy rate and exchange rate, and instead the country should rely on capital controls and FXI, which are more targeted to addressing the problem.

The lower two quadrants consider the case of a sudden stop shock, when a financial tightening leads to a tighter borrowing constraint for the country and limits the foreign currency value of its external debt. This shock is relevant when the country's debt is close to its debt limit, unlike in the case of the upper two quadrants. A tightening of the borrowing constraint generates a drop in demand. When prices are sticky, this reduction in demand opens an aggregate demand wedge because output is too low relative to efficient levels. In this case, the optimal policy response calls for a cut in interest rates and a depreciation of the currency, which stimulates higher consumption today and tilts demand toward domestic goods. However, if a country's debt is in foreign currency and the pledgeable collateral is in domestic currency — in other words, there is currency mismatch on the balance sheet — a depreciation exacerbates the shock by further tightening the borrowing constraint. In this case, policy needs to trade off the distortion in the aggregate demand wedge against the tightness of the debt limit. Accordingly, exchange rate depreciations cannot close the output gap ex post. Optimal policy requires the imposition of ex-ante capital controls that limit the extent of ex-ante foreign currency borrowing by domestic agents. The situation is improved when debt is partially in domestic currency because the ex-post exchange rate depreciation reduces the foreign currency value of the debt that needs to be repaid. In some circumstances, a greater reliance on domestic currency debt instead of foreign currency debt can lead to a lower optimal level of ex-ante capital controls.

To mitigate the negative impact of exchange rate depreciations on balance sheets, policymakers in emerging and developing economies often regulate the currency mismatch on the balance sheet of domestic-owned financial intermediaries. By encouraging reliance on domestic currency borrowing, policies that engineer a state-contingent exchange rate depreciation can lower the foreign currency value of the debt owed externally in adverse states, and shift demand toward domestic goods in those states. There is a side effect, however, when the country's FX markets are shallow (lower-right quadrant): restricting domestically owned financial intermediaries from taking on currency mismatch does not just reduce the size of the FX market that intermediates domestic and foreign currency bonds. It also tilts the composition of active intermediaries toward those owned by foreign investors. This side effect worsens the financial terms of trade externality because the increase in the premium to be paid to intermediaries is a net loss of resources from the country's perspective. Consequently, the

optimal level of regulation of currency mismatch depends on FX market depth and, in particular, banning FX mismatches entirely may be suboptimal when FX markets are shallow.

To summarize, the optimal policy response to a tightening in the global financial cycle depends on country-specific circumstances. When a country's financial markets are deep and its debt is well below the debt limit, the textbook prescription of relying exclusively on interest rates and flexible exchange rates can work well. But there are other cases when such a policy response does not suffice. In fact, after noise-trader shocks that disrupt the economy, the deployment of instruments such as foreign exchange interventions or capital inflow controls dominates the use of exchange rate flexibility.

The work at the IMF goes beyond theory to empirically evaluate the effectiveness of different policy instruments and to put in place safeguards to ensure that unconventional instruments are not deployed as a substitute for necessary macroeconomic adjustment. In addition, there may be dynamic trade-offs from excessive reliance on unconventional instruments. For example, government intervention in financial markets may delay the development of deep FX markets. Accordingly, Integrated Policy Framework advice goes hand in hand with advice that the IMF provides to countries on structural reforms, ensuring that short-term actions do not detract from long-term reforms. In the fall of 2020, the IMF Board approved work on the Integrated Policy Framework, and this work was an essential ingredient in the 2022 reform of the IMF's Institutional View on Capital Flows, which now puts greater emphasis on stocks of debt in addition to flows and allows the pre-emptive use of capital flow management measures to address financial stability risks even when there is no surge in capital inflows, especially when a country's debt is in foreign currency. Armed with the Integrated Policy Framework toolkit and policy recommendations, the IMF is much better placed than it was previously to address the growing demands from member countries for advice on how to best respond to the tightening of the global financial cycle.

Financial Cooperation Crucial to Asia's Prosperity*

By YU YONGDING*

On July 2, 1997, the Thai baht collapsed. After waves of speculative attacks, the government had run out of foreign currency and become unable to support its exchange-rate peg to the US dollar. So it floated the baht, which went into free fall. A wave of financial and nonfinancial Thai corporates that had borrowed heavily in dollars filed for bankruptcy. The Asian financial crisis had begun.

Unable to service their foreign debt, Thailand, Indonesia and South Korea turned to the International Monetary Fund for support. But the IMF's rescue packages were too little, too late, and came with excessively harsh conditions. East Asia, it increasingly appeared, would be better off saving itself.

The region certainly had resources. Though some countries, like Thailand, were running current-account deficits, East Asia as a whole ran an external surplus. So in September 1997, Japan proposed pooling the region's foreign-exchange reserves and using them to rescue ailing countries. The "Asian Monetary Fund" that would be established to manage this facility would, it was promised, move faster and impose less-stringent conditions than the IMF. But the United States and the IMF objected to the initiative, and the AMF was stillborn.

Nevertheless, regional actors did not give up on cooperation. In May 2000, the 10 ASEAN countries—Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam—plus China, Japan and South Korea (ASEAN+3) signed the Chiang Mai Initiative, the region's first currency-swap arrangement.

By enabling countries to swap their local currencies for US dollars for a fixed period of time, the CMI was supposed to help regional borrowers overcome short-term liquidity challenges, thereby serving as a complement to the IMF. This opened the way for the fulfillment of the AMF's promise: In 2009, the CMI became the Chiang Mai Initiative Multilateralization, a multilateral reserve-pooling program totaling \$120 billion. In 2014, the facility was expanded to \$240 billion.

Another milestone came in 2002, when ASEAN+3 launched the Asian Bond Markets Initiative in the hope that a regional bond market would strengthen financial stability, reduce vulnerability to capital-flow reversals, mitigate currency and maturity mismatches, and counter "overbanking." In March this year, emerging East Asia's local-currency bond market was worth \$23.5 trillion.

^{*}This article first appeared in CASS.

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In 2005, the Asian Development Bank proposed the most ambitious attempt at regional financial cooperation: the Asian Currency Unit. A basket of the ASEAN+3 currencies, the ACU was devised as an anchor to which countries in the region could tether their own currencies, thereby deterring competitive devaluations and enabling countries in the region to float their currencies collectively against the US dollar. This would enable faster adjustment of current-account imbalances and promote regional trade and financial flows.

Building on the Asian Currency Unit idea, a group of Japanese economists devised a supplementary concept: the Asian Monetary Unit, whose value would reflect a weighted average of East Asian currencies. However, while Asian academics welcomed the proposals as possible first steps toward the creation of a common regional currency, neither the Asian Currency Unit nor the Asian Monetary Unit has gained traction among policymakers.

Unfortunately, Asian financial cooperation has been losing momentum in recent years for several reasons.

First, the need for regional liquidity support has become less urgent. Most of the ASEAN+3 countries run current-account surpluses most of the time, and the region had accumulated some \$3.7 trillion in foreign-exchange reserves by the time the global financial crisis erupted in 2008 — a more than sixfold increase from the \$542 billion they held in 1997.

Second, although the Asian bond market has made impressive headway over the past 10 years, the development of local-currency bond markets is driven by domestic financial needs rather than regional financial cooperation, and cross-border local currency bonds are rarely issued. In fact, individual countries' financial development has significantly outpaced the development of infrastructure for the cross-border issuance of local-currency bonds. As a result, factors like nonstandardized regulations, inadequate market liquidity and a lack of an effective securities settlement system continue to hinder the development of cross-border issuance of local-currency bonds in the region.

Third, since the Asian financial crisis, most East Asian countries have adopted a managed-floating exchange-rate regime. But none of them have pegged their currencies to a basket of East Asian currencies based on the Asian Currency Unit, largely because they are unwilling to accept constraints on their exchange rates for the sake of exchange-rate stabilization among regional currencies.

More broadly, greater economic and financial cooperation is vital to Asia's long-term prosperity. Yet pursuing it—including the possible formation of an East Asian economic community—is fundamentally a political, not an economic, question. Because of East Asian countries' close geographic vicinity and economic connectivity, ASEAN+3 governments should urgently put the endeavor that began 25 years ago back on their agendas.

Reversal of Globalization is Leading to Long-term Stagflation*

By Zhang Ming^{*}

The global economy saw high growth rates and low inflation in the 1990s, a time known as the Great Moderation Era. After the global financial crisis in 2008, the world economy entered a period of low economic growth, low inflation, low interest rates and high government debt, a period characterized by the US economist Lawrence Summers as a period of secular stagnation.

The academic community believes that the main factors contributing to long-term stagnation include the aging of the global population structure, a slowdown in technological innovation, and rising imbalance in income and property distribution in major countries. These factors are structural issues rather than cyclical issues, and thus secular stagnation could continue for a considerable period of time.

It was in this context that the Modern Money Theory was proposed. The theory holds that as long as a government can pay its debts with its own currency, the country's central bank can pursue unlimited money printing to boost economic growth and solve domestic problems, on condition that such actions will not trigger high inflation.

However, the arrival of high inflation this year has exceeded expectations. In June, the consumer price index, a key gauge of inflation, surged by over 9 percent year-on-year in the United States, and major European countries are also facing similar levels of inflation. The high inflation faced by major developed countries has forced their central banks to start the process of raising interest rates and shrinking their balance sheets.

The question is, why did inflation, which has been under control for over 20 years, start to surge after the COVID-19 pandemic?

There are at least three immediate contributing factors. First, after the outbreak of the COVID-19 pandemic, some major countries adopted ultra-loose fiscal and monetary policies to bail out the economy. Developed economies have largely focused on shoring up spending by issuing direct subsidies to low- and middle-income families. This has resulted in a pattern in which consumer spending has recovered at a rate faster than production. This uneven recovery has pushed up inflation. Second, the pandemic has led to direct shocks to the global production network and supply chains. The disruption to key supply chains due to crises and the sharp rise in global transportation costs, especially ocean shipping costs, has resulted in a significant

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shortage of goods in the final product market and induced imported inflation. Third, the conflict between Russia and Ukraine that broke out in February is still ongoing. With Russia being an exporter of almost all key bulk commodities and Ukraine being one of the world's leading exporters of agricultural products, the conflict has pushed up the prices of bulk commodities, especially food and energy.

However, from the medium- and the long-term perspectives, one of the fundamental reasons for the sudden rise in the global inflation is that globalization, which has gathered steam since the 1980s, has suffered setbacks since the mid-2010s.

Economic and financial globalization kept gathering steam after the mid-1980s, especially with the active participation of emerging market countries. The acceleration of economic globalization meant that various production factors could be better allocated on a global scale, which undoubtedly led to higher levels of economic growth.

However, the distribution of benefits from globalization has been uneven despite the benefits being enhancing overall globally. The "elephant curve", produced by the former World Bank economist Branko Milanovic, argues that the main beneficiaries of globalization have been the middle class in emerging market countries and high-income groups in developed countries, while the main losers from globalization are the middle class in developed countries. In other words, the acceleration of globalization has led to a heightened imbalance in income distribution in developed countries and a greater divide among different income groups. In this context, political conflicts within developed countries have intensified, and some populist leaders have blamed globalization for their country's domestic woes, leading to the rise of populism, protectionism and isolationism.

After the global financial crisis in 2008, major developed countries adopted ultra-loose monetary policies to support their bailouts, which led to new highs in stock market indexes and further enlarged the income gap between asset owners and those without assets and that between large asset owners and small asset owners. For example, about 40 percent of the wealth in the US is owned by families that only take up about 1 percent of the population.

Under this context, the domestic political landscape of developed countries has undergone drastic changes. Politicians who cater to the tastes of groups that have suffered from losses and blame the domestic predicament on economic globalization have taken office and introduced policies leading to setbacks or even the reversal of economic globalization. 2016 was the most significant year in this regard, as there were two epoch-making events. First, in June 2016, the United Kingdom held a referendum that led to its withdrawal from the European Union, marking a major setback for European integration. Second, Donald Trump won the US presidential election later that year. His coming to power spoke volumes about the divisions in the US.

Another two key events after 2016 further exacerbated the reversal of globalization. First, in March 2018, the US provoked a trade war with China and began to impose high tariffs on a large number of Chinese imports, forcing a response from the Chinese government. The second is the outbreak of the COVID-19 pandemic in early 2020. The pandemic has forced many countries relying on imports to take into account the security of their industry chains. It led to the

shortening and regionalizing of global industry chains, possibly fragmenting the global industry chains into regional industry chains, which heralds a drop in the strength of the global production network.

The setbacks for economic globalization mean more obstacles for the better allocation of various factors of production on a global scale and rising costs for the global flow of production elements and commodities. The roles of countries within the global production network will be restructured. In other words, if the rapid progress of globalization has significantly lowered the production costs of various products, thus ushering in an era of high growth rates and low inflation, then the reversal of globalization will significantly increase the production costs of various products, leading to an era of stagflation characterized by a low growth rate and high inflation.

The direction and pace of globalization is closely related to the wellbeing of every country and every person on this planet. Faced with immediate short-term challenges such as unemployment, inflation, lack of confidence, declining income and shrinking assets, we have to look to the future and pay attention to changes in long-term variables such as globalization.

Global Debt

Frontier Economies Require New Approach to Sustainable

Debt*

By Polina Kurdyavko *

Redistribution of unused SDR allocations could be key.

When it comes to predicting market dislocations, investors can rarely spot a crisis before it unfolds. Yet in hindsight, the warning signals often appear obvious. In September and October, the UK was on the brink of a collapse in its pension fund system, following extreme volatility in the pound and gilts market – an event few had predicted.

When it comes to emerging markets, there are plenty of volunteers lining up to predict a doom-and-gloom scenario, especially during times of uncertainty. Commentators point to a range of triggers: balance of payments crises, liquidity tightening (given countries' reliance on external markets), sharp currency devaluations and geopolitical risk. The asset class has registered its worst performance on record, with EM hard currency debt down close to 25% in the first nine months of this year. The sell-off has been indiscriminate. However, there is a growing distinction between a group of countries that are in a stronger position, benefitting from tailwinds that support the broader EM beta investment case, and those that are likely to face a crisis.

Tailwinds that support EM investing include the strong commodity backdrop and orthodox monetary policy. The commodity backdrop has translated into a meaningful improvement in current account dynamics for the majority of EM countries, with over two-thirds of the universe being commodity exporters.

Orthodox hawkish monetary policy in many EM countries has resulted in close to double-digit policy rates following two years of hikes, allowing these countries to be on the front foot on inflation management. When it comes to liquidity, the depth of the domestic market is equally important. Out of \$23tn of EM fixed income assets, only \$4tn is denominated in hard currency.

^{*}This article first appeared on the website of OMFIF on 15 November 2022..

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Over the last 20 years, several EM countries have developed deeper local markets which they can rely on when external markets are closed. So, those who argue that EMs are likely to relive the 1980s style balance of payment crisis might be overly pessimistic, given the dynamics and evidence of policy evolution.

However, higher US rates will create headwinds for a group of EM countries and impair their ability to service their debt. Frontier economies – the segment that includes smaller countries with high reliance on external funding – are likely to be vulnerable to landing in this position. These economies comprise roughly 9% of the EM tradeable universe. Countries in sub-Saharan Africa, specifically, account for almost half of the JP Morgan NEXGEM Frontiers Index. Many of these countries haven't fully recovered from Covid-19, with vaccination rates of only 20%, and have witnessed 28m people fall into extreme poverty over the last three years.

Net exports have detracted from growth during this time and consumption is under pressure, given the high level of inflation. The growth outlook is even bleaker, with limited resources for investment and constraints on government budgets. This deterioration adds to already large structural imbalances, with 60% of sub-Saharan African economies in the index facing twin deficits above 10 percentage points of gross domestic product. These countries have also sustained the fastest growing stock of debt, with bond issuance alone increasing to \$100bn in 2021 from \$5bn in 2009.

So far, the region has received \$30bn of developmental assistance and \$60bn of International Monetary Fund emergency funding. With the existing elevated levels of indebtedness (debt-to-GDP in high double digits) and high gross financing needs, it seems unlikely that either bilateral lenders or bondholders would be prepared to lend more money to these countries without being confident that these issues will be addressed.

Could this play out over the next couple of years in the form of ad-hoc sovereign restructurings or are we likely to see a broader spillover in the region that could impair regional growth prospects and investors' risk appetite? The risk of the latter outcome cannot be discounted. Despite the willingness to pay and implement a correct policy mix, the pandemic and raw material pressure, combined with a relatively high debt load and higher global funding rates put the sub-Saharan African economies' debt profile on an unsustainable path.

When approaching a restructuring, the challenge in applying an appropriate framework doesn't lie in agreeing on the magnitude of the haircut required to repair the sovereign balance sheet. The real challenge lies in creating a framework that brings direct investment and portfolio flows, as well as a policy mix that is designed to improve growth prospects and put debt servicing on a sustainable path.

In the case of sub-Saharan Africa, a comprehensive approach would be most effective, but it is likely to require some features that are new to the market. The focus should not be limited to existing debt that could be reprofiled in a new instrument linked to sustainable development goals as key performance indicators. Attention should also be paid to providing additional liquidity through an environmental, social and governance-linked 'new money' solution that could be tightly monitored and linked to specific strategically important projects. If a broader

investor pool were to be targeted, these new money solutions could also offer high-quality collateral for additional comfort.

One such example could entail tapping into international reserve assets such as special drawing rights as a backstop for lending. In 2021, sub-Saharan Africa received \$20bn worth of SDRs, out of the total pool of \$660bn. Currently, a number of developed countries do not use their share of the SDR allocation. Putting together a framework that could reallocate a share of this amount towards frontier market economies with attached conditions and tighter monitoring could be a win-win for both investors and countries in need. This type of framework can be loosely compared to the Brady bonds plan in the 1980s that helped reprofile most of the commercial debt of EMs and gave birth to EM sovereign debt as an asset class.

Why should investors care if they can avoid the space? Africa is home to over 1bn people, 30% of the world's mineral reserves, 12% of the world's oil reserves and 8% of the natural gas supply. In addition to the economic and humanitarian motivations, there are environmental arguments for providing ESG-linked capital to sub-Saharan Africa. The region currently accounts for only a small fraction of carbon dioxide emissions globally, yet a recent study by the Mo Ibrahim Foundation reports that the continent contains the 10 most climate-vulnerable countries in the world.

The IMF and African Development Bank estimate that Africa as a whole needs to mobilise \$1.6tn between 2022-30 to meet their nationally determined contributions to fight climate change. On current trends, it is raising less than 10% of that amount. With the financial burden of mass poverty and a lack of resources, it is optimistic to expect that net zero and adhering to Paris club agreements will feature strongly on the priority list for policy-makers.

Frontier economies are facing structural challenges. Attention and action are needed to avoid a crisis. It is certainly easier to get into a crisis than to get out of it.

Riding the Global Debt Rollercoaster*

By VITOR GASPAR, PAULO MEDAS, ROBERTO PERRELLI^{*}

Global debt remained above pre-pandemic levels in 2021 even after posting the steepest decline in 70 years, underscoring the challenges for policymakers.

Total public and private debt decreased in 2021 to the equivalent of 247 percent of global gross domestic product, falling by 10 percentage points from its peak level in 2020, according to the latest update of the IMF's Global Debt Database. Expressed in dollar terms, however, global debt continued to rise, although at a much slower rate, reaching a record \$235 trillion last year.

Private debt, which includes non-financial corporate and household obligations, drove the overall reduction, decreasing by 6 percentage points to 153 percent of GDP, according to our unique tally, which has been published annually since 2016. The decline of 4 percentage points for public debt, to 96 percent of GDP, was the largest such drop in decades, our database shows (for further details see the 2022 Global Debt Monitor).

The unusually large swings in debt ratios are caused by the economic rebound from COVID-19 and the swift rise in inflation that has followed. Nevertheless, global debt remained nearly 19 percent of GDP above pre-pandemic levels at the end of 2021, posing challenges for policymakers all over the world.

^{*}This article first appeared on the website of IMF on 12 December 2022.

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Up and down

Global public and private debt ratios fell sharply in 2021, after the record surge in 2020. (debt as a percent of GDP)



Source: IMF Global Debt Database and IMF staff calculations. Note: The estimated ratios of global debt to GDP are weighted by each country's GDP in US dollars. NFC = Non-financial corporations.

Variation across countries

Debt dynamics varied significantly across country groups, however.

The fall in debt was largest in advanced economies, where both private and public debt fell by 5 percent of GDP in 2021, reversing almost one-third of the surge recorded in 2020.

IMF

In emerging markets (excluding China), the fall in debt ratios in 2021 was equivalent to almost 60 percent of the 2020 increase, with private debt falling more than public debt.

In low-income developing countries, total debt ratios continued to increase in 2021, driven by higher private debt.

Persistently high debt

Despite the exceptional drop, global public and private debt-to-GDP ratios remain well above pre-pandemic records. (debt as a percent of GDP)



Source: IMF Global Debt Database and IMF staff calculations. Note: The estimated ratios of global debt to GDP are weighted by each country's GDP in US dollars. AEs = Advanced economies; EMs = Emerging markets; LIDCs = Low-income developing countries.

Factors behind the global debt swings

Three main drivers explain these unusually large movements in both private and public debt around the world:

• Large fluctuations in economic growth. The economic recession at the onset of the pandemic contributed to a pronounced drop in GDP, which was reflected in the sharp rise in debt-to-GDP ratios in 2020. As economies moved on from the worst of the pandemic, the strong rebound in GDP helped the 2021 fall in debt ratios.

• High and more volatile inflation. Likewise, inflation rates fell significantly in the first year of the pandemic. This trend was reversed in 2021 as prices rose sharply in many countries. During 2020 and 2021, economic activity and inflation moved together: inflation fell and then rose with output. These factors induced large swings in nominal GDP that contributed to the changes in debt ratios.

• Effects of economic shocks on the budgets of governments, firms, and households. The volatile economic conditions also had a considerable impact on debt dynamics through budgets. Debt and deficits increased significantly in 2020 because of the economic recession and the sizable support extended to individuals and businesses. In 2021, fiscal deficits declined but remained above their pre-pandemic levels (see October 2022 Fiscal Monitor).

A few country examples illustrate these effects. The economic rebound and rise in inflation pushed debt down by more than 10 percentage points of GDP in Brazil, Canada, India, and the United States, but actual debt fell less owing to the financing needs of government and the private sector. In other cases—for example, in China and Germany—public debt increased as the large deficits more than compensated for the rise in nominal GDP.

Debt drivers The large fall in public and private debt ratios was mainly caused by growth and inflation.

(change in debt stocks, in percent of GDP)



More generally, the rebound helped to reduce public debt ratios between 2 and 3.5 percent of GDP (with the largest effect among advanced economies), while inflation shaved off between 1.5 and 3 percentage points (the effect was more pronounced in emerging markets). Conversely, fiscal deficits increased public debt by around 4.5 percent of GDP with considerable variation across countries.

How governments should respond

Managing the high debt levels will become increasingly difficult if the economic outlook continues to deteriorate and borrowings costs rise further. The high inflation levels continue to help reduce debt ratios in 2022, especially where deficits are returning to pre-pandemic levels.

However, the relief to debt dynamics from "inflation surprises"—that is, when price levels are different from what was expected—and the temporary growth rebound cannot be permanent (see April 2022 Fiscal Monitor). If high inflation were to become persistent, spending will increase (for example, on wages) and investors will demand a higher inflation premium to lend to governments and private sector.

The weaker growth outlook and tighter monetary policy calls for prudence in managing debt and conducting fiscal policy. Recent developments in bond markets show investors' heightened sensitivity to deteriorating macroeconomic fundamentals and limited fiscal buffers.

Governments should adopt fiscal strategies that help reduce inflationary pressures now and debt vulnerabilities over the medium term, including by containing expenditure growth—while protecting priority areas, including support to those hardest hit by the cost-of-living crisis. This would also facilitate the work of central banks and allow for smaller increases in interest rates than would otherwise be the case. In times of turbulence and turmoil, confidence in long-run stability is a precious asset.

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China

QE with Chinese Characteristics^{*}

By ANDREW SHENG & XIAO GENG*

In 2020, Sebastian Mallaby of the Council on Foreign Relations announced the beginning of the "age of magic money", in which advanced economies would "redefine the outer limits of their monetary and fiscal power". By July 2022, Mallaby was predicting that this age was coming to an end. But, while most major central banks are now reversing quantitative easing and raising interest rates, China may need to head in the opposite direction.

Observers often forget that QE was invented by the Bank of Japan in 2001 as a tool for dealing with balance-sheet deflation. Other tools included a zero interest rate and forward policy guidance. The BOJ's balance sheet expanded from 20 percent of GDP in 2001 to 30 percent by 2006, fueled mostly by purchases of Japanese government securities.

Yet, as Nomura economist Richard Koo observed in 2010, loose monetary and fiscal policy did not spur firms and households to invest or spend, because they remained focused on rebuilding their own damaged balance sheets. So, in 2015, the BOJ, led by Governor Haruhiko Kuroda, introduced so-called quantitative and qualitative easing (QQE).

Like QE, QQE aims to produce a decline in long-term interest rates through massive purchases of government bonds. But policymakers had a second goal in mind: to change Japan's entrenched deflationary mindset. In 2016, a negative interest rate was introduced, in order to allow for further monetary easing.

Annual inflation never quite reached the BOJ's target of 2 percent, and Japanese economic growth has averaged less than 1 percent per year for nearly three decades. What the BOJ did achieve was a comprehensive national balance sheet transformation, with far-reaching implications for Japan's fiscal and financial systems.

With a rapidly aging population, Japan has a very high savings rate, as people prepare for retirement. When most pension assets in Japan are held in government bonds that earn near-zero

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interest, deflation poses a risk to the Japanese financial system. At the same time, if inflation increases and bond yields rise, the pension funds could face very large losses.

QQE has changed everything. By buying government bonds from the pension funds, the BOJ impelled those funds to purchase more long-term US Treasuries and high-quality advanced-country securities offering higher yields. QQE thus reduced financial risks, while achieving very low interest rates, which ensured substantial domestic liquidity to support the financial system and kept the yen's value low, thereby helping Japanese exports. Japan's balance sheet has been transformed, both in terms of duration and asset allocation.

Also as a result of QQE, Japan's net investment position increased from \$800 billion (16.3 percent of GDP) in 1999 to a formidable \$3.6 trillion (75.8 percent of GDP) in 2021, making the country the largest net investor in foreign markets. Of course, the BOJ's balance sheet also ballooned, exceeding 134 percent of GDP in June 2022, compared to 66 percent for the European Central Bank, 35 percent for the US Federal Reserve, and 33 percent for the People's Bank of China.

The costs and benefits of QE are hotly debated in both academic and policy circles. Mainstream economists were surprised that massive QE programs did not cause inflation to spike. Though the collective balance sheet of the world's four largest central banks — the BOJ, the ECB, the Fed, and the PBOC — swelled from \$5 trillion (8 percent of world GDP) in 2006 to \$31 trillion (32 percent of world GDP) in 2021, inflation in the advanced economies remained subdued until last year. These mainstream voices may feel vindicated by current high inflation rates, though even this increase has been fueled significantly by the conflict in Ukraine.

QE can undoubtedly be used for good — including safeguarding financial stability (with implications for exchange rates and fiscal conditions). The Bank of England demonstrated as much in October, when it launched a temporary QE operation to stem a sell-off in the gilts market and avert a wider crisis.

But QE also has huge fiscal consequences. Lower interest rates mean lower debt-servicing costs. When interest rates rise, however, the finance ministry faces higher debt-servicing costs and must fill the quasi-fiscal hole created by the central bank's balance-sheet losses, since the bonds purchased at lower interest rates will be marked down at higher yields. The UK Treasury was forced to reimburse the BOE for the £11 billion (\$13 billion) in losses it incurred in its gilt operation.

In theory, there is nothing wrong with increasing liabilities if the corresponding assets yield social rates of return that are higher than the cost of funds. But using QE to finance fiscal deficits that are used for short-term spending, rather than channeled toward long-term investments, could end up lowering future productivity, while excess liquidity inflates asset prices, thereby exacerbating inequality.

In any case, amid high inflation, most major central banks have been left with little choice but to embrace aggressive tightening. But China's situation is different. Chinese government debt amounts to just 3.8 percent of the PBOC's balance sheet, whereas sovereign debt amounts to 55 percent of the Fed's balance sheet and a whopping 80 percent of the BOJ's.

With China still running a current-account surplus and a net-investment surplus of more than \$2 trillion (10 percent of GDP), it has plenty of space to use monetary expansion to support financial stability and boost structural reform. Already, the PBOC has announced a 25-basis-point reduction of banks' mandatory reserve ratio — a move that will free up liquidity and support growth.

Some traditionalists would argue that central banks should not engage in asset allocation, except through the interest-rate channel. But QE has already proven to be a powerful resource-allocation tool capable of transforming national balance sheets. An innovative, well-planned QE program — call it QE with Chinese Characteristics — could support China's efforts to tackle some of the biggest challenges it faces.

End of Tunnel Bumpy but Bright*

By GUAN TAO^{*}

Three years ago, the sudden outbreak of the Covid-19 pandemic hugely disrupted people's lives around the world. Economic activity came to an abrupt halt and the financial markets fell into extreme turmoil in the face of an unknown coronavirus. The International Monetary Fund called it the "Great Lockdown" recession, described as the worst economic downturn since the Great Depression.

