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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 China's th Five-Year Plan

CPC Plenum Concludes, Adopting Recommendations for China's 15th Five-Year Plan*

BY GLOBAL TIMES

The 20th Central Committee of the Communist Party of China (CPC) convened its fourth plenary session in Beijing from Monday to Thursday.

Participants at the session deliberated over and adopted the Recommendations of the CPC Central Committee for Formulating the 15th Five-Year Plan for Economic and Social Development, according to a communique of the session released on Thursday.

The Political Bureau of the CPC Central Committee presided over the meeting. Xi Jinping, general secretary of the CPC Central Committee, delivered important addresses, according to the communique.

The participants heard and discussed a report presented by Xi on the work of the Political Bureau.

Xi also delivered explanatory remarks on the draft recommendations.

At the session, the CPC Central Committee fully affirmed the work of the Political Bureau since the third plenary session of the 20th CPC Central Committee.

China is now on the verge of accomplishing the major objectives and tasks of the 14th Five-Year Plan, according to the communique.

Participants at the session gave a highly positive assessment of China's major development achievements during the 14th Five-Year Plan period (2021-2025), which has marked a momentous and extraordinary period in the country's development.

The 15th Five-Year Plan period (2026-2030) will be critical as the country works to reinforce the foundations and push ahead on all fronts toward basically achieving socialist modernization by 2035, and it will thus serve as a key link between the past and the future, according to the communique.

At present, China remains in a phase of development where strategic opportunities exist alongside risks and challenges, while uncertainties and unforeseen factors are rising.

"All of us in the Party must acquire a deep understanding of the decisive significance of establishing Comrade Xi Jinping's core position on the Party Central Committee and in the Party as a whole and of establishing the guiding role of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era," said the communique.

At the session, the CPC Central Committee established the following guiding principles for economic and social development during the 15th Five-Year Plan period: upholding the Party's overall leadership; putting the people first; pursuing high-quality development; comprehensively deepening reform; promoting interplay between an efficient market and a well-functioning government; and ensuring both development and security.

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* Published: Oct 23, 2025 05:00 PM

The CPC Central Committee also set the following major objectives for the 15th Five-Year Plan period: significant advancements in high-quality development; substantial improvements in scientific and technological self-reliance and strength; fresh breakthroughs in further deepening reform comprehensively; notable cultural and ethical progress across society; further improvements in quality of life; major new strides in advancing the Beautiful China Initiative; and further advances in strengthening the national security shield.

China should build a modernized industrial system and reinforce the foundations of the real economy, said the communique.

The country should achieve greater self-reliance and strength in science and technology and steer the development of new quality productive forces.

It should build a robust domestic market and work faster to foster a new pattern of development, said the communique.

China should move faster to develop a high-standard socialist market economy and boost the momentum for high-quality development.

The country should promote high-standard opening up and create new horizons for mutually beneficial cooperation.

It should accelerate agricultural and rural modernization and take solid steps to advance all-around rural revitalization.

China should refine its regional economic layout and promote coordinated regional development, according to the communique.

The country should inspire the cultural creativity of the entire nation and foster a thriving socialist culture.

China should work harder to ensure and improve public well-being and promote prosperity for all, said the communique.

The country should accelerate the green transition across the board in an effort to build a Beautiful China.

It should modernize its national security system and capacity and advance the Peaceful China Initiative to a higher level.

China should work to achieve the centenary goals of the People's Liberation Army on schedule and modernize national defense and the armed forces, according to the communique.

The whole Party and all Chinese people should be united in a concerted endeavor to fulfill the 15th Five-Year Plan.

Studying and implementing the guiding principles from this plenary session represent a major political task for the entire Party and nation both at present and in the period to come.

“To run the country well, we must first run the Party well; only a Party that is thriving can make our country strong,” said the communique.

Participants at the session carried out an analysis of the present situation and the tasks China faces. It was highlighted that the country must remain firmly focused on accomplishing this year's targets for economic and social development.

The session decided to add Zhang Shengmin as a vice chairman of the CPC Central Military Commission (CMC), according to the communique.

The session decided in accordance with the Party Constitution that empty seats on the Central Committee will be filled by alternate members Yu Huiwen, Ma Hancheng, Wang Jian, Wang Xi, Wang Yonghong, Wang Tingkai, Wang Xinwei, Wei Tao, Deng Yiwu, Deng Xiuming and Lu Hong.

At the session, a call was issued to the whole Party, the entire military, and Chinese people of all ethnic groups to rally more closely around the Party Central Committee with Xi at its core, work hard together toward the goal of basically realizing socialist modernization, and continue breaking new ground in the drive to build a great country and advance national rejuvenation on all fronts through Chinese modernization.

China Holds Central Economic Work Conference to Plan for 2026*

BY GLOBAL TIMES

The annual Central Economic Work Conference was held in Beijing from Wednesday to Thursday as Chinese leaders decided priorities for the economic work in 2026.

Xi Jinping, general secretary of the Communist Party of China Central Committee, Chinese president and chairman of the Central Military Commission, delivered an important speech at the conference.

In his speech, Xi reviewed the country's economic work in 2025, analyzed the current economic situation and arranged next year's economic work.

As the 14th Five-Year Plan (2021-2025) is set to approach a successful conclusion, the meeting noted that over the past five years, China has effectively navigated various shocks and challenges, and achieved new major accomplishments in the cause of the Party and the country.

It is necessary to fully tap the economic potential, continue to pursue both policy support and reform and innovation, ensure both market vitality and effective regulation, combine investment in physical assets with investment in human capital, and respond to external challenges by strengthening internal capabilities, the meeting said.

Noting that there are still long-standing and new challenges in China's economic development, and the impact of changes in the external environment has deepened while risks and hidden dangers persist in some key areas, the meeting said that these issues can be resolved through efforts, and the underlying conditions and fundamental trends sustaining China's long-term economic growth remain unchanged.

The conference stressed the need to fully and faithfully apply the new development philosophy, move faster to forge a new development paradigm and focus on promoting high-quality development.

China will adhere to the general principle of pursuing progress while ensuring stability, better coordinate domestic economic work with struggles in the international economic and trade arena, and ensure both development and security.

The country will implement more proactive and impactful macroeconomic policies, formulate more far-sighted, more targeted and better-coordinated policies, continuously expand domestic demand and optimize supply, and develop new quality productive forces according to local conditions.

Efforts will be made to develop a unified national market and continuously prevent and defuse risks in key areas. It is imperative to secure the steady development of employment, businesses, markets and expectations, getting the 15th Five-Year Plan (2026-2030) off to a good start.

China will continue to implement a more proactive fiscal policy and maintain necessary fiscal deficits, overall debt levels and expenditure scale, while standardizing tax incentives and fiscal subsidy policies.

Greater attention should be given to addressing local fiscal difficulties, and Party and government bodies will continue to keep their belts tightened.

China will continue implementing a moderately loose monetary policy, employ various monetary policy tools such as reserve requirement ratios and interest rates in a flexible and efficient manner to maintain ample liquidity.

China will guide financial institutions to scale up support for domestic demand expansion, sci-tech innovation, micro, small and medium enterprises, and other key areas.

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The RMB exchange rate will be kept generally stable at an adaptive, balanced level, the meeting said, adding that China will make macro policy orientations more consistent and effective, and refine expectations management mechanisms to bolster social confidence.

IMI International Monetary Review

Economic Planning with Chinese Characteristics

BY HERBERT POENISCH*

As this issue is devoted to the 15th Five year economic plan some thoughts about the evolution of economic planning and its limits will be elaborated here.

1. History of economic planning in China

Economic planning in China goes back to the early days of the Peoples' Republic. At that time it was inspired by the example of economic planning in the Soviet Union.

Production of goods and to a limited extent services was provided by state owned enterprises. Achieving targets was mandatory for each economic unit and failure was followed by sanctions. Foreign trade was a residual to fill gaps in production. Government consumption which included education and health services but also defense could be planned. Employment was planned as human resources were just one input into production, in addition to material resources and intermediate inputs from other sectors.

Wages and private consumption were a residual, as most daily necessities such as health, education, transport were provided by the government. Wages were pocket money which could not easily be spent as the availability of good was determined by the plan. As imbalances between private demand and supply of consumer goods showed up, the result was waiting lists such as for cars as prices were not allowed to adjust.

The mirror image of the material production was the financial plan. Money had a passive role and was extended by the central bank and specialised banks to fulfill planned projects. Money in circulation had no role in allocating production.

Comparing the Soviet model to present day China is like day and night. Presently, the Chinese economy is a mixed economy, with the market playing an important role but keeping the state sector controlling key sectors.

For a start, production is provided to a great extent by the private sector (some 60% of GDP) which also employs most of the human resources (some 80% of urban jobs). Job allocation by the state sector is still desirable but limited. Other productive resources, including technology are provided by the market with a visible hand of state intervention.

Private consumption at 40% of GDP (compared with 70% in the USA) is still too low to sustain adequate demand for the revved up production, which foreign sources such as IMF and ECB above call over-production. This has been addressed by recent comments by the Central Economic Work Conference to boost consumption.

Different from the Soviet model is also the role of the external sector. Export demand still makes up 1.7% of the total real GDP growth rate of 5%. Facing external resistance from the main markets for Chinese exports, such as the USA and the EU, other recipients such as the Belt and Road countries will have to absorb Chinese exports. They might have problems paying for these imports and need renminbi loans posing credit risk for China.

Finally, the financing side of the plan is different from the Soviet model. China has an autonomous monetary policy and banking sector and the supply of funds is not determined by the plan but by assessment of the credit risk of the economic agents in charge of achieving planned target.

2. Characteristics of Chinese economic plans

In order to understand the role of economic planning in China the following characteristics are noteworthy.

2.1. Supremacy of the State

In historical China as well as present day, the sovereign, present day CPC is the supreme leader in charge of the well being of China's population. If this is not assured, the supreme leader might loose the mandate of heaven and

* Herbert Poenisch, member of IMI International Committee, former BIS Senior Economist.

changes might be called for. Therefore ensuring material prosperity for the population is the first mandate for the government. Ever since gaining power, the CPC has used central planning to ensure material progress in the forthcoming five years.

2.2. Central authority

Historically centralisation has been a defining criteria of Chinese authority. Losing central power leads to chaos. Local governments are subordinate and have to fall in line with central priorities. Revenue is largely submitted to central authorities who might reward loyal local governments with subsidies and handouts. These have become a lifeline for local authorities as their income from land allocation has dried up since the start of real estate crisis in 2021. The shadow local government financing vehicles have become unsustainable. A new central-local sharing of tasks and finances in called for.

2.3. Central priorities

The central authority sets out their priorities for economic development in the five year plan. These have been spelled out clearly in the current Five Year plan as outlined in the contributions from The Global Times. During history, China has been plagued by material shortages causing social misery and turmoil. The main achievement of the CPC is that these shortages have been overcome by the ingenuity and industriousness of Chinese people under the leadership of the CPC. Shortages have been replaced by plentiful supply of material goods with ever improved quality. Something the CPC can be proud of as it is close to becoming the world's leading economy.

However, this drive for more quality production and technological innovation, which is mostly provided by the private sector has backlashes on the fabric of society which have hardly been explored. This even begs the question about the compatibility of the plan priorities. At present there is no time to explore the impact on society at large as the order of the day is to follow the planned economic priorities.

State owned enterprises have been reminded by President Xi of their responsibilities to achieve these central priorities defined by the CPC and the State. Private enterprises largely linked to the state can be expected to follow suite.

2.4. Self-reliance

Another lesson from the past is that China has been put under pressure from foreign forces trying to impose their will. Chairman Mao Zetong revived the old adage 'Zili gengsheng' to assure China's own way of development free of foreign pressures. Geopolitical tensions have reawakened this adage and the new Five Year Plan includes this adage in the domestic supply of vital resources and technology. However, relying on exports to such an extent does not fit well. Self reliance should cover both, supply and demand for China's production. Recent trade spats have shown the vulnerability of relying on exports. However, current pushbacks to the Chinese export drive have been alluded to but not been fully reflected in planned targets.

2.5. Ensure employment for population

In order to ensure social stability, stable employment and income as well as social security is the main pillar of China's society. While the government cannot assure employment any more as the major share of urban jobs is provided by the private sector, the government needs to deal with the fallout from lack of employment opportunities. Of particular concern is the impact of the technology push such as AI on human well being, social stability and job creation not just automation. Chinese experts have advocated a balanced AI adoption, and technology should enhance not replace human prosperity. AI might also increase potential structural inequalities and there is need to ensure broad benefits of AI.

3. From mandatory to indicative planning

While it is clear that the Soviet model of central planning is not suitable for a complex modern economy where the private sector is the vital economic engine, the government still needs to play the leading role to ensure prosperity and stability is paramount. The fact that 65% of private enterprises are state-connected helps implementing state priorities. Using the five year plan for guidance of all economic agents is a useful tool. However, as it is not mandatory any more, calling it something like the French term 'plan indicatif' which was used in France after WWII is more suitable.

An indicative plan is a non-binding economic strategy where the government provides forecasts, goals and guidance (like subsidies/taxes) to influence the private sector investment toward national objectives, rather than mandating it, complimenting market forces instead of replacing them.

4. Conclusion

The current central priorities focus too much on material production and technological progress. A maturing economy has increasingly non-material needs. These are vaguely defined in the plan, assuming that greater material wealth will satisfy society. However, the demographic problems, inadequate birth rate, aging population, social isolation caused by technology and resistance to work pressure do not receive adequate consideration. Including them might lead to a trade-off among central priorities. After all it is living standards and social security which have to be balanced with economic development.

Following the plan, economic agents know what has to be achieved for overall economic development and contribute their best to attain these goals. They have received additional guidance from the Central Economic Work Conference. Thus both, five year plan and additional priorities should avoid the chaos of individualistic decision making as in Western capitalist societies.

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IMF Staff Completes 2025 Article IV Mission to the People's Republic of China*

BY IMF

End-of-Mission press releases include statements of IMF staff teams that convey preliminary findings after a visit to a country. The views expressed in this statement are those of the IMF staff and do not necessarily represent the views of the IMF's Executive Board. Based on the preliminary findings of this mission, staff will prepare a report that, subject to management approval, will be presented to the IMF's Executive Board for discussion and decision.

IMF staff projects China's economy to grow by 5.0 percent in 2025 and 4.5 percent in 2026. These projections reflect an upward revision of 0.2 and 0.3 percentage points, respectively, compared to the October WEO, driven by welcome macroeconomic policy stimulus measures and lower-than-expected tariffs on China's exports.

Despite resilient growth, imbalances remain significant amid weak domestic demand and deflationary pressures. Low inflation relative to trading partners has led to real exchange rate depreciation, contributing to strong exports and rising current account surplus.

The key policy priority is to transition to a consumption-led growth model, which is one of the government's stated objectives in the 15th Five-Year Plan. In staff's view, this transition requires more urgent and forceful expansionary macroeconomic policies, reforms to reduce elevated household savings, and a scaling back of inefficient investment and unwarranted industrial policy support. Such a policy package will also reduce external imbalances.

Beyond these concerted policy efforts, tackling elevated risks and sustaining robust medium-term growth calls for: (i) reforms to fiscal and financial frameworks; (ii) balance sheet cleanup in the general government, property, and financial sectors; and (iii) advancing market-oriented reforms, including opening up the service sector and fostering competitive neutrality across firms.

Beijing, China: An International Monetary Fund (IMF) team, led by Ms. Sonali Jain-Chandra, Mission Chief for China, visited Beijing and Shanghai from December 1 to 10 for the 2025 Article IV Consultation. The team held constructive discussions with senior officials from the government, the People's Bank of China, private sector representatives, and academics on economic developments, risks, and policy priorities.

IMF Managing Director, Kristalina Georgieva, joined the discussions and met with Premier LI Qiang, Vice Premier HE Lifeng, PBoC Governor PAN Gongsheng, Minister of Finance LAN Fo'an, Minister of Commerce WANG Wentao, and other senior officials. IMF First Deputy Managing Director, Mr. Dan Katz, also joined part of the mission and met senior officials.

At the conclusion of the visit, Ms. Jain-Chandra issued the following statement:

"China's economy has shown notable resilience despite facing multiple shocks in recent years. We project growth at 5.0 percent in 2025 and 4.5 percent in 2026. These reflect upward revisions of 0.2 and 0.3 percentage points, respectively, from the IMF's October WEO, driven by recently-announced policy measures and reduced US-China bilateral tariffs. Headline inflation is expected to rise modestly from an average of 0 percent in 2025 to 0.8 percent in 2026.

"This resilience is being tested by continued imbalances. The prolonged property sector adjustment, spillovers to local government finances, and subdued consumer confidence have led to weak domestic demand and deflationary pressures. Low inflation relative to trading partners has led to real exchange rate depreciation, contributing to strong exports and supporting growth, but also exacerbating external imbalances, with the current account surplus projected to reach 3.3 percent of GDP in 2025. China's large economic size and heightened global trade tensions make reliance on exports less viable for sustaining robust growth."

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* Published: Dec 10, 2025

"Long-standing structural challenges will also weigh on the economy over the medium term. Growth is expected to moderate due to slowing productivity growth, an aging population, elevated debt levels, and decreasing returns to investment.

"The authorities recognize the imperative of increasing consumption as a driver of growth. To this end, they have implemented welcome policy measures. These include expansionary fiscal policy, monetary easing, as well as some targeted measures to support consumption and the property sector. They have also taken steps to address "involution", or excessive price competition, in certain sectors. Furthermore, the authorities have also increased the retirement age, which will lift potential growth, and are implementing local government debt swaps that will ease refinancing pressures.

"IMF staff agrees that the key policy priority for China is to transition to a consumption-led growth model, away from an overreliance on exports and investment. To support this transition, we recommend a more forceful policy package—implemented with greater urgency, while safeguarding financial stability and tackling debt vulnerabilities.

"First, tackling imbalances through more expansionary macroeconomic policies and complementary reforms to lower excessive household savings. Additional fiscal stimulus supported by monetary easing and greater exchange rate flexibility will boost domestic demand and help reflate the economy. Macroeconomic policy support should also be accompanied by stepped-up reforms to strengthen the social protection system and support the property sector adjustment—both of which will boost confidence and consumption. Meanwhile, scaling back unwarranted industrial policy support and inefficient investment will reduce resource misallocation. In addition to tackling domestic imbalances, such a policy package will also lead to real exchange rate appreciation and reduce external imbalances.

"Second, ensuring macro-financial stability and tackling debt vulnerabilities calls for fiscal and financial framework reforms and balance sheet cleanup. Restructuring the debt of unsustainable local government financing vehicles using insolvency frameworks can reduce fiscal strains and should be accompanied by a comprehensive plan to tackle financial sector spillovers and enhance fiscal frameworks. Stabilizing government debt will also require sustained fiscal consolidation over the medium term after deflationary pressures have durably abated.

"Third, structural reforms can lift medium-term growth by countering headwinds from slowing productivity and a shrinking labor force. Priorities include lowering barriers to internal trade, opening up the services sector, leveling the playing field across firms, and implementing labor market reforms to address skill mismatches and youth unemployment.

"Making progress on the three policy priorities outlined above could lift China's GDP by about 2.5 percentage points by 2030 and reduce external imbalances. This would not only improve living standards and prosperity in China but also contribute to a stronger and healthier global economy.

"IMF staff look forward to our continued engagement with the Chinese authorities and to support their efforts to build a more resilient and balanced economy."

The IMF team expresses its appreciation to the Chinese authorities for their warm hospitality, excellent organization, and open and constructive discussions throughout the mission.

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Opening Remarks at the 2025 China Article IV Consultation Press Conference*

BY KRISTALINA GEORGIEVA

Welcome, everybody, to this press conference to present IMF staff's key findings from the 2025 Article IV consultation with China—our annual economic health check.

Over the past two weeks, our team has engaged in constructive discussions with the Chinese authorities. We express our sincere thanks to them.

Let me start with our updated assessment of the outlook. Despite sizeable shocks, China's economy has shown remarkable resilience.

We have upgraded our projections for China's growth to 5 percent in 2025 and 4.5 percent in 2026. These are upward revisions of 0.2 and 0.3 percentage points, respectively, from our October World Economic Outlook. They reflect both strong exports and welcome fiscal stimulus. This resilient growth has supported household incomes, which is particularly important at a time when consumer confidence is weak. China is contributing about 30 percent to global growth.

This outlook provides a conducive environment for the Chinese authorities to address the significant and pressing challenges the economy faces. The authorities recognize these challenges and are taking steps in the right direction. We are encouraging them to move more forcefully and with greater urgency.

Let me elaborate.

Domestic demand in China has been persistently weak, in part because the property sector is still on a shaky footing. This has depressed consumer confidence, leading to weak consumption and deflationary pressures.

Low inflation relative to trading partners has resulted in significant real exchange rate depreciation. This has made China's exports cheaper, prolonging an excessive reliance on exports and worsening external imbalances.

As the second largest economy in the world, China is simply too big to generate much growth from exports. And continuing to depend on export-led growth risks furthering global trade tensions.

Add to this, the challenges from slowing productivity growth, high corporate and public debt levels, decreasing returns to investment, and an aging population. Taken together, these factors point to slower growth going forward.

Against this background, in their 15th Five Year Plan, the authorities have prioritized increasing consumption as a driver of growth. They also recognize the importance of reorienting the economy from goods to services.

We welcome this. Pivoting to consumption-led growth is the overarching policy priority for China.

The authorities are already taking steps to raise domestic consumption. They have adopted an expansionary fiscal stance, eased monetary policy, and implemented some targeted measures to reduce excess saving and address "involution". They gradually increased the retirement age, which will help expand labor supply and raise medium-term growth prospects, and raised subsidies for elderly care and childcare to boost the services sector.

Still, more is needed.

In our discussions, we recommended more forceful measures, to be implemented with greater urgency. Let me highlight three key areas of focus.

First area of focus: tackling domestic imbalances, and in particular deflationary pressures. This will require even more expansionary macroeconomic policies, paired with necessary reforms to reduce excess saving.

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* Published: December 10, 2025

We recommend a comprehensive macroeconomic policy package focused on additional fiscal stimulus, supported by further monetary policy easing and greater exchange rate flexibility.

Fiscal policy should prioritize strengthening the social protection system to give people the confidence and security they need to spend more and save less. Our analysis suggests that raising social spending, especially in rural areas, and accelerating Hukou reforms that provide migrant workers with access to social benefits can boost consumption by up to 3 percentage points GDP in the medium term.

At the same time, public investment and industrial policies in support of selected firms and sectors should be scaled back. This would increase productivity by improving resource allocation and putting market forces in the front seat. Reducing the size of industrial policy support would also generate fiscal savings, which could be redeployed to increase social spending and resolve the problems in the property sector.

Ultimately, boosting consumption would unlock the potential of China's vast domestic market, resulting in smaller internal and external imbalances and a more durable source of growth.

Second area of focus: structural reforms to lift medium-term growth. We recommend reducing regulatory burdens; lowering barriers to internal trade, particularly in the service sector; leveling the playing field across firms; and implementing labor market measures to reduce skill mismatches and youth unemployment.

These reforms will also help harness the full potential of new technologies, notably in the areas of artificial intelligence and energy-efficiency. China's digital infrastructure is well prepared to reap substantial gains from AI but care needs to be taken to mitigate labor market dislocations and guard against new financial stability risks.

Third area of focus: addressing high domestic debt levels. Years of high investment have left China with high public and corporate debt, leading to elevated risks. The government's debt swap program helps in the short term by reducing financing pressures, but to minimize long-term costs, unsustainable local government debt will need to be restructured. This should be combined with reforms to further strengthen financial sector oversight and enhance fiscal discipline and transparency.

What would be the benefits? Making material progress on these three essential priorities could substantially raise China's GDP level—by about 2.5 percent by 2030, creating some 18 million new jobs and simultaneously reducing deflationary pressures. It would also help deliver an appreciation of the real exchange rate and a smaller current account surplus.

A better-balanced Chinese economy, internally and externally, also means a stronger and healthier global economy.

In sum, China has the opportunity to reach a new stage in its economic development, in which its growth engine switches from investment and exports to domestic consumption and its economy reorients from goods to services. Seizing this opportunity requires brave choices and determined policy action.

We look forward to continuing our close engagement with the authorities in support of their efforts to build a more balanced and inclusive economy.

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The Evolution of China's Growth Model: Challenges and Long-term Growth Prospects*

BY EUROPEAN CENTRAL BANK

1. Introduction

China's rapid economic transformation to become the world's second-largest economy is inextricably linked to its investment-led growth model. This investment has been financed by high levels of domestic savings resulting from a number of government policies.[1] These savings have been channelled into a financial system that has provided highly-subsidised lending for infrastructure, manufacturing and real estate investment. As a result, China has achieved high rates of economic growth by ramping up its level of investment faster than most other countries at a similar level of development (Chart 1, panel a).[2]

Nevertheless, this investment-led growth model is coming under increasing pressure. First, diminishing rates of return imply that it is becoming more difficult to generate growth from one additional unit of investment, and some observers believe that China has long passed the point at which it can productively absorb these high rates of investment. Second, a policy-driven severe downturn in China's property sector, which accounted for about 30% of GDP before the real estate downturn in 2021, is set to sustainably diminish this major pillar of domestic demand. Third, external demand is also shrinking, as trade tensions are increasing and a rising number of trading partners are unwilling to further accommodate higher trade deficits with China. More generally, structural challenges, including an ageing population and low productivity growth, are adding to the headwinds faced by China's economy.

In response to these challenges, China's government is redoubling its efforts to spur growth through investment-centric policies. This additional push to boost investment appears to be driven almost exclusively by the state-owned sector, whereas fixed asset investment by the private sector has stalled since the onset of the housing crisis in 2021 (Chart 1, panel b). Government policies to expand output in the face of slowing demand have potential implications for China's trading partners. A supply-driven expansion of production could materially affect trade prices and hence inflation in their economies. The shift towards manufacturing previously-imported advanced goods is designed to enhance China's self-reliance, thereby reducing the import intensity of its growth while shifting competitiveness and trade balances in relation to its trading partners.

Against this background, this article will briefly summarise China's investment-led growth model and assess supply-demand imbalances in its manufacturing sector. It will then evaluate the potential spillover effects for China's trading partners and review the policy implications for key advanced economies.

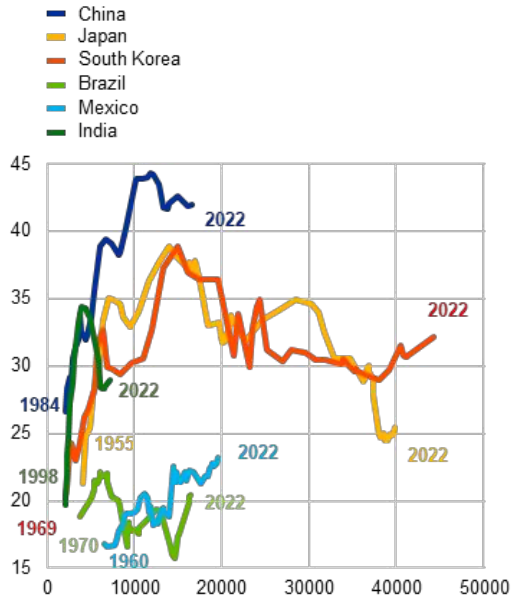
Chart 1

China's investment-led growth model

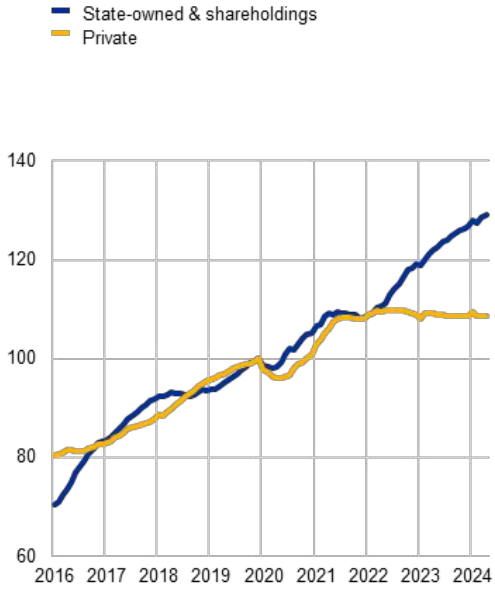
a) Investment by stage of development	b) China's investment by source
(x-axis: GDP per capita in US dollars based on 2017 purchasing power parities; y-axis: total investment as a percentage of GDP)	(index, 2019=100; 12-month moving average)

* Published as part of the ECB Economic Bulletin, Issue 5/2024

a) Investment by stage of development



b) China's investment by source



Source: World Bank, Penn World Tables, National Bureau of Statistics of China and ECB staff calculations.

Notes: GDP per capita from 2020 to 2022 is extrapolated based on World Bank data. The starting point for investment shares is GDP of USD 2,000 or above. The latest observations are for 2022 (panel a) and April 2024 (panel b).

2. The evolution of China's economic growth drivers

Investment remains a major growth driver in China. In the 30 years leading up to 2010, the share of investment in China's GDP gradually rose from 35% to 47% (Chart 2). By comparison, the typical investment-to-GDP ratio for developed economies is about 20%, whereas post-Soviet countries averaged about 30% in the first ten years after their transition to a market economy. Over the same 30-year period, the share of final consumption fell steadily from about 65% to below 50% in 2010. By comparison, the contribution of net trade to annual growth ranks significantly below that of investment and consumption. The net trade contribution to annual real GDP averaged 0.9 percentage points in the 1990s and since 2000 has averaged 0 percentage points. While integration into global value chains was instrumental in its technological development, China continued to have a high rate of imports, partly due to imports of intermediate goods processed for manufacturing exports but also imports of investment goods, such as machinery, to upgrade its productive capacities. For many decades, high investment rates provided the necessary upgrades to infrastructure and modernised China's production technology, helping the country to become a global manufacturing powerhouse.

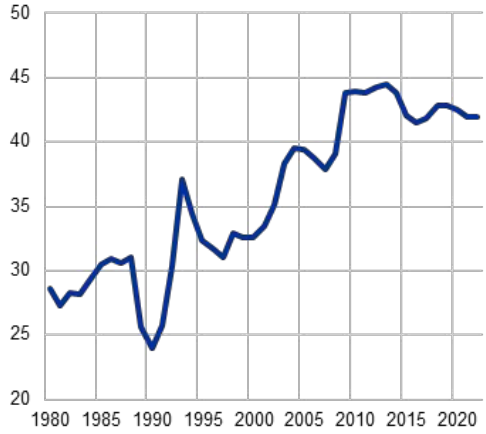
However, over time, high rates of investment face diminishing rates of return. Despite already high rates of investment, China's government proceeded with two further investment waves after the global financial crisis. The first was a response to the Great Recession, which saw the Chinese government implement a large-scale stimulus programme focusing on infrastructure and real estate, bringing annual state-financed fixed asset investment growth rates in 2008 and 2009 to 36% and 60% respectively. Once the stimulus policies came to an end, however, significant overcapacity had built up in a number of sectors. By 2015 the government reacted with supply-side reforms, which among other things aimed to reduce excess industrial capacity in specific industries, resolve unprofitable firms and reduce the stock of unsold housing.[3] The second investment wave started in 2020 as a response to the coronavirus (COVID-19) pandemic, when the Chinese government targeted its support programmes at firms with the aim of increasing growth across all manufacturing sectors, including those previously subjected to capacity reduction efforts in 2015. As a result, productive capacity built up again owing to supply-driven factors, outpacing demand, which was more subdued as a result of the zero-COVID policy.

Chart 2

Long-term trend in China's output components

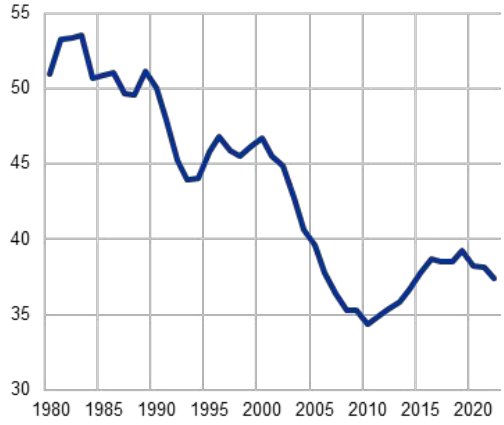
a) Total investment as a share of GDP

(percentage share of GDP)



b) Final consumption as a share of GDP

(percentage share of GDP)



Source: OECD and ECB staff calculations.

Note: The latest observations are for 2022.

Structural and cyclical factors are increasingly weighing on demand

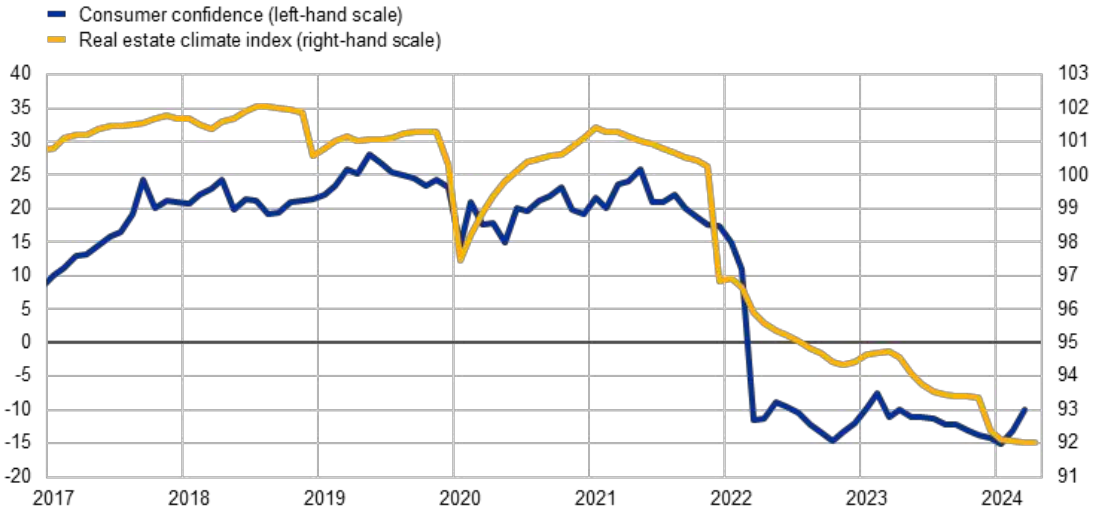
Since the global financial crisis, GDP growth has been on a secular decline in China, partly due to structural headwinds. Total factor productivity (TFP) began to decline as additional infrastructure spending enhanced productivity less over time. While aggregate annual TFP growth was 2.8% in the ten years leading up to the Great Recession, it slowed to 0.7% over the period 2009-18. In addition, China's working age population started to decline in 2011. According to UN estimates, by 2050 it will have declined by nearly a quarter. These headwinds are already depressing China's potential growth rate and this downward trend is likely to persist (see Box 1 for a model-based analysis).

In addition, cyclical demand factors became negative during the pandemic. Consumer demand fell sharply during the pandemic, as uncertainty amid pandemic restrictions led to a rise in precautionary savings (Chart 3). This was sustained by the housing crisis, which started in 2021 and further depressed consumer demand, given that the dominant share of household wealth in China is linked to the property sector.

Chart 3

Consumer confidence and real estate sector developments

(standardised index and index, 2019=100)



Source: National Bureau of Statistics of China and ECB staff calculations.

Notes: The latest observations are for April 2024 for consumer confidence and May 2024 for the real estate climate index. The real estate climate index summarises a set of indicators for real estate investment, capital, area and sales.

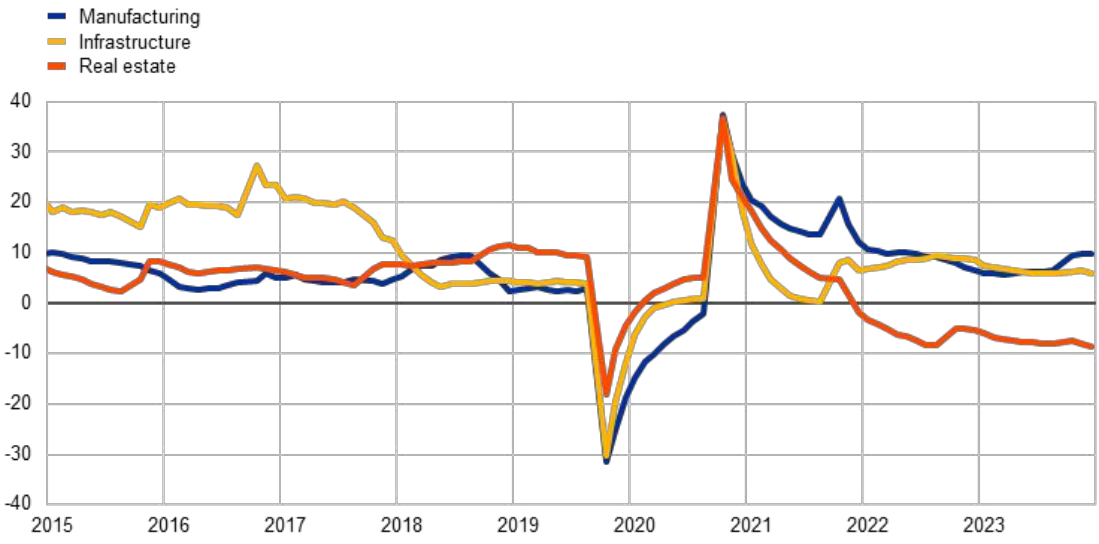
The current housing crisis is likely to make future investment less inward facing

The housing crisis severely impaired one of the three main pillars of investment growth. Total fixed asset investment in China consisted predominantly of three categories in roughly equal parts: infrastructure, real estate and manufacturing. The rapidly growing housing sector increasingly coincided with rising levels of leverage among developers, while the stock of housing began to outstrip demand in a growing number of regions. The Chinese authorities took steps in 2020 to rebalance and derisk the sector. With new restrictions on leverage, the derisking policies are also designed to achieve a long-term reduction in the overall size of the sector in terms of share of GDP. The resizing of the sector, amid a liquidity crisis among developers, led real estate investment growth to turn negative in late-2021 (Chart 4). In the absence of the real estate investment pillar, the investment-led growth model now relies more heavily on infrastructure and manufacturing investment to support economic growth.

Chart 4

Fixed asset investment by sector

(year-to-date year-on-year growth)



Source: National Bureau of Statistics of China.

Note: The latest observation is for April 2024.

Infrastructure and manufacturing investment are more likely than housing investment to be export oriented. China's push to become self-reliant and further develop its high technology sector implies that its infrastructure spending is changing. There will be less emphasis on building roads and bridges and more on building new infrastructure aimed at developing sectors, such as telecommunications networks, high-speed rail networks, and research and development facilities, which support advanced manufacturing. The most recent announcements made by China's government to build "new productive forces" to shore up growth targeted these sectors. Specifically, the government aims to support new technology sectors such as electric vehicles (EVs), microchip technology and new materials. Given the subdued outlook for domestic demand as a result of the ongoing housing sector weakness, this additional capacity will materialise over the next few years to a significant extent in the export sector, which will have potentially important implications for China's trading partners.