In order to cushion the impact of the decline in economic activity on households and businesses, many governments and central banks rolled out unprecedented stimulus policies. China proposed the policy objectives of ensuring stability on six fronts and maintaining security in six areas. China also continuously loosened monetary policy, and issued special government bonds as additional support.

China has made three important contributions to the global economic recovery. The first one is maintaining steady economic growth. In 2020, China was the only major economy to register positive economic growth, achieving 5.2 percentage points of growth rate higher than the global economy. In 2021, China's GDP growth rate was 8.1 percent, setting a new 10-year high. According to World Bank estimates, China contributed 38.6 percent from 2013 to 2021 on average to world annual economic growth, making it the world's top contributor. China has, therefore, become a major engine and stabilizer of the world's economic growth.

The second contribution is taking the lead in resuming work and production, which helped to stabilize global supply chains. In many countries, due to loose Covid-19 control policies and people's health concerns over the pandemic in the early stage, production capacity did not fully recover until 2021. Some of those capacities are still below pre-pandemic levels. China's industrial value-added (VAI) year-on-year growth rate bounced back to positive territory in April 2020. The average growth rate of the secondary industry in 2020 and 2021 was 5.4 percent, better than that in 2019. Global inflation could have been even higher without China quickly resuming its strong production capacity. The effort also helped China to maintain domestic price stability amid the return of high inflation worldwide.

The third contribution is global investors are maintaining confidence in investing in China. Thanks to high export growth and record trade surplus, the RMB exchange rate remained relatively stable despite a sharp dollar appreciation, and the RMB CFETS index fell only modestly. Over the past two years, China's foreign direct investment has registered double-digit growth and is expected to continue this year. In addition, as the RMB exchange rate has

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witnessed two-way fluctuations and enhanced flexibility in recent years, Chinese authorities have reduced reliance on administrative measures. Also, with the steady advancement of the two-way financial sector opening up, it has become more convenient for foreign investors to invest in RMB financial assets.

Overall, China has achieved better economic performance at a relatively small cost of pandemic prevention and control.

Like other countries, China needs to strike a balance between pandemic control and domestic economic recovery. China always upholds the principle of protecting people and their lives as the top priority, adheres to a scientific and targeted pandemic control strategy, and efficiently coordinates pandemic control measures with economic and social development. Due to the uncertainty around the pandemic development and the uneven distribution of medical resources, it poses a great challenge for China to fully reopen like Western countries. As a result, China's consumption recovery has not met expectations. In particular, the service industry remains suppressed and structural employment pressure exists. However, with the decline in Omicron's mortality rate and the reopening experiences from other countries, China will gradually move towards normalization in social and economic activities.

While the direction to normalization is clear, the road toward the end of the tunnel is not easy hiking. Overseas experiences, especially from Asian countries, have shown that society needs an adaptive process to gradually overcome psychological fears. During this period, there will be one or two bumps in the recovery of consumption and the service industries. However, overall demand is expected to show a trend of improvement. Especially for next year, against the backdrop of a gloomy global economic outlook, the expansion of domestic demand will be particularly important for China to maintain reasonable growth. Therefore, it is even more critical to optimize the pandemic control policy at this point. As long as the Chinese economy is stabilized, most of the challenges China will face could be properly dealt with, and the RMB exchange rate would also reflect the economic fundamentals.

Consumption, not Investment, Now Key to Growth*

By Teng Tai^{*}

Scholars and policymakers in China have not yet reached a consensus on whether stimulating consumption is the top priority for the Chinese economy at the moment. Some economists argue more about the need to boost growth by expanding investment, as they believe that stable investment will be the fastest way to encourage economic expansion.

My understanding is that competent policymaking departments and economists need to better realize and identify the importance of boosting consumption. Under China's 20 years of stabilizing investment through infrastructure construction, it is necessary to completely change such concepts and realize the significance of encouraging consumption. There is still a lot of work to be done on this front. If this year's policy is still the same as last year's and the year before, it will affect growth stabilization performance in 2023.

What makes stimulating consumption for growth so important? The main reason behind it is that China's economic structure has changed. In normal situations, consumption contributes about 65 percent of GDP growth in China. Therefore, as the proportion of fiscal funds spent to stabilize growth conforms to the economic structure, roughly 65 percent of fiscal funds are used to stabilize consumption, and the remaining 35 percent are put toward stabilizing investment. Yet, in practice, most of the fiscal funds are used to stabilize investment. This disrupts the overall growth structure.

With China's economy developing and upgrading rapidly, consumption has now become the core factor in economic growth. The country has moved beyond the stage of 20 years of rapid urbanization and rapid industrialization, and infrastructure investment has been oversaturated. Therefore, if the method of stabilizing investment is once again applied to stabilize growth, it will seriously distort the driving force of China's economic growth. However, I think such understanding has not yet been widely recognized by economists and policymakers, and therefore, further study on this matter is needed.

China's previous strategy of stabilizing investment has caused distortions in the overall fiscal expenditure structure. Last year, China's total GDP reached 114 trillion yuan (\$16.2 trillion). The total amount of investment in fixed assets was 55 trillion yuan, while fixed-asset investment accounted for 48 percent of GDP. In comparison, in developed countries such as the United States, Australia, Japan and European nations, the annual total investment in fixed assets accounts for only about 20 percent of the country's GDP.Long-term distorted structure caused by China's large proportion of fixed asset investment in GDP is unsustainable.

^{*}This article first appeared on China Daily on December 5, 2022.

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I would argue that if the current economic structure is corrected and adjusted in the next 10 years, investment in fixed assets will drop from 55 trillion yuan to 30-40 trillion yuan and then decline further. Its high growth will undoubtedly crowd out consumption in the economy, and have a negative impact.

Here are some ways to boost consumption:

First, efforts should be made to promote consumption in terms of raising incomes, instead of working from the production standpoint. Since 2020, in Europe and the United States, the key measure to stabilize consumption has been to issue consumption vouchers to residents, and this has generated a notable effect in boosting the economy. If people's disposable incomes decline, consumption will definitely drop. Therefore, efforts must be made to find a way to increase disposable income of Chinese consumers. However, if we talk about increasing disposable incomes and only work on stabilizing employment, it would not be sustainable over the long term. It is a long-term policy to stabilize employment as well as improve the social security system, medical system and education system, whatever the circumstances are. The core of stabilizing consumption is to increase household incomes. One way to bring this about is to increase current incomes; that is, issue consumption vouchers or money to residents. It is the correct way to stabilize consumption from the income side. Another way of effecting this is to increase investment income, such as making the stock market more prosperous, so that everyone makes money, thus leading to higher consumption.

Second, efforts should be made to increase the public's marginal propensity to consume by cutting interest rates. The best way to increase the marginal propensity to consume in the short term is, in fact, by reducing interest rates, which frees up credit. The two methods for stabilizing consumption in Europe and the US in 2020 were distribution of money and lowering of interest rates. By raising incomes through distribution of money and lowering of interest rates, it is possible to increase the general public's marginal propensity to consume. People's incomes are divided into two parts. One part is used for saving and the other part is used for consumption. When savings increase, consumption decreases. Savings are closely related and very responsive to interest rate changes. When Europe and the US faced economic downturn pressure in 2020 and wanted to stabilize consumption, they once lowered interest rates to zero or even negative. But China seems to be more conservative with regards to cutting interest rates.

There are many reasons for China to be shy about cutting interest rates. These include the need to prevent real estate bubbles, avoid a stock market sell-off, safeguard against rampant inflation, and stabilize the RMB exchange rate. The goal of monetary policy is complicated and has many facets. It needs to work not only to maintain economic growth, but also to stabilize prices, support the capital market, undergird the housing market and stabilize the exchange rate. Currently, in terms of the stock market, the Chinese bourse has a flat performance during the past 10 years, and share prices of many listed companies have fallen to historic lows. A rise in the stock market can increase investment income and benefit consumption. In terms of prices, China's producer price index has entered negative growth since October. Currently, we do not have serious inflation, so from the perspective of prices, cutting interest rates will also work. In terms of the RMB exchange rate, now that the appreciation of the US dollar has ended and

interest rate hikes outside China have slowed, the pressure of RMB appreciation is gradually picking up. Therefore, to increase the public's marginal propensity to consume and to stabilize consumption, we should cut interest rates.

In addition, it is also very important to boost consumption by creating consumption scenarios with engaging consumption activities, where consumers can truly interact with shops and products. If consumers cannot have such interactions, contact consumption in many scenarios will not be realized. This involves the impact of COVID-19 and how to contain the pandemic in a science-based, accurate way, instead of a one-size-fits-all approach.

To sum up, only by realizing the importance of consumption and work on the income front, cutting interest rates and creating more engaging scenarios for consumption can the Chinese economy likely see a rebound in the first quarter of next year.

China to Accelerate Recovery in 2023*

By YAO YANG^{*}

Economic forecasting often is not forecasting, but a projection based on what is happening today. This is what has happened to several recent forecasts about China's economy. The latest among them is a research result reported by Nikkei on Weibo, which says that due to COVID-19, China's GDP will not catch up with that of the United States for an indefinite period.

This conclusion resonates with former US secretary of treasury Larry Summers' pessimistic views about China in a Bloomberg interview in August 2022. In that interview, Summers likened today's China to Japan in 1990 when many people believed Japan would overtake the US in economic size.

But Summers' analogy is wrong — China's population is more than four times that of the US whereas Japan's population in 1990 was only one-third of the US'. It was wrong indeed to believe Japan would overtake the US in total GDP because that would require Japan to have three times the US' per capita income.

As for China, suffice it to say that it needs to increase its per capita income to one quarter of the US', a target that is by no means unachievable for China.

The most important aspect of a country's growth prospects is its potential growth rate. For mature economies, a good estimate of their potential growth rate is their rate of technological progress (total factor productivity, or TFP) plus their population growth rate. It is widely agreed that the US economy's potential growth rate is about 2.2 percent a year. For countries, such as China, moving toward the international technological frontiers, their potential growth rate depends on the rate of capital accumulation as well as the rate of technological progress.

China's savings still account for 45 percent of its national GDP while its stock of net capital in the production sector is 3.6 times of GDP. Assuming all savings are being converted into capital, China's capital stock would grow by 12.5 percent a year.

Also, China's capital stock is relatively young, with a reasonable yearly depreciation rate of 5 percent. As a result, productive capital would grow by 7.5 percent a year in net terms. And since capital makes up half of the production, it would translate into 3.75 percent in GDP growth.

China's TFP growth has been the subject of many past and ongoing debates. But since most of the TFP measures are derived from the so-called Solow residuals which are highly pro-cyclical,

^{*}This article first appeared on China Daily on December 19, 2022.

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many researchers have come up with very small or even negative TFP growth rates for China in the last decade — at a time when its economy had substantially slowed down.

Even so, the lower bound for the share of TFP growth in China's potential growth rate is 20 percent, and the upper 40 percent. If we use 3.75 percent as the basis, China's potential growth rate would vary from 4.7 percent to 6.3 percent, with the average being 5.5 percent.

Will China be able to reach the potential growth rate of 5.5 percent in 2023? This very much depends on the normalization of China's anti-pandemic policy. For the most part of 2022, China effectively contained the spread of the novel coronavirus, but paid a heavy economic price for that, as consumption growth has been sluggish, moving into negative territory in recent months. And since consumption accounts for more than 65 percent of China's GDP, sluggish consumption growth has become a big drag on GDP growth.

But thanks to the latest central government's decision, most Chinese cities have lifted their stringent anti-pandemic policies. This has caused the number of infected cases to soar, although the number of severe cases has been surprisingly low.

However, given the current trend, most cities will likely experience peak infection before Spring Festival (Jan 22), after which infections will start declining. Hence, life is expected to return to normal in most parts of the country during the spring of 2023.

Yet most cities will have to bear the aftermath shocks of the pandemic in the first quarter. As such, fast growth can be achieved only in the second quarter when social and economic life returns to normal. The second quarter will also benefit from a low-basis effect because the second quarter of 2022 registered almost no growth.

Also, government policy will be accommodating in accordance with the encouraging signals sent out by the recently concluded economic conference. While fiscal expansion will continue, monetary policy will be contingent on the growth trajectory. The most encouraging development is that the housing market has picked up, and will again become one of the strongest drivers of recovery. After a year of decline, the sector will probably resume growth in 2023.

Adding up all the factors, 5.5 percent growth in 2023 is an achievable target. In fact, if China is able to make up for the growth shortfalls of 2022 — growth for whole of this year will probably be 3-3.5 percent, 1.5-2 percentage points lower than the potential growth rate — even 7-7.5 percent growth would be reachable.

Easing Restrictions Builds on Past Success*

By ZHOU XIAOMING *

China released a 10-point plan on Dec 7 to further relax pandemic prevention and control measures following the announcement of rules on Nov 11 to optimize the anti-pandemic measures.

The latest move was expected. On the fourth day of my quarantine as a close contact in a hotel in mid-November, a hotel employee called me on the phone to say I could leave the next day because a new government policy had reduced quarantine time by two days. I realized then that major relaxations of COVID-19 restrictions were on the way.

Over the past three years or so, China has protected the lives and health of its citizens well. According to the World Health Organization, the United States reported 98.07 million confirmed COVID-19 cases and 1,074,367 deaths from Jan 3, 2020, to Dec 12, 2022, whereas China recorded 9.92 million confirmed cases and 30,879 deaths.

Had China not implemented the strict anti-pandemic measures, it would have had 425 million cases and 4.70 million deaths, given that its population is four and a half times that of the US. In other words, China's anti-pandemic policy has saved more than 4 million lives. Indeed, thanks to its strict anti-pandemic policy China has overtaken the US in terms of life expectancy.

Also, the Chinese economy has shown remarkable resilience, as it expanded by 14.3 percent in the last three years — an average 4.5 percent a year. Although weak by its own standards, China's growth compares favorably with the US' 4.7 percent — just above 1.5 percent a year — or the European Union's 2.8 percent over the past three years. Better still, the Chinese economy is expected to grow faster than the US' and the EU's in 2023.

However, the novel coronavirus has been constantly mutating and has become more infectious. The dominant sub variants of the virus in China — BA.4, and BA.5-spread easily, with R0 as high as 22, meaning an infection can infect up to 22 persons. But they are less likely to cause serious illness. For example, very few of the 160,000 infections in the southern Chinese city of Guangzhou, one of the epicenters of the current wave of infections, have turned serious. Nationwide, prior to the spread of the Omicron variant, the death rate was relatively high. But since September, more than 99 percent of the infections in Guangzhou and Chengdu, Sichuan province, have been mild cases. As for the death rate, it dropped to 0.1 percent, similar to that of common flu.

^{*}This article first appeared on China Daily on December 15, 2022.

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The government realized that given the nature of the virus's subvariants, it would be almost impossible to completely break the transmission chains. It was time for a new strategy.

Besides, the excessively strict measures in some places added to the misery of many small and micro businesses. The gym I visit regularly was forced to shut down for nearly half of this year. While the closure caused me inconvenience, it made it difficult for the gym's employees to make ends meet. If the virus no longer poses a serious threat to life in most cases, it is natural to ease the restrictions to safeguard people's livelihoods.

That the strict measures have impacted economic growth can be gauged from the fact the Chinese economy is forecast to grow by just about 3 percent this year when the government had set the GDP growth rate at 5.5 percent at the beginning of 2022. Apparently, the benefit of easing controls outweighs its cost.

Furthermore, China's healthcare system has vastly improved, and the country has enough stocks of COVID-19 vaccines and medicines needed to treat coronavirus patients. What's more, China is among the countries with the highest vaccination rate — more than 90 percent. This means China is prepared to counter the onslaught when it finally reopens.

Adjusting its response to new realities has been the hallmark of China as it constantly reviewed the situation on the ground, and made adjustments accordingly.

For instance, China's emphasis has shifted from strict screening and quarantine to cut off the transmission chains and saving every single life at all cost at the beginning of the pandemic to better balancing economic growth and pandemic control. In the process, China's health authorities have continually modified and optimized their COVID-19 control and treatment guidelines, with the ninth version issued on Nov 11.

Consequently, the wide-ranging relaxations announced on Dec 7 were widely anticipated and applauded in the country, while making those in the West who claimed Chinese leaders were politicizing pandemic prevention and control look like fools.

The measures allow those infected with the virus to quarantine at home, and eliminate the need for people to show a negative test result (and/or a green health code) to enter most public places. The focus is now on preventing and treating serious cases rather than completely cutting off the transmission chains.

In line with the government's commitment to prioritizing lives mask-wearing is still mandatory in public places while PCR tests are required to enter places such as schools, eldercare homes and in-door recreational centers.

Based on the experience of the Hong Kong Special Administrative Region, some claim that if the Chinese mainland fully reopens in the first half of 2023, it could see hundreds of thousands of deaths. In all probability, this would not happen. About 66 percent of the people aged 80 or above on the mainland have been fully vaccinated compared with just 20 percent of the same age group in Hong Kong when the SAR encountered a fresh wave of infections earlier this year. In addition, the central government is going all out to vaccinate all senior citizens. Despite all this, China's journey to normality is unlikely to be smooth, as the number of infections could still be large, with significant number of serious cases and deaths, given the size of its population.

Will Western-made vaccines help China's fight against the virus? Just the other day, my wife and I were talking about the claim that mRNA(activated) vaccines made by Pfizer and Moderna are superior to Chinese inactivated vaccines. I was hard pressed to respond when she asked: why China has fewer COVID-19-related deaths in the past six months than the US has in a single day if the US vaccines are more effective?

China has triumphed in the fight against COVID-19. As the last country in the world to lift strict restrictions, it has the added benefit of drawing on the experiences of other countries in reopening. In living with the virus, China looks to continue its success.

Monetary and Fiscal Policy

The Price to Pay: How to Rein in Inflation? Central Bank and

Government Perspectives*

By ALFRED KAMMER^{*}

In a matter of just two years, the monetary policy debate in Europe and beyond has shifted from fighting risks of a great depression and great deflation to coping with multi-decades high inflation that shows no signs of abating. Moreover, while the exit from the pandemic was uncharted territory, Russia's war in Ukraine has fundamentally changed the global outlook.

Today I would like to shed light on three key questions that confront policymakers in Europe:

- What has been driving the inflation surge and the rise in its dispersion across countries?
- How is inflation likely to evolve throughout the remainder of 2022 and 2023, and what are the risks around this path?
- What do inflation prospects and risks imply for the calibration of macroeconomic policies?

In a nutshell, my answers to these three questions are as follows:

- Much of the inflation surge can be traced back to soaring energy and food prices, but there is an unexplained part. Neither commodity prices, nor other conventional inflation drivers such as output or employment gaps and inflation expectations, can fully account for the rise in inflation. This holds in particular true for core inflation. At least some of the unexplained part seems to relate to unique pandemic-specific forces. These include the initial rotation of demand towards durable goods, later on towards contact-intensive services, and also rising shortages in input markets.
- Notwithstanding recent gas price increases, the prospective stabilization or even decline of commodity prices and the projected slowdown in growth should gradually bring down inflation. But that could be a slower process than sometimes assumed, given the

^{*}This speech was given at the IMF-World Bank Constituency Meeting, Sarajevo, Bosnia and Herzegovina on September 15, 2022.

^{*} Alfred Kammer, the Director of the European Department at the International Monetary Fund.

persistence of core inflation. Also, while there are large inflation risks both ways, core inflation risks are predominantly on the upside.

• Central banks should thus continue to raise policy rates under most scenarios—even more clearly in emerging European economies. Fiscal policies should strike the right balance between supporting the monetary policy stance and protecting vulnerable households and viable firms against sharp income losses from skyrocketing energy prices.

Let me now elaborate on each of these points. I will start with an overview of recent inflation dynamics in Europe.

Recent developments

On average across Europe, commodity prices contributed roughly two-thirds of the rise in headline inflation. In some of emerging European economies, food inflation contributed significantly more than energy prices. A prime example are the Western Balkan countries. There the share of food in the consumption basket on average is nearly 40 percent—twice the EU average.

Another striking feature of the inflation surge is how diverse it has been across countries. By August 2022, headline inflation reached between 20-25 percent in the Baltic countries, triple or quadruple the rate in the lowest inflation countries in the euro area. While partly reflecting different cyclical positions, this heterogeneity is also driven by cross-country differences in policies. In particular, energy price caps or freezes have been more prevalent in some countries (France, Malta or Spain, for example) than in others (Estonia).

Inflation pressures have also become increasingly broad-based. By mid-2022, about 70-90 percent of the core CPI basket consisted of items with year-on-year price increases above central banks' targets.

And domestic services inflation, which is less directly exposed to global food and energy developments, has also soared.

Inflation drivers

Looking beyond simple decompositions, a more in-depth understanding of the drivers of the recent inflation surge can be achieved by analyzing Phillips curves. This workhorse empirical model relates current inflation to lagged and expected inflation, the output gap, and external price pressures—including specifically from global energy and food prices. New estimates forthcoming in our October Regional Economic Outlook reveal three important differences between advanced and emerging European economies.

Inflation in emerging European economies: 1) increases more when labor markets tighten; 2) is less forward-looking; and 3) responds more to foreign price developments, especially global food prices, and also to exchange rates. Together with a higher starting level of inflation prior to the COVID pandemic, these patterns explain why inflation is currently higher in emerging Europe economies than in advanced European economies.

Conventional Phillips curves explain some of the recent rise in inflation, including through large foreign price increases. But by mid-2022, they showed large positive residuals. On average across Europe, roughly 40 to 50 percent of core inflation was unexplained in the second quarter of 2022.

What may account for this unexplained inflation? The jury is still out and more research is needed. But let me offer two possible explanations:

There could be a structural change in existing relationships after Europe was hit by two tail-risk events: the pandemic and Russia's war in Ukraine. For example, we find evidence that inflation in Europe has recently become more backward-looking and more responsive to global commodity prices.

Conventional measures of inflation drivers may fail to fully capture COVID-specific forces. For example, the unexplained component of inflation is correlated with a country's share of firms reporting input or labor shortages. This suggests that conventional output gap estimates may be over-estimating the downward inflation pressure from residual economic slack in European economies.

Prospects and Risks

How is inflation likely to evolve from here? Phillips curve models would predict a gradual fall in headline inflation to 3-4 percent in both advanced and emerging economies over the coming year. Inflation would still remain above central bank targets at the end of 2023.

However, if the large recent Phillips curve residuals that I just mentioned persisted for longer than expected, inflation would fall back to central bank targets more slowly.

Further, a number of inflation risks could materialize. Some are two-sided and not so new, but unusually large at the current juncture—think about the range of economic slack estimates or plausible future paths for commodity prices. Some of the other risks are on the downside, such as a more rapid easing of supply disruptions as demand slows. But most are on the upside and could take us more into uncharted territory: continued inflation surprises may de-anchor inflation expectations. Workers may demand compensation for recent high inflation in the form of higher wages, potentially triggering wage-price spirals.

How much should we be worried about wage-price spirals? At this stage, this risk remains contained, at least in advanced European economies where wage growth has risen to only modest levels so far, and public wage growth is expected to remain contained. Further, formal wage indexation across Europe is far less than it used to be. The sharp ongoing economic slowdown will help moderate wage claims.

But vigilance is called for. Our recent research suggests that the response of wages to price shocks is stronger when prevailing inflation is already high, as it is right now. In other words, persistent high inflation could trigger a change in regime with self-reinforcing increases in wages and prices resulting in entrenched inflation. In such a world, inflation formation may become more backward-looking. As I mentioned, we already see some signs of this happening in the post-COVID period.

Policies

What does this mean for policies, and primarily for monetary policy, the first line of defense against inflation? Real interest rates are still below plausible estimates of neutral levels, and currently tight labor markets should remain healthy under our baseline projections. Further, as I argued, there are risks that inflation could well stay uncomfortably high for longer than expected and become entrenched. Therefore, central banks should keep raising policy rates under most scenarios. While generally true across the board, this applies even more in emerging economies. There, inflation is typically higher and more persistent. Risks of an unmooring of inflation expectations are greater. And wage-price spirals are more likely amid already high nominal wage growth and tight labor markets.

At the same time, given very high prevailing uncertainty, monetary policy should remain nimble and data-dependent. To get a rough sense of how much central banks may need to change course should risks materialize, we ran illustrative simulations using a small DSGE model calibrated for advanced and emerging European economies. These simulations suggest that, depending on the countries and scenarios considered, monetary policies could easily need to tighten by up to 200 bps more than expected in our baseline forecasts, reducing GDP growth by up to 2 percentage points in the year ahead. That would be the case, for example, if inflation formation became as backward-looking as it used to be prior to the 1990s.

In any event, preserving central bank independence and policy transparency is key. When monetary policy lacks credibility, inflation expectations are not well anchored, and wages respond more strongly to price shocks. In other words, risks of wage-price spirals are greater.

Let me close with a word on other policy settings. Fiscal measures have a key role to play in cushioning the impact of the transitory component of the energy price shock on vulnerable households and viable firms. Such measures should remain consistent with a non-expansionary fiscal stance in most European economies. Fiscal policy should support, rather than conflict with, monetary policy. Finally, structural reforms remain key to improving energy security, speeding up the green transition and fostering longer-term growth and economic convergence in Europe. Some of them could also incidentally ease supply constraints and support monetary and fiscal policies in the fight against inflation.

Is Monetary Policy Still Regulatory Policy Today*

By JOACHIM NAGEL*

1 Introduction

You are in an enviable position here in Switzerland! Not just because of the glorious scenery here at Lake Lucerne, but also because of the country's inflation rate, which is admittedly also too high, at 3.5% in August. I would be happy, though, if we had that rate in the euro area right now, instead of 9.1%.

Yet my counterpart Thomas Jordan and I won't be focusing, like we often do, on economic activity and price developments today. I am pleased to be speaking on a subject that is of a fundamental nature but is nonetheless topical and of practical relevance at the same time.

2 Understanding regulatory policy

Is monetary policy still regulatory policy today? That is a question that is almost impossible to answer without delving first into what regulatory policy means and how it originated. But I will keep the backstory brief, I promise.

In some quarters these days, regulatory policy has a bad reputation, is couched in negative terms, and is sometimes seen as "typically German".^[1] Properly interpreted, though, it is neither a matter of harping on about principles nor dogmatic. I would like to show you that it offers important insights and serves as the backbone, so to speak, of a welfare-oriented economic policy – and that it also sets suitable guidelines for monetary policy. The theoretical roots of regulatory policy can be traced back to Walter Eucken and other co-founders of the Freiburg School, who shaped German ordoliberalism.

One hugely important aspect for ordoliberals is competition. But for them, it is not about a laissez-faire, unregulated interplay between market forces. Rather, the rationale is to design a framework competitive order in such a way that decentralised decisions yield the best possible outcomes for the economy as a whole. For this to be possible, economic power, for example, also needs to be kept in check. This school of thought posited that government intervention is legitimate and desirable, provided the interaction of individual decisions produces a better outcome as a result. Yes, it may even be justified to replace the market mechanism. Ordoliberalism, then, is by no means an approach that is hostile to government or regulation.

^{*}This speech was given at the seminar "Central Bank Digital Currency and Crypto Assets" in celebration of the 20-year Anniversary of the African Regional Technical Assistance Centre (AFRITAC) East.

^{*} Joachim Nagel, President of the Deutsche Bundesbank (2010-16: Executive Board).

At its heart, though, is the organisational power resulting from private, decentralised, individual decisions. These decisions are steered by prices. This is why a functioning price mechanism is the primary steering function. Undistorted prices provide key signals and information on the scarcity of goods, say, so that economic resources can be used to maximise welfare. High inflation rates, for example, disrupt this signalling and steering function of prices.

Walter Eucken witnessed hyperinflation and the Great Depression for himself, and his experiences fed into his oeuvre.^[2] He understood that a competitive order can only be made a reality if monetary stability is assured. Thus, Eucken gave priority to a policy of stable currency, calling this the "primacy of monetary policy".^[3]

Eucken's philosophy laid the foundations for German post-war economic policy, which was built around the concept of a social market economy. The social market economy made a conscious departure from a planned economy and steering approaches by combining unfettered market forces with a social safety net. The idea was that a growing economy should benefit not just a small elite but deliver "prosperity for all", to use Ludwig Erhard's familiar phrase that became the title of his famous book. In that book, Ludwig Erhard wrote that the social market economy is unthinkable without a consistent policy of price stability. This policy alone can also ensure that individual sections of the population do not enrich themselves at the expense of others.^[4] Ludwig Erhard's policies ultimately made Germany's economic miracle possible after the poverty of the immediate post-war period. The economy boomed, wages increased, and broader sections of the population were indeed able to share in the welfare gains.

3 Price stability is what matters

So what legacy do these origins of regulatory theory and policy represent for monetary policy nowadays? Can regulatory policy even hold its own under today's framework conditions?