Box 1

China's long-term growth prospects

Prepared by Sergiu Dinu and Seng Guan Toh

The recent decade has seen a slowdown in China's growth trajectory, particularly after the global financial crisis. As income levels in China approach those in more advanced economies, a further slowdown is expected, mirroring the convergence experienced in other fast-growing East Asian economies. Demographics would also suggest lower potential growth, as China's population is declining and it is faced with growing external constraints (e.g. tariffs and export controls imposed by advanced economies) that may hinder its attempts to catch up with the technological frontier.

This box summarises the findings of a model-based analysis of China's longer-term growth prospects to quantify several structural drivers that are pertinent to its growth model.[4] The model is based on an extension of the neoclassical growth framework entailing a total factor productivity (TFP) catch-up process which describes how China catches up with the world technology frontier (represented by the United States).[5] This model uses Penn World Table data covering 1995-2019 and is calibrated to match historical data on labour developments, capital and TFP. The findings of the analysis point to the importance of both demographics and productivity as structural determinants to understand and address China's growth-related challenges.

A baseline scenario evaluates potential long-term economic growth based on the following assumptions: a stable labour force participation rate, demographic developments based on UN medium-fertility forecasts and a continuation of historical TFP trends.[6] Baseline projections indicate that ageing and the downward trend in productivity growth would lead to a decline in the annual GDP growth rate from 5.3% in 2025 to 3.7% in 2035.[7] In other words, these two structural factors would reduce the annual growth rate by 1.6 percentage points over the decade to 2035. The baseline projections are necessarily subject to high uncertainty. To assess the impact of variations in the baseline, these projections are then compared with two alternative scenarios which quantify the impact of more adverse structural developments on the GDP growth rate. They are: (i) less benign demographic developments reflecting a stronger fall in the fertility rate; and (ii) a more adverse TFP growth slowdown scenario based on an Asian Development Bank paper, further compounded by additional foreign direct investment (FDI) outflows assumed to be the result of global value chain (GVC) fragmentation.[8]

China's fast demographic shift to a declining population threatens to limit the labour supply. The repercussions of China's now defunct one-child policy exacerbate the current issues of decreasing fertility and gender imbalance, which contributed to a fall in the population in 2022 for the first time since 1960. In the medium term, less optimistic demographic developments in the form of lower population growth are expected to cut the aggregate GDP growth rate per annum in 10 years' time by more than 0.2 percentage points relative to the baseline (Table A).

China's ability to deepen its domestic technological base faces risks from further fragmentation of GVC. Moreover, increasing uncertainty relating to regulatory and geopolitical risks coincides with rising outflows of FDI. A rise in GVC fragmentation could lead to further FDI outflows and accelerate the slowdown in TFP growth. This in turn could lower the 10-year-ahead baseline GDP growth rate by 0.6 percentage points.

Table A

Long-term structural growth of China

(percentages)

Year	Baseline	Demographics – Lower fertility	TFP slowdown – FDI outflows 2021-26
2030	4.4%	4.2% (-0.2pp)	3.7% (-0.7pp)
2035	3.7%	3.5% (-0.2pp)	3.1% (-0.6pp)
2040	3.2%	2.9% (-0.3pp)	2.6% (-0.6pp)
2050	2.2%	1.9% (-0.3pp)	1.8% (-0.4pp)

Sources: Penn World Table 10.01, UN, OECD, Peschel and Liu, op. cit., State Administration of Foreign Exchange of China, ECB staff calculations.

Note: The numbers in brackets correspond to the percentage point (pp) deviations of the scenarios' projections from the baseline projections.

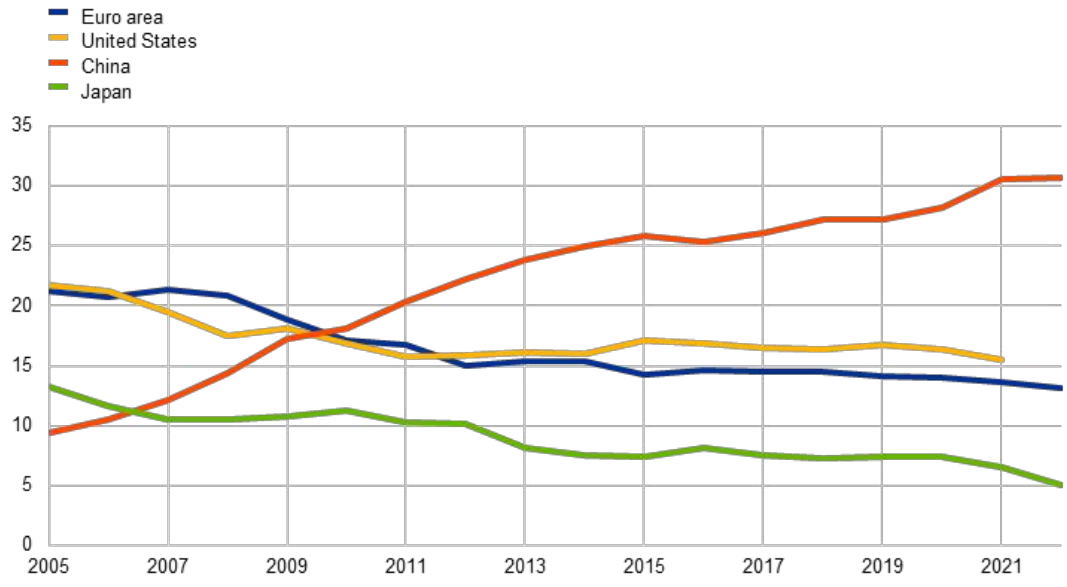
3. China's development of manufacturing capacity

The build-up of manufacturing capacity in China is historically unparalleled. China's share of gross global manufacturing production rose from 5% to 35% over the course of 1995-2023, and it currently has a higher manufacturing output than that of the next nine largest manufacturing countries combined (Chart 5). This unprecedented rise in productive capacity did not just serve China's large and growing domestic market but coincided with a rapidly rising share of world manufacturing exports, which grew from 3% in 1995 to 20% by 2020. If China is now aiming to invest further in productive capacities, this raises the question of whether the additional capacity will be absorbed domestically or externally.

Chart 5

Shares in global manufacturing value added by country or area

(percentage share)



Source: World Bank.

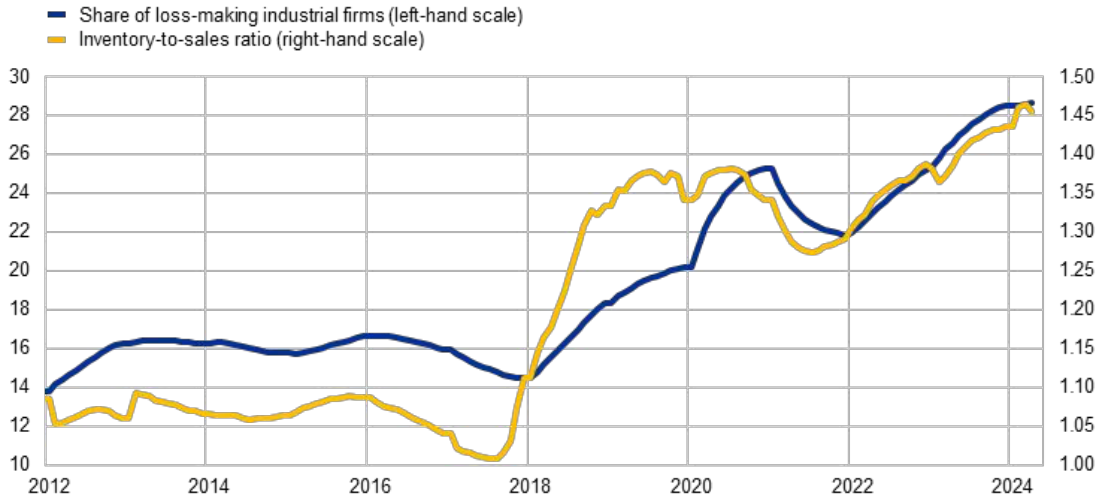
Note: The latest observations are 2021 for the United States and 2022 for the others.

There are signs that the recent rise in manufacturing output is creating distortions in the Chinese market. The supply of Chinese industrial firms outpaced demand, resulting in a build-up of inventories and a decline in prices, ultimately reducing firms' profitability. The number of loss-making firms has doubled to 28% since 2018 in tandem with a considerable increase in the inventory-to-sales ratio (Chart 6).

Chart 6

Loss-making firms and inventories

(percentage share and ratio, 12-month moving average)



Sources: National Bureau of Statistics of China and ECB staff calculations.

Notes: The inventory-to-sales ratio refers to the ratio between the end-of-month inventories and monthly operating income of Chinese industrial companies. The latest observation is for April 2024.

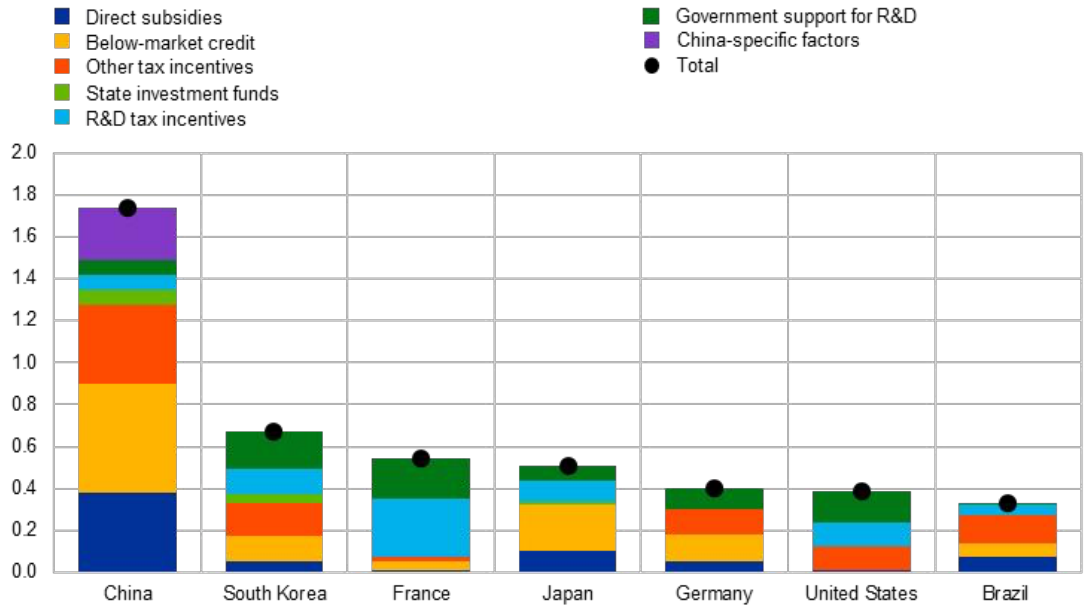
China's trading partners have been increasingly vocal about their level-playing-field concerns, as production surpluses are often linked to extensive government support. China's industrial policy measures account for a much larger share of GDP relative to other economies (Chart 7). While direct subsidies account for only a small share of all measures, indirect subsidies, such as preferential access to lending, lower financing costs and land allocation are much more common.[9] These policies are predominantly accessible to public firms and government-linked private firms, while private and foreign firms do not have the same preferential access.[10]

Chart 7

Industrial policy comparison across countries

State subsidies as a share of GDP

(percentage share and percentage point contributions)



Source: Center for Strategic and International Studies.

Note: The estimates refer to 2019. For more details, see DiPippo, G. et al., "Red ink: estimating Chinese industrial policy spending in comparative perspective", Center for Strategic and International Studies, May 2022.

Tracing excess capacity in China's manufacturing sectors

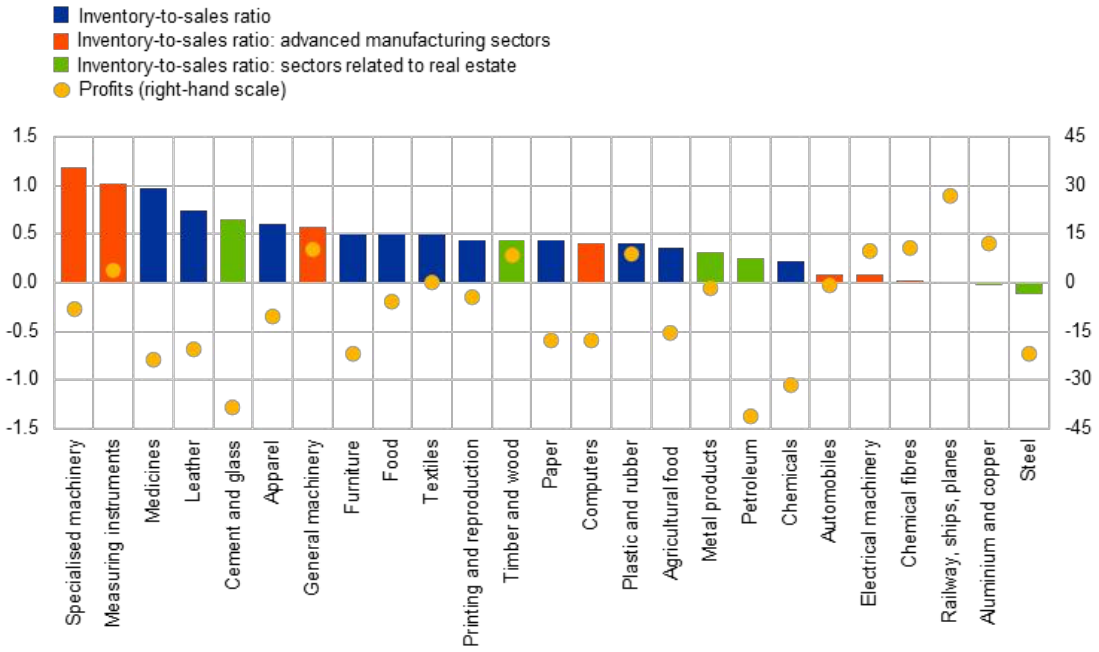
Signs of rising overcapacity can materialise in different forms across sectors. The building of excess capacity can be defined as a level of production that cannot be absorbed by demand at current prices. An increase in output would thereby increase inventories, be sold at lower prices, or a combination of both. We provide three types of evidence for the existence of overcapacities in China, namely an overview of Chinese inventories and profits by sector, the latest business survey data of European companies in China, and a structural Bayesian VAR analysis of Chinese exports. First, we find that in a wide range of sectors, which together represent the majority of China's manufacturing sector, the inventory-to-sales ratio has increased, highlighting that Chinese domestic output is currently expanding faster than sales (Chart 8). This is particularly evident for sectors linked to real estate, which faced a sudden and severe decline in domestic demand (especially in the cement, steel and metal products industries). Second, recent survey evidence confirms the existence of overcapacities and their disinflationary effects. In a recent survey by the European Union Chamber of Commerce in China, over one-third of respondents among European companies in China observed overcapacity in their industry in the past year and cited overinvestment as the main reason.[11] Moreover, in the sectors where overcapacities were observed, prices tended to decline. Overall, it emerges that where domestic demand cannot absorb the additional output, producers will aim to direct this excess capacity to export markets, often by lowering prices.

Chart 8

Overcapacity in Chinese sectors

Change in inventories-to-sales ratios and profit growth rates

(change and percentage point change between 2023 and 2015-19)



Sources: National Bureau of Statistics of China and ECB staff calculations.

Notes: The red columns refer to industries classified as “advanced manufacturing”, while the green columns refer to industries closely linked to the real estate sector. The remaining industries are shown in blue.

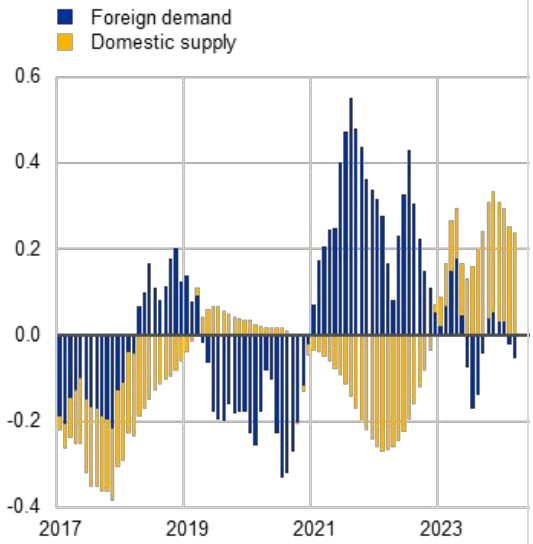
The rise in Chinese output is predominantly supply driven. As a third piece of evidence for the existence of overcapacities, a structural Bayesian VAR analysis is carried out to disentangle demand and supply factors in Chinese export growth.[12] It shows that in real estate-related industries, such as steel and other metals, exports over the past year have been almost entirely driven by supply factors, while foreign demand remained broadly neutral or negative (Chart 9, panel a). The same dynamics can be observed for motor vehicle exports (Chart 9, panel b). More generally, when comparing the share of supply factors in exports by sector, we find that over the past year, supply factors have become a growing driver of exports across a range of sectors compared with the 2017-19 period (Chart 9, panel c). The results show that the share of foreign demand in the exports of sectors related to the real estate and advanced manufacturing sectors in particular appear to be falling.

Chart 9

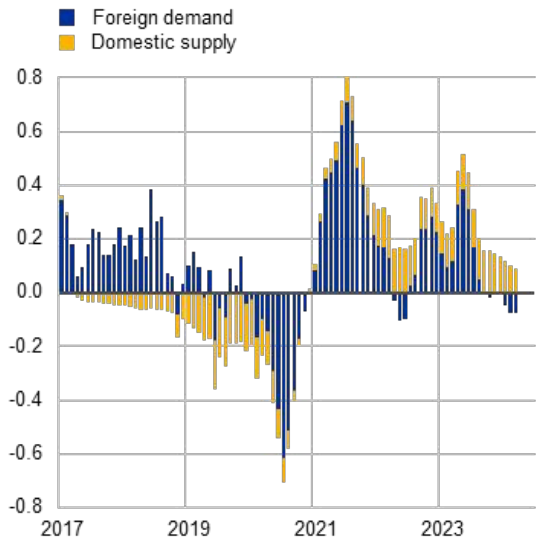
BVAR historical shock decomposition of Chinese exports

a) Foreign demand and Chinese domestic supply factors in steel and other metal exports	b) Foreign demand and Chinese domestic supply factors in motor vehicle exports
(percentage deviation from the mean and percentage point contributions, year on year)	(percentage deviation from the mean and percentage point contributions, year on year)

a) Foreign demand and Chinese domestic supply factors in steel and other metal exports

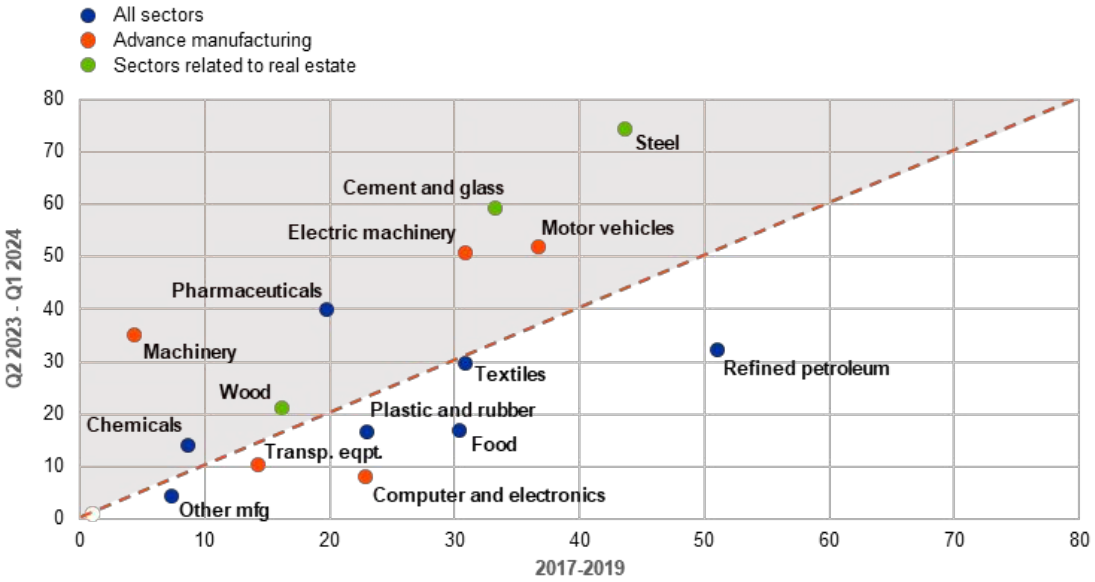


b) Foreign demand and Chinese domestic supply factors in motor vehicle exports



c) Change in domestic supply contribution by sector

(percentage share of domestic supply shocks in total deviations from the mean)



Sources: National Bureau of Statistics of China and ECB staff calculations.

Notes: Panels a) and b) show the median posterior distribution of the historical decomposition of Chinese exports in deviation from its initial condition. All variables are measured in log levels, while the chart shows the decomposition in year-on-year growth rates. In panel c), the x-axis measures the share of domestic supply shocks in total deviation from the mean between 2017 and 2019 based on a BVAR historical shock decomposition. The y-axis shows the average share between the second quarter of 2023 and the first quarter of 2024. For sectors above the diagonal line, it could be implied that domestic supply factors are behind the increase in exports, and thus more likely to have built up overcapacity. The latest observations are for March 2024.

4. Global implications of China's investment policies

China's efforts to further invest in the productive capacities of highly subsidised industries has global implications for its trading partners. To the extent that additional output cannot be entirely absorbed domestically

and external demand remains broadly constant, a rise in China's exports necessitates a further increase in its global share of manufacturing exports. Given recent tariff action against China, a further expansion of its export market share may not go unchallenged in global markets. Moreover, by lowering prices or increasing exports of heavily-subsidised products, a rise in exports could lead to international spillovers of disinflationary pressures. These could be further exacerbated if trading partners' domestic firms in turn lower their prices to remain competitive with Chinese exports. Finally, with China's development of its advanced manufacturing capacities, particularly in green technology sectors, the relatively larger size of state subsidies in China could also affect the competitiveness of trade partners in these relatively new and growing advanced manufacturing sectors.

Impact on euro area prices by sector

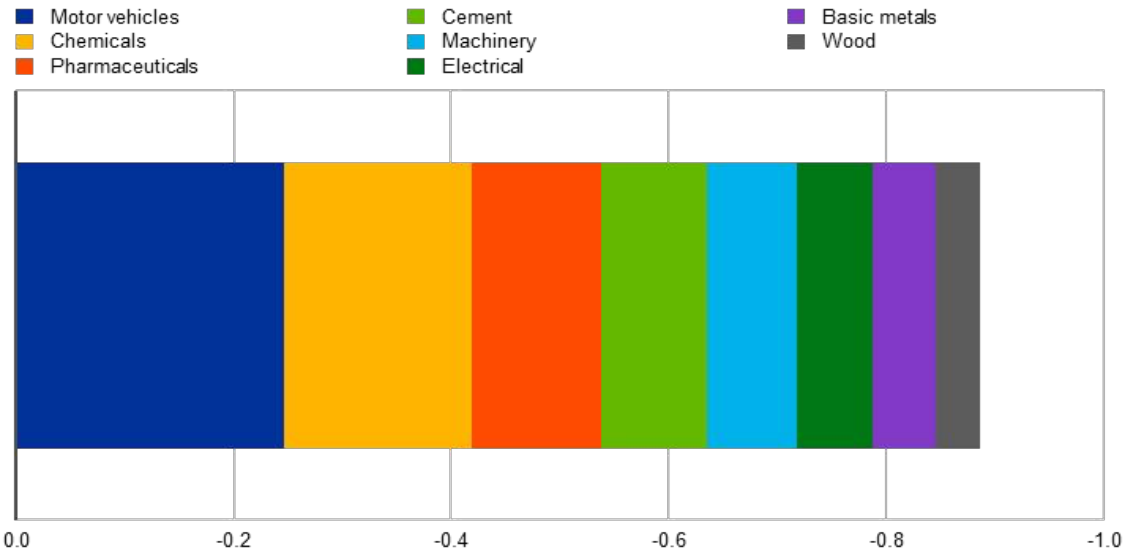
A static exercise modelling a further decline in Chinese export prices in sectors with overcapacity would have a downward impact on euro area consumer prices, which could be amplified through a subsequent decline in euro area producer prices. To quantify the potential impact, we perform a sectoral bottom-up analysis based on the elasticities of international production networks captured in input-output tables.[13] We first assume a 30% drop in Chinese export prices in sectors identified as having overcapacities in our BVAR analysis.[14] The decrease in price is calibrated by considering past price movements in the solar panel industry, as this industry can serve as a case study for potential developments in other green technology industries.[15] The simulation results find that the decline in Chinese export prices would lead to a 0.3 percentage point fall in euro area consumer price inflation. This result consists of a smaller direct impact through consumption of Chinese final products, and a larger indirect impact through intermediate input linkages, reflecting the rich interdependencies of euro area and Chinese production networks. Second, we look at how this change is amplified if euro area producers lower their prices in response to cheaper Chinese products. We consider a 7% decrease in the prices of euro area producers. This is calibrated by considering the differential in government subsidies between China and Germany, as German subsidies account for about one-quarter of those of Chinese producers.[16] The price reduction by euro area producers in affected sectors results in an additional 0.6 percentage point drop in euro area consumer price inflation (Chart 10). While the imposition of tariffs could mitigate this impact, it could vary across different products and producers and potentially lead to retaliatory measures.

Chart 10

Impact of declining Chinese trade prices on euro area prices by sector

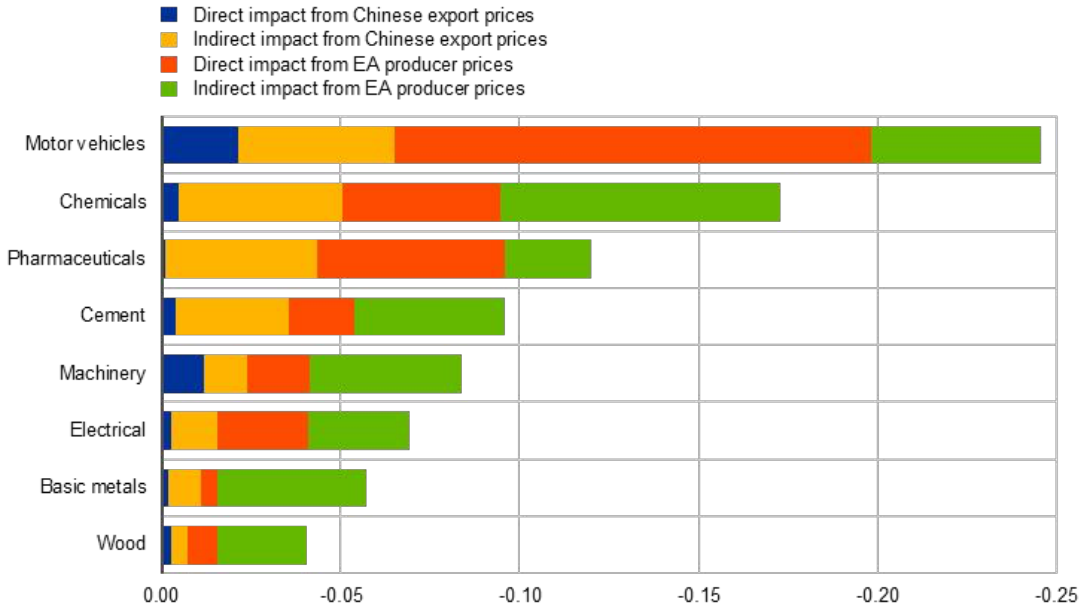
a) Cumulative impact and contribution of individual sectors

(percentage point changes)



b) Impact on individual sectors and contribution of direct and indirect spillovers

(percentage point changes)



Sources: Trade in Value Added (TiVA) input-output tables and ECB staff calculations.

Notes: The chart shows analysis based on the elasticities of international production networks captured in input-output tables. The chart shows the cumulative impact of declining prices on euro area consumer prices in Chinese sectors previously identified as having overcapacity (panel a) (see BVAR analysis above). It also shows the contribution of individual sectors (panel b). The positive technology shock is standardised to produce a 30% decrease in Chinese export prices in each sector and a reciprocal 7% decrease in euro area producer prices. The blue and red bars show the direct impact that changes in Chinese export prices have on final consumption in the euro area, while the yellow and green bars show the indirect impact, accounting also for intermediate input interlinkages. The latest observation is for 2020.

Impact on China's competitiveness

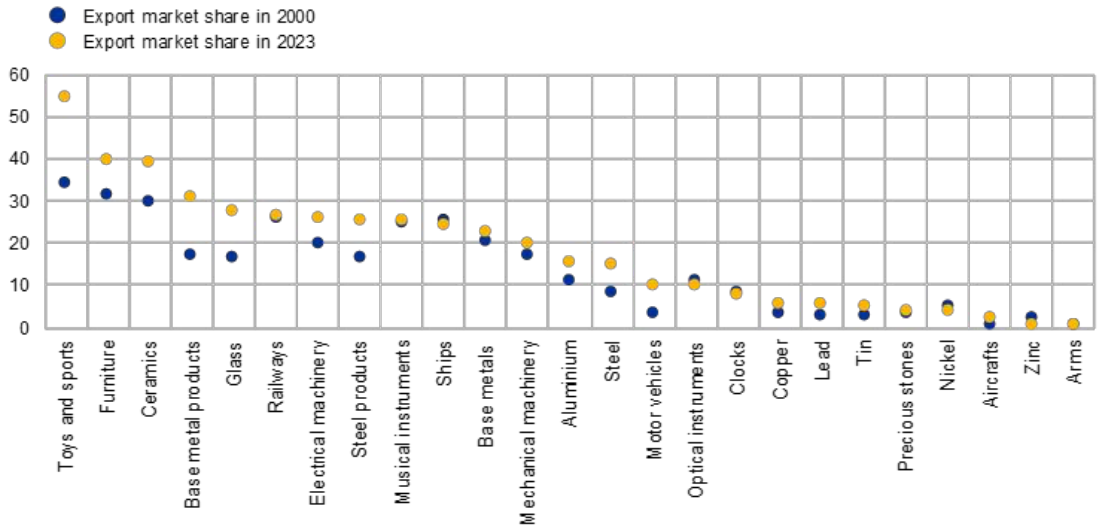
China's share of global exports has been consistently increasing, particularly in the advanced manufacturing and green technology sectors. These gains in market share can be observed across the board, including in industries where we find traces of overcapacity (Chart 11).[17] Rapid expansion is particularly evident in the new green technology industries, where China's growing share of the solar panel industry serves as a cautionary tale for other emerging green industries (Chart 12).To assess the potential scenario where the electric vehicle industry follows a similar trajectory to the solar panel industry, Box 2 attempts to quantify the potential impact a 50% decrease in EV prices would have on prices and market shares in the euro area and other countries.

Chart 11

Increase in China's competitiveness

Changes in Chinese export share

(percentage share of total exports)

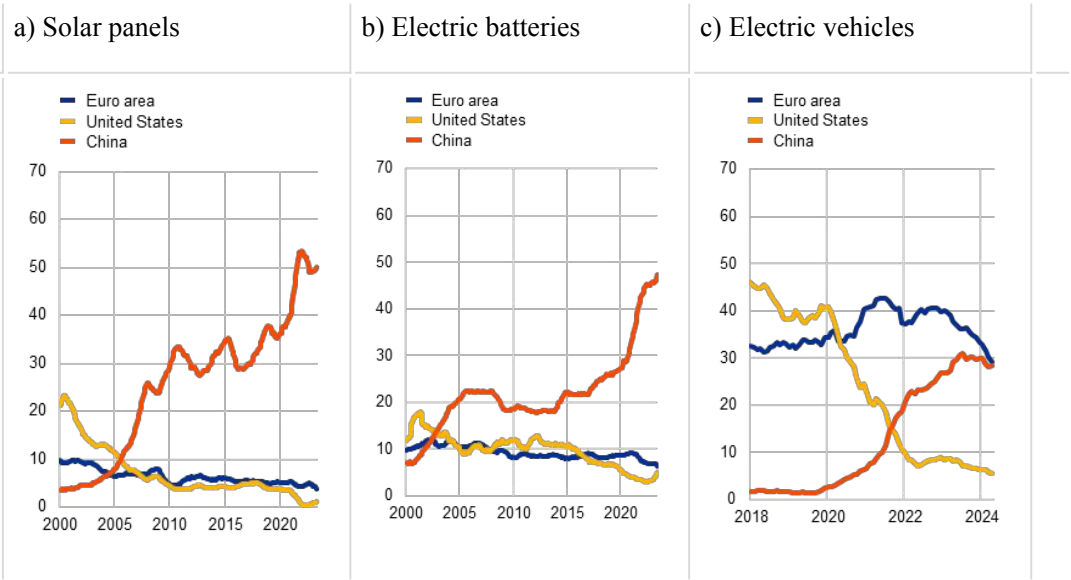


Sources: Trade Data Monitor, UNCTAD and ECB staff calculations.
Notes: The chart shows changes in China's export share in total exports by sector. The latest observations are for 2023 and 2022.

Chart 12

Changes in market share in green technology industries for China, the euro area and the United States

(percentage share of total exports)



Sources: Trade Data Monitor and ECB staff calculations.

Notes: The chart shows exports as a share of total exports in different green technology sectors. The data refers to trade flows in US dollars. Exports from the euro area exclude trade between euro area countries. The latest observation is for April 2024.

China has increased its competitiveness in sectors traditionally dominated by advanced economies. Along with rising market share, China's value added in global value chains has also been growing.[18] This increase in value added is enhancing China's competitiveness and exposing advanced economies to competition in a greater number of sectors, as China gradually develops a comparative advantage in sectors in which the latter specialise. In the last 20 years in particular, China has become increasingly competitive in sectors previously dominated by other advanced economies (Chart 13). Of these advanced economies, Italy appears to be most exposed because China has become competitive in 60 sectors where Italy holds a comparative advantage. On the other hand, Germany has seen the largest surge in exposure to Chinese competitiveness, which has increased from 20 sectors in 2000 to 50 in 2022.

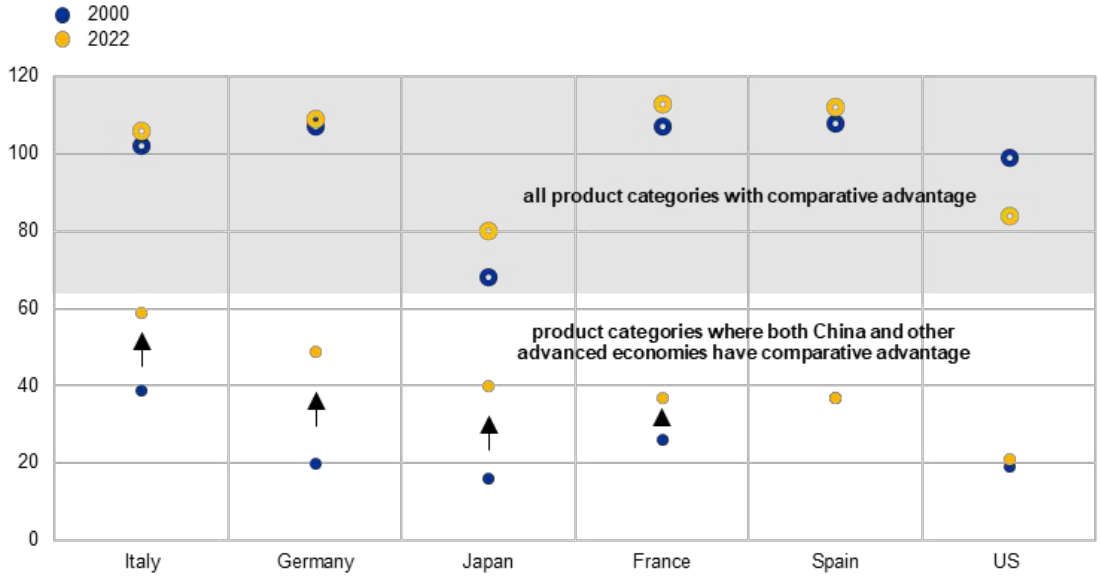
China's aim of boosting its self-reliance will impact its demand for imports and its competitiveness in third-country markets. It has been aiming to reduce its reliance on global trading partners by importing less and by vertically integrating its value chains.[19] As it gradually replaces imported goods with domestically-produced ones, China's demand for imported industrial goods will decline. A surge in the domestic production of industrial goods will also increase competition from China in third-country export markets. Both phenomena will put downward pressure on the trade balance of industrial goods exporters, such as the euro area. At the same time, the change in the trade balance is likely to affect the renminbi exchange rate, which will offset part of the gain in China's price competitiveness.

Chart 13

China's increased competitiveness

Countries exposed to China's increased competitiveness

(number of product categories with comparative advantage)



Sources: UN trade and development and ECB staff calculations.

Notes: The chart shows comparative advantage, referring to the revealed comparative advantage indicator, measuring the ratio between the share of a country's exports in a particular product category in its total exports and the same share for the world as a whole. A country has comparative advantage if the value of this ratio is over 1. The latest observation is for 2022.

Impact on competitors' prices

China's competition will also give rise to further disinflationary pressures through second-round effects emerging as a result of competitors being forced to lower the prices of their products. While Chinese production surpluses in some sectors may not affect the market shares of firms in advanced economies directly, they could lead to the reallocation of production from third markets to China, leading to overall lower prices for these products. At the same time, competitive Chinese prices could force producers in advanced economies to also reduce their prices. Both cases could potentially trigger second-round effects on consumer prices in advanced economies.