The main concept that we have inherited, in my view, is the firm belief that monetary stability is the foundation for economic growth and "prosperity for all". Hearing a central banker utter those words won't come as much of a surprise to you. And yes, monetary policy today is still regulatory policy in action, in my opinion. You see, the chief task of monetary policy in the euro area is to preserve price stability. This makes it part of the overall regulatory structure, in which it plays a crucial role. Echoing Walter Eucken's words, Otmar Issing remarked that the primacy of monetary policy had been reconfirmed by the establishment of European monetary union.^[5]

That said, Walter Eucken was not thinking of a central bank to safeguard price stability. In his opinion, a good monetary constitution should, like the competitive order, function as automatically as possible. This is because Eucken warned of weaknesses in central bankers and their influence. I quote: "... experience shows that a monetary constitution which gives those in charge of monetary policy a free hand places greater confidence in them than it is advisably possible to do. Ignorance, weakness with regard to interest groups and public opinion, incorrect theories, all these things influence those responsible for monetary policy, to the great detriment of the task they have been assigned."^[6]

As Otmar Issing admitted, Walter Eucken is not a name that springs immediately to mind when searching for the intellectual antecedents of the euro.^[7] What is noticeable instead is Eucken's general scepticism towards central and uncontrolled monetary policy institutions. Today's advocates of regulatory policy see central bank independence in a more positive light. It is precisely this, together with a narrow mandate, which shields monetary policymakers against being co-opted for political purposes and is the sine qua non for striving for price stability without compromise.

Last year saw the ECB Governing Council complete the review of its monetary policy strategy, a key component of which was to recalibrate the manner in which the Governing Council intends to preserve price stability in the euro area.^[8] The Eurosystem is now aiming for an inflation target of 2% in the medium term. The target is symmetrical, meaning that positive and negative deviations of inflation from the 2% target are equally undesirable. By setting this target above zero, monetary policy has a greater safety margin against deflationary risks.

The medium-term orientation accounts for the fact that short-term fluctuations in inflation can balance out over time and that monetary policy measures will only fully feed through into prices with something of a lag. It is therefore inevitable that the target might be missed in the short term. Monetary policy does not have to hastily respond to every change in the data. However, the Governing Council very much does have to respond to signs that the target will be missed over a medium-term horizon. And the Council has to explain its policy to the general public. That's more important today than it ever was, given that inflation in the euro area has been above 2% for more than a year now, and currently exceeds 9%. And it looks set to persist well above 2% next year, too – the latest ECB staff macroeconomic projection expects the rate to come to 5.5%.

Alongside its narrow mandate focused on price stability, the Eurosystem's accountability is an important counterpart to its independence. In a democracy, you see, the general public must be able to understand whether the central bank is fulfilling its mandate – whether it is doing its job properly. The monetary policy strategy is also supportive in this regard as a benchmark for successful monetary policy.

4 The Maastricht regulatory framework

The Maastricht Treaty created the institutional framework for the euro. Besides enshrining the ECB's mandate and independence, it also lays down the prohibition on monetary financing of government. This underscores the separation between monetary policy and fiscal policy. In addition, that treaty established limits for new borrowing and debt levels so that monetary policy does not come under pressure in practice and is not forced to step in and support fiscal policy.

Theory and practice alike have shown just how important sound government finances are for the success of a stability-oriented monetary policy. The Maastricht regulatory framework has the single monetary policy on the one side and the national fiscal policies on the other. The Stability and Growth Pact then followed soon thereafter, fleshing out the provisions of the Maastricht Treaty. In practice, though, this set of rules lacked binding force. The European Commission will now soon be presenting its proposals on the reform of European fiscal rules. The Bundesbank also sees a need for reform.^[9] Above all, it is important that the rules are designed to be transparent, comprehensible and verifiable enough to ensure greater credibility and binding force than in the past. Clear, quantified requirements are crucial for this. These need to be selected in a way that high debt ratios can be relied upon to decline if the rules are complied with. While flexibility and discretionary leeway are needed as well, too much of this undermines the rules and counteracts their purpose, which is to effectively limit government debt.

This brings me back to the question of whether regulatory policy still has a place, or whether it is a relic that has outlived its usefulness. I think the review of the monetary policy strategy and the forthcoming reform of the fiscal framework exemplify two things. First, that a clear regulatory framework is needed. Viewed through this lens, the rationale underpinning regulatory policy is timeless: it is about creating an overall regulatory policy structure with the appropriate institutions in which the economy can thrive and deliver prosperity for all. Second, as part of this framework it must be possible to adapt, as and when necessary, to an evolving environment, new insights and weaknesses that come to light so that it can continue to deliver the best possible results.

5 Non-standard monetary policy measures

The global financial crisis and the euro area debt crisis showed that the regulatory framework enshrined the Maastricht Treaty only works well if the rules set forth therein are rigorously adhered to. In the years that followed, monetary policy operated in a setting characterised by very low inflation rates and proximity to the lower bound.

The Eurosystem's monetary policy responded to this with unconventional measures. The various non-standard measures were designed to counter the risk of deflationary tendencies and safeguard the transmission of monetary policy. Additional instruments were deployed, such as targeted longer-term refinancing operations for banks, forward guidance and purchases of private and public securities. From a regulatory perspective, it was particularly the purchases of government bonds that came in for criticism.

Large-scale government bond purchases create undesirable incentives for policymakers and risk blurring the boundaries between monetary and fiscal policy.^[10] There was no shortage of critical remarks, such as "regulatory lapse"^[11] or "capitulation of regulatory policy".^[12] One thing is for sure: unconventional measures have to be justified on monetary policy grounds. They also need to comply with the prohibition on monetary financing of government. And they must be proportionate.

"Unconventional monetary policy – a regulatory policy appraisal" was the title of a speech delivered by the then ECB Executive Board member Yves Mersch,^[13] in which he argued that the European Central Bank's actions were motivated by monetary policy and consistent with regulatory policy principles. Mersch added, though, that "at the same time, we should be under no illusions that these market interventions are sometimes significant. For this reason, too, our market interventions are explicitly defined as non-standard measures and are not intended for the

long term. It could also be said that the objective of our unconventional measures is to make themselves superfluous."

Well, the persistently low level of inflation meant that the net purchases of government bonds continued for quite some time. Under the public sector purchase programme, or PSPP for short, net asset purchases ultimately went on for seven years – from March 2015 to June 2022 (with a break in 2019). And the pandemic emergency purchase programme (PEPP) introduced in response to the monetary policy challenges posed by the coronavirus crisis saw government bonds being purchased in net terms from March 2020 to March 2022. However, unlike under the PSPP, the Governing Council granted a degree of leeway under the PEPP by allowing the net asset purchases to deviate temporarily from the ECB capital key so as to provide a targeted response to pandemic-related risks to transmission.

Principal payments from maturing securities under both programmes are being reinvested, so the stocks of assets are not declining yet. After net asset purchases under the PEPP were discontinued, the possibility of deviating from the capital key was retained for the reinvestment phase. The flexibility of reinvestments under the PEPP is intended to counteract further pandemic-related risks to the transmission of monetary policy.

Picking up on what Yves Mersch said, I believe it is important that we swiftly end our non-standard measures once they have fulfilled their task.

In addition, other programmes have been adopted in principle to safeguard the monetary policy transmission mechanism: the OMT programme from 2012 and the recently adopted Transmission Protection Instrument (TPI). Subject to certain criteria, the TPI enables targeted purchases of individual jurisdictions' government bonds in particular as a way of countering market dynamics that are not warranted by the fundamentals. These market dynamics must furthermore pose a serious threat to the transmission of monetary policy such that the preservation of price stability would be at risk.

From a regulatory policy perspective, focusing on certain countries' bond yields is obviously a balancing act. On the one hand, it is about ensuring a functioning transmission mechanism. On the other hand, there is the danger of intervening in a market that is actually still functioning or of governments having less of an incentive to put their public finances on a sustainable path.

For this reason, the TPI contains safety precautions. Hence, before making any purchases the Governing Council will consider a list of criteria to assess whether the jurisdictions in which the Eurosystem may conduct purchases under the TPI pursue sound and sustainable fiscal and macroeconomic policies. This examination needs to be rigorous and consistent, including and especially when it comes to assessing the debt sustainability of Member States.

I would, however, like to reiterate that the objective of the TPI and OMT is precisely not to influence government bond yields as one sees fit, thereby disabling the signals sent by prices. Instead, it is merely about countering those shares of yields that cannot be tallied with the Member State's fundamentals so as to ensure the functioning of the transmission mechanism. Since situations like these come up rarely – fortunately – and are not easy to identify –

unfortunately -a decision by the Governing Council to activate the TPI is to be based on a comprehensive assessment of market and transmission indicators, so that there is sufficient evidence that transmission is disrupted.

6 Current environment in the fight against inflation

The main issue right now is the fight against inflation. Historically high inflation rates are posing a stiff challenge for monetary policy. We central banks must not leave any doubt that we take this test very seriously, and that we shall prevail.

The ECB Governing Council acted decisively with the two significant key interest rate hikes totalling 125 basis points in July and September. Further tightening steps have been signalled and will have to follow, in my view.

I make no secret of the fact that combating inflation will create burdens. It is likely to temporarily dampen growth. But doing nothing and letting things run their course is no alternative. Inflation erodes prosperity. It depresses economic participation because it hits the weakest hardest. This puts it at odds with promises to deliver "prosperity for all".

Monetary policy and its toolkit evolve over time. That's because new academic and scientific insights come to light, but it's also primarily due to changes in the economic environment. Over time, monetary policy needs to be updated, as it were, to enable it to perform its statutory – and crucial regulatory policy – mandate of preserving price stability.

Time and again, crises, or transmission disruptions triggered by market failures, might necessitate new interventions. However, these updates need to remain within the guidelines. In particular, account needs to be taken of the specific challenges inherent in the euro area, whose regulatory framework is enshrined in the European Treaties.

I am aware that some of the updates carried out in the Eurosystem bring with them regulatory policy risks. That is why, when I look at the TPI, there is an important point to bear in mind: if temporary activation were to be considered, we have to be able to provide compelling evidence that we would be correcting a fault in the markets that is severely restricting monetary policy.

If we confine ourselves to necessary regulatory interventions, I am convinced that good monetary policy remains, to this day, regulatory policy in action.

Thank you very much for your attention. I am now eager to hear what my Swiss counterpart has to say on this topic. And I look forward to our discussions afterwards.

Footnotes:

- [1] Young, B. (2017), Ordoliberalism as an 'irritating German idea', in Ordoliberalism: A German oddity?, pp. 31 ff.
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[3] Eucken, W. (1952/1990), Grundsätze der Wirtschaftspolitik, 6th edition, Tübingen, pp.

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How Fiscal Restraint Can Help Fight Inflation*

By TOBIAS ADRIAN AND VITOR GASPAR^{*}

Fiscal policy can ease the task of monetary policy in reducing inflation while mitigating risks to financial stability

Government support was vital to help people and firms survive pandemic lockdowns and support the economic recovery.

But where inflation is high and persistent, across-the-board fiscal support is not warranted. Most governments have already dialed back pandemic support, as noted in our October Fiscal Monitor.

With many people still struggling, governments should continue to prioritize helping the most vulnerable to cope with soaring food and energy bills and cover other costs—but governments should also avoid adding to aggregate demand that risks dialing up inflation. In many advanced and emerging economies, fiscal restraint can lower inflation while reducing debt.

Fiscal consolidation, limiting debt

Central banks are raising interest rates to dampen demand and contain inflation, which in many countries is at its highest levels since the 1980s. Because rapid price gains are costly to society and detrimental to stable economic growth, monetary policy must act decisively.

While monetary policy has the tools to subdue inflation, fiscal policy can put the economy on a sounder long-term footing through investment in infrastructure, health care, and education; fair distribution of incomes and opportunities through an equitable tax and transfer system; and provision of basic public services. The overall fiscal balance, however, affects the demand for goods and services, and inflationary pressures.

A smaller deficit cools aggregate demand and inflation, so the central bank doesn't need to raise rates as much. Moreover, with global financial conditions constraining budgets, and public debt ratios above pre-pandemic levels, reducing deficits also addresses debt vulnerabilities.

Conversely, fiscal stimulus in the current high inflation environment would force central banks to slam on the brakes harder to curb inflation. Amid elevated public and private sector debt, this may raise risks for the financial system, as our Global Financial Stability Report described in October.

^{*}This article was published on IMF website on November 21, 2022.

^{*} Tobias Adrian, the Financial Counsellor and Director of the IMF's Monetary and Capital Markets Department. Vitor Gaspar, Director of the Fiscal Affairs Department at the IMF.
Demonstrating alignment

Against that backdrop, policymakers have a responsibility to provide strong protections to those in need, while paring back elsewhere or raising additional revenues to reduce the overall deficit. Fiscal responsibility—or even consolidation where needed—demonstrates that policymakers are aligned against inflation.

When fiscal adjustment is sustained, ideally through a medium-term fiscal framework that sketches the direction of policy over the next few years, it also addresses looming pressures on debt sustainability. These include aging populations in most advanced and several emerging economies, and the need to rebuild buffers that can be deployed in future crises or economic downturns.

Curbing inflation

Fiscal tightening can help cool inflation and reduce public debt. (percentage points)





Source: Erceg and Lindé, 2012; and IMF staff calculations.

Note: Simulations by IMF staff using a two-country dynamic stochastic general equilibrium model. Parameters for the "home economy" are based on the United States, but the results would be similar if a large group of other advanced economies pursued these policies. The results also apply qualitatively to emerging market economies, though the size of the effects depends on country-specific features. From left to right for both rows: average of first 12 quarters; average of first 4 quarters; after 5 years; average of first 4 quarters.



In our research, we use a stylized two country model (where the "home economy" may be the US or a group of advanced economies). We study two different approaches to curb inflation. The first relies exclusively on monetary tightening to cool the overheating economy, whereas the second involves fiscal consolidation. Both are constructed to have similar effects on economic growth, and each is effective in reducing inflation. Under the first, higher interest rates and the weaker growth contribute to rising public debt. Meanwhile, the currency appreciates as higher yields attract investors.

Under the second approach, fiscal tightening cools demand without the need for interest rates to rise, so the real exchange rate depreciates. And with lower debt-service costs and smaller primary deficits, public debt declines. The real exchange-rate appreciation under tighter monetary policy implies that inflation falls a bit more, but this difference would diminish if more countries pursued these policies.

Faced with high food and energy prices, governments can improve their fiscal position by moving from broad-based support to assisting the most vulnerable—ideally, through targeted cash transfers. Because supply shocks are long-lasting, attempts to limit price increases through price controls, subsidies, or tax cuts will be costly to the budget and ultimately not be effective. Price signals are critical to promote energy conservation and encourage private investment in renewables.

The desirable fiscal stance and measures underpinning it will depend on country-specific circumstances, including current inflation rates and longer-term considerations such as debt levels and developmental needs. In most countries, higher inflation strengthens the case for fiscal restraint, calling for raising revenue or prioritizing spending that preserves social protection and growth-enhancing investments in human or physical capital.

International dimensions

In the United States, the early-1980s disinflation under Federal Reserve Chairman Paul Volcker exemplified the challenges of controlling inflation. Inflation had become entrenched at high levels, and fiscal policy was expansionary. The Fed had to raise rates sharply to rein in inflation, causing a collapse in housing investment and historically large appreciation of the dollar. Manufacturing was hard hit, leading to calls for trade protectionism.

That historical episode is relevant for many countries facing similar challenges today. A more balanced removal of policy stimulus, including fiscal restraint, can reduce the risk that some parts of the economy—especially those most sensitive to interest rates—experience disproportionate effects, or that large swings in the currency heighten trade tensions.

This would also reduce risk globally. Less abrupt interest rate hikes would imply a more gradual tightening of financial conditions and mitigate financial stability risks. This would tend to limit adverse spillovers to emerging market economies and reduce the risk of sovereign debt distress. Avoiding a sharp appreciation of the US dollar or other major currencies would also lessen pressures on emerging markets that borrow in those currencies.

January 2023 Vol.10, No.1

While many central banks are tightening policy in response to the large and persistent rise in global inflation, the policy mix matters. Fiscal restraint will reduce the cost of bringing inflation back to target in a timely way, compared with the alternative of leaving monetary policy alone to act.

Financial Regulation

Proportionality and Financial Inclusion: Implications for

Regulation and Supervision *

By FERNANDO RESTOY*

Let me welcome all participants to our regular workshop on financial inclusion, which this year is organised by the Consultative Group to Assist the Poor (CGAP) and the Financial Stability Institute (FSI) of the Bank for International Settlements (BIS).

Before starting the sessions, let me share some reflections on proportionality in regulation and supervision and its impact on financial inclusion, from a Basel perspective.

According to World Bank research, the concept of proportionality in relation to financial inclusion can be dated back to a 2011 white paper by the G20 Global Partnership for Financial Inclusion, which identified some challenges specific to each standard-setting body (SSB) and also joint challenges for all SSBs. That report also made recommendations to be considered by all SSBs to encourage financial inclusion efforts globally.

The paper introduced the proportionality principle for regulation and supervision, ie the balancing of risks and benefits against costs of regulation and supervision. It acknowledged that risks and benefits are often perceived and measured differently by different stakeholders, and that the complexity of the risk and benefit assessment multiplies when the varied regulatory and supervisory standards of the SSBs are applied across the different products, services and providers that a broad financial inclusion agenda involves. It also advocated that proportionality needs to consider not just the risks of financial exclusion, but also the benefits of financial inclusion beyond the mitigation of financial exclusion risks. In this light, it argued that while these benefits may be only indirectly related to the core mandate of SSBs, they can motivate SSBs to incorporate financial inclusion considerations into their work.

^{*}This article is the welcome remarks by Fernando Restoy at the workshop on "Proportionality and financial inclusion: implications for regulation and supervision", 7 November 2022.

^{*} Fernando Restoy, Chair of Financial Stability Institute.

The idea, of course, is not to compromise SSBs' ability to deliver on their core objectives but rather to accept the principle that good regulation should also minimise any unintended adverse impact on other social policy goals.

In fact, applying the principle of proportionality can help regulation to avoid negative side effects on financial inclusion. This is true for both activity-based – such as AML/CFT – and entity-based regulation – such as that for banking or insurance firms.

For example, alleviating know-your-customer (KYC) requirements for basic financial products – like pure payment accounts offered to unsophisticated firms or individuals – constitutes a good example of a proportionate application of AML/CFT rules. Arguably, risks that that leeway will be used to facilitate material illegal activities are clearly contained, but the potential benefits in terms of facilitating access to the financial system by the undeserved are very large.

In the area of prudential regulation, rather than applying the whole set of highly sophisticated rules based on global standards to all financial institutions, imposing simplified requirements on firms that are small and run a traditional business model is generally warranted. If the simplified rules are properly defined, they could remain effective at preserving the safety and soundness of small institutions, but they would also reduce an otherwise disproportionately costly regulatory burden. To the extent those firms are often active only in specific local communities and provide financial services to agents that could have difficulties obtaining the same services from larger institutions, proportionate prudential regulation would facilitate financial inclusion.

That said, the implementation of a sound proportionality regime is not an easy task, as it is subject to relevant technical and, sometimes, political challenges.

For example, the principle of proportionality has been wrongly advocated to protect small – but sometimes inefficient – firms from the competition of larger – and often more efficient – players in the markets where they operate. In that regard, proportionality should be understood as a way to correct or mitigate the penalisation of small firms by disproportionately burdensome regulation. But in no way should it become an excuse to create new privileges and distortions leading to socially sub-optimal market structures.

In addition, successful financial inclusion policies may sometimes entail strengthening rather than alleviating some regulatory safeguards. For example, increasing the access of larger segments of the population to credit or payment facilities without sufficiently effective consumer protection rules could increase rather than reduce the vulnerability of some of the newly financially included individuals.

Very importantly, national authorities may be reluctant to introduce a proportionate approach in their regulatory frameworks, if they perceive that this could affect their international standing. Their concern is that this approach may be perceived as less rigorous, thus tainting the jurisdiction's reputation as a safe and sound place to do business. That could lead to efforts to adopt the full package of international standards with insufficient tailoring to the specific domestic situation and needs.

To overcome those obstacles, I believe that it is very important that national authorities are provided with sufficient international guidance. That can help authorities to properly address the technical challenges when they aim at putting in place an effective proportionality regime. Moreover, the adoption of that international guidance can help to assuage the stigma problem I have just mentioned.

In that regard, all the good work that has recently been carried out by international standard-setting bodies is certainly welcome. To cite just a few such efforts: over the summer, the Basel Committee on Banking Supervision issued high-level considerations on proportionality, which provide some options for tailoring international standards to non-internationally active banks in specific jurisdictions. Moreover, for the International Association of Insurance Supervisors, the Access to Insurance Initiative has published a series of recent reports looking at proportionality in practice, drawing on case studies in individual countries. In the area of cross-border payments, the Financial Stability Board and the other SSBs and international financial institutions involved in the design of the Roadmap on improving cross-border payments, issued in 2020, continue to monitor the issue of proportionality. In particular, the 2022 progress report on implementation of the roadmap highlights the risks of financial exclusion related to the application of disproportionate AML/CFT requirements. Moreover, in that area, the Financial Action Task Force has spearheaded the global work on the unintended consequences of the application of AML/CFT guidance, as demonstrated in its dedicated report published last year.

All those efforts are substantive and relevant. I have the impression, though, that there is sometimes scope to make the existing guidance still more practical, consistent and applicable, to use the same terms as Her Majesty did a few minutes ago.

To give you a recent example of where guidance can help to overcome inertia in applying a proportionate approach and to support coordination among national authorities, let me mention the statement published in April by the European Banking Authority (EBA). There, it issued guidance on the offering of banking services to Ukrainian refugees moving to the European Union. The EBA sets out how its AML/CFT guidelines would apply in this context, and how financial institutions could adapt their AML/CFT measures to provide a pragmatic and proportionate response to the compliance challenges they face.

More broadly, and looking in particular at emerging market and developing economies, I feel there is a clear demand for the international regulatory community to provide clear references for effective proportionality regimes that would help them address the challenges they face in their jurisdictions while still being perceived globally as fully consistent with a sound regulatory framework.

I am sure that over the course of this workshop we will hear from representatives of those SSBs, learn more details about what they have done and, more importantly, get information about their plans for further work on the matter.

I very much look forward to what I am sure will be an interesting exchange of ideas among participants, speakers and chairs.

Why Bank Capital Matters*

By MICHAEL S. BARR^{*}

In my first speech as Vice Chair for Supervision in September, I said that the Federal Reserve Board would soon engage in a holistic review of capital standards. My argument, then and now, is that our review of regulatory policy must be a periodic feature of bank oversight. Banking and the financial system continuously evolve, and regulation must adapt to address emerging risks. Bank capital is strong, but in doing our review, we should and are being humble about our ability—or that of bank managers—to predict how a future financial crisis might unfold, how losses might be incurred, and what the effect might be on the financial system and our broader economy. That humility, that skepticism, will serve us well in crafting a capital framework that is enduring and effective. It will help make sure that we do not lose the hard-fought gains in resilience over the past decade and that we prepare for the future.

That review is still underway, and I have no firm conclusions to announce today. Rather, I thought it would be helpful at this early stage to offer my views on capital regulation and the role that capital standards play in helping to advance the safety and soundness of banks and the stability of the financial system.

By "holistic," I mean not looking only at each of the individual parts of capital standards, but also at how those parts may interact with each other—as well as other regulatory requirements—and what their cumulative effect is on safety and soundness and risks to the financial system. This is not an easy task, because finance is a complex system. And to make the task even harder, we are looking not only at how capital standards are working today, but also how they may work in the future, when conditions are different.

As I mentioned, we are approaching the task with humility—not with the illusion that there is an immutable capital framework to be discovered, but rather, with the awareness that revisions we conceive of today will reflect our current understanding and will inevitably require updating as our understanding evolves.

Why Do Banks Have Capital?

Let me start by explaining why banks have capital. Banks play a critical role in the economy by connecting those seeking to borrow with those seeking to save. A bank lends to its customers, including individuals and businesses, based on its assessment of the customer's creditworthiness. A bank's depositors benefit from having bank accounts that allow them to easily make payments

^{*} This is a speech (virtual) by Mr Michael S Barr at the American Enterprise Institute, Washington DC on 1 December 2022.

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to others and to maintain a balance of money in a safe and liquid form. A healthy banking sector is central to a healthy economy.

The nature of banking, however, along with the interconnectedness of the financial system, can pose vulnerabilities. Even if a bank is fundamentally sound, it can suddenly be threatened with failure if its customers lose confidence and withdraw deposits. This inherent vulnerability can pose risks to the entire economy.

In the 19th and early 20th centuries, before the creation of the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC), banking panics were frequent and costly to the economy. Based on this experience—and similar experiences around the globe—many countries employ deposit insurance and other forms of a safety net to protect depositors and banks. But offering this protection, shielding depositors and banks from risk, can have the perverse effect of encouraging risk-taking, creating what is called "moral hazard." Supervision and regulation—including capital regulation—provides a critical counterbalance, to ensure that banks, not the taxpayers, internalize the costs to society of that risk-taking.

The impact of inadequate supervision and regulation was starkly revealed in the Global Financial Crisis, as banks and their functional substitutes in the nonbank sector borrowed too much to fund their operations. While nearly all were "adequately capitalized" in theory, many were undercapitalized in practice, since their capital levels did not reflect future losses that would severely weaken their capital positions. And banks lacked appropriate controls and systems to measure and manage their risks.

That crisis also exposed the extent to which banks and broader financial system had become reliant on short-term wholesale funding and prone to destabilizing dynamics. The sudden shutdown of short-term wholesale funding posed severe liquidity challenges to large financial intermediaries, both banks and nonbanks, and caused significant dislocations in financial markets.

The cost to society was enormous, with widespread devastation to households and businesses. Even with an unprecedentedly large response by government, six million individuals and families lost their homes to foreclosure. The crisis brought on the worst and longest recession since the Great Depression. It took six years for employment to recover, during which long-term unemployment ran for long periods at a record high, and more than 10 million people fell into poverty. The crisis left scars on families and businesses that are evident even today, and it was in part driven by imprudent risk taking by banks and nonbank financial institutions. This experience prompted the United States and other jurisdictions to revisit how supervision and regulation, including capital regulation, could have better contained that risk in both the bank and nonbank sectors. That is why capital levels today are strong. While we have learned from and adapted to the lessons from the Global Financial Crisis, this experience underscores the need for humility and continued vigilance about the risks we may not fully appreciate today.

What Bank Capital Is and Isn't

Capital regulation—requiring a bank to operate with what is deemed to be an adequate level of equity based on its asset size and its risks—is a useful tool to strengthen the incentives for banks to lend safely and prudently.

First, I'll begin with what capital is—essentially shareholder equity in the bank. People sometimes use the shorthand of banks "holding capital" when speaking of capital requirements; however, it's helpful to remember that capital is not an asset to be held, reserves to be set aside, or money in a vault; rather, it is the way, along with debt, that banks fund loans and other assets. Without adequate capital, banks can't lend. Higher levels of capital mean that a bank's managers and shareholders have more "skin in the game"—and have incentives to prudently manage their risks—because they bear more of the risk of the bank's activities.

Next, let me speak to how capital and debt work together to fund a firm's operations. In theory, companies should be indifferent to the mix of equity and debt they use to fund themselves, since the creditors of a safer firm will lend to it at lower rates and shareholders of a safer firm will accept a lower return on their investment. That may not fully hold for banks because insured depositors are made risk-insensitive through deposit insurance and other creditors may provide lower cost funding if they believe the government may bail out banks in distress. Forcing banks to fund more of their activities with equity, instead of debt, could raise the private costs of funding to the bank, and cause banks to pass those higher costs of credit to consumers. These considerations must be balanced against the public benefits of higher capital.

Empirical research supports the social benefits of strong capital requirements at banks, particularly when economic conditions weaken. While poorly capitalized banks may be forced to shrink during bad times, better capitalized banks have the capacity to support the economy by continuing to lend to households and businesses through stressful conditions. And to the extent bank capital reduces the frequency or severity of financial crises, the public is much better off with strong capital.

Last, the highest standards should apply to the highest risk firms. Larger, more complex banks pose the greatest risk and impose greater costs on society when they fail. Higher capital requirements help to ensure that larger, more complex banks internalize this greater risk and counterbalance the greater costs to society by making these firms more resilient. Further, matching higher capital standards with higher risk appropriately limits the regulatory burden on smaller, less complex banks whose activities pose less risk to the financial system. This helps to promote a diverse banking sector that provides consumers greater choice and access to banking services.

Interactions with the Nonbank Sector

Banks, of course, are part of a broader financial system. The share of credit intermediated outside of banks has grown considerably over the past 40 years. In fact, nonbank financial intermediaries, broadly defined, fund nearly 60 percent of the credit to the U.S. economy today as compared to approximately 30 percent in 1980. Nonbank financial firms include money market funds, the insurance sector, the government-sponsored enterprises (Fannie Mae, Freddie

Mac, and the Federal Home Loan Bank system), hedge funds and other investment vehicles, and still other nonbank lenders.

There are lots of reasons for these trends, including technological advancements, financial innovation, regulatory arbitrage, and quirks of history. Bank capital requirements, combined with the lack of strong or sometimes any capital requirements in the nonbank sector, are part of that. We should monitor the migration of activities from banks to the nonbank sector carefully, but we shouldn't lower bank capital requirements in a race to the bottom. In times of stress, banks serve as central sources of strength to the economy, and they need capital to do so.

We need to worry, a lot, about nonbank risks to financial stability. During the Global Financial Crisis, many nonbank financial firms had woefully inadequate capital and liquidity, engaged in high-risk activities, and were faced with devastating runs that crushed the financial system and caused enormous harm to households and businesses. The collapse of Bear Stearns and Lehman Brothers, the failure of Fannie Mae and Freddie Mac, the implosion of the insurance conglomerate AIG, and many others, laid bare the weakness of nonbank intermediation, and the need to regulate risks outside the banking system. Many of those risks remain today. In far too many cases, nonbanks rely on funding sources that are prone to runs and do not maintain sufficient capital to internalize their risks to society.

The answer, however, is not lower capital requirements for banks, but more attention to those very risks. Further, as stress in nonbank financial markets is often transmitted to the banking system, both directly and indirectly, it is critical that banks have enough capital to remain resilient to those stresses.

Calibration of Bank Capital Requirements

One of the threshold questions is how should we think about calibrating bank capital to a socially optimal level? There is not an easy answer to that question. In my mind, as I said at the outset, it starts with humility. Bank capital should be sufficient to enable the bank to absorb unexpected losses and continue operations through severely stressful but plausible events. Yet translating that principle into a quantum of capital involves an estimate of what future risks will emerge and what losses banks will suffer. I'm skeptical that regulators—or bank managers—know the answers to these questions. Despite complex regulatory risk-weights, or simple leverage ratios, or the internal models used by banks, at bottom bank capital ought to be calibrated based on that humility, that skepticism. Capital provides a cushion against unexpected risks and unforeseen losses, those a humble and skeptical person might guard against.

That is the spirit in which I am approaching the Fed's holistic review of capital standards. There is a body of empirical and theoretical research on optimal capital, which attempts to determine the level of capital that equalizes the marginal benefits of capital with the marginal costs. While the estimates vary widely, and are highly contingent on the assumptions made, the current U.S. requirements are toward the low end of the range described in most of the research literature. International comparisons also suggest strong capital requirements support banks and the U.S. economy. We have strong capital levels today, and generally higher bank capital

requirements in the United States after the Dodd-Frank Act have corresponded with healthy economic growth and have supported the competitiveness of U.S. firms in the global economy.

Finally, some banks have asserted that the resilience of the banking system in the pandemic suggests that bank capital is already high enough. There were some positive signs from a Federal Reserve-conducted sensitivity analysis and subsequent stress test. Banks did their part and lent strongly, based on their strong capital positions and widespread government support. But we didn't get a real test of resilience because Congress, the President, and the Federal Reserve rightly stepped in with massive assistance to avert an economic disaster. Furthermore, I'd observe that the recent experience of the pandemic suggests that large, unexpected shocks can occur with little notice. Our inability to predict such events would argue for a higher overall capital level than one based solely on historical experience. So let me return to where I began on this topic: figuring out the right level of capital requires one to be humble and skeptical.

Components of Bank Capital Requirements

Let's turn to the design of capital requirements. U.S. capital rules contain many individual elements, including risk-based requirements, leverage standards, stress testing, and long-term debt requirements for the largest banks.

The risk-based capital requirement is premised on the fact that a firm is likely to experience higher losses from its riskier activities; thus, sizing capital requirements based on risk will better estimate a firm's capital needs so that it internalizes the risks of its activities. The Basel III capital reforms, as implemented in the United States, aimed to address many of the shortcomings identified during the Global Financial Crisis. The international standards were developed to enhance the quantity and quality of regulatory capital, better reflect risks of banks' activities, impose a heightened capital requirement on global systemically important firms, and reduce procyclicality and promote countercyclical buffers, among others. The last set of comprehensive adjustments to the Basel III Accord, now under consideration in the United States, would further strengthen capital rules by reducing reliance on internal bank models and better reflect risks from a bank's trading book and operational risks. I am working closely with my counterparts at the FDIC and the Office of the Comptroller of the Currency on the U.S. version of the Basel III endgame reforms. Any rule changes that might be proposed in capital standards would be deliberate, adopted through the notice and comment process so that we have the benefit of public perspectives, and implemented with appropriate transition periods to achieve the long-term goal of improving the capital regulation.

Risk-based capital requirements are important tools; however, they are complex, underinclusive under some conditions, and like all capital requirements, can be gamed. Thus, a non-risk-based leverage measure can provide transparency and a further measure of resilience. Of course, one also needs to pay attention to how different capital measures interact with one another, and some have indicated that the leverage requirement for large banks is overly binding and may contribute to lower liquidity in Treasury markets, especially in stressed scenarios. We are exploring the empirical evidence and examining whether adjustments to the leverage ratio might be appropriate in the context of our holistic capital review, as well as in the context of broader reforms being undertaken by the Federal Reserve and a range of other agencies.

In addition to risk-based capital requirements, the Federal Reserve Board implemented a supervisory stress test that is used to set dynamic and risk-sensitive capital requirements for large banks. The stress test adds risk sensitivity to the capital requirements and provides the public with information about the banks' risks and resilience. Moreover, the stress test can achieve a higher degree of risk sensitivity than the standard Basel risk weights. The stress test can also be more dynamic than the capital rules because a new test is conducted each year, reflecting a new set of hypothetical financial and economic conditions and updates to the banks risk profile. Lastly, the stress test can potentially counteract actions by a bank to "optimize" against the capital regime—for instance, lowering its risk-weighted assets without reducing its risk. In this way, the stress test—along with strong supervision—can serve as a check on excessive bank risk-taking. As I'll return to in a moment, we are focused on ensuring that stress testing remains forward-looking and effective at requiring banks to have capital to cushion losses from emerging risks.

A final prudential requirement—a long-term debt requirement—complements the regulatory capital regime. Unlike regulatory capital—which helps a firm absorb losses as it continues operations through times of stress—long-term debt becomes especially relevant once a firm has already entered bankruptcy or resolution. At the point of resolution, equity can be written off and certain long-term debt claims can be written down to absorb losses. The remaining debt claims can be effectively converted to equity to provide flexibility to the bankruptcy court or resolution authority in managing the firm's path through resolution. In particular, this equity can be used to help the firm continue critical operations as its operations are restructured, wound down, or sold, in order to minimize disruptions to the larger financial system. Long-term debt requirements were initially applied to global systemically important banks (GSIBs). The Board and the FDIC are currently considering whether the costs of a resolution of a large, non-GSIB may also justify the imposition of long-term debt requirements on such firms as well.

Role of Stress Testing in the Forward-Looking Regime

As I've said before, it is critical that our capital regime is forward-looking. And while the stress test is the most risk-sensitive and dynamic component of our regulatory capital framework, history has taught us not to become complacent or to shed our humility. In an environment of ever-changing risks, stress tests can quickly lose their relevance if their assumptions and scenarios remain static. Let's not forget that for some years before the financial crisis, the agency regulating Fannie Mae and Freddie Mac conducted a regular stress test. Unfortunately, that test used models and scenarios that weren't regularly updated, a key reason why the test failed to detect risks building for years before the Global Financial Crisis, and why capital levels at Fannie and Freddie proved to be woefully inadequate.

Stress tests are not meant to be predictions about the future. Humility suggests caution in that regard. But they should be stressful: poking and prodding at the system so we can attempt to uncover hidden risks that could become manifest under certain scenarios. This is particularly important in today's complex and interconnected financial system, in which problems can spread and lead to unexpected losses. For instance, we recently saw how exposure to interest rate risk at a set of leveraged pension funds in the United Kingdom, coupled with unprecedented large

movements in rates, caused significant disruptions to the gilt market. This was not a risk that anyone saw coming, but it spilled over to the U.K. financial markets in a way that required a large-scale intervention by the government. Other recent examples, to name a few, include the messy failure of Archegos last year; Russia's war against Ukraine; tensions in and with China; the implosion of the crypto-asset exchange FTX and the resulting crypto-asset market dislocations; and volatility in the markets for fixed-income securities, affecting market liquidity.

We are currently evaluating whether the supervisory stress test that is used to set capital requirements for large banks reflects an appropriately wide range of risks. In addition, we are considering the potential for stress testing to be a tool to explore different sources of financial stress and uncover channels for contagion that lead to unanticipated consequences. Using multiple scenarios or adapting the stress test in other ways to better account for the high degree of interconnectedness between banks and other financial entities could allow supervisors and banks to identify those conditions and take action to address them. And banks should continue to invest in and prioritize development of their own stress testing and scenario design capabilities, regularly run scenarios to understand the changing risk environment, and incorporate the results of these stress tests into the bank's assessment of its risks and capital needs.

Conclusion

Stress testing and all the other aspects of capital regulation that I have discussed today will be considered as part of our holistic review. We're starting from a good place because capital today is strong. I hope to have more to say about that review early in the new year. As I have argued today, capital plays a central role in how a bank manages its risks, and capital regulation is fundamental to bank oversight. History shows the deep costs to society when bank capital is inadequate, and thus how urgent it is for the Federal Reserve to get capital regulation right. In doing so, we need to be humble about our ability, or that of bank managers or the market, to fully anticipate the risks that our financial system might face in the future.

Financial Innovation

Anchors and Catalysts - Central Banks' Dual Role in

Innovation*

By FRANÇOIS VILLEROY DE GALHAU^{*}

It is a great pleasure to welcome you in the Louvre for this conference organised by the Banque de France. I am honoured by the presence of Commissioner Mairead McGuinness, of my most distinguished peers at central banks, and of prominent representatives of the public and private sectors. I trust this unique blend of skills will offer a comprehensive overview of the topic that will keep us busy: the tokenisation of finance, and the role of central banks in it.

Let me just recall what I describe as the "triangle of disruptions new players; new settlement assets based on blockchain; and new decentralised market infrastructures. These disruptions offer the potential for cheaper and faster services. However, they could also lead to fragmentation and to systemic risk. How can we collectively reap the "net benefits" from innovation? That will only be possible if we come out on top of two false contradictions.

The first apparent oxymoron opposes stability and innovation. Financial stability implies that the financial system is capable of withstanding shocks, so as to avoid impacts on the real economy. But it does not mean stagnation or paralysis, and does not ban innovation in any way. On the contrary, financial stability creates trust, which is an imperative for innovation to last. Well-tailored, consistent and evolving regulations are key in this regard.

The second false contradiction opposes public and private players, with the former supposedly conscribed in their conservative regulators' role and the latter in their innovators' role. After decades of developing and maintaining state-of-the-art technologies, central banks may sometimes consider this caricature as unfair. To private players who know us better – and to others: you can rest assured that we are willing to continue our fruitful partnership. We will obviously have to reinvent the terms and conditions of that partnership to some degree, but let me stress that central banks' action will only succeed together with you, not against you. And that we central banks need to be on both sides: regulation, and innovation. I will now elaborate on these two key issues.

^{*} This is a speech Mr François Villeroy de Galhau at the conference on opportunities and challenges of the tokenisation of finance, Paris, 27 September 2022.

^{*} François Villeroy de Galhau, Governor of the Bank of France

I. The need for well-tailored, consistent and evolving regulations

A number of players in the crypto world have recently stumbled - so-called "stablecoins", DeFi protocol, lending platforms, hedge funds -, demonstrating in practice what many regulators and central banks had been claiming for years: that these new tools of payments and finance had unlocked age-old dangers, meaning that the industry requires robust regulation. Salvador's decision to make bitcoin an official "currency" in September 2021, regrettable as it is, is a noteworthy experience of a forced attempt to label a currency something that is nothing more than a crypto asset. One year later, actual use is far from taking off. The value of bitcoin against the dollar has been divided by three; this certainly stands as an explanation, yet a partial one. People also rightly mistrust bitcoin because it does not fulfil most of the basic characteristics of a currency - nor any of its ethical requirements. But the so-called "crypto-winter" is no reason for complacency or inaction. Europe has been a pioneer, designing and drafting a new regulatory framework known as MiCA (Markets in Crypto-Assets) that is tailored to new players and assets. I can only hope for its swift formal adoption, ideally by March next year, as well as the adoption of the very welcome agreement on the extension of transparency rules to transfers of crypto assets, which will make money laundering and criminal use more difficult.

Other major jurisdictions are less advanced in a similar process. We should be extremely mindful to avoid adopting diverging or contradictory regulations, or regulating too late. To do so would be to create an uneven playing field, risking arbitrage and cherry picking. An unduly complex legal pattern would run counter to our objective of protecting clients, and preventing money laundering. Crypto players operate globally, and even their place of establishment is sometimes difficult to determine.

We are fortunate to have a common international framework. The G7 as early as 2019, then the FSB and the G20 have made great progress in this direction: by the end of the year, the FSB will publish updated high-level recommendations. This success shows that regulation of crypto players and crypto assets and more broadly of payments is one course of action where a "pragmatic" or "focused" multilateralism can, and must, still deliver. To avoid further payments fragmentation, there are two imperatives: (i) let us keep coordinated. I am sometimes impressed by the growing number of international bodies which play in the "crypto-regulations" orchestra; we need a strong, single conductor, and that should be the FSB (ii) let us implement in all jurisdictions. The current moment calls less for further global reflection or ever refining of taxonomies of financial tokens, and more for decisions and the monitoring of basic, consistent and robust national regulations.

II. Central banks have their own driver's seat in innovation

Digital technologies are profoundly transforming finance: from artificial intelligence, API and mobile apps for the development of open banking and of the "banking-as-a-service", to distributed ledger technology and smart contracts. We are certain to see a significant development of tokenised and decentralised finance. In such a context, our stance at the Banque de France is both to support regulatory reforms and to play an active innovative role. The

Banque de France has been using blockchain for several years now. In 2017, we were the very first central bank worldwide to implement a blockchain solution to manage, together with commercial banks, a repository of creditors. Our CBDC experiments, on which I will elaborate in a few minutes, also led us to develop our own permissioned blockchain (called DL3S-Distributed Ledger for Securities Settlement System) in collaboration with an IT provider. We have also drawn on artificial intelligence for various uses, such as a new forex trading tool and supervisory tools. The question that now attracts public attention is whether central banks' investigation phases will lead to the development of CBDCs.

Almost all of that attention is focused on retail CBDCs. At the same time, we can sometimes hear, and not only from commercial banks, that they are "a solution in search of a problem". In my view, this phrase simply misses the point. What we are currently doing is keeping our eyes and minds open on this new way of making "public money" available. In Europe, we are halfway through our investigation phase: the Eurosystem will make its decision by the end of 2023, before a potential launch in 2026 or 2027. I am sure President Christine Lagarde will be able to shed some light on the project.

Beyond purely technical considerations, a retail CBDC could play an anchor role in the digital world, similar to the role played by banknotes in the physical world and hence preserve the accessibility and usability of central bank money. Regarding the euro area, a digital euro would also contribute to supporting monetary sovereignty and strategic autonomy, by preventing the use of external digital assets – such as private crypto assets and non-euro CBDCs – as settlement assets, and by facilitating the emergence of a pan-European payment solution at the point of sale, which could serve as a vehicle for the use of a digital euro. But such a digital euro could and should be decentralised in its implementation, in the spirit of public / private partnerships mentioned earlier.

On the other side of a mountain, you will obviously always find a side that is less exposed to the sun; here, this northern face is wholesale CBDC. It currently attracts little public interest, although it poses relatively less complex legal issues, and has two strong business cases. First, a wholesale CBDC could significantly contribute to improving cross-border and cross-currency payments, a topic on which we have made progress over the past year. Following a first report delivered to the G20 in July 2021, the Future of Payments Working Group of the BIS has recently finalised a new report outlining options for access and interoperability of CBDCs for cross-border payments. Second, a wholesale CBDC could accompany the tokenisation of securities as a safe and liquid settlement asset for them on a blockchain technology. Failing to offer market participants a wholesale CBDC could open the door to an extensive use of so-called stablecoins, which would pose a systemic risk.

Over the past two years, the Banque de France has therefore been looking into a wholesale CBDC with a view to contribute to Eurosystem's efforts in designing and developing it when the time comes. And this time could come sooner than expected, with the upcoming entry into application of the European Pilot Regime in early 2023 - only six months from now. This new regulation provides a framework for market players to experiment the use of blockchain in real-life conditions to issue and trade tokenised securities. It also offers a unique opportunity for

the Eurosystem to conduct its own "pilot regime", in close cooperation with private players. Without overpromising on that pilot wholesale CBDC, we have to seize the opportunity to try out various solutions from 2023 onwards. Learning by doing is the best way to acquire knowledge.

In that spirit, since 2020, the Banque de France has been conducting experiments with a wide range of partners to develop its expertise, with the aim of providing that expertise to the Eurosystem. Our first nine experiments have already delivered key insights, shared in a report published in November last year. Considering these promising results, we have decided to launch a new series of three experiments. You will learn more on them in the coming weeks, but let me already give a few insights today.

Two of them focus on improving cross-border payments by working on interoperability between CBDCs with innovative solutions, such as a liquidity management tool based on decentralised finance technology (AMM, automated market maker), which we upgraded in the first half of 2022. The third experiment aims at deepening previous ones on the use of central bank money as a safe settlement asset for tokenised securities, together with other European partners. It involves issuing and distributing tokenised bonds on a blockchain.

* * *

Let me conclude by recalling that in the 1980s it was decided to design and build a large glass pyramid in its courtyard of the Louvre. This disruptive architecture by I.M. Peï was first met with outrage, as critics considered it incompatible with classical style. It was nonetheless built, and has since then become a cherished symbol of the Louvre. I hope that we central bankers will find our way to make tokenisation fit in the existing architecture, while regulating it to the extent necessary.

International Cooperation in a World of Digitalisation *

By PABLO HERNÁNDEZ DE COS*

Introduction

Welcome to the 22nd International Conference of Banking Supervisors (ICBS). This is the second ICBS that we have held in virtual format, following the outbreak of Covid-19 in 2020. I am pleased to see that over 450 participants from about 90 jurisdictions are taking part in this year's event.

We have seen profound changes over just the past few years, and many more since the first ICBS in July 1979. The banking system is now much bigger and more interconnected. By one measure, total banking assets have grown by almost 4,000%. Foreign bank claims have more than doubled, now totalling almost \$34 trillion, which is equivalent to more than a third of world GDP. Cross-border links between banks and other financial institutions now stand at \$7.5 trillion. We have also endured more than 50 systemic banking crises during this period, a stark reminder of the critical importance of prudent regulation and robust supervision.

Despite these changes, the ICBS – which exists to promote supervisory cooperation within the international banking supervisory community – has stood the test of time. A common thread throughout the previous 21 conferences has been the commitment by central banks and supervisory authorities to collaborate and cooperate with the aim of strengthening the resilience of the global banking system and safeguarding financial stability.

Looking ahead, the need for global cooperation is perhaps more important than ever. We face a highly uncertain outlook, with no shortage of risks facing the global banking system. Stagflationary forces, rising interest rates, and high levels of public and private debt are keeping central banks and supervisors busy. Geopolitical developments continue to shape the economic trajectory. Major structural changes are shaping the future of banking system, including climate-related financial risks; the growth of non-bank financial intermediation; and perhaps one of the most significant – and the theme of this year's ICBS – the digitalisation of finance.

Indeed, we are seeing profound technological advancement and innovation. Since the first ICBS, the speed of the fastest supercomputer has risen exponentially from roughly 1 million to over 400 quadrillion computations per second today. Moore's Law is still delivering impressive improvements, with the number of transistors on microchips now exceeding 100 billion, a percentage increase of almost 4 million from 1979.

^{*} This is a keynote speech delivered at the 22nd International Conference of Banking Supervisors (virtual) on 29 November 2022.

^{*} Pablo Hernández de Cos, Chair of the Basel Committee and Governor of the Bank of Spain.

So it is fitting that we will be spending the next three days discussing financial technology and its implications for banks and banking supervision. What are the opportunities and challenges posed by new technologies for banks and supervisors? How should supervision adapt to digital innovation and the emergence of new services and business models? And, perhaps most existentially, what does it mean to be a "bank" in 2022?

I will not try to provide a definitive answer these all of these questions – we will benefit from the views of a wide and diverse range of speakers over the coming days. But let me provide a first approach to our debate during the next few days, I will focus my remarks on three broad financial stability implications resulting from the current wave of financial digitalisation, namely the impact on banks' business models, the risks from an ever-more pervasive use of digital services, and the emergence of new interconnections in the global financial system. All three observations, underline the critical importance of cooperation among central banks and supervisory authorities in overseeing the structural changes brought about by technological innovations, reaping their benefits, and mitigating the risks they pose to global financial stability.

Digitalisation and financial stability: benefits and challenges

Finance and technology have a long and symbiotic relationship. Bankers have been applying technology for more than 150 years. Finance started to shift from analogue to digital as soon as the transatlantic telegraph cable was completed in 1866. A second wave of technological innovations in financial services began with the advent of the automated teller machine in 1967. Yet the most recent technological breakthroughs in payment systems, digital banking services and data analytics stand out for their pace and scale.

So what does the current digitalisation of finance mean for global financial stability? What opportunities does it present for consumers and banks? What are the risks? And what does it mean for supervisors? The Committee is conducting a series of thematic studies on the impact of various technological innovations for banks and supervisors to help answer these questions. This work is ongoing, but let me offer a few personal observations.

Digitalisation holds potential benefits for all users of financial services. These include expanding greater access to financial services and reaching underserved consumers, reducing transaction costs, in some cases providing greater transparency with simpler products and clear cost disclosures, providing greater convenience and efficiency, and enabling tighter controls over spending and budgeting. Enhanced analytics and the use of big data can also help improve risk management practices and supervisory oversight.

But technological change can also create new vulnerabilities and amplify existing risks. These dangers are accentuated by the breakneck pace at which new technologies are being developed and rolled out, when compared with previous episodes of innovation in banking.

My first observation on the implications for global financial stability relates to the potential impact of digitalisation on banks' business models. The very definitions of "banking" and what a "bank" is are being put to the test because of these technological innovations. Indeed, the banking system is witnessing profound structural changes, including:

• Greater competition from outside the banking sector, as new competitors have access to extensive customer data, technological infrastructure, and the capabilities needed to link an unbundled set of financial services with non-financial services. This creates opportunities to implement new or alternative business models, potentially without becoming subject to bank regulation.

• The emergence of niche providers with digital-native systems that are able to develop and deploy products quickly and fragment markets.

• The prevalence of online services which allow customers to access financial services independent of physical location, reducing the importance of bank branches that have traditionally played an important role in serving retail customers.

• A growing tech-savvy customer base that is willing to rapidly adopt new technologies and change providers to access better and more convenient services.

Against that backdrop, it is perhaps not surprising to see that banks are responding by investing in technology. For example, between 2008 and 2018, bank investments in fintech grew at an annual compounded rate of almost 43% and totalled more than \$23 billion. In just the first quarter of this year, 52 banks invested in 77 fintech startups across six continents.9 But this adaptation process creates significant execution and strategic risks as banks make decisions under great uncertainty.

Similar challenges arise for supervisors and regulators. Supervisors must be able to assess the potential impact of new technologies along with the complex processes underpinning the provision of products and services. This requires supervisors to ramp up their own knowledge and capabilities. In some cases, supervisors are essentially competing with banks, who in turn are competing with technological companies, for the same and relatively small set of qualified experts. When faced with such constraints, and in order to ensure that technological innovation in banking is being used in a responsible manner, erring on the side of caution and prudence may be necessary as a first approximation. But let us not forget that this is a long-distance race and we would need to adapt our supervisory approaches to this new digital world.

My second observation is that the use of ever-more digitalised banking services presents its own set of risks to banks. In some cases the proliferation of innovative products and services may increase the complexity of financial service delivery, making it more difficult for banks to manage and control operational risk. Legacy bank IT systems may not be sufficiently adaptable, and banks' change management may be inadequate. The greater use of third and fourth parties, either through outsourcing or other fintech partnerships, increases the risks surrounding data security, privacy, money laundering and customer protection.

A concrete example is banks' use of artificial intelligence (AI) and machine learning (ML). AI/ML technology is expected to increase banks' operational efficiency and also to facilitate improvements in risk management. While significant opportunities are emerging from the increasing use of AI/ML in many areas of banking, there are also risks and challenges associated with these techniques.

In some cases, AI/ML models may be more difficult to manage than traditional models as they can be more complex and the "explainability" and governance of these models should continue to be a key responsibility of the banks. Similar challenges exist when AI/ML model development is outsourced, as banks still maintain the responsibility and accountability for appropriate due diligence and oversight. As AI/ML deployment often involves the use of large data sets, interconnectivity with third parties, and the use of cloud technologies, it can also create multiple possible points of cyber risk. In addition, given the volume and complexity of data sources commonly used to support AI/ML models, they may present greater data governance challenges in ensuring data quality, relevance, security and confidentiality. Furthermore, AI/ML models (as with traditional models) can reflect biases and inaccuracies in the data they are trained on, and may potentially result in unethical outcomes if not properly managed.

To help banks and supervisors in managing such risks, the Committee published a series of newsletters earlier this year covering its work to date on AI/ML and third- and fourth-party risk management and concentration risk.

At the system-wide level, the rise of technology in finance could lead to more technological interdependencies among market players and infrastructures, which could cause an IT risk event to escalate into a systemic crisis, particularly where services are concentrated in one or a few dominant players.

And cyber risk is only likely to grow in magnitude. New technologies and business models can increase cyber risk if controls do not keep pace with change. Heavier reliance on application programming interfaces, cloud computing and other new technologies are facilitating increased interconnectivity with actors or sectors not subject to equivalent regulatory expectations. And this could potentially make the banking system more vulnerable to cyber threats and expose large volumes of sensitive data to potential breaches. To help mitigate these risks, the Committee has published a set of principles to increase banks' operational resilience and their capacity to withstand operational disruptions.

Another topical example is banks' use of distributed ledger technology (DLT). DLT could, in principle, allow for cheaper, faster and more customised financial intermediation. But, here again, such benefits must be weighed against the risks if not properly regulated and managed. These include potential threats to banks' operational resilience, a lack of legal clarity with regard to assets transacted on DLTs, and concerns with regard to anti-money laundering and the financing of terrorism.

My third remark is that digitalisation may increase the interconnections across different sectors and nodes of the global financial system. Consider the example of cryptoassets. Much has been said about cryptoassets already, including their purported benefits and risks for financial stability. Filtering the noise from the signal is often an arduous task.

What we can say with confidence is that such markets have the potential to scale up rapidly and pose risks to individual banks and overall financial stability. The Committee has identified no fewer than 20 potential direct and indirect channels through which banks could be exposed to cryptoassets, in their capacity as lenders, issuers and providers of custody services or as

market-makers, among other roles. Opacity and insufficient data make it hard to fully map out the crypto ecosystem, but recent episodes of distress have highlighted a range of interconnections, including those with more "traditional" financial institutions.

While banks' current cryptoasset exposures are relatively low – accounting for less than 0.15% of total exposures at the end of last year – we need to pursue a forward-looking approach to regulating and supervising them. This is why the Committee will be publishing its final prudential standards for banks' exposures to cryptoassets in the coming months.

Conclusion: the need for international cooperation

Financial stability is a global public good.13 The cross-border spillovers of financial distress can result in under-investment in financial stability by individual jurisdictions.14 So an open global financial system requires global prudential standards.

This principle – that financial stability is a global public good – is what underpins the standards set by the Basel Committee. It is why the global regulatory community has worked collaboratively and constructively in developing Basel III, which is the cornerstone of the global regulatory response to the Great Financial Crisis. And the Governors and Heads of Supervisions of Basel Committee member jurisdictions have reiterated their expectation that these standards should be implemented in full, consistently, and as soon as possible.

Digital innovation will further fuel cross-border and cross-sectoral financial interconnections. In some cases, these interconnections are physical in nature: about 450 submarine cable systems, which together span over 1.35 million kilometres, provide a critical digital infrastructure for countries worldwide.16 In other cases, these interconnections are visible on banks' digital balance sheets, and sometimes they are not even visible.

Safeguarding financial stability will require ongoing cooperation to ensure that we achieve a baseline regulatory level playing field both across jurisdictions and across the financial system. Global collaboration across a wide range of authorities – going beyond just central banks and bank supervisors – is needed, given the ongoing growth of non-bank players and the blurring of regulatory boundaries, if we are to meet the oft-cited objective of "same activity, same risk, same regulation". This is particularly the case since the longstanding policy debate about entitybased versus activity-based regulation is not necessarily binary; indeed, it can be considerably more subtle than often presented.

In conclusion – and to adapt the words of the English poet John Donne to the theme of this year's ICBS – no bank is an island, entire of itself. Each is a piece of the financial continent.18 Central banks and supervisory authorities have a critical role in cooperating to reap the benefits from digitalisation while mitigating risks. This year's ICBS will be an important step in this direction.

Green Finance

Bridging Data Gaps Can Help Tackle the Climate Crisis*

By Bo Li & Bert Kroese *

A new data gaps initiative will play an important role in addressing climate-related data deficits

A famous physicist once said: "When you can measure what you are speaking about, and express it in numbers, you know something about it".

Nearly 140 years later, this maxim remains true and is particularly poignant for policymakers tasked with addressing climate mitigation and adaptation.