Box 2

A model-based assessment of the spillovers of Chinese subsidies to electric vehicles

Prepared by Maria-Grazia Attinasi, Lukas Boeckelmann, Bernardo de Castro Martins and Baptiste Meunier

China increasingly subsidises electric vehicle producers, mirroring what happened in the solar panel industry where it has become a global leader thanks to massive state aid. Overall, industrial subsidies in China are estimated

to be three to nine times higher than those in advanced economies, with conservative estimates showing subsidies amounting to €221 billion (2% of China's GDP). There has recently been a huge increase in subsidies to Chinese green tech companies, notably to producers of electric vehicles.[20] This approach mirrors how China has become a world leader in the solar panel industry, increasing its global market share from 5% in 2000 to 50% in 2024 through massive government subsidies.[21]

Global spillovers are quantified using a state-of-the-art, multi-country, multi-sector model run on a newly-developed granular input-output table. We use the Baqaee and Farhi (2024) model, which accounts for amplification effects of shocks through global production networks and substitution effects via international trade.[22] The model makes it possible to simulate the propagation of shocks both downstream to consumers and upstream to suppliers, and to derive the non-linear effects of shocks across countries and sectors. By enhancing the granularity of available input-output tables in the calibration of the model to isolate green sectors, such as EVs, our methodology enables us to simulate shocks targeted only at green sectors and to recover the sectoral impact on the industries of interest.[23] We simulate a hypothetical and stylised scenario where the relative price of Chinese EVs and electric batteries drops by 50% following government subsidies, in line with estimates of the price differential between Chinese and EU producers.[24]

Massive Chinese subsidies would lower the price of EVs for consumers across the globe but would also severely downsize their domestic production in the rest of the world. Heavily-subsidised Chinese EVs are estimated to lower the price consumers pay for EVs by 30% globally and 15% in the EU (Chart A, panel a). This leads to a 6% increase in the global production of EVs, as consumers substitute thermal vehicles for cheaper EVs, but EU domestic production would decline by 70% (Chart A, panel a) as consumers switch to cheaper Chinese products. As a result, China substantially increases its global market share in EVs by 60 percentage points, notably at the expense of EU producers, whose share shrinks by 30 percentage points (Chart A, panel b), of which 18 percentage points relate to German producers. This scenario closely resembles what happened in the solar panel industry, where Chinese subsidies made products cheaper and enabled China to gain a dominant market share while producers in the rest of the world were forced to scale back production. Finally, even though the sectoral impact on the EV industry is sizeable, the global impact is limited: total consumer prices decline by only 0.2% and overall EU production falls by a mere 0.1% owing to the small size of the EV industry.

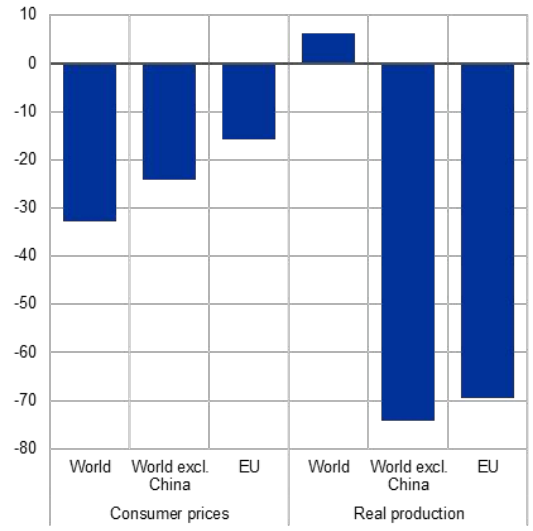
The estimates presented in this box should be considered an upper bound for losses in market shares for the euro area as the model abstracts from potential mitigating effects. First, EU producers may react endogenously to Chinese subsidies by lowering their prices or by bridging the price competitiveness gap through more innovation and digitalisation.[25] The EU could also impose countervailing duties, such as the new tariffs announced in June 2024 and not accounted for in the box.[26] The scenario considered in the box instead illustrates, other things being equal, the risks related to sizeable Chinese subsidies. Second, consumer preferences for EVs might be less price sensitive than assumed in our scenario. While we account for this in the Baqaee-Farhi model by setting a product-specific elasticity of substitution, estimates in the literature relate to all vehicles and not specifically to EVs.[27] Should price sensitivities for EVs be lower than for other vehicles, this could lead to an over-estimation of the substitution effects towards Chinese EVs.

Chart A

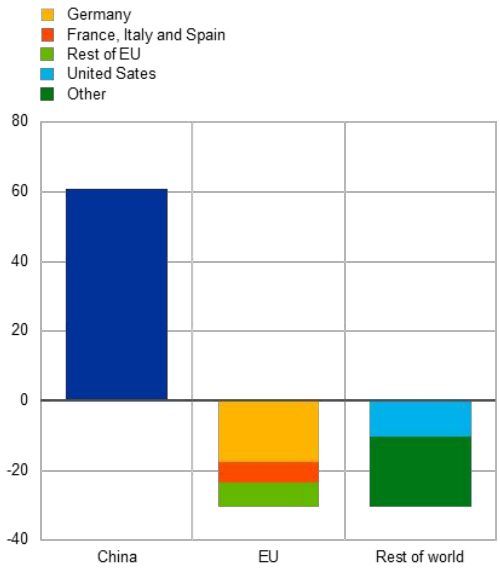
Global sectoral spillovers of Chinese subsidies to electric vehicles

a) Consumer prices and real production of EVs	b) Changes in global market share of EVs
(deviation from steady state, percentages)	(percentage points)

a) Consumer prices and real production of EVs



b) Changes in global market share of EVs



Sources: Baqaee and Farhi, op. cit., OECD, International Energy Agency, Fally, T. and Sayre, J., "Commodity Trade Matters", Working paper, No 24965, National Bureau of Economic Research, August 2018 and ECB staff calculations.

Notes: The non-linear impact is simulated through 25 iterations of the log-linearised model. The granular input-output tables isolating electric vehicles are obtained following the methodology of Attinasi, M-G.et al., op.cit.

5. Conclusion

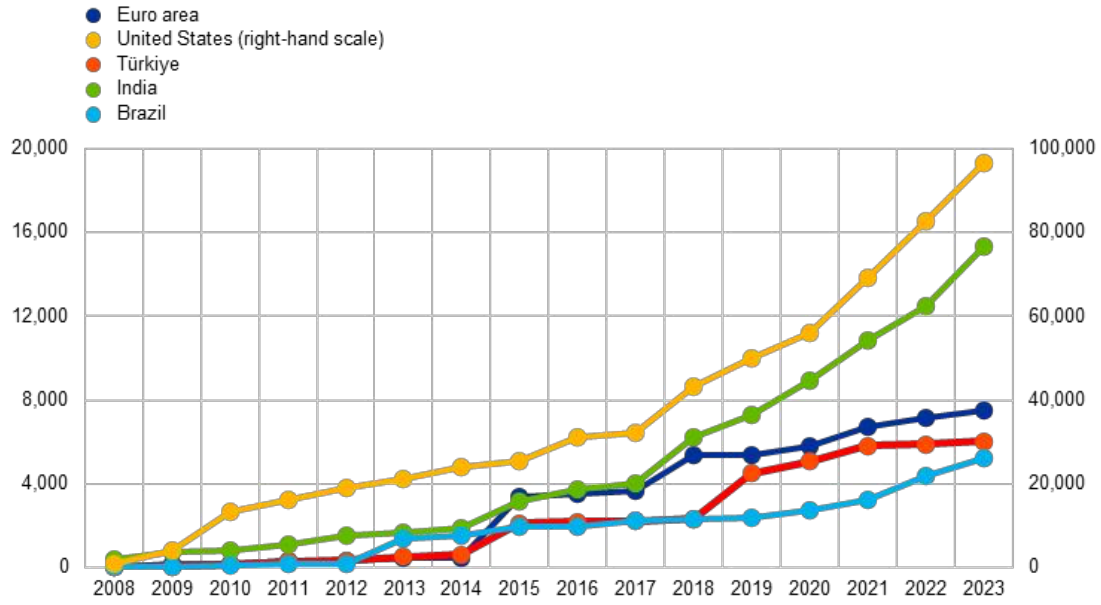
China's recent policy approach to address economic weakness by doubling down on its investment-driven growth model and identifying new productive sources is widely expected to increase already existing overcapacities. Given diminishing marginal returns to investment, the continued emphasis on the supply side of the economy is leading to rising inventories, lower profitability and growing supply-demand imbalances in a number of sectors and industries. Against a background of subdued domestic demand, efforts to direct additional productive capacities to export markets is fuelling tensions in global trade relations.

Trade policies vis-à-vis China are changing rapidly. The United States recently introduced a sharp increase in tariffs on Chinese imports, notably raising tariffs on Chinese EVs from 25% to 100%. Moreover, other countries are also increasing tariff and non-tariff barriers to Chinese imports (Chart 14). In the EU, several trade policy instruments were introduced that address level playing field considerations in public procurements and also review dumping practices. The changing trade policy dynamics are also increasingly visible in trade flows. Since 2017-18, China's share of imports has been on a declining path in the United States and Japan, albeit briefly interrupted by the pandemic, when demand initially focused temporarily on medical products and then on manufacturing goods made in China. By contrast, China's share continued to rise in the EU, currently standing above pre-pandemic levels (Chart 15).

Chart 14

Trade measures introduced on Chinese products

(number of trade measures)



Sources: Global Trade Alert and ECB staff calculations.

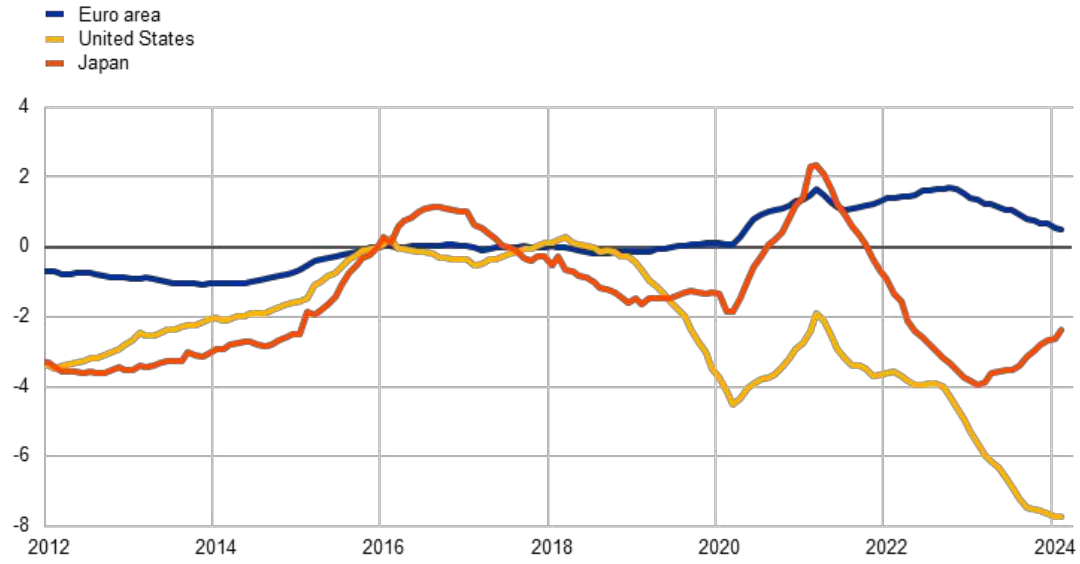
Notes: The chart shows new trade measures introduced on Chinese products with HS 6-digit detail since 2008. The latest observation is for December 2023.

Given these shifting trade policy dynamics, the role of the EU as an export market for China could potentially become more central. In the event that non-EU countries further close their markets to Chinese products, China could redouble its efforts to export to the EU, thereby exacerbating the impact on Europe in terms of rising disinflationary pressures, a loss of competitiveness in advanced manufacturing sectors and a declining share in both manufacturing output and exports. Given the potentially significant effects on output, inflation and labour markets, the European policy response needs to be carefully calibrated to ensure level playing field conditions.[28]

Chart 15

Share of imports originating from China

(change since 2015; 12-month moving average)



Sources: IMF and ECB staff calculations.

Note: The latest observation is for January 2024.

1. The one-child policy introduced in the late 1970s reduced the amount of old-age support from dependants, thereby raising retirement savings. The shift from a centrally-planned economy towards a greater role for markets in the 1990s reduced the social safety net, driving up precautionary savings, and the switch from employer-provided housing to private property ownership required higher savings for down payments and mortgage payments.

2. See also Dorrucci, E., Pula, G. and Santabárbara, D., "China's economic growth and rebalancing", Occasional Paper Series, No 142, ECB, February 2013; and Dieppe, A., Gilhooly, R., Han, J., Korhonen, I. and Lodge, D. (editors), "The transition of China to sustainable growth – implications for the global economy and the euro area", Occasional Paper Series, No 206, ECB, January 2018.

3. The industries targeted included steel, coal, cement, glass, real estate and agriculture. See Boulter, J., "China's supply-side structural reform", Bulletin, Reserve Bank of Australia, December 2018.

4. See Dinu, S. and Toh, S.G., "China's structural growth prospects - scenario analysis with demographics and productivity", Working Paper Series, European Central Bank, forthcoming.

5. See Fernández-Villaverde, J., Ohanian, L. E. and Yao, W., "The Neoclassical Growth of China", Working Paper Series, No 31351, National Bureau of Economic Research, June 2023. This model allows the construction of scenarios that can quantify the impact of structural and secular issues on China's GDP growth rate.

6. The most recent World Population Prospects report, which presents demographic trends and projections, was published by the United Nations in 2022.

7. Note that the projected growth rate measures underlying structural potential long-term growth and hence does not include the unique effects of the COVID-19 pandemic nor recent cyclical drivers, such as the real estate downturn or policy stimulus.

8. See Peschel, D. and Liu, W., "The Long-Term Growth Prospects of the People's Republic of China", Working Paper Series, No 54, Asian Development Bank, December 2022. Their TFP projections for China incorporate additional information about challenges in technological advancements.

9. Chinese government policies promoting firms in strategic industries largely fall under two initiatives: the "Made in China 2025" initiative aimed at promoting high-tech industries, and the "10,000 Little Giants" initiative targeted at small and medium-sized enterprises.

10. For more details, see García-Herrero, A. and Schindowski, R., "Unpacking China's industrial policy and its implications for Europe", Working Paper, Issue 11, Bruegel, 13 May 2024.

11. Business confidence survey 2024, European Union Chamber of Commerce in China, May 2024.

12. The Bayesian VAR analysis decomposes supply and demand shocks in Chinese export growth. Structural shocks are identified using sign restrictions, estimated using monthly samples ranging from January 2012 to March 2024. In particular, aggregate foreign demand shocks are identified by assuming that real exports and export prices move in the same direction, while aggregate domestic supply shocks assume they move in opposite directions.

13. The production network framework assumes a positive technology shock affecting Chinese sectors with overcapacities, propagating forward to export prices and accounting for input interdependence in the supply chains. The framework also assumes nominal rigidities, namely that there exists some wedge between the final price and marginal cost, which softens the overall impact on euro area prices.

14. The sectors identified are pharmaceuticals, electrical machinery, chemicals, basic metals, motor vehicles, non-metallic minerals, and timber and wood.

15. As Chinese solar panel prices fell on average by about 30% each year between 2007 and 2011 (from 5.5 USD/kW to 1 USD/kW), our simulation considers a similar magnitude, to gauge the largest potential impact on euro area consumer prices. For more insight into the solar panels industry, see Wen, D., Gao, W., Qian, F., Gu, Q. and Ren, J., "Development of solar photovoltaic industry and market in China, Germany, Japan and the United States of America using incentive policies", Energy Exploration & Exploitation, Vol.39, Issue 5, pp.1381-1836, September 2021.

16. See also di Sano, M., Pongetti, G., Schuler, T. and Toh, S.G., "Spillovers to the euro area from recent negative inflation in China", Economic Bulletin, Issue 7, ECB, 2023; see also the box by Dieppe, A., Frankovic, I. and Liu, M., "Could China export disinflation?", Eurosystem staff macroeconomic projections for the euro area, ECB, June 2024.

17. Analysis by Jean, S. et al., "Dominance on World Markets: the China Conundrum", Policy Brief, No 44, CEPII Research Center, December 2023. This Policy Brief shows that, at a more detailed level of harmonised trade classification, China's export market share surpassed 50% for more than 600 products. In comparison, the United States had 100 dominant products while the EU had 300.

18. Value added in Chinese exports to the EU is growing. This is particularly evident in industries reliant on Chinese inputs within international supply chains, such as basic metals, chemicals and electrical equipment. For more details see Vandermeeren, F., "Understanding EU-China economic exposure", Single Market Economics Briefs, No 4, European Commission, 17 January 2024.

19. China owns entire value chains, ranging from raw material mines to final production processes in specific technologies, such as drones and electric vehicles. For more details, see Arjona, R. et al.,"An enhanced methodology to monitor the EU's strategic dependencies and vulnerabilities", Single Market Economics Papers, No14, European Commission, 18 April 2023.

20. See Bickenbach, F., Dohse, D., Langhammer, R. J., and Liu, W-H. (2024), "Foul Play? On the Scale and Scope of Industrial Subsidies in China", Kiel Policy Brief, No 173. For example, direct subsidies to the car maker BYD increased from about €0.2 billion in 2020 to €2.1 billion in 2022.

21. See Gang, C., "China's Solar PV Manufacturing and Subsidies from the Perspective of State Capitalism", The Copenhagen Journal of Asian Studies, Vol. 33, Issue 1, pp. 90-106, June 2015.

22. Baqaee, D. and Farhi, E., "Networks, Barriers, and Trade", Econometrica, Vol. 92, Issue 2. pp. 505-541, March 2024.

23. While input-output tables feature sectoral granularity (e.g. 45 sectors in OECD TiVA tables), they are not granular enough to isolate specific green products. For example, electric vehicles are merged with thermal vehicles in the motor vehicles sector in the OECD TiVA tables. The construction of granular input-output tables relies on product-level trade data to decompose each broad sector in an initial input-output table into green and non-green products following the methodology of Borin, A., Conteduca, F. P., di Stefano, E., Gunnella, V., Mancini, M. and Panon, L., "Trade decoupling from Russia", International Economics, Vol. 175, pp.25-44, October 2023. We refine the methodology to capture specific sectoral interlinkages in Attinasi, M-G., Boeckelmann, L., Borin, A., de Castro Martins, B., Mancini, M. and Meunier, B., "Climate change and trade fragmentation", unpublished manuscript, European Central Bank, 2024.

24. For example, Rhodium Group estimates the price differential between German and Chinese EVs to be around 50%. The Baqaee-Farhi model does not include a fiscal block that would simulate the financing mode of subsidies.

25. See also de Santis, R.A., Neves, P., di Nino, V., Furbach, N. and Neumann, U., "Will the euro area car sector recover?", Economic Bulletin, Issue 4, ECB, 2024.

26. As a result of the anti-subsidy investigation launched by the European Commission in October 2023 on imports of battery electric vehicles for passengers originating in China, in June 2024 the Commission announced new tariffs on Chinese EV producers ranging from 17.4% to 37.6% on top of a 10% duty that was already in place for all electric cars imported from China.

27. Trade elasticities are based on Fontagné, L., Guimbard, H. and Orefice, G., "Tariff-based product-level trade elasticities", Journal of International Economics, Vol. 137, July 2022, as well as on Boehm, C.E., Levchenko, A.A. and Pandalai-Nayar, N., "The Long and Short (Run) of Trade Elasticities", American Economic Review, Vol. 113, No 4, pp. 861-905, April 2023.

28. A report by the European Commission highlights how China is the main source of the EU's dependencies, accounting for about one-third of all products identified as Single Origin Dependencies. For more details, see Arjona,

R. et al., “An enhanced methodology to monitor the EU’s strategic dependencies and vulnerabilities”, Single Market Economics Papers, No 14, European Commission, 18 April 2023.

January 2026

Vol.13, No.1

China's Economic Rebalancing under the 15th Five-Year Plan

BY NOUT WELLINK*

Introduction

The recommendations of the Central Committee of the Communist Party for the formulation of the 15th Five-Year Plan are ambitious and wide-ranging. Their ultimate relevance will depend on implementation rather than stated objectives, many of which – such as a future-proof modern economy, a harmonious society, a healthy environment, upholding the rule of law, security (food, energy, resources) – are broadly shared internationally. Yet, as the saying goes, there are many roads to Rome. The key issue is not the goals themselves, but the chosen path and its internal and external implications.

China's economy combines large aggregate size with relatively low income per capita. While China is the world's second-largest economy, it ranks around 70th globally in per capita income (PPP terms). For China, the priority is raising living standards and building a moderately prosperous society; for the rest of the world the focus is on the geopolitical and economic consequences of China's continued expansion. It is self-evident that the legitimate aspiration to catch up in terms of per capita income will affect the size of the economy and, consequently, China's relationship with other countries. These other countries —particularly the United States, but also Europe—will have to come to terms with China's growing economic and political weight. Conversely, China itself will need to exercise prudence in managing this process of economic and geopolitical transformation.

Unbalanced growth

In April 2024, I wrote in this journal that, despite geopolitical headwinds, a qualitatively sound economic growth rate of around 5 percent for the coming years seemed achievable, not least because the Chinese authorities have a proven track record of responding in a timely manner to unexpected developments. This assessment has indeed been borne out for 2024 and 2025.

A relevant question at present is whether the growth ambition of around 5 percent should be revised downward considering recent developments, and whether maintaining this ambition does not require urgent policy adjustments. The latter is clearly the case.

External conditions deteriorated due to heightened geopolitical uncertainty and erratic, increasingly restrictive U.S. trade policies. Moreover, long-standing domestic challenges—most notably in the real estate sector and local finances - have only been partially resolved, partly because insufficient use is made of insolvency frameworks. A relatively new problem is the widening gap in certain sectors between domestic supply and demand. Since early 2023 producer prices have declined persistently. In retrospect, one may ask whether sufficient attention was paid to this decline that began in early 2023. Falling producer prices may reflect productivity gains, excess capacity, or a combination of both. Determining which factor predominates is not always straightforward. While initially consistent with productivity gains, the prolonged nature of these declines increasingly pointed to structural overcapacity in several sectors. This has forced Chinese companies to tap into new markets., a strategy in which they proved highly successful. While this has benefited some emerging countries - particularly in Asia and parts of Latin America - it is perceived in countries with an already well-developed industrial base and relatively high-cost levels, such as Europe, as a form of dumping and a threat to domestic industry. In these countries, as well as in countries that are under pressure from the U.S. to impose import tariffs on Chinese products (for example Mexico), this has triggered, or is likely to trigger, further trade restrictive measures.

The conclusion can hardly be avoided that the growth rate of around 5 percent—particularly in 2025—has been achieved in an unsustainable manner. Interpretation of the 2025 data should, however, remain cautious. The trade tariffs imposed by the United States, as well as those repeatedly announced, modified or postponed, may have induced behavior that distorted the data- not only for China incidentally.

* Nout Wellink, Member of IMI International Advisory Board, Former Governor of the Dutch Central Bank.

China in a global context

It is useful to place the development of the Chinese economy in a somewhat broader perspective. The table below covers the years 2020–2025, an exceptional period marked by the COVID-19 crisis and rising trade tensions. The figures are largely drawn from the IMF's World Economic Outlook of October 2025 and are still provisional for 2025. Although the table contains only a limited number of macroeconomic indicators, it nevertheless allows for some interesting conclusions.

In a nutshell, the table shows that all major economic blocs—the United States, the euro area, and China - together accounting for almost 60 percent of global GDP - face significant challenges, albeit of different nature. China is therefore not alone in confronting major economic difficulties.

	Real gdp	private consumption	current account (% gdp) average	current account (% gdp) 2025	gross government debt (% gdp)* average	gross government debt (% gdp)* 2025
U.S.	2,3%	2,9%	-3,6%	-4,0%	123,9	125,0
Eurozone	1,1%	0,8%	1,9%	2,3%	90,3	87,8
China	5,0%	4,6%	1,8%	3,3%	112,9	128,9

*) For the U.S. and the eurozone the gross debt figures have been taken, without deduction of financial assets. For China the so-called augmented debt has been chosen, which includes debt of LGFVs and other off-budget government funds. These debt concepts seem most relevant for financial markets in times of stress.

The United States relies heavily on consumption-driven growth supported by expansive fiscal policy, resulting in persistently large current account deficits and (especially since 2020) a rapidly rising public debt. Americans consume excessively from abroad without being penalised by a sharp structural depreciation of the dollar, owing to its status as the world's reserve currency. Through import-restrictive measures, the U.S. seeks to reduce its current account deficit and bring production back to the United States. Problems caused in one's own country are thus shifted onto other countries.

The euro area, by contrast, struggles with severe supply-side constraints, including weak innovation, an incomplete internal market, and limited investment dynamism, alongside subdued private consumption (to some extent due to the corona crisis and the war in Ukraine). Fiscal policy was less expansionary than in the United States, reflecting concerns about debt sustainability. While the euro area's aggregate debt ratio is significantly lower than that of the U.S., existing disparities between countries within the monetary union can generate serious tensions—as witnessed during and around 2012.The Draghi Report, prepared at the request of the European Commission, outlines the policies Europe would need to pursue in order to raise its growth potential and make the area more resilient to international competition.

China has outperformed in terms of real gdp growth both the United States and, even more markedly, the euro area over the period 2020–2025. Negative assessments of China's economic performance in recent years are therefore overstated. If the growth differential persists, the Chinese economy will continue to converge in size toward that of the United States. However, recent growth has relied excessively on external demand, leading to substantial balance-of-payments imbalances, alongside a pronounced upward trend in augmented government debt.

In summary, the major economic blocs are characterised—albeit for different reasons—by growing balance-of-payments imbalances, high debt ratios, and diverging real gdp growth trajectories. These developments generate tensions between countries. Given the interconnected nature of these challenges, it is shortsighted to focus only on China.

Restoring balance

Rebalancing the Chinese economy requires addressing both supply- end demand-side distortions. On the supply side cut-throat price competition reflects persistent overcapacity in several industries (e.g. EV's and steel). The success achieved in manufacturing and technological development has thus had a downside: expansion proceeded too rapidly relative to domestic market developments. Chinese authorities acknowledge this problem and have explicitly stated that "involution" will be addressed. This is easier said than done and must not undermine efforts to improve productivity and cost efficiency.

Current policy responses focus mainly on stricter enforcement of existing regulations, reduction of unnecessary subsidies, and behavioral guidance by appealing to firms, industry associations, and banks to avoid disorderly competition. While these measures may have some effect, they risk increasing bureaucracy and, in my view, do not fully address the underlying problem of structural overcapacity. A truly effective approach would need to include bankruptcy- and exit mechanisms. Admittedly such measures are politically and socially sensitive.

On the demand side, strengthening private consumption is essential for building a robust domestic market and exploiting the huge potential of the domestic market. While there is broad consensus on this objective, scope for large-scale fiscal or monetary stimulus is limited. Debt dynamics - especially when accounting for all contingent liabilities that could ultimately fall on the central government - are already strongly upward. Budgetary space should therefore be created by reallocating existing resources, including the elimination of inefficient subsidies, and by encouraging private investment which is already under pressure rather than relying on debt-financed stimulus. Further monetary easing, while not excluded, should also be approached cautiously to avoid sustaining over-indebted "zombie" firms.

The weak contribution of consumption to GDP growth in recent years partly reflects confidence effects related to COVID-19 and the prolonged real estate crisis. Beyond that, more deeply rooted structural factors play a role. Exceptionally high precautionary savings continue to constrain consumption growth. Numerous measures have been taken at reducing uncertainty related to employment, pensions, healthcare, social security and family costs, but more still needs to be done in all these areas.

Accelerating agricultural and rural modernization is one of the top priorities of the authorities. China already has an extensive but, in my view, overly fragmented system of regional redistribution and development. Given large regional income disparities, a more coherent and integrated framework for regional redistribution could further support consumption growth, the more so because the marginal propensity to consume in poor areas is relatively high. Greater transparency and coordination – potentially through a nationally integrated cohesion mechanism – would enhance effectiveness of regional policies.

China's current account has followed an interesting trajectory over recent decades. After peaking at around 10 percent of GDP in 2007–2008, the surplus declined to approximately 1.5 percent by 2020. During the COVID-19 crisis it temporarily increased, mainly due to exports of medical supplies, but subsequently returned to a level that led the IMF, in its External Sector Report 2024 (ESR, July 2024), to conclude that China's external position and the RMB exchange rate in the period 2018-2023 were broadly consistent with long-term stability. Only one year later, this assessment has changed markedly. According to the IMF's most recent ESR (July 2025), the RMB was undervalued by approximately 8.5 percent in 2024, with estimates for 2025 likely to be even much higher given the rising current account surplus. While such rather "mechanical" estimates are subject to considerable uncertainty—particularly in China's case due to data limitations—it is nevertheless clear that a gradual RMB appreciation should form part of the policy mix. This is also what financial markets already expect. In its concluding statement following the Article IV Consultation of 10 December 2025, the Fund urged the Chinese authorities to fix swiftly and decisively important balances in its economy, including its exchange rate. The latter would contribute to reducing external imbalances by moderating export growth and supporting domestic absorption.

Concluding remarks

China' faces the need for accelerated structural transformation if it wants to maintain a high-quality real growth rate of around 5% (4,5 to 5%), necessary to bring per capita income on par by the mid-2030's with that of a mid-level developed country. It will not be easy to achieve such a target, but it is not impossible either. The necessary transformation process cannot be viewed in isolation from the adjustments required in other countries, which must also adapt to new geopolitical realities, changing market conditions, technological and demographic developments, and climate change. In a multipolar world dialogue is the preferred approach rather than confrontation.

Confrontation and self-reliance—particularly the race for technological superiority—have become increasingly dominant policy principles in all three blocks, with strategic and commercial considerations almost inextricably intertwined. However, confrontation and excessive self-reliance are in no one's interest, as it foregoes the welfare gains derived from international trade.

The common objective should be to reach a situation in which no party benefits from unilaterally changing its strategy: sufficient autonomy to avoid vulnerability, combined with sufficient interdependence to make escalation prohibitively costly. Achieving this balance requires a clear understanding of mutual dependencies and of the genuine red lines that should not be crossed. Effective communication, but also trust and the recognition that we will continue to need one another—whether in energy, food security, or climate policy—are crucial.

January 2026

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Reflecting on China's 15th Five-year Plan – 2026-2030*

Focus on Human Development Integrating Technical Advances for Improved Shared Benefits

BY PETER KOENIG

China's 15th Five-Year Plan (2026–2030) presents a balancing act of human and technical development. The two pillars are part are a strategy of integration, where technical advances favor human-centered progress; meaning full employment trough enforced human inputs in manufacturing, services, and agriculture, as well as in technical Research and Development.

Continued R&D will have a new meaning in this human centered development strategy.

Human Development Focus

The Plan prioritizes improving people's wellbeing, expanding social welfare, and addressing key societal needs such as education, healthcare, elderly care, and employment. Policies are designed to promote high-quality and full employment, refine income distribution, and expand the middle-income group, ensuring that economic growth benefits the population broadly. The plan also emphasizes common prosperity and aims to resolve pressing issues like childcare, housing, and social assistance.

Technical Development Focus

Simultaneously, the plan places a major emphasis on technological self-reliance and innovation, especially in critical sectors such as semiconductors, artificial intelligence (AI), quantum technology, and advanced manufacturing, i.e., technology assisted manufacturing.

The Plan intends to achieve breakthroughs in core technologies, reduce reliance on foreign inputs, and build a modern industrial system resilient to external shocks, i.e., foreign interferences, à la tariffs- and sanction-wars emanating from the west, notably from the United States.

This strategy is to be enhanced by stronger R&D initiatives which, in turn, requires expanding R&D funding. This shift in R&D emphasis aims at supporting emerging industries, and closer integration of science and industry, strengthening China's autonomy and independence from foreign influences.

In Summary

The 15th Five-Year Plan positions both human and technical development as mutually reinforcing. Industrial modernization and technological advancement are seen as essential for improving living standards and ensuring national security, while social policies are designed to support and empower the workforce driving these changes. The Plan's guiding principle is a "people-centered" approach, but this is closely linked to the need for technological progress and economic resilience.

Th Plan seeks advancing both human and technical development in parallel, recognizing that each is crucial for achieving sustainable, high-quality growth and national prosperity with shared benefits for all.

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IMI International Monetary Review

The Chinese Economy

Eddie Yue: Opening remarks - 15th Annual International Conference on the Chinese Economy "Macroeconomic Management and Structural Transformation"

BY EDDIE YUE

Opening remarks by Mr Eddie Yue, Chief Executive of the Hong Kong Monetary Authority, at the 15th Annual International Conference on the Chinese economy "Macroeconomic management and structural transformation", hosted by the Hong Kong Institute for Monetary and Financial Research, Hong Kong, 14 October 2025.

Distinguished guests, ladies, and gentlemen, good morning and welcome to the Annual International Conference on the Chinese Economy, hosted by the Hong Kong Institute for Monetary and Financial Research. The 15th anniversary of this conference marks a significant milestone in this journey of exploring China's economic transformation and its implications for the global economy.

The changing global economic landscape

The global economic landscape is changing, shaped by multiple transformative forces. The theme of this year's conference, "Macroeconomic Management and Structural Transformation," is particularly timely as China is at the forefront of these transformations. Its journey, therefore, offers valuable insights for economies worldwide.

As we explore the drivers of these changes, it becomes clear that several key factors are at play. On the global side, the urgent need to address climate change is driving the growth of climate finance, which is enabling the transition to a low-carbon economy and the development of new markets such as renewable energy and green technologies. Meanwhile, advancements such as cost-effective artificial intelligence (AI) models, are creating new opportunities.

Alongside these factors, supply chain restructuring, triggered by geopolitical uncertainty and the push for domestic resilience, is introducing new complexities. Demographic trends, such as ageing populations and evolving labour supply dynamics, are also reshaping consumption and investment patterns. Economies must adapt to these shifts while pursuing growth and resilience.

Against this backdrop, China's economic journey has been remarkable, driven by rapid industrialisation, integration into the global supply chain, and a focus on innovation and sustainability. Under the National 14th Five-Year Plan, the country has emphasised high-quality growth, sustaining progress by facilitating industrial upgrades, fostering service-oriented growth, and strengthening domestic consumption.

China's industrial upgrading

For decades, manufacturing has been central to China's economic success. The country's industrial structure has continued to optimise and be upgraded, enabling a shift up the value chain from labour-intensive production to advanced, high-tech manufacturing that delivers greater value-added growth. For example, equipment and high-tech manufacturing accounted for more than half of China's total industrial output in 2024. By leveraging domestic innovation, China has developed sophisticated production capabilities and become an integral part of the global supply chain, accounting for roughly 30% of total global manufacturing growth over the past five years1.

China's industrial upgrading has also been accompanied by a concerted effort to pursue a green transition, leading the world in investments in renewable energy and green technologies aimed at reducing emissions and creating new

industries. As a result, the country has seen a significant expansion in its renewable energy infrastructure, with the cumulative installed capacity of renewable energy sources, such as solar and wind power, now accounting for 56% of the nation's total energy capacity2.

As China's industrial upgrading continues, new opportunities are created for growth and innovation in human-capital-intensive industries, such as research and development. By fostering a culture of innovation and implementing market-oriented reforms, these industries can drive productivity growth, strengthening the virtuous cycle between industrial sophistication and services expansion.

The expanding service sector

Fuelled by the ongoing industrial upgrading and the growing complexity of manufacturing capabilities, a ripple effect has spurred demand for services such as logistics, finance, and marketing. As the service sector continues to expand, its role in driving economic growth has become increasingly prominent, with its contribution rising from 48% to 56% over the past decade. As a result, the sector has emerged as a significant source of job creation, with considerable potential for future expansion and development as demand for high-quality services is likely to increase, both domestically and internationally.

A vibrant financial services industry is central to this growth. By efficiently mobilising domestic savings and channelling capital to the service sector, it can unlock new growth possibilities. With advances in digital finance and cross-border capabilities, we can expect to see even greater efficiency and access to global markets for Chinese service providers as market reforms continue to progress.

The rise of domestic-led consumption

China's industrial base upgrade and growing service sector have led to a significant increase in per-capita disposable income. This growth, combined with rapid urbanisation encompassing two-thirds of the population, has created a vast and dynamic middle class of over 400 million people3. As a result, consumption patterns are shifting from goods to services, with per-capita spending on services rising by 7.4% in 2024, driving 63% of the overall growth in per-capita consumption expenditure4. These emerging patterns are likely to redefine the economy, with domestic demand becoming a central pillar.

By consolidating domestic circulation, China is enhancing its resilience against global uncertainties and reducing its exposure to external shocks. Despite having a lower average propensity to consume compared to other economies at a similar stage of development, China possesses considerable opportunities for long-term growth. To unlock this potential, supportive policies are important, and the recent initiatives indeed aimed at expanding access to financial services and strengthen household spending. Moving forward, institutional reforms that foster a diverse range of long-term financial products can help cater to the evolving needs of the population, unlock household savings, and propel economic growth. This, in turn, will help maintain momentum in industrial upgrades, diversify growth drivers, ultimately achieving a balanced and sustainable economic trajectory.

Conclusions

In a shifting global environment, China's pursuit of high-quality growth through industrial upgrading, the cultivation of a dynamic services sector, and the strengthening of domestic demand offers valuable lessons for driving the prosperity cycle for sustainable development. This experience holds broader implications for the rest of the world, especially as China embraces the next chapter of economic development under the new National 15th Five-Year Plan.

With its unique position, Hong Kong is ready to make significant contributions to the country's development. The city's deep and vibrant capital markets can facilitate fundraising for Chinese enterprises, promoting a more efficient funding ecosystem that supports technological innovation and real economy transformation. Additionally, Hong Kong's strong global connectivity can continue fostering the seamless exchange of goods, services, and knowledge between China and the rest of the world, further solidifying its position as a crossroads for international trade, investment, talent and innovation.

This conference is a valuable forum to explore these themes in depth. The papers to be presented will delve deep into China's industrialisation journey, and explore the broader implications for the macroeconomy going forward.

IMI International Monetary Review

Openness, Win-win Features of Chinese Economy*

BY ZHONG CAIWEN

A container ship leaves Qingdao Port, Shandong province. [YU FANGPING/FOR CHINA DAILY]

President Xi Jinping has emphasized that China will not change its resolve to expand high-level opening-up, its determination to share development opportunities with the rest of the world, and its commitment to an economic globalization that is more open, inclusive, balanced and beneficial for all. Guided by Xi's economic thought, China's economy continues to forge ahead with distinctive features of openness and win-win outcomes.

First, China is committed to steering economic globalization in the right direction and fostering sustained global economic growth. Having benefited from globalization, China has also been a contributor to, defender of, and driving force behind it. Since its reform and opening-up, China's economy has deeply integrated with the world economy, consistently contributing around 30 percent to global economic growth. The country also played a crucial role in stabilizing the world economy during the Asian financial crisis of the late 1990s and the global financial crisis of 2008.

At present, globalization is facing headwinds as imbalances between growth and distribution and capital-labor disparities within some countries intensify, alongside the rise of unilateralism and protectionism. As President Xi said, the only way out is to practice true multilateralism, and economic globalization is an irresistible trend of history. As a result, China consistently upholds and practices true multilateralism, firmly safeguards the multilateral trading system with the World Trade Organization at its core, promotes the reform and improvement of global economic governance, and contributes its wisdom to steering globalization in the right direction.

Besides, China is firmly committed to safeguarding the resilience and stability of global industry and supply chains, promoting smooth circulation of the world economy. President Xi has emphasized that maintaining the resilience and stability of global industry and supply chains is a vital guarantee for promoting the development of the world economy and serves the common interests of people globally.

* Published: October 8, 2025

China is the only country comprising all the industrial categories listed in the United Nations classification. During the COVID-19 pandemic, as the world's leading manufacturer, China played a crucial role in maintaining the stability of global industry and supply chains, and contributing significantly to the global fight against the pandemic and the recovery of the world economy.