That's because they face major information gaps that impede their ability to understand the impact of policies—from measures to incentivize cuts in emissions, to regulations that reduce physical risks and boost resilience to climate shocks. And without comprehensive and internationally comparable data to monitor progress, it's impossible to know what works, and where course corrections are needed.

This underscores the importance of the support of G20 leaders for a new Data Gaps Initiative to make official statistics more detailed, and timely. It calls for better data to understand climate change, together with indicators that cover income and wealth, financial innovation and inclusion, access to private and administrative data, and data sharing. In short, official statistics need to be broader, more detailed, and timely.

The sector where change is needed the most is energy, the largest contributor to greenhouse gas emissions, accounting for around three-quarters of the total.

Economies must expand their renewable energy sources and curb fossil fuel use, but while there's been a gradual shift in that direction, the pace is still not sufficient. And not only is there a lack of policy ambition in many cases, there also is a lack of comprehensive and internationally comparable data to monitor progress.

 $^{^{\}star}$ This article was published on IMF website on November 28, 2022.

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Falling short

Current G20 climate commitments will only reduce greenhouse gas emissions by 10% by 2030. (GHG emissions, GtCO₂e per year)



NDCs = Nationally determined contributions.

To accelerate cuts to emissions, policymakers need detailed statistics to monitor the path of the energy transition and assist them in devising effective mitigation measures that can deliver the fastest and least disruptive pathway toward net zero emissions.

Slow transition

About 30% of G20 electricity is generated from renewables. (power generation by source, millions of gigawatt hours)



At the same time, countries also need to monitor how mitigation and adaptation measures affect household incomes, consumption, and wealth. How, for example, will rising fossil fuel costs impact vulnerable households? And how should we prioritize investments to address new weather patterns and more frequent climate shocks?

Robust data are vital—because policies must be based on a clear understanding of the broad impacts of climate change, the green transition, and the associated physical, economic, and financial risks.

Encouragingly, the new Data Gaps Initiative argues for G20 economies to go beyond gross domestic product in their national statistics, by capturing a suite of climate indicators and

distributional estimates of household income and wealth. This will help policymakers better weigh the distributional implications of policies.

In welcoming the new data gaps initiative, G20 Leaders asked the IMF to coordinate with the Financial Stability Board, the Inter-agency Group on Economic and Financial Statistics, and statistical authorities across the G20 to "begin work on filling these data gaps and report back on progress in the second half of 2023, noting that the targets are ambitious and delivery will need to take into account national statistical capacities, priorities, and country circumstances as well as avoiding overlap and duplication at the international level."

The initiative will draw on the collective expertise of the international agencies that are coordinating the work as well as on work undertaken by groups such as the Network for Greening the Financial System to develop a common understanding of climate-related financial instruments.

This work is also closely linked to other IMF initiatives such as the IMF's Climate Indicators Dashboard, which is another statistical initiative to help supply relevant climate-related data for economic analysis. It is also linked to the IMF joint project to provide implementation guidance on G20 high-level principles for taxonomies and other sustainable-finance alignment approaches.

G20 policymakers have recognized that better data is needed to inform the more complex challenges they face. The data gaps initiative will play a key role in addressing this.

Greening Economy while Achieving Inclusive Growth*

By PENG WENSHENG*

Promoting the green transition could be the most important industrial policy in the decades to come, and finance has a role to play in addressing the inclusivity challenges

Efforts to combat climate change and the push for the green transition are, in essence, correcting for the negative externality of carbon emissions resulting from economic activities. To this end, major economies have set timetables for reaching the peak of carbon emissions as well as achieving carbon neutrality.

Greenhouse gas emissions are global in nature, and reducing carbon emissions requires both technological innovations and the restructuring of traditional industries, potentially necessitating an important set of industrial policies in the decades to come. Industrial policies to facilitate the green transition may lead to significant interregional, interindustry and inter temporal utility shifts, resulting in greater income inequalities among different regions and groups of people.

Within an economy, the green transition may lead to inequalities among different regions and economic sectors. Central to the green transition is how to lower the green premium — the additional cost incurred by choosing clean energy over one that emits more greenhouse gases. With the green transition accelerating, traditional industries related to fossil fuels will face rising costs and dwindling production, whereas industries using cleaner energy, buoyed by favorable policies, will gain a comparative advantage. This is likely to increase the income gaps among different regions.

A recent study conducted by the Global Institute of China International Capital Corp shows that the gaps in per capita GDP have been growing between underdeveloped regions with high carbon emissions and those with low emissions, since the adoption of China's policy of "dual control" for energy consumption and energy intensity. As energy-intensive industries tend to lie in the middle of industry chains, they enjoy weaker bargaining power compared with upstream energy producers as well as downstream energy consumers, and they bear the bulk of the transition costs. Since the economies of less-developed regions tend to be more reliant on high-emission industries, the caps on carbon emissions will exacerbate regional imbalances in development.

Carbon reduction will also impact local governments' fiscal revenue. For example, around 40 percent of the fiscal revenues of Shanxi province and the Inner Mongolia autonomous region come from mining and the power industries, they also employ the bulk of local labor. The two

^{*} This article was publisehd on China Daily on December 5, 2022.

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regions are expected to face greater fiscal pressure besides the need to provide job training for laid-off workers during the transition process.

So, what role could finance play in facilitating a more inclusive green transition in China?

China can step up the use of policy-based finance, developing transition financing alongside green finance. Policy-based finance has played a vital role in China, as it mobilizes social financing, simultaneously supporting the implementation of national strategies, and funding key areas and weaker parts of the national economy.

In recent years, policy-based finance has made significant contributions in areas that promote equality and inclusive growth, such as work related to agriculture, rural development, the growth of small and micro enterprises, and shanty town renovation. Policy-based financing tools have also promoted green and low-carbon development, building an increasingly comprehensive green financial system.

However, one drawback of the existing green finance system is that it mainly targets new carbon emissions, with limited coverage of the existing carbon footprint of traditional high-emission industries. In comparison, "transition finance," financing provided to high-emission industries, could complement green finance and help fill the funding gap during the green transition, thus ensuring a fair transition for the whole economy.

The Framework for Transition Finance adopted at the recent G20 Summit in Bali, Indonesia, stresses that a fair transition is one of the five pillars of transition finance. The document states that governments and financial institutions of member countries should encourage borrowers to assess the potential socioeconomic implications during the green transition and disclose the measures taken to mitigate possible negative impacts.

In general, China's transition finance lags far behind green finance both in the scale of financing and in the diversity of products. Currently, not enough attention has been paid to ensuring an inclusive green transition, and the potential for growth in transition financing remains substantial. Since 2020, China's financial institutions have rolled out, on a trial basis, standards for the issuing of transition financial products and released trial guidelines in the green finance pilot zone in Huzhou, Zhejiang province.

Last year, the Bank of China and the China Construction Bank published guidelines on transition bonds, which provided definitions for transition bonds and the range of supported use of proceeds. The two banks also issued transition bonds. The National Association of Financial Market Institutional Investors (NAFMII) also launched Sustainability-Linked Bonds (SLBs). By linking the financing costs to an issuer's sustainable performance targets, SLBs help issuers achieve and follow through on their green transition commitments.

This year, the Shanghai Stock Exchange and the NAFMII released a document related to transition bonds. The Shanghai Stock Exchange stressed that funds raised for the purpose of the green transition should conform to the requirements of the national strategic plans and industrial policies, and at least 70 percent of the total proceeds must be used for the green transition. NAFMII requires funds raised by transition bonds to be used exclusively on green transition.

Meanwhile, China can also create a sound financial environment for an inclusive green transition by strengthening coordination between policy-based financing and fiscal policies.

On the one hand, the country should use transfer payments to cushion the impacts on the people affected by the transition and support socioeconomic development in provinces whose fiscal pressure will increase in the process of the green transition. At the same time, support should be given to these provinces to assist in their green transition, for example, by enhancing research on decarbonization technologies. By phasing out the excess production capacity of emission-intensive industries such as steel and coal, China has set up special funds to reward and subsidize the restructuring of industrial enterprises with an emphasis on helping laid-off workers seek reemployment.

In the future, with the progress in transition finance, the country could improve the social security system to smooth household income streams for unemployed persons and create jobs through infrastructure-building projects, which require relatively low-skilled labor and can be rapidly implemented. In addition, social security funds and industrial development funds should be set up to support infrastructure building, ecological restoration, and fostering of new industries to avoid the effects of population migration and the hollowing-out of industries.

On the other hand, as China's national carbon trading market matures, carbon credits could be auctioned, and its revenues could be used to support an inclusive green transition. For instance, the 2022 revision of the European Union's Emissions Trading System proposed to increase the Modernization Fund to help 10 low-income member states modernize their energy systems and improve energy efficiency, which will be conducive to promoting inclusive green energy transition among low-income countries.

Currently, the draft regulations on carbon emissions trading have yet to be finalized. But the revised draft in March 2021 proposed to allocate carbon emission allowances to key emitters for a price, the revenues from which could go into the national carbon trading fund.

In the transition process, China could learn from the practices of the European Union, and consider setting up two funds, one to finance the building of the national carbon market and major programs that reduce greenhouse gas emissions, and the other, dedicated to promoting an inclusive green transition and to support the development of clean energy systems in most vulnerable regions in the process of decarbonization.

Working Paper

State Common Ownership and Banks' Governance Role

Evidence from CEO Turnovers in China *

By Qing He & Dongxu Li^*

Abstract: Using hand-collected data of bank loans and CEO turnovers in China, we investigate whether common ownership would compromise creditors' governance role when their borrowers underperform. Unlike prior literature that documents the overall lack of bank monitoring on state-owned enterprises (SOEs) in China, we argue that such governance inefficiency exists only among the lending relationships where the banks and the firms share the same government agency (i.e., common state ownership). These effects are more pronounced among the firms with a board director appointed by the lending bank, with ownership in the bank's shares, and with political connections. Following forced CEO turnovers, local SOEs with common ownership enjoy less strict loan terms while those with no common state ownership face stricter loan terms. Overall, this paper sheds light upon the functions of state-owned business groups in emerging markets.

JEL Classification: G21, G30, G32, G38, K22

Keywords: Common ownership; lending relationship; SOE; CEO turnover; China

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1. Introduction

The existing literature has widely discussed the functions of business groups under common ownership (e.g., the Korean chaebols or the Japanese keiretsu), one issues that remains largely unexplored is the interactions between financial institutions and nonfinancial firms of the same business group. Does common ownership affect the governance role of creditors in forcing out underperforming CEOs? In this paper, we exploit a context of lending relationships in which the banks and their nonfinancial borrowers are ultimately controlled by the same owner. Nini, Smith and Sufi (2012) argue that creditors have disciplinary motives when the borrowers underperform. Under the circumstances of common ownership, however, such disciplinary motives may be weakened because the ultimate owner may not want their firms to default and thus make the banks tolerate more the borrowers' underperformance. Whether the banks would discipline the firms depends on the relative importance of these two competing motives.

To empirically address this issue, we investigate the lending relationships in China. Unlike the Korean chaebols and the Japanese keiretsu in which the common ownership is dominated by the founding families, the bank-firm relationships in China are deeply involved with common state ownership. The state government is the largest shareholder not only of the state-owned enterprises (SOEs), but also of the state-owned banks (such as the *Big Four¹*). Both SOEs and state-owned banks are run in a way that is often times politically desirable but not economically efficient (Li et al, 2008). State-owned banks may issue loans to SOEs under the commands from the state government². Since the SOEs' credits are endorsed by the government, the state-owned banks may discipline SOEs less than non-SOEs. Consequently, the common state ownership may render the lending relationships economically inefficient.

Previous research on the efficiency of bank relationships in China mainly focuses on the allocation of credit resources. Bailey et al (2011) document that substantial volumes of non-performing loans are concentrated among the state-owned banks, and poorly performing SOEs are the heaviest borrower. On the basis of these findings, this paper further examines after the bank relationships are established, whether the state-owned banks efficiently discipline the SOE borrowers. Particularly, what is the role of common state ownership in the lending

¹ The *Big Four* stands for the biggest four commercial banks in the world (by total assets) according to the 2019 annual rankings by S&P Global Market Intelligence: the Industrial & Commercial Bank of China, the China Construction Bank, the Bank of China and the Agricultural Bank of China. These four banks are all owned by the Chinese central government.

² Podpiera (2006) finds that the state-owned commercial banks lend significantly more in less profitable provinces with lower enterprise profitability. He argues this result indicates the lending decisions of these banks have been policy driven. Berger et al (2009) find that the "Big Four" are by are the least efficient while the foreign banks are the most efficient. FitchRatings (2016) estimates that around 20% of bank loans in China are non-performing.

relationships? Does it compromise the banks' monitoring efforts, or does it facilitate information transmission between the bank and the firm?

To investigate whether banks actively discipline their poorly performing borrowers, we evaluate the effect of bank loans on the sensitivity between a firm's profitability and CEO turnovers. Specifically, we use hand-collected datasets of bank loan covenants and CEO turnovers of Chinese listed firms, and we employ the standard Cox competing risk model to test the effect of loan intensity on the turnover-performance link. One unique advantage of our datasets is the diversity of lending banks. We classify the banks into four different types based on their ownership structure: the *Big Four* banks, the local state-owned banks, the joint-equity banks, and the foreign banks. The banks in each category are ultimately controlled by different entities, which allows us to identify the common state ownership and distinguish the disciplinary effects in different types of bank relationships.

In this paper, we document that underperforming CEOs are more likely to be forced out when the firm relies more on bank loans, but this effect would be neutralized when the firm and the bank are ultimately controlled by the same government. In other words, common state ownership weakens the disciplinary effects of banks on the governance of the underperforming borrowers. We argue that common state ownership can be one of the factors that explains the inefficiency of bank discipline in China. In our baseline tests, firms' underperformance is measured with the industry-adjusted profitability. The main results would be even more significant when we narrow our sample to firms close to bankruptcy, which is consistent with Nini, Smith and Sufi (2012) that creditors would actively discipline borrowers well outside of payment default states.

Second, we separately examine different types of bank loans. Even if common state ownership makes banks less monitor the borrowers, it is possible that such inefficiency can be alleviated by stricter loan covenants. To avoid credit default, firms can be more self-disciplined ex ante. We find that poorly performing borrowers are more likely to force out the managers when the firms have more short-term loans. This result suggests that the underperforming borrowers may be concerned about increased borrowing costs under frequent loan renewals, thus they are more motivated to improve governance. Similarly, the turnover-performance sensitivity is greater when the firms have more secured loans, suggesting that firms have greater incentives to improve governance to avoid default, which may incur stricter collateral requirements.

Next, we specifically examine the interactions between firms and banks of different types of state ownership. The results show that bank loan intensity would increase the forced turnover-performance sensitivity when a firm's lead lender is a joint-equity bank which has diversified ownership structure, while such effect is insignificant when the leader lender is a state-owned bank (either the *Big Four* or the local state banks). More interestingly, we find that the incremental effect of joint equity banks has significantly smaller magnitude on SOE borrowers than non-SOE borrowers. These results suggest that although joint-equity banks have greater monitoring motives than the state-owned banks towards underperforming companies, the bank discipline would to some extent weakened by government interventions.

This paper evaluates three potential channels through which the disciplinary effect of bank loans is weakened by common state ownership. First is the director appointment on the firms' board. Among the firms with common state ownership, we examine the effect of bank directors on the turnover-performance sensitivity. The results show that, having board directors appointed by the lending banks neutralizes the negative relations between firm performance and the likelihood of forced CEO turnovers. These findings are consistent with He et al. (2016) that bank directors improve access to bank loans for Chinese listed firms, yet such bank financing fails to create firm value.

The second potential channel is firms' equity investment in their lending banks. It is possible that the corporations are important equity investors of the bank lenders, which results in the situation where state government concurrently are the ultimate controller of both the bank and the borrowing firms. Since firms have voting rights on the holding banks' decisions, when the firms underperform, they may have incentives to make the banks less exert monitoring efforts. Consistent with this argument, we find some results that for firms with at least 5% of ownership in the lending banks' equity, the disciplinary effect of bank loans on forced CEO turnovers becomes insignificant.

The third potential channel is through firms' political connections. In order to test if the managers with political connections are more likely to intervene with the discipline of lending banks, we manually collect the job experience of the underperforming CEOs and test if the CEOs' political connections affect the turnover-performance sensitivity. Although there is some evidence that firms with political connections indeed have less significant turnover-performance sensitivity, the effect of political connections does not hold significant when firms' loans are collateralized or have short maturity. Overall, the results from the mechanism tests suggest that common state ownership may neutralize bank discipline over underperforming firms, while the inefficiency can partly be offset by loans with stricter covenants.

Next, we examine firms' borrowing conditions subsequent to forced CEO turnovers. Using propensity-score-matching on a control sample without CEO turnovers, we find that after forced CEO turnovers, the local SOEs under common state ownership with the banks have decreased secured loan intensity but increased unsecured loan intensity, while those without common state ownership have increased short-term loan intensity. In other words, it seems that following forced CEO turnovers, the borrowing conditions become less strict for firms with common state ownership, but more stringent for those without common state ownership. These differences in loan term changes suggest banks' tradeoff between their uncertainty about the firms' new management and their reward to firms' following their discipline. More specifically, in bank relationships where the bank and the firm share the same ultimate owner, there is apparently less uncertainty about the firm's new management, but for those under no common state ownership, there might be increased uncertainty, so the loan terms may become stricter, consistent with the management risk argument in Pan, Wang and Weisbach (2018).

To address the endogeneity concern that CEOs of poor ability may choose not to borrow bank loans to avoid bank discipline, we follow Ozelge and Saunders (2012) and instrument bank loan

intensity with the bank financing conditions in the regional market. It is reasonable to believe that the local bank financing is positively associated with the firm level bank loan intensity, while the aggregate banking market should not affect the firm-specific CEO replacements except via the channel of the firm's own bank loans. Using six alternative instrumental proxies, we conduct two-stage least squares (2SLS) estimations not only for the overall sample, but also for the firms under common state ownership. The estimates remain similar to the main results, suggesting that the effects of bank loan intensity on the likelihood of forced CEO turnovers are likely to be causal. Specifically, the instrumented loan intensity tends to render the turnover-performance sensitivity stronger for the firms without common state ownership, while vice versa for the firms under common state ownership.

Overall, the findings in this paper indicate that common state ownership is the underlying factor that contributes to the inefficient governance role of lending banks in disciplining underperforming SOEs. One disclaimer is about the initiations of bank relationships. As we discussed earlier, under common state ownership, it is possible that state banks lend to the underperforming SOEs under the government's policy, whereas we do not reject the possibility that the poorly performing SOEs choose to borrow from state banks to avoid market discipline. Unfortunately, in our setting, we are unable to split the negotiating power during this two-sided matching process.

This paper contributes to the literature on the effect of common ownership on corporate policies. Based on a long theoretical literature on the implication of common ownership for firm interactions, the empirical tests have been emerging in recent years. Previous studies mainly investigate the effect of common ownership on the efficiency of product market competition. They emphasis that common ownership tends to induce anticompetitive behaviors, leading to less efficient markets (Azar 2012; He and Huang 2017; Azar, Schmalz and Tecu 2018). In this paper, we focus on corporate interactions *across* industries under the effect common ownership. The closest paper to ours is Lu et al. (2012) that examines the equity investment of Chinese firms in banks' ownership. They argue that non-SOEs in China hold significant ownership in banks to address the financing disadvantages. The non-SOEs that hold banks' equity shares tend to enjoy more favorable borrowing terms. Our paper adds to their study in three important ways. First, we examine that given common ownership, whether the bank efficiently monitors the underperforming firms, while Lu et al. (2012) discusses firms' motives to establish common ownership in order to weaken the bank discrimination ex ante. Second, Lu et al. (2012) only compares the differences between SOEs and non-SOEs, while we also examine the heterogeneities among the banks. We provide evidence that the disciplinary effect among these four types of banks varies significantly from one another. In addition, Lu et al. (2012) and our paper address different types of common ownership. Lu et al. (2012) examines the bank relationships where the firms hold the banks' equity shares, while we examine the cases where the firm and the bank share the same ultimate owner. We consider not only the cases of direct ownership control between the firm and the bank, but also the cases in which the bank and the firm are jointly controlled by the third party. The results in this paper not only complement Lu et al. (2012) that the direct ownership control of the bank and the firm weakens monitoring effect,

but also discover other channels that weaken the monitoring effect (e.g. bankers on the board, CEOs' political connections). Considering the large portion of SOEs and state-owned banks in China, we believe that our tests on the role of common state ownership shed broad light on the bank discipline in China.

This paper also adds to the research on the governance of business groups. Despite a long literature on the Chinese SOEs, less is discussed about the *cliques* formed among the SOEs. In this paper, we define the cliques in China as the SOEs that share the same government as the ultimate owner. This classification resembles the definition of the Korean chaebols and the Japanese keiretsu. Previous research on the governance of the Korean chaebols and the Japanese keiretsu often reaches mixed results on the efficiency of their internal discipline (Berglöf and Perotti 1994; Kim and Limpaphavom 1998; Bae et al 2002; Campbell and Keys 2002; Ferris et al 2003; Dow and McGuire 2009; Almeida et al 2011). Using the setting of bank-firm relationship, this paper examines the governance of state-owned business groups in China. Building on Nini et al (2012) that creditors would actively exert the role of external governance even when borrowers underperform, we provide further evidence that the banks' governance role might be weakened if they share the same ultimate owner with the borrowers. Also, there is some evidence that the underperforming firms still can be disciplined with stricter loan terms, such as short maturity or high collateral requirement, which is consistent with Bester (1985) and Chan et al (1987) that credit rationing will be reduced if banks choose collateral requirements and interest rate to screen investors' riskiness.

Finally, this paper adds to the literature on the access to external capital markets of SOEs in emerging markets. Prior empirical studies document that Chinese SOEs have preferential access to external financing (Bailey, Huang and Yang 2011; Megginson, Ullah and Wei 2014; Chen, Li and Tilmann 2019), but it still remains unclear about the functions behind the financing relationships. In terms of the lending banks, García-Herrero et al. (2009) document that better capitalized banks tend to be more profitable, while the largest banks, the *Big Four*, have been the main drag for the banking system in China. Building on the discussion in Schwert (2018) on the endogenous matching process between firms and banks, this paper complements this discussion by proposing common state ownership as an alternate factor that shapes the functions of bank-firm relationships. The findings in this paper also shed light on a better understanding of the credit markets in other emerging countries.

They find that underperforming firms tend to replace the managers if the firms are more bank dependent. Following this methodology

The remainder of the paper is structured as follows. Section 2 develops hypotheses on the effect of common state ownership on disciplinary role of banks in China. Section 3 introduces the sample and methodology. Section 4 describes the main results. Section 5 discusses the channels through which common state ownership may take effect on the banks' governance role. Section 6 addresses the endogeneity concern with instrumental variables and conducts a series of robust tests, and Section 7 concludes.
2. Related Literature and Hypotheses Development

Regarding creditors' role of corporate governance in the borrowers, Nini, Smith and Sufi (2012) argue that in efficient capital markets, creditors have motives to actively discipline the borrowers whose performance deteriorates. Ozelge and Saunders (2012) empirically test this argument by estimating the influence of bank loan intensity on the likelihood of borrowers' firing the underperforming managers. Under bank discipline, CEO replacements should become more sensitive to the borrowers' poor performance. Meanwhile, another strand of literature argues that common ownership may limit the efficiency of markets. For example, an emerging literature shows that the concentration of common ownership reduces competition in product markets (Azar 2012, 2017; Azar, Schmalz and Tecu 2018). In the Chinese lending markets where most of the commercial banks are state-owned, the lending decisions may be biased towards the state-owned companies. Lu et al (2005) attribute the biased lending as the reason for the mounting non-performing loans in China. In this paper, we particularly argue that the banks may share the same government with their borrowing firms as the largest shareholder, then the common state ownership reduces the conflict of interest between shareholders and creditors. In this case, the banks are less likely to exert efforts to intervene with the poorly performing borrower's governance. Hence, the common state ownership hypothesis predicts that:

H1: Common state ownership weakens the disciplinary effect of banks on the CEO replacements of underperforming borrowers.

Existing literature documents fruitful findings on the channels through which state ownership shapes the corporate governance in China. These channels can help us understand the role of common state ownership in the bank relationships of Chinese companies. There are mainly three channels that may facilitate the function of common state ownership. First is bankers in the boardroom He, Rui and Zhu (2016) documents that the presence of a banker on the board increases the firms' access to bank loans, yet the appointments are typically followed by declines in the appointing firms' stock performance, operating performance and increases in rent-seeking activities. They argue that these effects are driven by the state-owned companies, implying that under government endorsement, the bankers on the board of borrowers are less willing to make monitoring efforts. The second channel might be the borrowing firms' ownership in the lending banks' equity shares. Taboada (2011) argues that in countries with less developed institutional environments, credit allocations would become less efficient if the lending banks have greater blocks of shares held by their borrowers. The third channel might be political connections. Claessens et al (2008) document that politically connected firms have more preferential access to bank financing resources, while the politics-driven credit allocation induces significant costs of rent seeking in the capital market. Since under common state ownership, firms are more likely to establish these bank-firm channels (i.e., bankers on board, firms' ownership in the banks' equity shares, and political connections), we predict that the disciplinary effect of bank monitoring would be weaker in these scenarios:

H2: The weakening effect of common state ownership would be more pronounced among the firms with bankers in the boardroom, with shares in the bank's equity, and with political connections.

CEO turnovers significantly affect firms' costs of borrowing. Pan, Wang and Weisbach (2018) argue that CEO turnovers would incur investors' uncertainty about the quality of the new management team. They document that firms' borrowing costs significantly increase at the time of CEO turnovers and then decline over the first three years of the new CEO's tenure. Similarly, Deng et al. (2019) show that banks tend to issue loans with worsened terms due to the increase in uncertainty about new CEOs. Following this information uncertainty argument, it is expected that firms with CEO turnovers would encounter stricter borrowing covenants, such as shorter loan maturity, greater collateral requirements. On the other hand, information uncertainty may be less of concerns in bank relationships when the bank and the firm have the same owner. The banks would have fewer motives to monitor or discipline the underperforming firms. It is less likely for the banks to perform as harshly as those efficiency-oriented banks.

In addition, by forcing out underperforming managers, the borrowing firms may be more likely to negotiate with the lenders for better loan terms. Having successfully disciplined the governance of the borrowers, the banks more willing to agree on less stringent terms in order to save firms out of financial distress. Such agreements are more likely to be reached when firms have common state ownership with the banks, given the government's favoritism in capital allocations (Bailey, Huang and Yang 2011). Therefore, we expect that:

H3: Following forced CEO turnovers, firms with common state ownership would enjoy less strict loan terms, while the firms without common state ownership would encounter stricter loan terms.

3. Data and Methodology

3.1 Data

Our sample is composed of three datasets. First, we hand-collect the bank loan information of Chinese listed firm from their annual reports. Starting from 2007, the *China Securities Regulatory Commission* (CSRC) required that all listed firms should disclose the information about their major bank loans, including loan maturity, loan collateralization, and their five largest outstanding loans. We exclude the observations where the maturity date or the lender identity is missing. As a result, the time period of the data is from 2008-2018.

Second, we collect the CEO turnover information of Chinese listed firms and manually identify whether each turnover is forced or voluntary. The CEO turnover events are accessed via the GTA Financial Research Database. This dataset includes information about the CEO departure date and the announced reason for the departure.

Third, the financial information of the listed firms is collected from the CSMAR Database, and we complement the data with the information from the WIND Database. These two

databases are widely used in empirical financial studies on Chinese listed firms. Following the standard practice of previous research on Chinese public firms, we exclude firms in the financial industry and firms that are under special regulatory treatments (i.e. the "*ST stocks*").

3.2 Classifying CEO turnovers: forced vs. voluntary

To examine banks' governance role in the CEO turnover decisions in the borrowing firms, we must be able to distinguish the managers who are forced out rather than those who voluntarily resign. Following Huson et al (2001), Chang & Wong (2009) and Cao et al (2011), we first exclude turnovers due to takeovers, mergers, spinoffs, and interim CEO appointments. This leaves us an initial sample of 1,888 CEO turnovers in 1,227 listed firms. Then we use the reported reason for CEO departure to classify forced and voluntary CEO turnovers.

A CEO turnover is considered forced if it satisfies at least one of the three conditions. 1) the CEO was dismissed, assigned to a lower position (i.e. demotion), or resigned because of legal dispute; 2) the departing CEO is younger than 60 for males and 55 for females, and the announcement does not state that the CEO died, left due to poor health, or accepted another position elsewhere or within the firm; or 3) the CEO "retires" but leaves the job within six months of the "retirement" announcement. The CEO turnovers in condition 3) are reclassified as voluntary if the incumbent takes a CEO position in another firm or departs for business reasons that are unrelated to the firm's activities, 0 otherwise. The selection procedure gives us 620 cases of forced CEO turnovers, among which 479 departing CEOs end up at a lower position, including 134 cases of taking a lower position in the same company and 345 of taking managerial positions in unlisted or smaller firms.