Additionally, through its industrial restructuring and upgrading, China has established the world's largest and most comprehensive new energy industry and supply chains. Over the past decade, China has contributed to a cumulative reduction of over 60 percent and 80 percent in the global average levelized cost of energy for wind and solar power, respectively.

Third, it is advancing high-quality Belt and Road cooperation, offering public goods and a platform for international cooperation. Since 2013, the Belt and Road Initiative has become the world's most extensive platform for international cooperation. Solid progress has been made in "hard connectivity" of infrastructure, with the completion of projects such as the China-Laos Railway. The framework of "six corridors, six routes, and multiple countries and ports" has taken shape. The China-Europe Railway Express has completed over 110,000 trips, which, according to German media, has reinvigorated Duisburg — a city in Germany facing receding growth momentum.

For "soft connectivity", China has signed Belt and Road cooperation deals with more than 150 countries and over 30 international organizations, and has sealed 23 free trade agreements with 30 countries and regions. In terms of "heart connectivity", people-to-people bond as well as people's well-being has also been continuously strengthened, with numerous "small yet impactful" livelihood programs taking root in sectors such as agriculture, education, healthcare, poverty reduction, water resources, and disaster prevention and mitigation.

Furthermore, the country is steadfastly opening wider at a high standard, creating development opportunities for all countries. In a meeting with international business leaders in late March, Xi stated that partnering with China will bring more opportunities; believing in China is believing in tomorrow, and investing in China is investing in the future. With its market boasting nearly 50 trillion yuan ($7 trillion) in annual consumption and over 20 trillion yuan in imports, China offers significant development opportunities. It has proactively expanded imports, extending zero-tariff options to all least-developed countries with which it has diplomatic relations. Notably, the first seven editions of the China International Import Expo have generated a total intended transaction amount exceeding $500 billion.

China is actively aligning with high-standard international economic and trade rules, continuously improving its business environment, and steadily advancing institutional opening-up. It has completely lifted foreign investment access restrictions in the manufacturing sector and is advancing pilot programs to open up service sectors such as telecommunications, healthcare, and education.

As a survey by the US-China Business Council shows, an overwhelming majority of its member companies consider the Chinese market as indispensable to their global competitiveness. China's development presents tremendous opportunities to the world, not "shocks". These features of openness and win-win outcomes demonstrate that China is consistently sharing development opportunities with the world and playing a positive role in the global economy.

The article is an abridged translation of an article appearing in People's Daily.

The views don't necessarily represent those of China Daily.

Xi-Trump Meeting Vital for Sino-US Ties[☆]

BY ZHAO MINGHAO*

People walk past signs for APEC 2025 Korea on Tuesday at Gyeongju railway station in Gyeongju, the Republic of Korea, ahead of the 2025 Asia-Pacific Economic Cooperation Economic Leaders' Meeting. The 32nd APEC Economic Leaders' Meeting is scheduled to take place in Gyeongju from Friday to Saturday. JUNG YEON-JE/AFP

Editor's note: *As the 2025 APEC Economic Leaders' Meeting kicks off in Gyeongju, the Republic of Korea, on Friday, amid global economic uncertainty, China will make efforts to work with other economies in the Asia-Pacific region for regional prosperity and development. Three experts share their views with China Daily.*

Given recent frictions between Beijing and Washington over tariffs and rare earth exports, no wonder the world's spotlight was on the meeting between Chinese President Xi Jinping and his US counterpart Donald Trump, in Busan, the Republic of Korea, on Thursday.

In the first face-to-face meeting between the two leaders after Trump assumed his second term, Xi calls on China and the US to focus on long-term benefits brought by cooperation rather than falling into the vicious cycle of

☆ Published: October 31, 2025

* Zhao Minghao, professor and deputy director at the Center for American Studies, Fudan University.

retaliation, stressing that economic and trade teams of China and the US need to constantly narrow down the list of problems, extend the list of cooperation.

The meeting took place against the backdrop of an economic slowdown and trade protectionism affecting many APEC economies. The US' tariff policy posed a significant threat to the global multilateral trading system. According to the APEC Regional Trends Analysis report released in May 2025, economic growth in the APEC region is projected to slow down to 2.6-2.7 percent in 2026, a notable decline from 3.6 percent in 2024. In addition, many APEC economies are grappling with challenges such as declining exports, rising fiscal deficits and a shrinking labor force due to aging populations, casting a shadow over the region's long-term growth prospects.

The trajectory of Sino-US friction since April demonstrates that Washington should not underestimate the resilience of China's economy or Beijing's resolve to resist coercion. What President Xi said has chartered a right course that the two major countries should move forward, and President Trump said he has made deals with China after the meeting. Therefore in the follow-up, disagreements across US departments should not be allowed to disrupt bilateral consultations about the details.

Just as President Xi said, China never seeks to challenge or replace any country, but just focuses on doing its own business well. Confrontation is not China's goal, yet to promote stability, countermeasures are necessary. It is crucial for the big two to avoid a path of antagonism. The healthy development of bilateral relations is crucial for stability in the Asia-Pacific region and holds significance for the global economy.

In fact, the respective domestic economic transformations of the world's two largest economies can also create opportunities. In 2024, the total value of US trade in goods and services reached $7.3 trillion, while China's was approximately $7.1 trillion. China is striving to become a "major consumer", with annual consumption nearing 50 trillion yuan ($7.04 trillion).

The communique issued after the recently-concluded fourth plenary session of the 20th Central Committee of the Communist Party of China emphasizes working toward improving living standards while increasing consumer spending and coordinating investments in physical assets and human capital.

With a population of over 1.4 billion, China's middle-income group is projected to exceed 800 million within the next decade, signaling immense market potential. This presents significant opportunities for foreign companies, including US firms. While the US aims to revitalize its manufacturing sector, and Chinese enterprises are willing to invest in the US, this requires the US side to provide a stable and predictable investment environment for Chinese investors.

As the world's two largest economies, both the US and China have a responsibility to inject stability into global development and engage in deeper dialogue on how to better ensure both development and security.

The two countries should engage in dialogue on issues such as the multipolar world and identify the right way for major countries to coexist. Clearly, the US administration hopes to reduce the burden of maintaining the international order, but this should not undermine multilateral mechanisms or neglect shared global interests. Whether in the Asia-Pacific region or other areas, there is room for coordination between China and the US.

The US needs to move beyond a zero-sum mindset and refrain from viewing Sino-US relations through a winner-versus-loser lens. Hopefully the APEC meeting in the ROK has presented an opportunity for the two nations to deepen dialogue, as the whole world hopes Sino-US ties will progress toward a track of "strategic stability".

The author is a professor and deputy director at the Center for American Studies, Fudan University.

IMI International Monetary Review

Global Debt Remains Above 235% of World GDP*

Decline in private lending offsets increase in public borrowing; notable differences persist across countries and income groups.

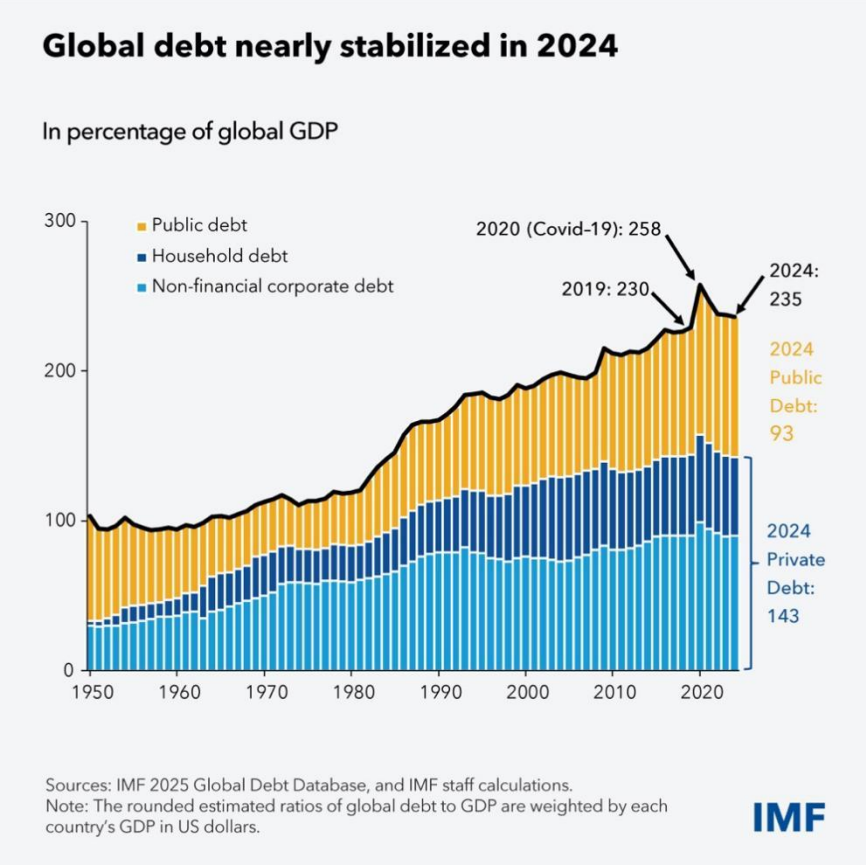
BY VITOR GASPAR, CARLOS EDUARDO GONCALVES, MARCOS POPLAWSKI-RIBEIRO

Global debt has stabilized, though it remains at an elevated level, as a continued reduction in private-sector lending offset greater borrowing by governments.

Total debt was little changed last year, just above 235 percent of global gross domestic product, according to the latest update of the IMF's Global Debt Database.

Private debt declined to under 143 percent of GDP, the lowest level since 2015, reflecting a reduction in household liabilities and little change in non-financial corporate debt. In contrast, public debt rose to nearly 93 percent, according to our database reflecting an annual survey of the amount and composition of debt held by governments, businesses, and households.

In US dollar terms, total debt increased slightly to $251 trillion, with public debt rising to $99.2 trillion and private debt decreasing to $151.8 trillion.



* Published: September 17, 2025

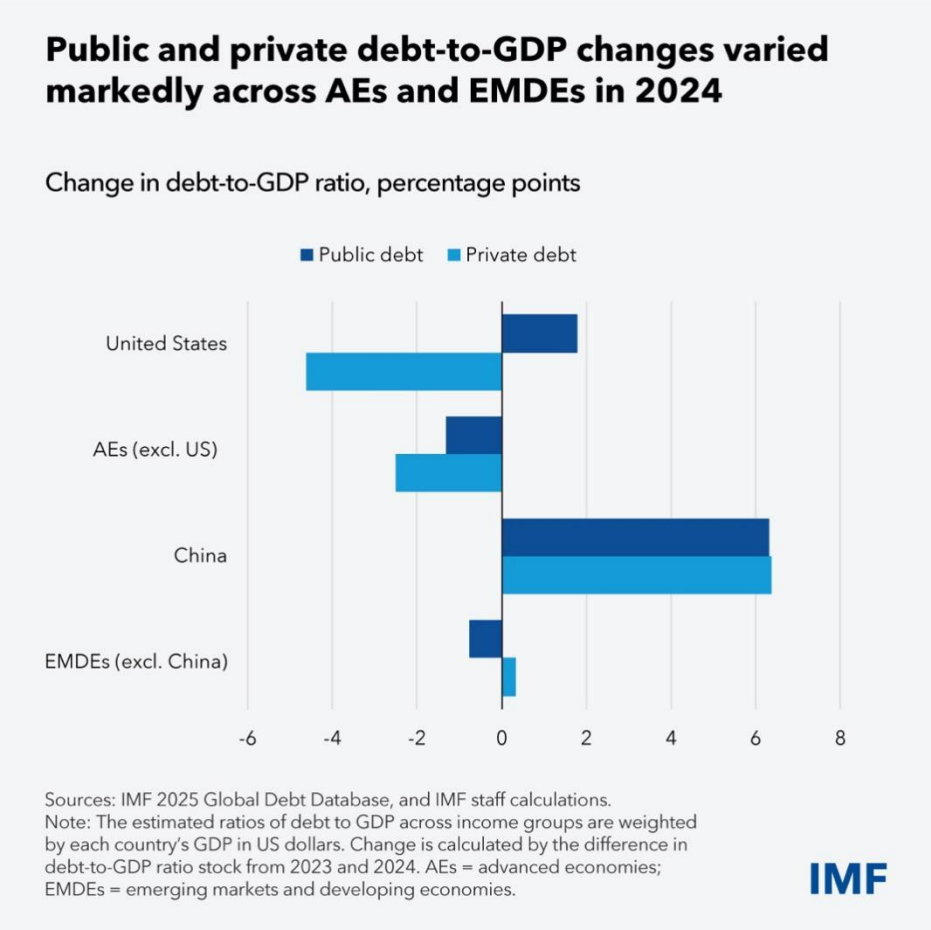
Diverging trends across income groups

These global averages mask notable differences across countries and income groups. While the US and China continue to play a dominant role in shaping global debt dynamics, as our April Fiscal Monitor showed, debt and deficit levels in many countries are still high and concerning by historical standards, in both advanced and emerging economies.

In the US, general government debt last year rose to 121 percent of GDP (from 119 percent), while China saw an increase to 88 percent (from 82 percent). Excluding the US, public debt in advanced economies fell by more than 2.5 points to 110 percent of GDP. Increases in some large, advanced economies like France and the UK were offset by declines in Japan and smaller economies, such as Greece and Portugal.

Excluding China, public debt in emerging markets and developing economies edged down to under 56 percent on average.

Private debt trends varied significantly across countries. The United States experienced a significant drop of 4.5 percentage points, to 143 percent of GDP), while China recorded an increase of 6 points, to 206 percent of GDP. Among other emerging markets and developing economies, private borrowing surged in larger economies like Brazil, India, and Mexico, but declined in Chile, Colombia, and Thailand.



What drives public and private debt patterns?

The persistently high global fiscal deficit, averaging around 5 percent of GDP, is the main driver of rising public debt. This deficit still reflects legacy costs from the Covid-19—such as subsidies and social benefits—combined with rising net interest costs.

The decline in private debt stems from different factors depending on the country and income group. In many advanced economies, companies are borrowing less, likely in response to subdued growth prospects, continuing a trend started in 2023. In the US, strong balance sheet positions and cash holdings are also contributing to lower

corporate borrowing. In other cases, rising public debt alongside falling private debt suggests a crowding-out effect, in which heavy public borrowing limits credit availability or raises its cost for the private sector.

In China, the increase in private debt was led by non-financial corporate debt. The pickup, despite ongoing weakness in the property sector, reflects still-ample credit supply, especially to support strategic sectors. In contrast, household debt edged lower, as soft mortgage demand and concerns over employment and wage growth continue to weigh on borrowing.

Elsewhere in large emerging markets and developing economies, rising private debt stems from high interest rates and their impact on non-performing loans (as in Brazil), improved near-term growth prospects (as in India), and corporate mergers and acquisitions. Conversely, weaker growth prospects have led to private debt declines in countries such as Colombia or Thailand.

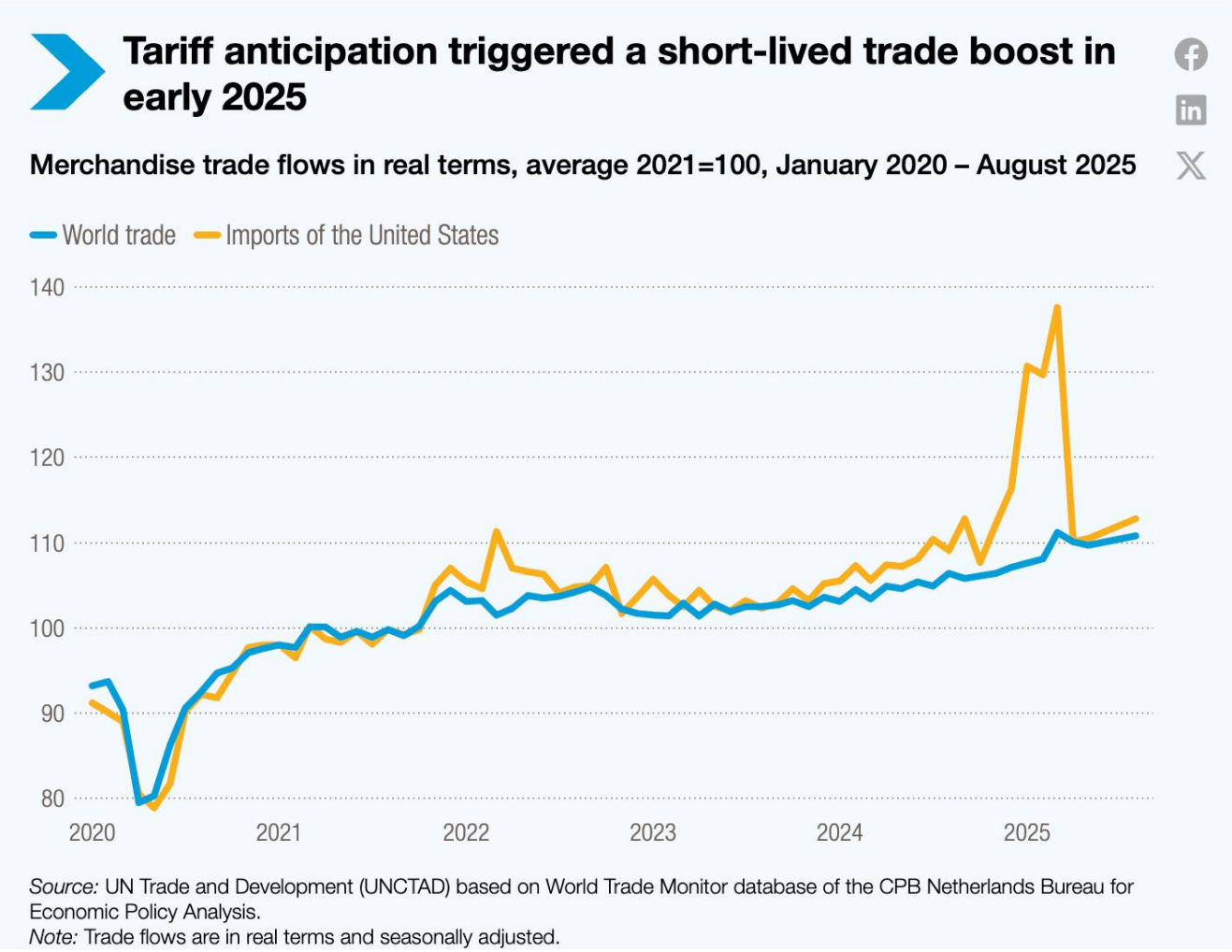
In low-income countries, recent debt dynamics reflect a range of additional factors. They include more limited financial development, tight liquidity conditions, and crowding-out effects linked to the sovereign debt-private debt nexus.

Governments should help manage these trends by prioritizing gradual fiscal adjustments within a credible medium-term plan to reduce public debt, while helping to avoid crowding- out private borrowing and investment. At the same time, fostering an environment that boosts economic growth and reduces uncertainty will help ease public debt and encourage private sector investment.

Over 90% of Global Trade Now Depends on Finance, Reshaping Opportunities and Deepening Vulnerabilities*

BY UNCTAD

Shifts in financial markets move global trade almost as strongly as real economic activity, influencing development prospects worldwide.



World trade began 2025 with what looked like a rebound. Shipments jumped as firms rushed to beat new tariffs in the United States, and investment in artificial intelligence gave an extra lift.