There are 121 cases in which we were unable to trace the final whereabouts of the departing CEO. Given the important role of managerial positions, it is unlikely that the post-departure information is unavailable if the departing CEO had taken up a better or comparable position. Thus, we classify these cases as forced CEO turnovers. There are two cases where the CEO departure involves a legal dispute. We classify these as forced turnovers. We also classify four cases as forced turnovers where early retirement (under 60 years old for men and 55 for women) is stated as the reason for the CEO departure. As a result, our sample has 620 forced turnovers, or 32.8% of all CEO turnovers in the sample. This proportion is similar to the estimates reported in Chang and Wong (2009) and Cao et al. (2011) for Chinese listed firms (30.98% and 31.01%, respectively).

The voluntary turnover group includes 1,036 cases where the departure reasons are retirement, contract expiring, change in the largest shareholder, resignation, health reasons, personal reasons,³ corporate governance reform, or completion of active duties. For the remaining 852

³ Sometimes personal reason is used as an excuse in CEO turnovers. In order to alleviate the concern, we reclassify personal reasons as an indicator of forced turnovers, and our main results are qualitatively similar.

cases of CEO turnovers, we trace the destinations of the departing CEOs to assess whether the departure is truly forced or not. Indeed, there are 232 turnovers where the departing CEOs assumed a better position, including 65 posts as government officers, 119 as chairman or vice chairman of the company board, and 48 comparable managerial positions in the parent firm or another listed firm. As a result, there are 1,268 CEO turnovers are considered as voluntary, taking up 67.16% of the total sample of CEO turnovers. We report CEO turnover classifications in Table 1.

Table 1 CEO turnover frequencies by departure reasons

Reasons for turnover	# of turnovers	Percentage points
1. Voluntary turnover	1,268	67.16
Retirement	46	2.44
Contract expiration	358	18.96
Change in controlling shareholders	8	0.42
Resignation	351	18.59
Health	43	2.28
Personal reasons	136	7.20
Corporate governance reforms	52	2.75
Completion of active duties	42	2.22
Promotion	232	12.29
2. Forced turnover	620	32.84
Demotion	479	25.37
Dismissed	14	0.74
Legal Dispute	2	0.11
Early Retirement	4	0.21
Details not provided	121	6.41
Total number of turnovers	1,888	100.00

Panel A: Reasons for turnover

Panel B: Frequencies of voluntary and forced CEO turnovers

Year	# of listed	# of firms with voluntary turnover	% of voluntary	# of firms with forced	% of forced turnovers
2008	1,266	177	15.54	105	8.29
2009	1,307	205	16.04	95	7.27
2010	1,348	193	16.55	93	6.90
2011	1,410	239	17.31	93	6.60

2012	1,411	214	17.32	101	7.16
2013	1,404	240	17.24	133	9.47
Total	8,146	1,268	15.57	620	7.61

The table reports the frequencies of CEO turnovers of Chinese listed firms during the period of 2008-2013. The CEO turnovers are categorized by the announced departure reasons. A CEO turnover is categorized as "forced" if it satisfies one of the following conditions: 1) the CEO is fired, forced out, or departed under the board's decisions; 2) the CEO takes an early retirement, i.e. the departing CEO's age is less than 60 for males and 55 for females, and the announcement does not report that the CEO dies, leaves due to poor health, or accepts another position outside or within the firm; 3) the CEO "retires," but leaves office within six months of the retirement announcement. A CEO turnover is defined as "voluntary" if the manager takes a comparable position outside the firm or departs for business reasons that are unrelated to the firm's activities. We identify three cases as voluntary turnovers in which the tenure of the departing CEO is no more than one year. We also classified four cases of early retirement as forced turnovers.

3.3 Methodology

The econometric specification employed in this paper is derived from a competing-risk model (CRM). The model accounts for the censoring problem embedded in prior CEO turnover literature⁴. In our CRM model, we set up the turnover probability as a function of the CEO tenure, bank loan intensity, firm performance and other time-specific variables (He et al., 2010; Jenter and Kanaan, 2015). The CRM model is semi-parametric in the sense that we do not impose linearity assumption on the hazard functions. We estimate the sensitivity of a firm's industry-adjusted ROA (*IROA*) to the forced CEO turnovers and voluntary CEO turnovers respectively⁵, and then evaluate how this relation is affected by the firm's bank loan intensity.

Suppose that the departure of CEO *i* can be either voluntarily or forced. The time to departure ti and the turnover type *j* are observable. *j* is an indicator variable that equals 0 if the CEO stays in his / her position, 1 if there is a voluntary turnover, and 2 if the CEO is forced out. For each type of turnover, there is a latent duration Tj, which is the CEO's tenure before the spell ends via type *j*. The actual departure date and turnover model can be interpreted as the realizations of random variables *T* and *J*, defined as follows:

$$T = min(T_{j}, j = 1, 2)$$

J = argmin_i(T_i, j = 1, 2)

Hence, the hazard rate for a turnover of type *j* is defined as:

$$\lambda_j(t) = \lim_{dt \to 0} \frac{\Pr(t \le T < t + dt, J = j | T \ge t)}{dt}$$
(1)

The overall hazard function is as follows:

$$\lambda(t) = \lambda_1(t) + \lambda_2(t) \quad , \tag{2}$$

⁴ Previous studies using logit models to examine the effect of performance on CEO turnover includes (e.g. Huson et al., 2001; Parrino et al., 2003; Ozelge and Saunders, 2012). The logit models in these empirical settings may introduce biased estimates due to the censoring issues (Efron, 1977).

⁵ Jenter and Kanaan (2015) argue that managers are evaluated based on their performance relative to the industry level.

where $\lambda_1(t)$ and $\lambda_2(t)$ are the cause-specific hazard functions for voluntary and forced turnover respectively. We further use risk-specific hazard function with the Cox (1972) proportional hazard types. The Cox method flexibly accommodates for the probability of a currently employed CEO's departure over the next year. The CEO turnover is a function of CEO tenure, bank loans, and other control variables. The functional form is as follows:

$$\lambda_{ji}(t \mid x_{ji}(t), \beta_j) = \lambda_{0j}(t) \exp[x_{ji}(t)'\beta_j], \qquad j = 1,2$$
⁽³⁾

where λ_{0j} is the baseline hazard function specific to type *j* hazard at time *t*, $x_{ji}(t)$ is a vector of time-dependent covariates for CEO *i* specific to type *j* hazard at time *t*, and β_j is the vector of unknown regression parameters to be estimated. The partial likelihood function for each specific hazard *j* is given by:

$$L_{j}(\beta_{j}) = \prod_{i=1}^{k_{j}} \frac{\exp[x'_{ji}(t_{ji})\beta_{j}]}{\sum_{l \in R(t_{ji})} \exp[x'_{jl}(t_{ji})\beta_{j}]}, \qquad (4)$$

where k_j refers to the number of CEOs in specific hazard j, and $t_{j1} < \cdots < t_{jk_j}$ denotes the k_j ordered failures of hazard j. $R(t_{ji}) = \{l | t_{jl} \ge t_{ji}\}$ is the set of CEOs that have not left their position at time t_{ji} . The likelihood function for the Cox CRM is:

$$L(\beta_{1},\beta_{2}) = \prod_{j=1}^{2} \prod_{i=1}^{k_{j}} \frac{\exp[x'_{ji}(t_{ji})\beta_{j}]}{\sum_{l \in R(t_{ji})} \exp[x'_{jl}(t_{ji})\beta_{j}]}$$
(5)

To investigate the sensitivity of CEO turnover to performance and loan intensity, $x_{ji}(t)'\beta_j$ is defined as follows:

(6)

$$\begin{aligned} x_{ji}(t)'\beta_{j} &= \beta_{0j} + \beta_{1j}Loan intensity_{ji,t} + \beta_{2j}IROA_{ji,t} + \beta_{3j}Loan intensity*IROA_{ji,t} \\ &+ \beta_{4j}Controls_{ji,t} + \varepsilon_{i,t} \end{aligned}$$

Following Ozelge and Saunders (2012), we use the interaction term between *Loan intensity* and *IROA* to capture the impact of bank loans on the sensitivity of CEO turnover to firm performance. The governance power of lending banks is measured by *Loan intensity*, which is the ratio of total loan outstanding over the borrowing firm's total assets. We also compute the intensity of different types of loans, including the secured (unsecured) loan intensity, measured as the ratio of secured (unsecured) loans outstanding over the borrowing firm's asset (i.e. *secured, unsecured*), the short-term (long-term) loan intensity, measured as the ratio of short-term (long-term) loans outstanding over the borrowing firm's asset (i.e. *short-term, long-term*). We identify a firm's largest lender of bank loans based on the information disclosed in the firm's top-five largest loan contracts outstanding. A firm's largest lender is further categorized into the *Big Four* (state banks), the joint equity banks, the local state banks (local banks), and foreign banks.

We also include a series of control variable that are documented to be associated with a firm's CEO turnover. We measure firm risks by the stock return volatility over the 12 months before the CEO turnover, i.e. *Stock volatility*. We use the Market-to-Book ratio (*MTB*) to control for growth opportunities. This ratio is measured by market value of equity plus book value of debt over book value of total assets, and the logarithm of total assets to measure firm size. We include the percentage ownership of the largest shareholder, *Largest shareholder*, to control for the conflict of interest between block holders and minority shareholders, which is considered the main governance issue in emerging countries. *Board size* is the number of directors on board, and *Independent director* is the ratio of independent directors on board.

Finally, we control a set of CEO characteristics that are associated with CEO turnovers. *Duality* equals to one if the CEO is also the chairman of the board, 0 otherwise; *Tenure* is the annualized duration for the CEO in the position; *CEO shareholding* is the proportion of the equity held by the CEO; *Education* is a categorical variable from one to five (higher value indicates higher education). All explanatory and control variables are lagged by one year before the CEO turnover, and variable definitions are described in more detail in Appendix 1.

We present the summary statistics of the key variables in Table 2. All financial variables are winsorized at the 1st and 99th percentile. The average loan intensity for China's listed firms is 0.27. The secured loan and short-term loan ratios are 0.20 and 0.16, respectively. These numbers suggest that most bank loans are short-term and borrowers are required to pledge collaterals to secure loans. More than half of firms borrow primarily from state-owned banks. Only a tiny proportion of listed firms use foreign banks as their main loan providers (0.96%).

Variable	# of Obs.	Mean	Std. Dev.	Min.	Median	Max.
Loan intensity						
Loan intensity	8,146	0.269	2.308	0.000	0.202	0.877
Secured loan	8,146	0.197	2.267	0.000	0.120	0.794
Unsecured Loan	8,146	0.071	0.346	0.000	0.010	0.499
Short-term loan	8,146	0.155	0.460	0.000	0.107	0.668
Long-term loan	8,146	0.113	2.258	0.000	0.030	0.564
Bank type						
Big Four	6,348	0.561	0.496	0.000	1.000	1.000
Joint Equity	6,348	0.352	0.477	0.000	0.000	1.000
Local	6,348	0.075	0.264	0.000	0.000	1.000
Foreign	6,348	0.100	0.300	0.000	0.000	1.000
Financial variables						
ROA	8,146	0.034	0.206	-0.329	0.033	0.282
IROA	8,146	0.000	0.206	-0.373	0.000	0.251
Stock volatility	8,146	52.188	31.766	0.000	48.384	121.523
Firm Size	8,146	21.726	1.399	18.466	21.635	25.720
MB	8,146	2.393	7.423	0.677	1.533	11.400
Corporate governance	?					
SOE	8,146	0.339	0.473	0.000	0.000	1.000
Largest shareholder	8,146	0.359	0.156	0.087	0.337	0.749
Board size	8,146	2.299	0.964	1.609	2.197	9.000
Independent director	8,146	0.364	0.051	0.272	0.333	0.555
CEO characteristics						
Tenure	8,146	3.224	2.667	0.019	2.589	11.372
Education	8,146	3.519	0.808	1.000	4.000	5.000
Duality	8,146	0.149	0.356	0.000	0.000	1.000

Table 2 Summary statistics

This table describes the summary statistics for the key variables. All continuous variables are winsorized at the 1% and the 99% percentile. Variable definitions are in Appendix Table A1.

Figures 1 depicts the relation between CEO tenure and the probability of a firm's CEO turnover, i.e. the estimated survival function using the CRM model. Figure 1A shows that as a CEO's tenure extends, the probability of him / her leaving office increases, and the sharpest rise of CEO turnover comes in year seven, i.e. the hazard ratio of CEO turnover increases by about 56% from year seven to nine. Figures 1B and 1C show that the increase of hazard ratio in forced turnover is steeper than that in voluntary turnover. The hazard ratio for forced CEO turnovers increases from 0.023 to 0.05 (almost doubled) while that for voluntary CEO turnovers increases

from 0.06 to 0.09 (up by 50%). Based on these facts, next we examine the factors that result in the differences between the hazard ratios of forced and voluntary CEO turnovers.



Figure 1A: Estimated hazard functions for overall CEO turnovers



Figure 1B: Estimated hazard functions for forced turnovers



Figure 1C: Estimated hazard function for voluntary turnoversr

4. Main Results

4.1 The effects of bank loans on CEO turnovers

We investigate the disciplinary effect of banks on poorly performing borrowers by testing how bank loans affect the sensitivity between firms' profitability and the likelihood of the firms' CEO turnovers. Under the bank discipline hypothesis, higher loan intensity increases the sensitivity between firm performance and forced CEO turnovers. In our baseline tests, the bank loan intensity is measured with three alternative proxies, the firm's aggregate amount of bank loan ratios, the firm's secured bank loan ratios, and the short-term bank loan ratios. We present the estimation results in Table 3.

All four columns in Table 3 show that a firm's industry-adjusted ROA is negatively associated with the likelihood of forced CEO turnovers⁶, which is consistent with the long empirical studies on the relationship between CEO turnover and firm performance. However, the magnitude of coefficients, *IROA*, increases significantly when we include the *Firm* × *Bank State-owned* fixed effects into the regressions⁷. Specifically, in column (1), A 1% decrease in *IROA* is associated with a 1.1% higher probability of a forced CEO turnover (=exp [(-1.046) × (-0.01)]-1) while in columns (2) - (4) the coefficient of IROA has greater magnitude. A 1% decrease in *IROA* is

⁷ We define the bank's state ownership using the ownership status of the bank that issues the biggest portion of the firm's bank loans (i.e. the lead bank lender or the main bank).

⁶ Nini, Smith and Sufi (2012) argue that creditors have incentives to monitor the underperforming borrowers even if the borrowers are not yet in the state of bankruptcy. Firms still can choose to strategically default and not pay off the debt. Therefore, we follow Ozelge and Saunders (2012) and use industry-adjusted ROA to indicate the borrower's underperformance. As robust tests, we also use firms' bankruptcy risk, measured with Z-score (Altiman 1968), in the baseline regressions. The results remain similar (See Appendix Table A1).

related to a 7.1% higher probability of a forced CEO turnover (=exp [(-6.847) × (-0.01)]-1) when the *Firm* × *Bank State-owned* fixed effects are controlled. These results are closer to the estimates of the turnover-performance sensitivity reported in Jensen and Murphy (1990), which implies that the state ownership reduces the sensitivity between performance and CEO turnovers among Chinese listed firms.

In addition, in column (1) when $Firm \times Bank State-owned FEs$ are not controlled, there is no significant influence of bank loan intensity on the relationship between the firm's performance and the likelihood of forced CEO turnovers, which is inconsistent with the finding documented in Ozelge and Saunders (2012). However, when the effects of $Firm \times Bank State-owned FEs$ are controlled in column (2), the coefficient becomes significantly negative. For firms with an average level of bank loan intensity at 26.9%, a 1% decrease in *IROA* is associated with an 8.5% higher likelihood (=exp [(-6.847) × (-0.01) +(-5.010) × (-0.01) × 0.269] - 1) of forced CEO turnovers. The coefficients have greater magnitude when we use the ratio of secured loans (column 3) and short-term loans (column 4) to measure loan intensity. The results indicate that state ownership of both the banks and the firms weakens the disciplinary effect of bank loan intensity on the replacements of underperforming CEOs. Instead of controlling the fixed effects of *Bank* \times *Firm* state ownership, in unreported tests, we investigate the effects of including only the state ownership of either the bank or the firm. The results show the coefficient of the interaction term, IROA × Loan Intensity, remains insignificant. These results suggest that it could be the common state ownership in the lending relationships that contributes to inefficiency of bank loans in disciplining forced CEO turnovers.

		Forced CEO Turnover				
	Overall	Overall	Secured	Short		
	(1)	(2)	(3)	(4)		
IROA	-1.031***	-6.847***	-6.919***	-7.063***		
	(-4.142)	(-6.372)	(-6.412)	(-6.547)		
Loan Intensity	0.005	1.176***	1.121***	1.226***		
	(0.881)	(3.269)	(2.963)	(2.645)		
IROA \times Loan Intensity	-0.010	-5.010**	-6.363***	-6.008**		
	(-1.513)	(-2.359)	(-2.754)	(-2.235)		
Stock Volatility	0.003**	0.003**	0.004	0.004		
	(2.299)	(2.314)	(0.982)	(1.071)		

Table 3 The Effects of Bank Loan Intensity on CEO Forced Turnovers

Firm Size	-0.195***	-0.179***	-0.224***	-0.226***
	(-4.226)	(-3.902)	(-2.996)	(-2.986)
Market to Book Ratio	-0.015	-0.014	-0.107*	-0.111*
	(-1.558)	(-1.507)	(-1.794)	(-1.836)
Largest Shareholder	0.494	0.511	0.710*	0.678
	(1.489)	(1.541)	(1.717)	(1.640)
Board Size	-0.014	-0.013	-0.041	-0.043
	(-0.300)	(-0.290)	(-0.639)	(-0.671)
Independent Director	0.716	0.706	0.950	0.905
	(0.800)	(0.787)	(0.931)	(0.884)
Duality	-0.101	-0.132	-0.064	-0.056
	(-0.764)	(-0.711)	(-0.382)	(-0.338)
Education	0.104*	0.116	0.108	0.103
	(1.797)	(1.042)	(1.464)	(1.412)
Firm \times Bank State-owned FE	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	8,140	6148	6148	6148
Log Likelihood	-4853.67	-3711.29	-3709.64	-3710.76

This table reports the estimates about the effects of bank loan intensity on the likelihood of an underperforming firm replacing its managers. The model follows Ozelge and Saunders (2012) using the standard Cox CRM model. Column (1) reports the results without controlling for the bank and the borrowing firm's state ownership. Column (2) reports the results controlling for the firm × bank state ownership. Column (3) reports the estimates about the fraction of secured loans. Column (4) reports the estimates about the fraction of short-term loans. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled in all four columns. Firm × Bank state ownership is controlled in columns (2) - (4). The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

In comparison, we examine whether bank loan intensity would affect the relations between firm performance and voluntary CEO turnovers. The results are presented in Appendix Table A2. Not surprisingly, the coefficients of the interaction term, IROA × Loan Intensity, is insignificant even when the Firm × Bank State-owned fixed effects are included. In addition, the sensitivity between voluntary CEO turnovers and bank loan intensity is significantly weaker than that of forced CEO turnovers . Therefore, it seems that bank loan intensity could effectively discipline the governance of underperforming borrowers, while in China, such effects may be compromised by the state ownership of both the lending banks and the borrowing firms.

4.2 The role of common state ownership

In order to investigate whether it is the common state ownership that contributes to the inefficiency of bank loans disciplining forced CEO turnovers, we check the identity of the ultimate controller for both the lending banks and the borrowing firms. For those that are ultimately owned by the same government, either the central government or the local government, we define that the parties in the lending relationship share common state ownership. The estimates about the effects of common state ownership on the relationship between loan intensity and forced CEO turnovers are presented in Table 4.

The results in Table 4 show that after controlling for the common state ownership in the lending relationship, the coefficient of the interaction term $IROA \times Loan$ Intensity becomes significantly negative. Also, the coefficient of the interaction term, $IROA \times Loan$ Intensity \times Common State Ownership, is significantly positive, which reduces the magnitude of the coefficient, $IROA \times Loan$ Intensity. These results are consistent with the argument that common state ownership weakens the banks' motives to monitor the underperforming firms. These results suggest that the common state ownership could be the reason that contributes the inefficiency of bank monitoring.

In column (2), when bank loans are measured with the ratio of secured loans, it is shown that the effect of common state ownership is less significant, both economically and statistically. It is likely that when bank loans are secured with collateralized assets, banks are less worried about borrowers' default risk because they can claim the assets once the default occurs. Therefore, the lending banks would have smaller monitoring incentives. In column (3), the coefficient of the triple interaction term is economically greater when firms' loan intensity is measured with short-term loans. It is possible that when lending relationships are plagued with common state ownership, short-term loans are less effective disciplining the underperforming borrowers. Controlling the common state ownership helps estimates the disciplinary effect that short-term loans should have on replacing the underperforming CEOs.

Forced CEO Turnover							
Overall Secured Short							
	(1)	(2)	(3)				
IROA	-5.555***	-5.183***	-4.834***				
	(-4.105)	(-3.617)	(-3.286)				
Loan Intensity	1.135	1.200	1.267				
	(1.605)	(.521)	(1.010)				
IROA × Loan Intensity	-9.330**	-10.753**	-11.585**				
	(-2.434)	(-2.308)	(-1.992)				
IROA × Loan Intensity× Common State Ownership	5.665**	3.667*	7.989**				
	(1.997)	(1.821)	(1.978)				
Common State Ownership	2.350	9.691	7.700				
	(0.387)	(1.482)	(0.891)				
IROA × Common State Ownership	6.299**	4.824*	11.992***				
	(2.385)	(1.924)	(2.845)				
Loan Intensity × Common State Ownership	5.956	5.003	4.346				
	(1.135)	(1.310)	(0.997)				
SOE Borrower	0.124	-0.053	-0.056				
	(1.157)	(-0.422)	(-0.476)				
State-owned Banks	-0.598	0.045	-0.686				
	(-1.234)	(0.131)	(-1.326)				
Stock Volatility	0.003	0.002	0.003				
	(1.490)	(0.771)	(1.564)				
Firm Size	-0.185***	-0.188***	-0.180***				
	(-3.066)	(-3.077)	(-2.853)				
Market to Book Ratio	-0.007	-0.006	-0.005				
	(-0.665)	(-0.612)	(-0.505)				
Largest Shareholder	0.897**	0.919**	0.887**				
	(2.414)	(2.464)	(2.387)				
Board Size	-0.022	-0.024	-0.028				
	(-0.378)	(-0.409)	(-0.465)				
Independent Director	0.377	0.449	0.307				
	(0.390)	(0.462)	(0.314)				
Duality	-0.088	-0.071	-0.109				
	(-0.563)	(-0.452)	(-0.682)				
Education	0.066	0.063	0.073				
	(0.961)	(0.922)	(1.062)				
Year FE	Yes	Yes	Yes				

Table 4 The Effect of Common State Ownership on CEO Forced Turnovers

Vol.10, No.1

Industry FE	Yes	Yes	Yes
Observations	6148	6148	6148
Log Likelihood	-3787.81	-3778.95	-3784.39

This table reports the results about the effect of common state ownership on the sensitivity between bank loan intensity and CEO forced turnovers. The model follows the same specification as in Table 3, except that we include the variable, Common State Ownership, and its interactions with the main independent variables, IROA and Loan Intensity. Common State Ownership is an indicator of 1 if the lending bank and the borrowing firm share the same government as the ultimate shareholder. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled in all columns. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

Another interesting result in Table 4 is that, the interaction term, $IROA \times Common State Ownership$, has significantly positive coefficient, which cancels out the negative relation between firm performance, IROA, and forced CEO turnovers, suggesting that there might be alternative channels beyond bank discipline through which common state ownership affect forced CEO turnovers. These results are in line with the argument for the results in Table 3 that, the state ownership of both the firm and the bank weakens the sensitivity between firm performance and forced CEO turnovers (see columns (1) and (2) in Table 3). The results in Table 4 make it more clear that it is the *common* state ownership that weakens the sensitivity.

4.3 Common ownership and different types of lending banks

Considering the diverse types of the commercial banks in China, we examine the identity of banks in the lending relationships and examine their monitoring effects upon the firms with common ownership. For each firm, we identify as the lead bank lender the bank that accounts for the largest portion of the firm's bank loans. The lead banks are classified into four types: the *Big Four* Banks, the local state banks, the joint-equity banks, and the foreign banks. The firms are classified by whether they share common ownership with the lead bank lender. We attempt to find out which combinations of the banks and the firms make efficient monitoring and which do not. If banks efficiently monitor the underperforming borrowers, it is expected that when the bank loan intensity would increase the sensitivity between firm performance and the likelihood of forced CEO turnovers.

The estimates about the effect of different types of bank lenders on forcing out the underperforming CEOs are presented in Table 5. The firms that do not have a lead bank lender are considered as the benchmark in the regressions.⁸ Column (1) shows that for firms that do not

⁸ A firm may not have a lead bank lender either because the firm has zero bank loans, or because the firm's bank loans are evenly from different types of banks, which makes it difficult to identify the type of the lead bank.

share common ownership with the lead banks, the sensitivity between firm performance (*IROA*) and the likelihood of forced CEO turnovers is greater than that of the firms with common ownership with the lead banks, both statistically as well as economically, which suggests that for firms with common ownership, the turnover decisions of CEOs depend less on the firm's profitability.

Interestingly, column (1) shows that for firms that do not share common ownership with the lead bank, higher bank loan intensity significantly increases the sensitivity of the turnover-performance relationship, irrespective of the lead bank's state ownership, while in column (2), such incremental effects become less significant, both statistically and economically. More precisely, for firms under common ownership with the leading bank, the discipline of bank loans on forced CEO turnovers becomes insignificant when the lead bank is state-owned (either the Big Four banks or the local state-owned banks). Even though the disciplinary effect of bank loans holds significant when the lead bank is a joint-equity bank or a foreign bank, the disciplinary power is still undercut by more than half if the firm and the bank are controlled by the same ultimate owner. The results imply that it is the common ownership, rather than simply state ownership, that weakens the monitoring effect of bank loans. In other words, the findings in Table 5 suggest that although state-owned banks less monitor the borrowers with common state ownership, they seem to be actively monitoring those without common state ownership. Also, the non-state-owned banks are actively monitoring the underperforming borrowers, while they appear to be less active if the borrower and the bank are under common ownership. These results extend our understanding about the inefficient bank discipline in China

Forced CEO Turnover				
No	Yes			
(1)	(2)			
-0.741***	-0.482*			
(-3.661)	(-1.717)			
-0.053*	0.289			
(-1.823)	(0.298)			
-0.667***	-0.259**			
(-2.836)	(-2.264)			
-0.101*	0.109			
(-1.739)	(0.265)			
-0.036**	-0.013*			
(-2.223)	(-1.667)			
-0.142	0.409			
(-0.536)	(1.141)			
0.135*	0.063			
	No (1) -0.741*** (-3.661) -0.053* (-1.823) -0.667*** (-2.836) -0.101* (-1.739) -0.036** (-2.223) -0.142 (-0.536) 0.135*			

Table 5 Common Ownership and Different Types of Lending Banks

Vol.10, No.1

	(1.843)	(1.234)
Local bank	-0.235	0.588
	(-0.846)	(0.707)
Foreign bank	0.036	0.002
	(1.058)	(0.237)
Stock volatility	0.002**	0.005***
	(2.265)	(2.875)
Firm size	-0.172***	-0.317***
	(-2.660)	(-2.817)
Market to book ratio	-0.009	-0.167
	(-0.904)	(-1.440)
Largest shareholder	0.608	0.955*
	(1.330)	(1.647)
Board size	-0.387	-0.034
	(-1.234)	(-0.435)
Independent director	0.911	2.206
	(0.707)	(1.254)
Duality	-0.032	0.251
	(-0.181)	(0.884)
Education	0.047	0.183
	(0.551)	(1.491)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	2020	4128
Log Likelihood	-2265.72	-1030.95

This table reports the results about the effect of loan intensity on CEO forced turnovers when the lead bank lender is of different types of ownership. Column (1) includes borrowers that do not share common ownership with the firms' lead bank lender. Column (2) includes borrowers that do. For each firm, we identify as the lead bank lender the bank that issues the largest amount of loans, and the bank types include the Big Four, the joint-equity banks, the local-state owned banks, and the foreign banks. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled in all columns. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

It is important to point out that although we pin down common ownership as the real source of the inefficiency in bank monitoring, we do not reject the findings in prior studies that overall the bank relationship involved with state ownership is less efficient than that without state ownership (Bailey et al. 2011). For example, we show in column (2) that when the firm's lead bank is a joint-equity bank which does not share common ownership, higher bank loan intensity still significantly improves the forced turnover-performance sensitivity, although to a less extent than when they do not share common ownership. To test the *overall* effect of state ownership, we present in Appendix Table A4 and A5 respectively on the effect of bank loan intensity for different types of firms and banks. The results show that the monitoring effect of bank loans is significant when the lender is a joint-equity or a foreign bank, or when the borrower is a non-SOE, but insignificant when either the bank or the firm is state-owned, consistent with the prior research on the inefficiency of bank monitoring in China.

One may concern about the measure of firms' performance. From the perspective of the banks, the firms' bankruptcy risk is far more important than bad performance. In our paper, we show that the disciplinary effects of bank loans increase with the firm's profitability getting more below the industry average, which is consistent with the idea by Nini, Smith and Sufi (2012) that creditors would actively monitor the borrowers well outside of payment default states. Intuitively, using firms' bankruptcy risk in place of industry-adjusted profitability would only reinforce our argument about the disciplinary effect of bank loans. We use bankruptcy risk⁹ as the alternative of firm performance and present the results in Appendix Table A6. As expected, the effects of bank loans become even more pronounced for the firms with high probability of default.

5. Mechanisms

5.1 Bankers in the boardroom

We next examine the channel through which common state ownership weakens the monitoring efforts of banks over underperforming borrowers. Kaplan and Minton (1994) argue that banks play an important monitoring and disciplinary role in corporate governance. They find among Japanese firms that appointments of bank directors on the board are more likely among the firms with poor stock performance and earnings losses. However, He et al (2016) document that in China, bankers appointed on the board are normally followed with declines in the firms' operating performance as well as market reactions. They argue that bank directors can be the channel through which corporate insiders expropriate financial resources instead of creating firm value.

To examine whether, for the firms of common ownership, recruiting a banker in the boardroom may either save the firm from the discipline of bank loans or expose the firm to

⁹ A firm's bankruptcy risk is measured with the Z score (Altman 1968) and the O score (Ohlson 1980) following Hillegeist et al (2004). A firm is likely to go bankrupt if the Z-score is below 0.8 or the O-score is below 2.8.

greater monitoring of the bank. We check the professional background of the firms' board directors. The dummy, *Bank Director*, is equal to one if at least one of the board directors used to work for the bank that issues loans to the firm. The results are presented in Table 6. The coefficients of the triple interaction term, *IROA* × *Loan Intensity* × *Bank Director*, are significantly positive, which essentially cancels out the negative relations between *IROA* and the likelihood of forced CEO turnovers. The results are consistent with He et al (2016) that in China where the insider expropriation issues are severe, bankers on the underperforming borrowers' board tend to weaken the governance role of the lending banks. Therefore, it is possible that banker appointments on the underperforming borrower's board can be the channel through which common ownership weakens the monitoring and disciplinary effect of the lending banks.

Forced CEO Turnover						
Overall Secured Short						
	(1)	(2)	(3)			
IROA	-5.985***	-5.438***	-5.451***			
	(-7.386)	(-6.894)	(-6.512)			
Loan Intensity	1.296***	1.275***	1.467***			
	(5.033)	(4.478)	(4.187)			
IROA × Loan Intensity	-0.632	-1.191	-0.196			
	(-0.531)	(-0.895)	(-0.122)			
IROA × Loan Intensity × Bank Director	5.885**	5.345**	6.133*			
	(2.535)	(2.081)	(1.651)			
Bank Director	0.577***	0.597***	0.580***			
	(4.748)	(4.921)	(4.729)			
IROA × Bank Director	2.786***	2.615*	3.262*			
	(3.687)	(1.782)	(1.932)			
Loan Intensity × Bank Director	0.216	0.798*	-6.388			
	(0.412)	(1.792)	(-0.792)			
SOE Borrower	0.116	-0.023	-0.081			
	(1.034)	(-0.425)	(-0.491)			
State-owned Banks	-0.528	0.065	-0.667			
	(-1.051)	(0.133)	(-1.328)			
Stock volatility	0.002	0.002	0.002			
	(1.504)	(1.414)	(1.552)			
Firm size	-0.219***	-0.206***	-0.210***			
	(-4.764)	(-4.428)	(-4.433)			
Market to book ratio	-0.011	-0.010	-0.009			

Table 6 Bankers in the Boardroom

	(-1.080)	(-0.979)	(-0.923)
Largest shareholder	0.059	0.074	0.054
	(0.554)	(0.685)	(0.505)
Board size	0.939***	0.895***	0.942***
	(2.919)	(2.772)	(2.916)
Independent director	0.037	0.029	0.037
	(1.237)	(0.934)	(1.221)
Duality	-1.165	-1.128	-1.165
	(-1.381)	(-1.336)	(-1.380)
Education	0.138	0.102	0.139
	(1.064)	(0.786)	(1.075)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	4128	4128	4128
Log Likelihood	-5645.35	-5639.85	-5644.81

Among the bank relationships under common ownership, this table reports the estimates about the effect of bank loan intensity on CEO forced turnovers when the borrowing firms' board has at least one director appointed by the lending banks (a dummy named Bank Director). Column (1) measures loan intensity using the overall amount of loans. Column (2) measures loan intensity using the amount of secured loans over total assets. Column (3) measures loan intensity using the amount of short-term loans. All other variable definitions are in Appendix 1. Heteroscedasticity robust t-statistics are presented in parentheses, and are clustered at firm levels. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

5.2 Borrowers' shareholdings of the lending banks

The ownership structure of banks can also affect the efficiency in capital allocation. Taboada (2011) argues that in countries with higher levels of corruption, more domestic blockholder ownership of banks negatively affect the efficiency in credit allocations. Following this spirit, we test, among the listed firm in China where the institutional environment is less well-developed, whether the inefficient monitoring of banks results from the fact that the lending banks are essentially owned by the borrowing firms. We use an indicator of one if at least one of the firm's lending banks have equity shares controlled by the borrowing firms. The estimates about the role of owning banks' share are presented in Table 7.

The results show that, after controlling for firms' investment in the lending banks' equity shares, bank loan intensity significantly increases the sensitivity between firm performance and forced CEO turnovers (See the negative coefficients of IROA×Loan Intensity in Table 7). The coefficients of the triple interaction term, IROA×Loan Intensity×Bank Investment, are significantly positive, which suggest that owning the equity voting shares of the lending banks can help the underperforming borrowers less monitored by the lending banks. As a consequence, the incompetent CEOs are less likely to be forced out. In addition, the coefficients of the interaction term, IROA × Bank Investment, are positive, which also weaken the sensitivity between firm performance and forced CEO turnovers. The results indicate that there might be alternative channels through which the underperforming firms get away with bank monitoring. Being an owner of the lending bank overall weakens the firm's corporate governance. Note that these results appear inconsistent with Wang et al (2020) that bank ownership improved the corporate governance of borrowing firms, probably because in our setting, we test the disciplinary effect of bank loans particularly on firms under common ownership with the banks. It might be the common ownership of banks that explain the inefficient bank discipline over the underperforming firms.

Forced CEO	Turnover							
Overall Secured Short								
	(1)	(2)	(3)					
IROA	-6.223***	-5.886***	-5.837***					
	(-4.764)	(-4.464)	(-4.344)					
Loan Intensity	1.032***	0.963***	1.274***					
	(3.483)	(2.989)	(3.247)					
IROA × Loan Intensity	-6.238*	-8.490**	-6.127					
	(-1.761)	(-2.069)	(-1.530)					
IROA × Loan Intensity × Bank Investment	6.266*	8.232**	10.337**					
	(1.906)	(1.965)	(2.180)					
Bank Investment	0.673	0.749	1.233					
	(1.081)	(1.471)	(1.038)					
IROA × Bank Investment	0.878***	0.876***	0.881***					
	(4.679)	(4.647)	(4.655)					
Loan Intensity × Bank Investment	9.538	-5.547	-5.716					
	(1.396)	(-0.595)	(-0.431)					
SOE Borrower	0.114	-0.046	-0.080					
	(1.127)	(-0.475)	(-0.496)					
State-owned Banks	-0.528	0.067	-0.656					
	(-1.144)	(0.143)	(-1.301)					
Stock volatility	0.002	0.002	0.003*					
	(1.382)	(1.237)	(1.679)					
Firm size	-0.222***	-0.224***	-0.216***					
	(-3.781)	(-3.818)	(-3.513)					
Market to book ratio	-0.009	-0.009	-0.008					
	(-0.951)	(-0.933)	(-0.834)					
Largest shareholder	0.042	0.030	0.043					
	(0.325)	(0.236)	(0.340)					
Board size	1.073***	1.042***	1.053***					
	(2.931)	(2.849)	(2.863)					
Independent director	0.037	0.041	0.047					
	(0.622)	(0.675)	(0.743)					
Duality	-0.673	-0.629	-0.639					
	(-0.671)	(-0.626)	(-0.637)					
Education	-0.161	-0.130	-0.158					
	(-1.065)	(-0.858)	(-1.051)					

Table 7 Borrowers' Ownership in the Lending Banks

Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	4128	4128	4128
Log Likelihood	-3976.89	-3973.76	-3975.84

Among the bank relationships under common ownership, this table reports the estimates about the effect of bank loan intensity on CEO forced turnovers when the borrowing firm is among the top ten shareholders with at least 5% ownership of the lending banks (a dummy named Bank Investment. Column (1) measures loan intensity using the overall amount of loans. Column (2) measures loan intensity using the amount of secured loans over total assets. Column (3) measures loan intensity using the amount of short-term loans. All other variable definitions are in Appendix 1. Heteroscedasticity robust t-statistics are presented in parentheses, and are clustered at firm levels. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

5.3 Borrowers' political connections

It has been widely acknowledged in prior studies that state ownership is closely associated with government-related benefits, where political connections help firms to attain key resources such as bank loans, tax benefits and IPO (Claessens et al 2008; Piotrovski and Zhang 2012). Sapienza (2004) argues that the lending behavior of state-owned banks is affected by the political connections of the firms in the local area. The stronger the political party in the area where the firm is borrowing, the lower the interest rates charged and state-owned banks charge lower interest rates than do privately owned banks, even if firms are able to borrow more from privately owned banks. To evaluate if the firms' political connections is the mechanism through which the underperforming manager get away with the monitoring of lending banks, we investigate the job experience of the manager. A manager is considered politically connected if she worked at a government agency. Among the firms' bank loan intensity and investigate whether it would weaken the disciplinary effect of bank loans.

The estimates about the role of CEO's political connections are shown in Table 8. The results in column (1) suggest that political connections would not only weaken the sensitivity between firm performance and the likelihood of forced CEO turnovers, but also weaken the disciplinary effect of bank loan intensity on the replacement of underperforming CEOs (the coefficient of the interaction term, $IROA \times Loan$ Intensity \times Political Connection, is positively significant at 0.634). Interestingly, in columns (2) and (3), the coefficients of the triple interaction term are not significant, suggesting that secured loans and short-term loans may be effective at disciplining the governance of the under-performing firms. As suggested by the significantly negative coefficients of *IROA* \times *Loan Intensity* in columns (2) and (3), higher ratios of secured loans and short-term loans increase the sensitivity between firm performance and the likelihood of forced CEO turnovers, which is consistent with the argument that collateralization and frequent needs of debt refinancing would incentivize the borrowers to better discipline themselves under greater pressure of payment default (Boot et al 1991; Boot and Thakor 1994; Diamond 2004; Graham et al, 2008; Freixas and Rochet 2008). However, the insignificance of the triple interaction term, $IROA \times Loan$ Intensity \times Political Connection, in columns (2) and (3) imply that the disciplinary effect of loan collateralization and short loan maturity may be cancelled out by the effect of the managers' political connections. Therefore, the results in Table 8 indicate that the manager's political connections can partly explain the channel through which common ownership weaken the disciplinary effect of bank loans. These results also explain the baseline results that bank monitoring is less efficient when the borrowers are loaded with secured loans and short-term loans (see columns 2 and 3 in Table 4).

Forced CEO Turnover						
	Overall	Secured	Short			
	(1)	(2)	(3)			
IROA	-1.371***	-1.961***	-1.748***			
	(-3.620)	(-4.380)	(-5.148)			
Loan Intensity	0.005	-0.007	0.498***			
	(0.961)	(-0.905)	(4.999)			
IROA × Loan Intensity	-0.005	-0.395*	-0.128***			
	(-0.302)	(-1.686)	(-3.348)			
IROA × Loan Intensity × Political Connection	0.634***	0.002	0.011			
	(3.808)	(0.086)	(0.106)			
Political Connection	-0.517***	-0.507***	-0.511***			
	(-3.459)	(-3.384)	(-3.424)			
IROA × Political Connection	0.381***	0.002	0.011			
	(2.838)	(0.086)	(0.106)			
Loan Intensity × Political Connection	-0.038	-0.018	0.151			
	(-0.169)	(-0.299)	(0.234)			
SOE Borrower	0.115	-0.024	-0.083			
	(1.144)	(-0.445)	(-0.497)			
State-owned Banks	-0.528	0.067	-0.670			
	(-1.021)	(0.147)	(-1.367)			
Stock volatility	0.003**	0.003**	0.003**			
	(2.123)	(2.425)	(2.359)			
Firm size	-0.198***	-0.203***	-0.186***			
	(-4.776)	(-5.090)	(-4.529)			
Market to book ratio	-0.068	-0.157***	-0.176***			
	(-1.200)	(-2.865)	(-3.470)			
Largest shareholder	-0.013	-0.017	-0.015			
	(-1.567)	(-1.573)	(-1.016)			
Board size	0.110	0.089	0.108			
	(1.189)	(0.956)	(1.172)			
Independent director	0.526*	0.528*	0.569**			
	(1.823)	(1.829)	(1.964)			
Duality	-0.011	-0.012	-0.011			
	(-0.240)	(-0.267)	(-0.252)			
Education	0.913	0.802	0.908			
	(1.212)	(1.049)	(1.208)			

Table 8 Borrowers' Political Connections

Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	4128	4128	4128
Log Likelihood	-4825.36	-4818.93	-4813.87

Among the bank relationships under common ownership, this table reports the estimates about the effect of loan intensity on CEO forced turnovers when the borrowing firms' CEOs are politically connected to the government. *Political Connection* is defined as 1 if the CEO used to work for the central or the local governments, 0 otherwise. Column (1) measures loan intensity using the overall amount of loans. Column (2) measures loan intensity using the amount of secured loans over total assets. Column (3) measures loan intensity using the amount of short-term loans. All other variable definitions are in Appendix 1. Heteroscedasticity robust t-statistics are presented in parentheses, and are clustered at firm levels. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

January 2023

Vol.10, No.1

One alternative concern is that managers' political connections can be disrupted by the political turnovers in China. When new politicians take over a region, firms in the region would lose their original personal connections to the government. In this case, the manager's political connections would not save firm from the monitoring from the lending banks. Also, the newly installed politician would have greater incentives to force out the underperforming managers. To examine the validity of this argument, we exclude firm years where there are turnovers of the head of the provincial government and redo the estimations. The results in Appendix Table A7 show that removing the firm years with political turnovers indeed remove the effect of political connections. The coefficients of the interaction term, IROA \times Loan Intensity, become negative. which strengthens the sensitivity between firm performance and forced CEO turnovers. These results are consistent with Piotrovski and Zhang (2012) that political connections can be a channel through which firms exploit government-related benefits.

6. Robustness

6.1 Instrumental variables

As discussed in Ozelge and Saunders (2012), firms' Loan Intensity is endogenously determined. It is possible that CEOs of poor ability choose not to borrow bank loans in order not to be disciplined by banks. Also, there could be other unobservable factors that jointly affect the CEOs' replacement (such as the CEOs' personality). To address these endogeneity concerns, we follow Ozelge and Saunders (2012) and instrument each firm's bank loan intensity with the level of aggregate bank financing conditions in the region. It is reasonable to believe that the aggregate conditions of local bank financing are positively associated with the firm level bank loan intensity, while the aggregate banking market should not affect the firm-specific CEO turnover decisions except through the channel of the firm's own bank loan intensity.

Following Ozelge and Saunders (2012), regional conditions of bank financing is measured by the multiplication between loan demand and loan supply. The loan demand is measured by firms' one-year lagged working capital deficit and capital expenses. The loan supply is measured with the survey data about bankers' attitudes towards the lending conditions in their local region. The three indexes, BankLoanApprIndex, MonPolPercIndex, and CashNetSupply are available in the CSMAR Survey Database. We use these six alternative measures of instrumental variables multiplying these two set of variables and then conduct 2-Staged Least Square (2SLS) estimations. We run the 2SLS estimations not only for the overall sample, but also respectively for the relationships with common ownership, for the SOEs and non-SOEs. The estimates are presented in Table 9.

	E-11 C1-	Firm	Туре	Common Ownership	
	Full Sample	Non-SOE	SOE	No	Yes
	(1)	(2)	(3)	(4)	(5)
Panel A: Second Stage					
IROA	-0.376**	-1.645**	-0.342*	-0.086**	-1.060**
	(-2.18)	(-2.103)	(-1.710)	(-2.071)	(2.035)
Loan Intensity	0.795	0.787*	1.233*	3.786***	1.324
	(1.550)	(1.693)	(1.851)	(2.586)	(1.043)
IROA * Loan Intensity	-0.168	-4.203**	-0.258	-9.847**	1.164**
	(-0.823)	(-1.989)	(-1.004)	(-1.996)	(2.466)
Stock volatility	-0.000	-0.002	0.001	-0.005	0.001
	(-0.210)	(-0.881)	(0.691)	(-1.608)	(1.021)
Firm size	-0.028	0.001	-0.080**	0.143**	-0.111*

Table 9 Instrumental Variables

January 2023

Vol.10, No.1

	(-1.058)	(0.033)	(-2.265)	(2.064)	(-1.835)
Market-to-book ratio	-0.004	-0.004	-0.018	-0.001	-0.002
	(-0.750)	(-0.815)	(-0.591)	(-0.162)	(-0.403)
Largest shareholder	0.234	0.659*	0.178	0.327	0.088
	(1.235)	(1.924)	(0.788)	(1.240)	(0.238)
Board size	-0.008	-0.042	-0.003	0.026	0.036
	(-0.237)	(-0.632)	(-0.051)	(0.486)	(0.714)
Independent director	-0.083	0.497	-0.264	-0.356	-1.026
	(-0.169)	(0.582)	(-0.443)	(-0.533)	(-0.959)
Duality	0.002	-0.116	0.158	-0.072	0.022
	(0.021)	(-1.089)	(1.364)	(-0.607)	(0.151)
Education	0.006	0.011	-0.013	-0.005	-0.105
	(0.183)	(0.230)	(-0.274)	(-0.113)	(-1.396)
Tenure	0.015*	0.000	0.026**	0.006	0.050***
	(1.726)	(0.027)	(2.350)	(0.510)	(2.750)

Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.112	0.101	0.321	0.176	0.181
Observations	5,248	2,138	3,074	2,433	1,658

Panel B: First Stage	Loan Intensity					
CapEx×BankLoanApprIndex	0.123**	0.033**	0.044**	0.028**	0.075*	
	(2.263)	(2.162)	(2.619)	(2.356)	(1.791)	
CapEx×MonPolPercIndex	0.274**	0.013**	0.119*	0.063**	0.207*	
	(2.225)	(2.027)	(1.724)	(2.347)	(1.956)	
CapEx×CashNetSupply	3.627**	0.027**	1.574*	0.757**	2.840**	
	(2.208)	(2.004)	(1.717)	(2.312)	(1.983)	
WC Deficit×BankLoanApprIndex	0.050***	0.051***	0.064***	0.004*	0.043***	
	(8.689)	(5.756)	(5.789)	(1.746)	(4.046)	
WC Deficit×MonPolPercIndex	0.118***	0.117***	0.142***	0.008*	0.106***	
	(9.159)	(5.996)	(5.423)	(1.751)	(4.538)	
WC Deficit×CashNetSupply	1.594***	1.588***	1.897***	0.118*	1.441***	
	(9.303)	(6.078)	(5.356)	(1.833)	(4.624)	
Stock volatility	-0.000	0.000	0.000**	-0.000	-0.000	

	(-0.191)	(0.096)	(2.180)	(-0.432)	(-0.257)
Firm size	0.018***	-0.002	0.021***	0.040***	0.025***
	(4.804)	(-0.197)	(7.665)	(12.639)	(7.459)
Market-to-book ratio	-0.007***	-0.007***	-0.013***	-0.002***	-0.003***
	(-8.989)	(-6.360)	(-5.780)	(-3.610)	(-3.813)
Largest shareholder	-0.100***	-0.053	-0.087***	-0.077***	-0.022
	(-3.569)	(-0.849)	(-4.430)	(-3.241)	(-0.864)
Board size	-0.001	-0.005	-0.001	0.003	-0.002
	(-0.282)	(-0.543)	(-0.311)	(0.570)	(-0.455)
Independent director	0.069	0.180	0.020	-0.074	0.116
	(0.903)	(1.041)	(0.380)	(-1.164)	(1.529)
Duality	-0.008	-0.000	0.029***	-0.001	-0.012
	(-0.665)	(-0.018)	(2.881)	(-0.091)	(-1.132)
Education	0.003	0.000	0.008**	-0.005	0.011**
	(0.627)	(0.009)	(1.991)	(-1.119)	(2.166)
Tenure	-0.002	-0.005	0.001	-0.001	0.001

	(-1.620)	(-1.568)	(1.135)	(-1.044)	(0.687)
Constant	-0.086	0.280	-0.136**	-0.515***	-0.314***
	(-1.013)	(1.395)	(-2.150)	(-7.024)	(-3.760)
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
F statistics	17.369	6.844	41.260	15.114	10.732
AR weak instrument test	60.90	26.65	84.10	8.15	9.10
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	5,248	2,138	3,074	2,433	1,658

This table reports the estimates of a probit model of forced CEO turnover with instrumental variables. Following Ozelge and Saunders (2012), loan intensity is instrumented by loan demand multiply loan supply. Loan demand is measured by lagged working capital deficit and capital expenses. Loan supply is proxied by BankLoanApprIndex, MonPolPercIndex, and CashNetSupply, which are proxies for bankers' attitudes towards the lending conditions of their local region. Panel A presents the estimates in the second stage and Panel B presents the estimates for the results in the first stage. All other variable definitions are in Appendix 1. Heteroscedasticity robust t-statistics are presented in parentheses, and are clustered at firm levels. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

Panel A of Table 9 presents the results of the second stage estimation and Panel B presents the results of the first stage estimation. The estimates of the first stage regressions in Panel B confirm our notion that the firm level bank loan intensity is positively associated with the regional conditions of bank financing. Specifically, the association is more pronounced when working capital deficit is used as the instrument to proxy for firms' demand for bank financing. These results are consistent with Peterson and Rajan (1994) that firms with more trade credit paid late are more likely in greater demand for bank financing¹⁰. In Panel A, the second stage results show similar patterns to the baseline results that the estimated level of bank loan intensity overall do not have significant effects on the performance-forced CEO turnover relationship (column 1), while for the bank relationships of non-SOEs, higher estimated bank loan intensity would increase the sensitivity between firm performance and the likelihood of forced CEO turnovers (column 2). More importantly, the results in columns (4) and (5) show that for the firms without common state ownership, loan intensity significantly increases the performance-forced CEO turnovers (-1.060+1.164=0.104, not statistically different from zero). Overall, these results are consistent with our main argument that it is the common state ownership that wipes out the disciplinary effect of bank loans on the CEO replacement decisions of underperforming firms.

6.2 Firms' bank loan terms following forced CEO turnovers

Do firms enjoy more favorable loan terms when they follow the discipline of the lending banks and force out the underperforming managers? On the one hand, CEO turnovers incur uncertainty to lenders about the new management team, which may increase the firms' borrowing costs (Pan et al. 2018), so the firms may face more stringent terms of bank loans. On the other hand, management uncertainty may be less of a concern in bank relationships where the bank has sufficient knowledge about the operations of the borrowing firm. This might be especially true when the bank relationship is under common ownership. It is possible that when firms force out the underperforming managers it is reasonable for the bank to believe that the borrower's performance may increase in the future. Thus, firms with forced CEO turnovers, the lending banks may punish the underperforming firms with stricter loan terms.

¹⁰ The data is not available for firms' trade credits that are paid late. Instead, we use firms' working capital deficit as the alternative to proxy for firms' demand for bank financing.

January 2023

Vol.10, No.1

To empirically answer the question about firms' borrowing conditions subsequent to forced CEO turnovers, we investigate firms' intensity in different types of loans. We examine loan intensity because as suggested in Peterson and Rajan (1994), bank discipline takes effect through the amount of loan issuances rather than through loan pricings. We construct two matched samples of firms and test the implication of CEO replacements for bank loan credits. The treated group includes firms with forced CEO turnovers while the control group includes the firms with no CEO turnovers in the same event year with the treated group. The firms in both groups should be in the same industry and are matched based on the log of total assets in the year before the CEO turnover. We measure the three years average of firms' bank loan intensity before and after each turnover event.

We present the changes in bank loan intensity following forced CEO turnovers in Table 10. In Panel A, we report the overall estimates irrespective of the state ownership. It shows that compared with the control group, in the three years following forced CEO turnovers, the treated group has reduced secured loan intensity but increased unsecured loan intensity. Also, the treated group's short-term loan intensity increases. In Panel B, we pin down the identity of firms that encounter these loan term changes.

The results in Panel B suggest that the reduction in secured loans and the increase in unsecured loans are driven by the bank relationships where the lender and the borrower are concurrently controlled by the same local government (columns 2 and 3). Similarly, following forced CEO turnovers, the SOE borrowers in general have significant drops in secured loan intensity while increases in unsecured loan intensity of almost the same magnitude. These results suggest that since the bank relationship is under common state ownership, there is much less uncertainty about the new management team. Therefore, there isn't evidence about tightened loan terms for firms with common state ownership. Instead, it is likely that state-owned banks follow the government's command and issue less strict loan terms after the SOEs fire the underperforming managers.

However, for firms with no common state ownership, there is some evidence that firms have increased intensity in short-term loans, and this effect is more pronounced when the lead lender is a joint-equity bank (column 4). To the extent that shorter loan maturity implies more frequent external monitoring and higher refinancing costs, this result supports Pan, Wang and Weisbach (2018) that due to the borrowers' increased information uncertainty after CEO turnovers, the lenders may issue stricter terms.
Table 10 Firms' bank loan intensity following forced CEO turnovers

Panel A: Loan change around a forced CEO turnover

	Loan intensity	Secured	Unsecured	Short	Long
Treated	0.105	-0.107	0.212	0.058	0.056
Control	0.087	-0.083	0.171	0.034	0.049
Difference	0.017	-0.025**	0.050^{***}	0.025***	0.007
	(1.485)	(-2.491)	(3.329)	(2.793)	(0.828)

Panel B: Firm types, bank types, and loan change

	Loan intensity difference	Secured	Unsecured difference	Short difference	Long difference
	(1)	(2)	(3)	(4)	(5)
Central Common	-0.089	-0.053	-0.044	-0.064	-0.008
	(0.061)	(0.049)	(0.061)	(0.044)	(0.042)
Local Common	-0.170	-0.019**	0.014**	-0.105	-0.081
	(0.123)	(2.098)	(2.123)	(0.089)	(0.084)
No State Common	0.007	0.076	0.034	0.030**	-0.039
	(0.040)	(1.032)	(0.040)	(2.029)	(0.027)
SOE	0.023	-0.032**	0.031**	0.013	-0.013
	(0.037)	(-2.030)	(2.037)	(0.027)	(0.025)

Joint Equity	0.030	0.031	0.001	0.059**	-0.033
	(0.038)	(0.030)	(0.038)	(2.028)	(0.026)
Local	0.020	0.001	0.001	-0.006	0.049
	(0.062)	(0.050)	(0.062)	(0.046)	(0.043)
Big Four	-0.052	0.076	-0.147	0.039	-0.003
	(0.076)	(0.061)	(1.076)	(0.055)	(0.051)
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Observation	491	490	490	488	488
Adj. R-squared	0.034	0.061	0.077	0.055	0.057

This table reports estimates of firms' changes in bank loan intensity following forced CEO turnovers. The outcome variables are loan intensity, secured loan intensity (secured), unsecured loan intensity (unsecured), short-term loan intensity (short), and long-term loan intensity (long). For every firm with forced CEO turnovers ("treated"), we find a firm without a CEO turnover ("control") but the firm has same likelihood of forced CEO turnovers in the same year. We apply the standard CRM to identify the control group. Panel A shows the overall difference between the treated group and the control group. Panel B shows estimates about the difference in bank loan intensity among groups of different state ownerships. Central (Local) Common indicates that the bank and the firm are both owned by the central (local) government. No State Common indicates that the bank and the firm do not share the same government as the ultimate owner. All variable definitions are in Appendix Table A1. Year and industry fixed effects are controlled. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

6.3 Firms' information uncertainty following forced CEO turnovers

One may concern that CEO turnovers may lead to increased uncertainty about the competence of the new management and there would be increased uncertainty about the firm's prospect. These uncertainties may increase the firms' borrowing costs (Pan, Wang and Weisbach 2018). For example, Deng et al (2019) examine US firms and find that firms with increased uncertainty would experience worsened bank loan covenants. To examine whether such relations may also occur to firms in China, following Dechow and Dichey (2002), we calculate firms' information uncertainty measured with the accrual estimation errors around CEO turnovers. Panel A of Table 11 presents the t-statistics for the change in information uncertainty specifically for the bank relationships under state ownership.

Table 11 Firms' information uncertainty following forced CEO turnovers

	Δ Information	on uncertainty
	Mean	Median
Full sample	0.0014	0.0003
Forced	0.0069	0.0037
Voluntary	0.0066	0.0014
Difference (Forced – No turnover)	0.0003	0.0023
	(0.385)	(0.757)
Matched	0.0062	0.0024
Difference (Forced - Matched)	0.0007	0.0013
	(0.808)	(0.938)

Panel A Change in information uncertainty from pre- to post- turnover periods

	Δ Info. U	Jncertainty	DID in information uncertainty (Forced Voluntary)
	Forced	Voluntary	DiD in mormation uncertainty (Foreed - Voluntary)
State-owned banks	0.018**	0.005	0.017**
	(2.399)	(0.704)	(2.425)
SOEs	0.012*	0.008	0.012*
	(1.652)	(1.335)	(1.663)
State-owned banks	-0.017	-0.013	-0.018
× SOEs	(-1.408)	(-1.398)	(-1.296)
Constant	-0.004	0.003	-0.010*
	(-0.777)	(0.649)	(-1.845)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adj. R-squared	0.082	0.070	0.093
Observations	429	745	429

Panel B Change in information uncertainty by state ownership

.

This table reports estimates about firms' information uncertainty around CEO turnovers. Following Dechow and Dichev (2002), information uncertainty is measured with the accrual estimation errors. Δ Information Uncertainty is defined as the change of information uncertainty in the one year around CEO turnovers. For every forced CEO turnover ("forced"), we match a firm with a voluntary CEO turnover ("matched"). Student's t-test is implemented to examine if the two mean values are equal, Wilcoxon rank-sum test is implemented to examine if the two median values are equal on unmatched data, and Wilcoxon signed-rank test is implemented to examine if the two the medians are equal on the matched data. The

probability of rejecting the equality is reported in parentheses in panel A and the t values are reported in panel B. The standard errors of coefficients are clustered at the firm level. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

In terms of the changes in information uncertainty, Panel A shows insignificant differences between the firms with forced CEO turnovers and those with voluntary CEO turnovers. This result suggests that having forced CEO turnovers do not induce more information uncertainty than having voluntary CEO turnovers. Panel B shows that for bank relationships under common state ownership, there is no significant change in the firms' information asymmetry. This insignificance should not be surprising because it is possible that when both the bank and the firm are concurrently controlled by the same state government, they are able to have access to more information about the successor of the firm. After all, the upcoming managers ought to be politically appointed by the government. Then, the absence of information uncertainty under common state ownership should not affect the loan covenants.

In addition, there is some evidence that firms would have increased information uncertainty if the lending relationship is between a state-owned and a non-state-owned entity. Specifically, for non-SOE borrowers with forced CEO turnovers, their increases in information uncertainty would be 1.8% more than the increases in SOE borrowers. For non-state-owned banks, the increases in the borrowers' information uncertainty would be 1.2% higher for SOE borrowers than for non-SOEs. One possible explanation of these differences is that, the source of information uncertainty following forced CEO turnovers in China is about the sustainability of bank relationship between state-owned and non-state-owned parties. The forced CEO turnovers may in nature be a disruption to the political connections embedded in the bank relationship, which might be particularly important for the parties operated in the Chinese capital markets.

6.4 Alternative measures of borrowers' performance

This paper uses the industry-adjusted ROA to proxy for firms' underperformance. In Table 5, we show similar results when firms' underperformance is represented by the firms' bankruptcy risk. Following Nini, Smith and Sufi (2012) that creditors would have monitoring incentives even when borrowers are well outside the state of financial distress, we use four alternative measures to define firms' underperformance

Vol.10, No.1

as the placebo tests, i.e., whether the firm has one-year or two-year consecutively negative ROA, and whether the firm has one-year or two-year consecutively negative stock returns. The results are presented in Table 12.

The estimates in Table 12 show that when firm performance is measured with ROA, for the borrowers with positive ROA (columns 1 and 3), there is no significant relation between firm performance and forced CEO turnovers, and there is no effect of bank loan intensity on this relation either. But for the borrowers with negative ROA (columns 2 and 4), these firms have greater chance of replacing the underperforming CEOs, and such relations become more pronounced when the firm has greater bank loan intensity. The effect of bank loan intensity on the performance – forced CEO turnover sensitivity remains similar when firm's underperformance is represented by stock returns. These results overall confirm the robustness of the baseline results. Note that the disciplinary effect of bank loans on the likelihood of forced CEO turnovers is significant only when the fixed effects of common ownership of the bank and the firm are controlled. In our unreported analysis, the coefficients of the interaction term become insignificant when we do not control for the common ownership in the bank-firm relationships.

	Forced CEO Turnover									
Performance Measures	One-year ROA		Two-year ROA		One-year RET		Two-year RET			
	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative		
-	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		
Performance	0.445	1.916***	0.319	2.397***	-0.871***	4.820***	-0.903***	4.255***		
	(1.127)	(7.348)	(0.747)	(6.345)	(-3.295)	(3.640)	(-3.239)	(3.122)		
Loan intensity	0.044	0.832***	0.018	0.767***	-0.000	1.952***	0.000	2.059***		

Table 12 Alternative Measures of Borrowers' Performance

	(0.649)	(4.688)	(1.112)	(2.885)	(-0.092)	(3.309)	(0.076)	(3.553)
Perf. × Loan Intensity	1.885	0.476***	0.737	0.950**	-0.023	4.594**	-0.024	5.694*
	(0.725)	(2.766)	(1.224)	(1.980)	(-1.498)	(1.993)	(-1.552)	(1.934)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Common Ownership FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Log Likelihood	-1150.41	-3207.94	-1443.03	-1950.02	-2723.60	-656.89	-2746.49	-642.11
Observations	4,079	4,024	3,976	2,539	5,023	1,126	5,077	1,072

This table reports the estimates of the standard Cox CRM model under forced CEO turnover with alternative measures of the borrowers' performance. Column (1)/(2) includes firms with one-year positive/negative ROA. Column (3)/(4) includes firms with positive/negative ROA in two consecutive years. Column (3)/(4) includes firms with one-year positive/negative annual returns. Column (7)/(8) includes firms with positive/negative annual returns in two consecutive years. All other variable definitions are in Appendix 1. The control variables are the same as the ones included in the baseline regressions (see Table 3). The fixed effects of industry, year, and common state ownership in the lending relationships are controlled. Heteroscedasticity robust t-statistics are presented in parentheses, and are clustered at firm levels. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

7. Conclusion and Discussion

Regarding the role of banks in disciplining underperforming borrowers, the existing literature documents that state ownership would negatively interfere with the efficiency of bank monitoring. This paper extends this literature through the lens of the ownership structure underlying the bank relationship. Specifically, we examine whether common state ownership between the bank and the firm compromise the monitoring mechanism during the lending process.

This paper has four main findings. First, firms' reliance on bank financing increases the sensitivity between firm performance and forced CEO turnovers, but this effect does not hold if the bank and the firm share common state ownership. Second, the weakening effect of common state ownership is more pronounced among the firms with political connections, with a banker in the boardroom, and with ownership in the banks' equity. Third, the inefficiency induced by common state ownership can be partly offset by strict loan covenants such as short maturity and collateralization. Finally, following forced CEO turnovers, the underperforming borrowers tend to have less stringent loan terms than those without CEO turnovers, suggesting that underperformers may use manager replacements to sustain the borrowing conditions in the bank relationship.

The results in this paper shed light upon a series of issues regarding the efficiency of bank discipline in the capital markets that are deeply intertwined with government interference. For example, besides CEO turnover decisions, would bank discipline also be reflected in firms' other governance-related operations? Using earnings management as one example, we calculate firms' levels of earnings management following Jones (1991) and Dechow et al (1995) and report the estimates of these additional tests in Appendix Table A8. The results show that when firms' realized earnings beat the analyst forecast, bank loans do not seem to have significant influence on firms' earnings management. But when firms perform poorly (i.e., Meet_exp=0), bank loan intensity significantly decreases earnings management, which is consistent with the findings using US data by Ahn and Choi (2009). However, these coefficients are significant only when the firms and the banks do not share common state ownership. These results are consistent with the notion that banks have disciplinary motives on the underperforming borrowers, but these motives are reduced under common state ownership.

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Appendix 1 Variable Definitions

This table includes the detailed definitions of key variables in the regression models.

Variable	Definition
Dependent variable	
Forced turnover	Equals 1 if 1) the CEO was dismissed, assigned to a lower position (i.e., demotion), or resigned because of legal dispute; 2) the departing CEO is younger than 60 for males and 55 for females, and the announcement does not report that the CEO died, left due to poor health, or accepted another position elsewhere or within the firm; or 3) the CEO "retires" but leaves the job within six months of the "retirement" announcement. The CEO turnovers in the third group are reclassified as voluntary if the incumbent takes a CEO position in another firm or departs for business reasons that are unrelated to the firm's activities, 0 otherwise.
Explanatory variables	
Loan Intensity	Bank loan intensity, the ratio of bank loan amount to lagged total assets
Secured (Unsecured)	Proportion of secured (unsecured) loan amount to lagged total assets
Short (Long)	Proportion of short-term (long-term) loan amount to lagged total assets, i.e. (short-/long-term) loans have a maturity less (more) than one year).
IROA	Industry adjusted EBIT over total assets, i.e. (EBIT – industry average of EBIT) / total assets. Industry classifications follows the GTA Database.
SOE Borrower	An indicator of one if the borrowing firm is ultimately owned by a government entity, zero otherwise.
State-owned Banks	An indicator of one if the lead bank lender of the borrowing firm is either a <i>Big-Four</i> bank, or a commercial bank ultimately owned by a local state government, zero otherwise. The lead bank lender is defined as the bank that takes up the biggest portion of the firm's bank loans.
Stock volatility	Standard deviation of a firm's daily stock returns (winsorized at the 1% and the 99% level) in the 12 months before CEO turnovers
Firm Size	Natural logarithm of total assets
Leverage	The ratio of total liabilities over total assets
MB	Market-to-Book ratio. Total book value of liabilities plus the market value of equity over the book value of total assets
SOE	Whether the actual controller of the company is a state-owned enterprise or state-owned organization
Largest shareholder	Proportion of equity ownership held by the largest shareholder
Board size	Natural logarithm of number of directors on board
Independent director	Proportion of independent directors on board
Tenure	Annualized duration of CEO in his or her position
Education	Categorical value ranging from 1 to 5; increases with level of education
Duality	Equals 1 if CEO is also chairman of the board, 0 otherwise.

Appendix Tables

Appendix Table A1 CEO Forced Turnovers in Financially Distressed Firms

Using Z-score as an alternative of firm performance, this table reports the estimates about the effects of bank loan intensity on the likelihood of a distressed firm replacing its managers. Firms' financial distress is measured with the Z-score developed by Altman (1968). Column (1) reports the results without controlling for the bank and the borrowing firm's state ownership. Column (2) reports the results controlling for the firm × bank state ownership. Column (3) reports the estimates about the fraction of secured loans. Column (4) reports the estimates about the fraction of short-term loans. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled in all four columns. Firm × Bank state ownership is controlled in columns (2) - (4). The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

		CEO Force	d Turnover	
	Overall	Overall	Secured	Short
Z score dummy	1.979***	6.563*	6.503**	-6.409
	(3.446)	(1.698)	(2.425)	(-1.068)
Loan intensity	0.005	1.197***	1.119***	1.326***
	(0.881)	(3.336)	(3.083)	(2.913)
Z score dummy × Loan intensity	-0.358	6.814**	6.575***	6.077**
	(1.007)	(1.990)	(2.813)	(2.165)
Stock volatility	0.002**	0.005***	0.002	0.006***
	(2.235)	(2.785)	(1.552)	(2.795)
Firm size	-0.172***	-0.317***	-0.234***	-0.295***
	(-2.666)	(-2.837)	(-3.209)	(-2.588)
Market-to-book ratio	-0.009	-0.136	-0.002	-0.196
	(-0.911)	(-1.457)	(-0.214)	(-1.647)
Largest shareholder	0.608	0.955	0.606	0.802
	(1.330)	(1.047)	(1.059)	(1.445)
Board size	-0.387	-0.012	-0.322	-0.027
	(-1.584)	(-0.435)	(-1.555)	(-0.360)
Independent director	0.911	2.208	0.839	2.153
	(0.707)	(1.254)	(0.671)	(1.253)
Duality	-0.032	0.251	-0.066	0.320
	(-0.171)	(0.854)	(-0.333)	(1.210)

Education	0.045	0.183	0.179	0.219
		· · · ·		
Firm × Bank State-owned FE	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	4,128	2,012	4,128	2,012
Log Likelihood	-2295.32	-1061.13	-2254.18	-1033.25

Appendix Table A2 The Effect of Bank Loan Intensity on CEO Voluntary Turnover

This table reports the estimates of the effects of bank loan intensity on the CEO voluntary turnovers. The effects are estimates using the standard Cox CRM model. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

	CEO Voluntary turnover							
	(1)	(2)	(3)					
IDOA	0 402**	0 202**	0.260**					
IROA	-0.403**	-0.392**	-0.369**					
T 1 <i>1 1</i>	(-2.015)	(-2.119)	(-2.040)					
Loan intensity	-0.182	-0.123	-0.121					
	(-0./40)	(-0.614)	(-0.602)					
IROA × Loan intensity	0.052	0.029	0.028					
	(0.724)	(0.488)	(0.472)					
Stock volatility	0.000	0.000	0.001					
	(0.115)	(0.333)	(0.480)					
Firm size	-0.217***	-0.258***	-0.249***					
	(-6.096)	(-7.265)	(-6.856)					
Market-to-Book Ratio	-0.005	-0.005	-0.005					
	(-1.507)	(-1.641)	(-1.555)					
Largest shareholder		1.427***	1.442***					
		(5.151)	(5.222)					
Board size		0.087***	0.087***					
		(4.470)	(4.458)					
Independent director		0.944	0.917					
		(1.334)	(1.296)					
Duality			0.196**					
			(2.070)					
Education			-0.005					
			(-0.104)					
Firm × Bank State-owned FE	Yes	Yes	Yes					
Year FE	Yes	Yes	Yes					
Industry FE	Yes	Yes	Yes					
Observations	8,140	8,140	8,140					
Log Likelihood	-9981.45	-9948.52	-9945.00					

Appendix Table A3 Estimates of multinomial logit model

This table reports the estimates of a multinomial logit model. The model estimates the effects of bank loans on the sensitivity between a firm's performance and CEO turnovers. The logit regressions redo the same tests covered in Tables 3. Columns (1) and (2) examine the different effects of bank loans on forced CEO turnovers vs. voluntary ones. Columns (3)-(6) examine the role of bank loan intensity in SOEs vs. non-SOEs. Columns (7) - (14) examine the effect of bank loan intensity on CEO turnovers when the borrowing firm has different types of lead lending banks. Panel A (B, C) measures loan intensity using the aggregate (secured/short-term) amount of bank loans scaled by the firm's one-year lagged total assets. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

	Full S	ample		Firm 7	Types				Bank Type					
			Non-	SOEs	S	DEs	Big	Four	Joint	Equity	Loca	l Bank	Foreig	n Bank
	Forced	Voluntar	Forced	Voluntar	Forced	Voluntar	Forced	Voluntar	Forced	Voluntar	Forced	Voluntar	Forced	Voluntar
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Panel A: Loan	Intensity													
IROA	-1.263**	-0.358*	-2.952**	-0.273	0.092	-0.523	-1.197	-0.899*	-4.021*	0.182	-2.025	-2.335**	-3.951**	1.952
	(-2.798)	(-1.786)	(-3.582)	(-1.184)	(0.146)	(-0.823)	(-0.800)	(-1.652)	(-1.915)	(0.964)	(-0.911)	(-2.213)	(-2.406)	(1.165)
Loan	0.004	-0.221	1.198***	-0.074	0.085	-0.929**	0.014	-0.547*	0.752*	0.182	1.632	0.384	-0.255	-2.148*
	(0.700)	(-1.290)	(4.181)	(-0.531)	(1.342)	(-2.541)	(0.480)	(-1.750)	(1.710)	(0.674)	(0.978)	(0.456)	(-0.192)	(-2.123)
IROA × Loan	-0.033	0.025	-0.907**	-0.006	3.514	3.291	0.691	0.777	-3.144	0.459	3.973	-1.344	-5.026*	2.525*
	(-1.741)	(0.558)	(-2.644)	(-0.164)	(1.428)	(1.049)	(0.580)	(0.723)	(-1.232)	(0.298)	(1.148)	(-0.262)	(-1.854)	(1.959)
Log	-549	94.16	-363	6.94	-18	02.73	-219	93.94	-126	6.76	-22	6.35	-454	4.83
Observations	81	46	53	83	2	763	32	247	19	62	3	82	6	57
Panel B: Secur	ed Loan Int	ensity												
IROA	-1.914**	-0.262	-2.902**	-0.121	0.103	-0.495	-0.854	-0.813*	-6.006**	0.087	-3.555*	-1.827	-4.022**	2.019
	(-3.055)	(-1.361)	(-3.493)	(-0.602)	(0.171)	(-0.781)	(-0.685)	(-1.746)	(-3.632)	(0.512)	(-2.162)	(-1.564)	(-2.205)	(0.969)
Secured	-0.008	-0.356*	1.331***	-0.184	0.112	-0.975**	-0.004	-0.432	0.833*	0.149	1.666	0.518	0.432	-2.434**
Secured	(-1.002)	(-1.677)	(5.030)	(-0.807)	(1.009)	(-2.169)	(-0.260)	(-1.325)	(1.659)	(0.448)	(1.032)	(0.574)	(0.462)	(-2.177)
IROA×secure	-0.467*	0.410	-0.750**	0.629	4.631	5.264	0.015	0.472	-1.621	2.194	1.656	-1.911	-5.132*	4.291
d	(-1.787)	(1.382)	(-2.147)	(1.734)	(1.066)	(0.964)	(0.027)	(0.605)	(-0.722)	(1.222)	(0.550)	(-0.309)	(-1.703)	(1.302)
Log	-549	00.54	-363	2.01	-17	99.83	-218	84.27	-126	0.57	-22	4.32	-45	8.77
Observations	81	46	53	83	2'	/63	33	347	19	62	3	82	63	57

Panel C: Short-term Loan Intensity

IROA	-1.940**	-0.317	-2.931**	-0.242	0.162	-0.522	-1.192	-0.784	-4.207*	0.209	0.017	-3.006**	-5.317**	1.360
	(-2.802)	(-1.513)	(-3.742)	(-1.064)	(0.260)	(-0.825)	(-0.722)	(-1.621)	(-1.918)	(1.119)	(0.013)	(-2.419)	(-2.901)	(0.903)
Short	0.542***	-0.214	1.261***	-0.176	1.819**	-0.522	0.981**	-0.402	0.805	0.170	1.026	-0.086	0.346	-1.515
	(2.707)	(-1.255)	(4.468)	(-1.000)	(3.429)	(-0.949)	(2.781)	(-1.068)	(1.634)	(0.595)	(0.489)	(-0.085)	(0.359)	(-1.257)
IROA × Short	-0.133**	0.033	-0.891**	0.018	0.743**	2.546	0.249	1.022	-3.274	-1.554	7.134*	0.939	-4.778**	2.131
	(-2.322)	(0.667)	(-2.296)	(0.385)	(2.233)	(0.693)	(1.098)	(1.069)	(-1.310)	(-0.524)	(1.825)	(0.173)	(-2.092)	(1.391)
Log	-548	8.85	-363	5.96	-179	07.29	-218	9.17	-126	5.46	-22	4.43	-451	1.94
Observations	81	46	53	83	27	63	33	47	19	62	3	82	65	57

Appendix Table A4 Banks of different state ownerships

This table reports the estimates of the effect of bank loan intensity in subsamples by the types of the firm's lead lending bank. Firms' lead lending bank is defined as the bank corporation with the largest fraction of bank loans issued to the borrowing firm. Column (1) shows the estimates for the firms whose lead lender is the *Big Four*. Column (2) shows the estimates if the main lenders are joint-equity banks (*Joint*). Similarly, it is the local state banks (*Local*) and foreign banks (*Foreign*) in columns (3) and (4). All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

Overall Loan	Big Four	Joint	Local	Foreign
-	(1)	(2)	(3)	(4)
IROA	-6 513***	_7 779***	-9 270	-4 106***
interv	-0.515	(-4.226)	(-1.629)	(-2.980)
Loan Intensity	-0.004	0.332	1 582	-1 133
Loan intensity	-0.004 (-0.754)	(0.686)	(0.654)	(-1.109)
$IROA \times I$ can Intensity	-0.026	-3 551**	(0.034)	-3 985*
ICON ~ Loan Intensity	(-0.480)	(-2.090)	(0.369)	(-1.803)
Stock volatility	0.002	0.002	(0.30)	0.010***
Stock volatility	(0.615)	(0.937)	(1,710)	(3.474)
Firm size	(0.013)	(0.937)	0.248	-0.338**
	(-1.840)	(-0.821)	(0.789)	-0.338
Market to Book Ratio	(-1.8+0)	-0.086	0.127***	-0.300**
Market-10-BOOK Katio	(0.382)	(-1.265)	(3.189)	-0.300
SOF	(0.382)	0.067	0.871	(-2.337)
SOE	(0.003)	(0.282)	(1.235)	(2.408)
Largest shareholder	(0.993)	(0.282)	(-1.233)	(-2.498)
Largest shareholder	(2,502)	(0.251)	-3.132	$(1.060)^{\circ}$
Doord size	(2.393)	(0.231)	(-1.308)	(1.940)
Board Size	-0.042	-0.004	(0.222)	-0.243
In daman dant dinaatan	(-0.410)	(-0.040)	(0.222)	(-1.420)
Independent director	0.027	0.362	1.369	-1.514
Dualita	(0.018)	(0.188)	(0.340)	(-0.488)
Duanty	-0.106	0.293	0.040	-0.414
	(-0.4/5)	(1.126)	(0.041)	(-1.205)
Education	0.119	0.018	1.023	-0.108
	(1.198)	(0.142)	(1.562)	(-0.594)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	3,345	1,960	381	657
Log likelihood	-1652.07	-860.93	-113.01	-476.62

Appendix Table A5 Borrowers of different state ownerships

This table reports the estimates of the effect of bank loans in state-owned enterprises (SOEs) vs. non-SOEs. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

	Forced CEO Turnover		
	Non-SOEs	SOEs	
	(1)	(2)	
IROA	-1.145***	-0.439	
	(-4.977)	(-0.358)	
Loan intensity	0.339***	-0.010	
	(3.841)	(-1.458)	
IROA × Loan intensity	-0.138***	-0.139	
	(-2.921)	(-0.639)	
Stock volatility	0.005***	0.002	
	(3.196)	(0.925)	
Firm size	-0.186***	-0.220***	
	(-3.394)	(-2.776)	
Market-to-Book Ratio	-0.016	-0.066	
	(-1.516)	(-0.828)	
Largest shareholder	1.023**	0.250	
	(1.994)	(0.593)	
Board size	0.040	-0.150	
	(0.823)	(-1.040)	
Independent director	2.424*	-0.628	
	(1.654)	(-0.565)	
Duality	-0.233	0.255	
	(-1.482)	(1.099)	
Education	0.084	0.096	
	(1.199)	(0.939)	
Year FE	Yes	Yes	
Industry FE	Yes	Yes	
Observations	5,378	2,762	
Log Likelihood	-2920.38	-1494.25	

Appendix Table A6 Common Ownership and Different Types of Lead Bank Lenders

This table reports the results about the effect of loan intensity on CEO forced turnovers when the lead bank lender is of different types of state ownership. Columns (1) and (3) include borrowers that do not share common ownership with the firms' lead bank. Columns (2) and (4) include borrowers that do. *Bankruptcy Risk*, is an indicator of one if a firm is highly probable to default. A firm's bankruptcy risk is measured with the Z score (Altman 1968) and also the O score (Ohlson 1980) following Hillegeist et al (2004). A firm is likely to go bankrupt if the Z-score is below 0.8 or the O-score is below 2.8. All variable definitions are described in Appendix Table A1. Year and industry fixed effects are controlled in all columns. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

	Forced CEO Turnover				
Measure of Bankruptcy Risk	Z-Sc	core	O-Score		
Common Ownership	No	Yes	No	Yes	
	(1)	(2)	(3)	(4)	
Bankruptcy risk	0.979***	0.563*	0.503**	0.409*	
	(3.446)	(1.698)	(2.425)	(1.680)	
Big Four bank \times Bankruptcy risk	0.069**	-0.290	0.045**	-0.031	
	(2.165)	(-0.253)	(2.166)	(-0.044)	
Joint-equity bank \times Bankruptcy risk	0.814**	0.305**	0.575***	0.177**	
	(1.990)	(2.488)	(2.813)	(2.161)	
Local bank \times Bankruptcy risk	0.090*	-0.269	0.064*	-0.019	
	(1.750)	(-0.215)	(1.677)	(-0.017)	
Foreign bank × Bankruptcy risk	0.038**	0.013*	0.032*	0.007	
	(2.073)	(1.705)	(1.831)	(1.418)	
Big Four bank	0.135	-0.414	0.056	-0.821	
	(0.527)	(-1.518)	(0.251)	(-1.523)	
Joint-equity bank	-0.083	-0.161	-0.100	-0.203	
	(-0.493)	(-0.740)	(-0.547)	(-0.874)	
Local bank	0.237	-0.594	0.041	-0.686	
	(0.857)	(-1.238)	(0.135)	(-1.326)	
Foreign bank	-0.032	-0.002	-0.021	-0.002	
	(-0.244)	(-0.036)	(-0.198)	(-0.079)	
Controls	Yes	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes	
Industry FE	Yes	Yes	Yes	Yes	
Observations	2012	4128	2012	4128	
Log Likelihood	-2265.72	-1030.95	-2278.24	-1031.16	

Appendix Table A7 The Effect of Political Turnovers

This table reports the estimates about the effect of bank loan intensity over forced CEO turnovers considering the political turnovers of provincial governors. This subsample test only includes the firm years when there is a governor turnover on the province level. All other variable definitions are in Appendix 1. Heteroscedasticity robust t-statistics are presented in parentheses, and are clustered at firm levels. ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels.

	CEO Forced Turnover			
	Overall	Secured	Short	
	(1)	(2)	(3)	
IROA	-7.966***	-7.501***	-7.142***	
	(-6.939)	(-6.265)	(-5.893)	
Loan Intensity	1.275***	1.271***	1.361***	
	(4.300)	(3.989)	(3.456)	
IROA × Loan Intensity	-3.959	-7.972**	-5.522*	
	(-0.999)	(-2.244)	(-1.839)	
SOE Borrower	-0.061	-0.052	-0.075	
	(-0.580)	(-0.431)	(-0.478)	
State-owned Banks	-0.535	0.419	-0.506	
	(-1.056)	(0.137)	(-1.036)	
Stock volatility	0.002	0.002	0.002	
	(0.844)	(0.684)	(0.950)	
Firm size	-0.092*	-0.092	-0.092	
	(-1.671)	(-1.638)	(-1.603)	
Market-to-Book Ratio	-0.014	-0.013	-0.014*	
	(-1.593)	(-1.524)	(-1.703)	
Largest shareholder	0.968***	0.926***	0.968***	
	(2.789)	(2.625)	(2.773)	
Board size	-0.042	-0.044	-0.045	
	(-0.610)	(-0.627)	(-0.644)	
Independent director	0.732	0.725	0.697	
	(0.829)	(0.820)	(0.789)	

January 2023

Vol.10, No.1

Duality	-0.034	0.006	-0.037
	(-0.231)	(0.040)	(-0.255)
Education	0.001	0.000	-0.000
	(0.022)	(0.002)	(-0.003)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	5,166	5,166	5,166
Log Likelihood	-3050.01	-3046.42	-3050.61

Appendix Table A8 Borrowers' Earnings Management

This table reports the estimates of the bank loans' effects on the borrowers' earnings management. The tests follow the same specification as in the baseline regressions, except that firms' performance is measured with *MissExp* is an indicator that equals one if the realized earning per share (EPS) is below the median of the analyst forecasts and zero otherwise. Earning management is calculated using the modified Jones model (Jones 1991, Dechow et al 1995). Year and industry fixed effects are controlled. The standard errors of coefficients are clustered at firm levels. ***, **, and * indicate the coefficient significance at the 1%, 5%, and 10% levels.

	Earnings Management			
Common Ownership	No	Yes		
-	(1)	(3)		
MissExp	-0.001	-0.001		
	(-0.056)	(-0.054)		
Loan Intensity	-0.057***	-0.038		
	(-4.605)	(-1.183)		
MisssExp ×Loan Intensity	-0.057***	0.042		
	(-4.595)	(0.738)		
SOE Borrower	0.156	-0.028		
	(1.035)	(-0.423)		
State-owned Banks	-0.535	0.049		
	(-1.056)	(0.137)		
Stock Volatility	-0.005**	-0.005**		
	(-2.179)	(-2.209)		
Firm Size	-0.002**	-0.002**		
	(-2.863)	(-2.903)		
Market-to-Book ratio	-0.009***	-0.009**		
	(-2.969)	(-2.913)		
Largest Shareholder	0.032**	0.031*		
	(2.194)	(2.084)		
Board Size	-0.003***	-0.003***		
	(-3.089)	(-3.153)		
Independent Director	-0.067*	-0.066*		
	(-1.867)	(-1.830)		
Duality	0.014***	0.014***		
	(3.861)	(3.877)		
Education	0.004	0.004		
	(1.345)	(1.333)		
Year FE	Yes	Yes		
Industry FE	Yes	Yes		
Observations	4,084	4,084		
R-squared	0.045	0.046		

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