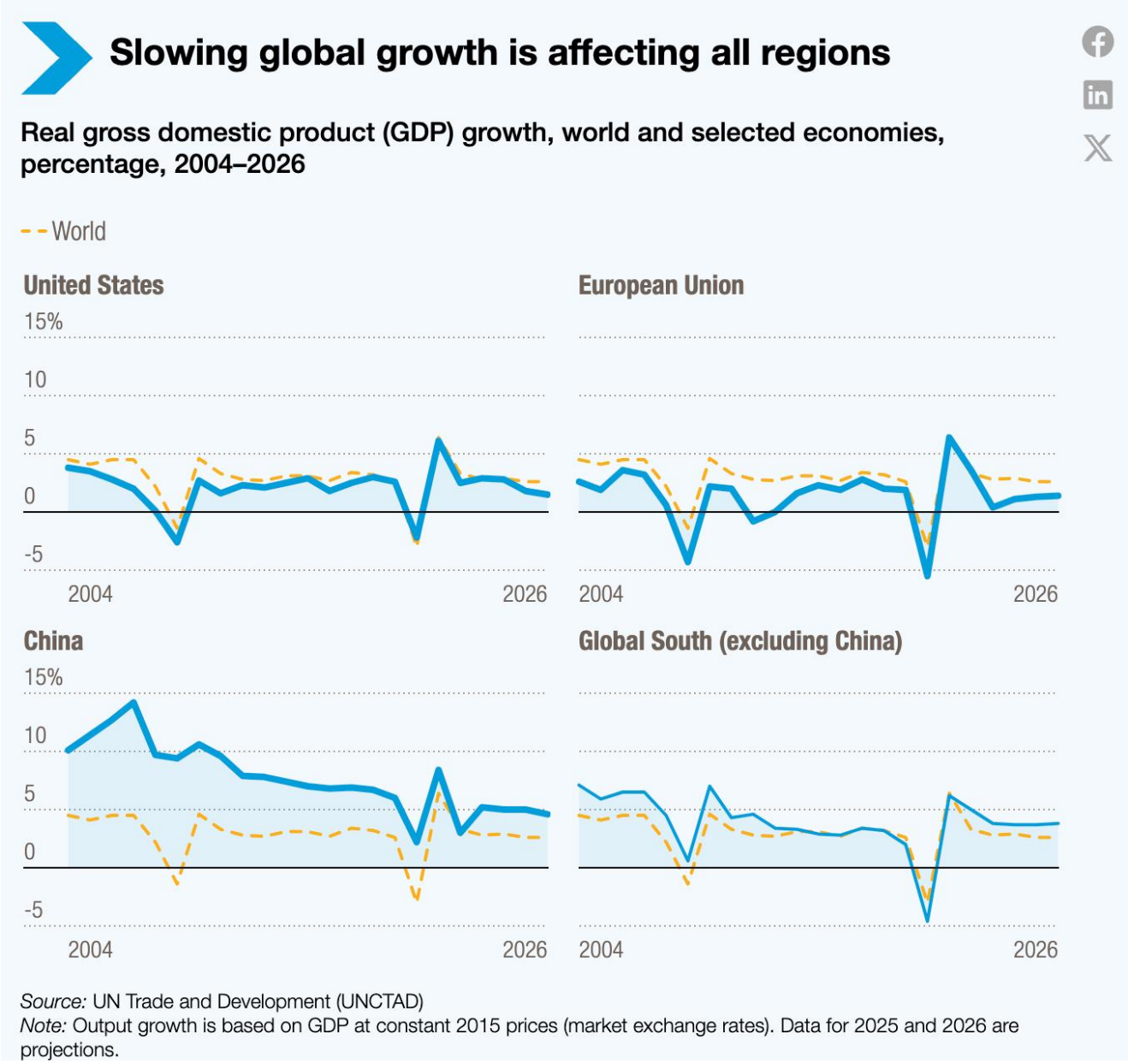
But once you remove these temporary boosts, the picture changes. Trade growth in the first half of the year **drops from 4% to between 2.5% and 3%** – and a slowdown looms on the horizon.

The wider economy tells a similar story. The Trade and Development Report 2025 projects **global economic growth to slow from 2.9% in 2024 to 2.6% in both 2025 and 2026.** This is below the pre-pandemic trend of 3% and far below the 4.4% average growth seen before the 2008-2009 financial crisis.

* Published: December 02, 2025

Source: UN Trade and Development (UNCTAD)
Note: Output growth is based on GDP at constant 2015 prices (market exchange rates). Average annual growth rates for 2004–2007: 4.4%, 2011–2019: 3.0% and 2023–2026: 2.7%. Data for 2025 and 2026 are projections.

Major economies are also losing steam. In the US, economic growth is expected to slow to 1.8% in 2025 and 1.5% in 2026. China's economy is slowing, too. Its growth is projected to fall from 5% in 2025 to 4.6% in 2026, down from an average of 6.7% in the years before the pandemic.



The resilience seen at the beginning of the year now looks much thinner.

Trade and finance increasingly move in sync

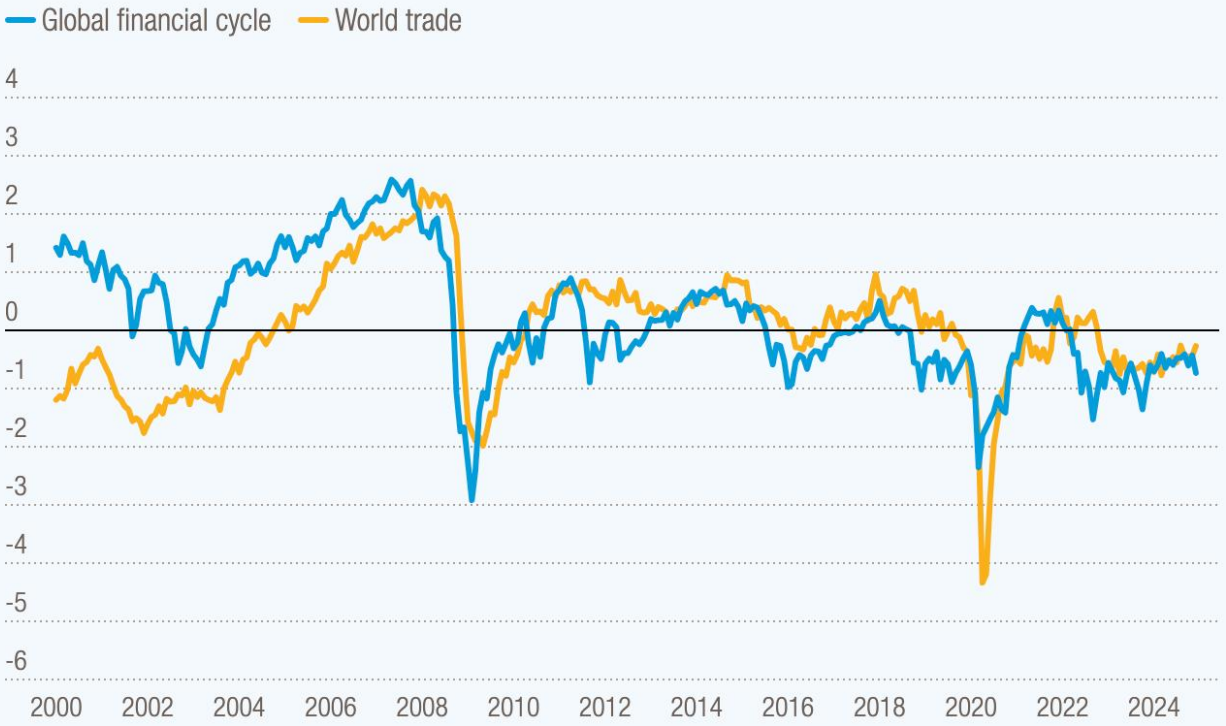
When we think about trade, we picture ports and shipping routes. But behind every shipment is a credit line. Behind every container is an exchange rate. And behind every trade route is a network of banks.

Today, more than 90% of world trade relies on trade finance. Banks, payment systems and financial instruments like derivatives increasingly determine who can trade, on what terms and at what cost.

Because of this, trade has become more sensitive to financial factors like changes in interest rates and shifts in investor sentiment.

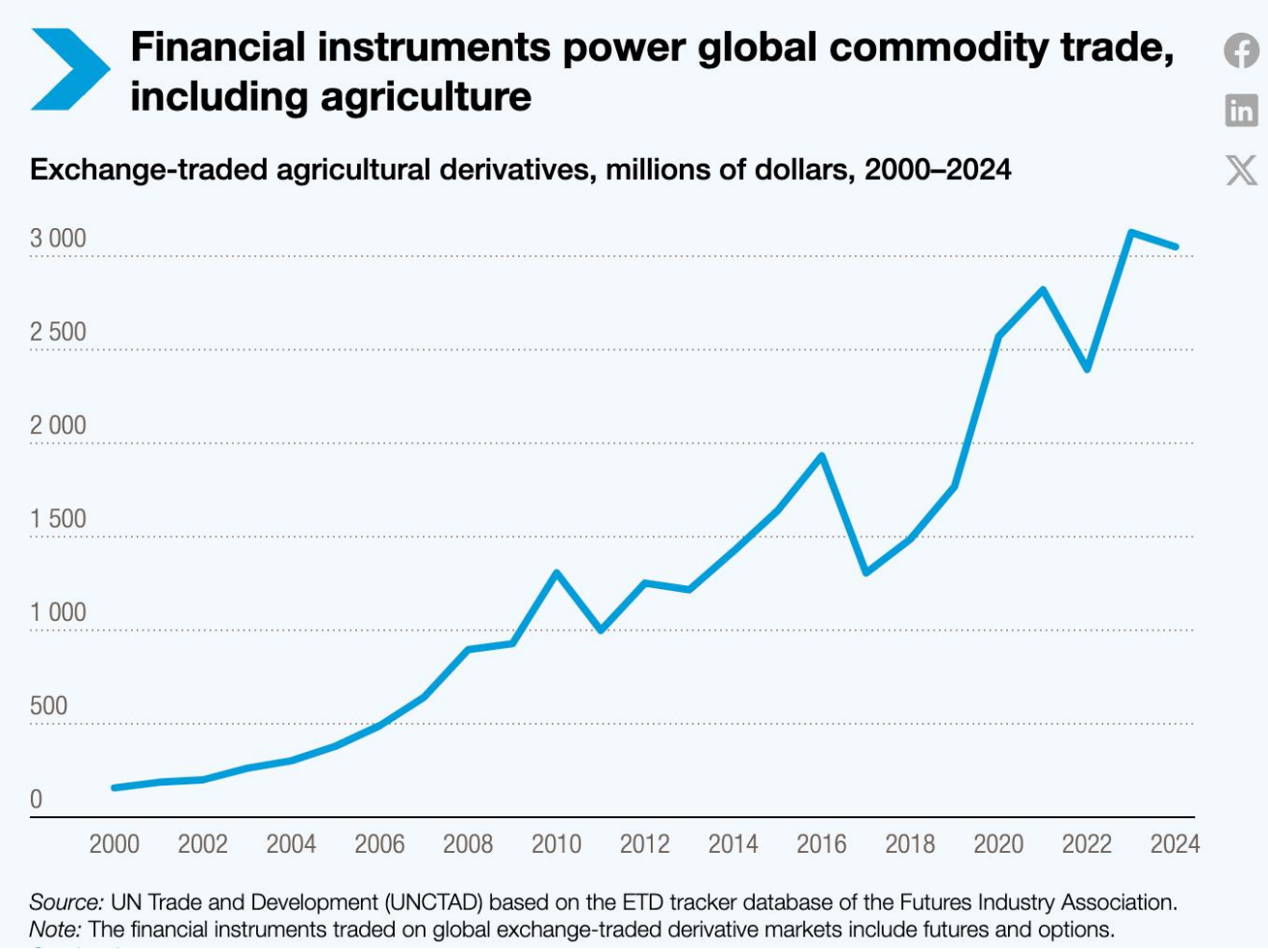
World trade and the global financial cycle move in sync

Monthly global financial cycle and detrended world trade volumes, standard deviations, January 2000 – December 2024



Source: UN Trade and Development (UNCTAD) based on an updated version of Miranda-Agrippino and Rey (2020) and the CPB World Trade Monitor.
Note: The GFCy is a statistical construct that captures common fluctuations in financial activity based on more than 800 asset prices related to credit conditions, risk-taking, capital flows, leverage, etc. (see sources for more details). Trade data have been linearly detrended. The two series are standardized with a mean of 0 and a standard deviation of 1. The correlation between the two series equals 0.54.

The tight link is clear in food markets. **Over 75% of major food-trading companies' income now comes from financial operations** like agricultural derivatives – not from moving wheat, coffee, cocoa or other agricultural products.

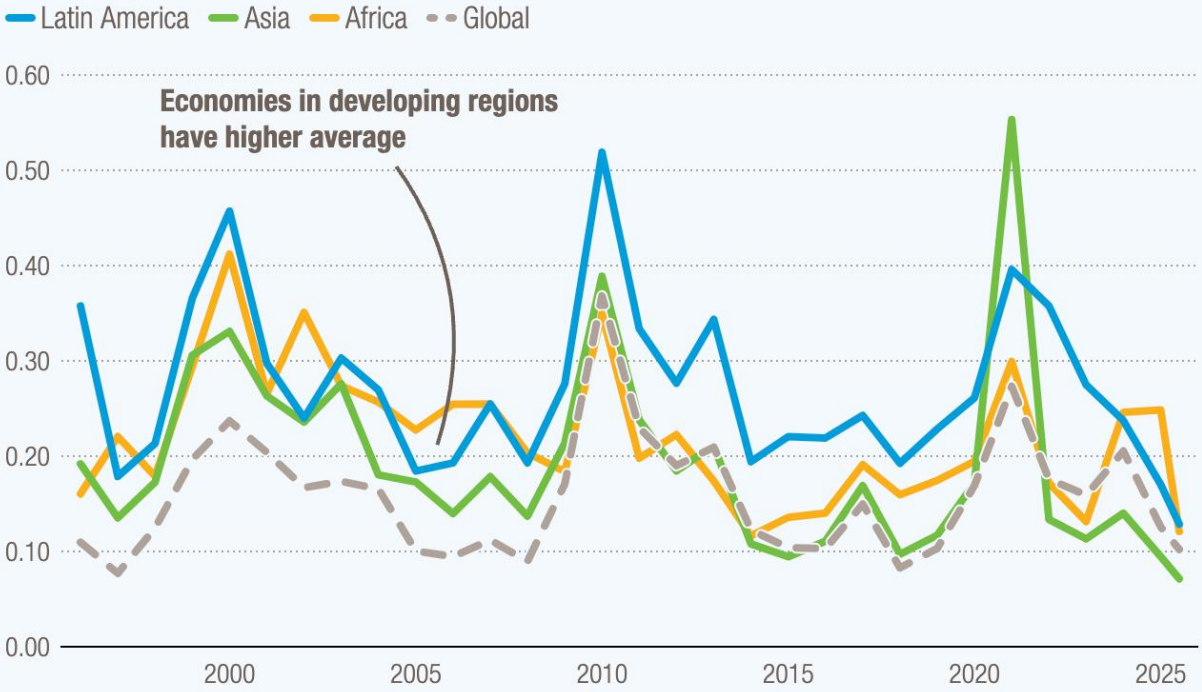


When finance drives trade, vulnerabilities grow

For developing countries, the growing role of finance in trade brings real vulnerabilities. Currency swings make imports and debt more expensive. Shifts in global risk appetite can cut off credit. And financial volatility tends to hit their markets harder and more often.

Developing economies are more exposed to financial volatility

Annual average of twelve-month rolling standard deviation of monthly market capitalization, selected country groups

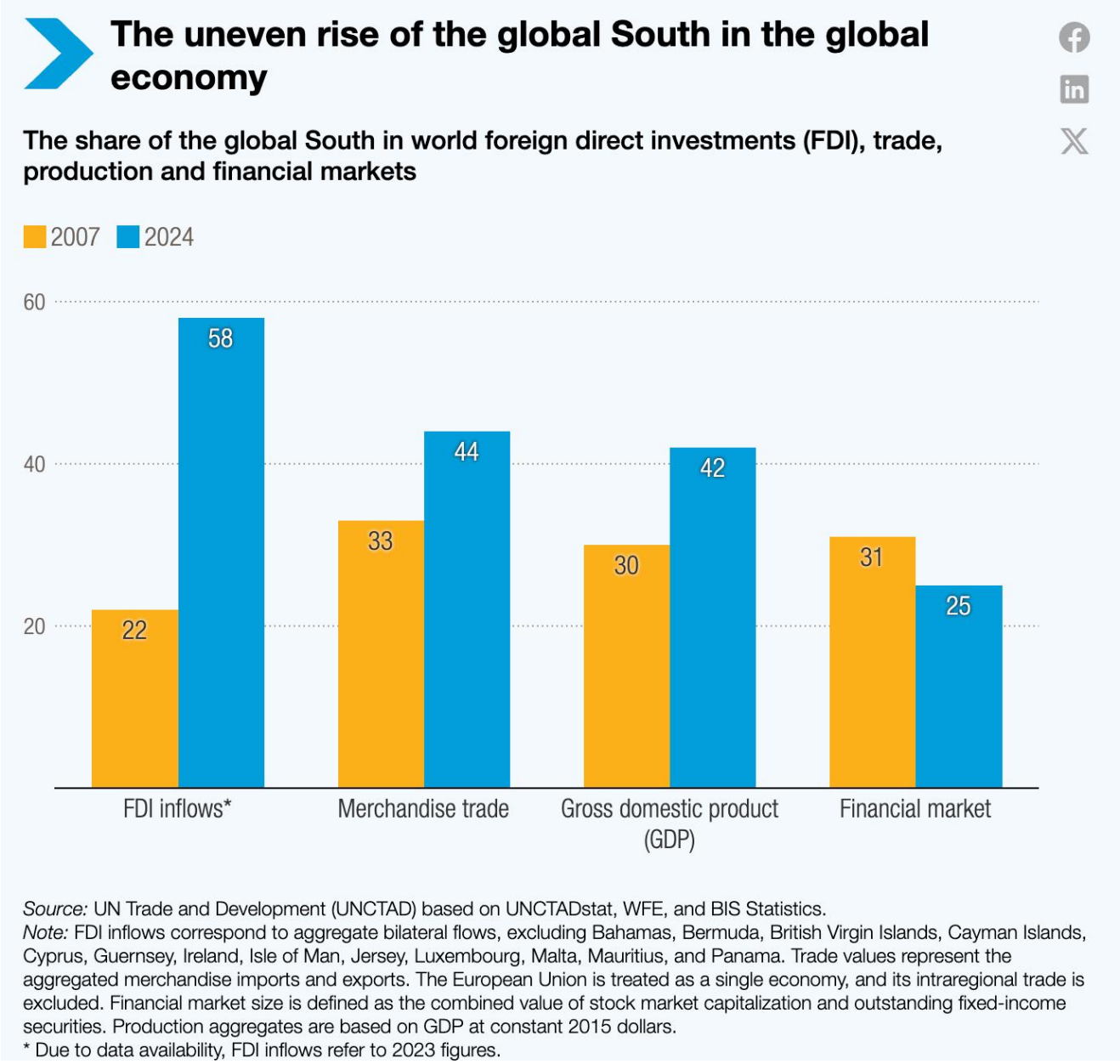


Source: UN Trade and Development (UNCTAD) based on LSEG DataStream.
Note: Market capitalization is proxied by 333 large-cap companies across 39 countries, of which 109 are based in the global North and 224 are located in the global South. 2025 includes data up to June.

When prices move on financial signals rather than real economic conditions, their companies and producers compete on a more uneven playing field.

The UN Trade and Development report highlights a widening gap between developing countries' growing weight in the world economy and their limited role in global financial markets.

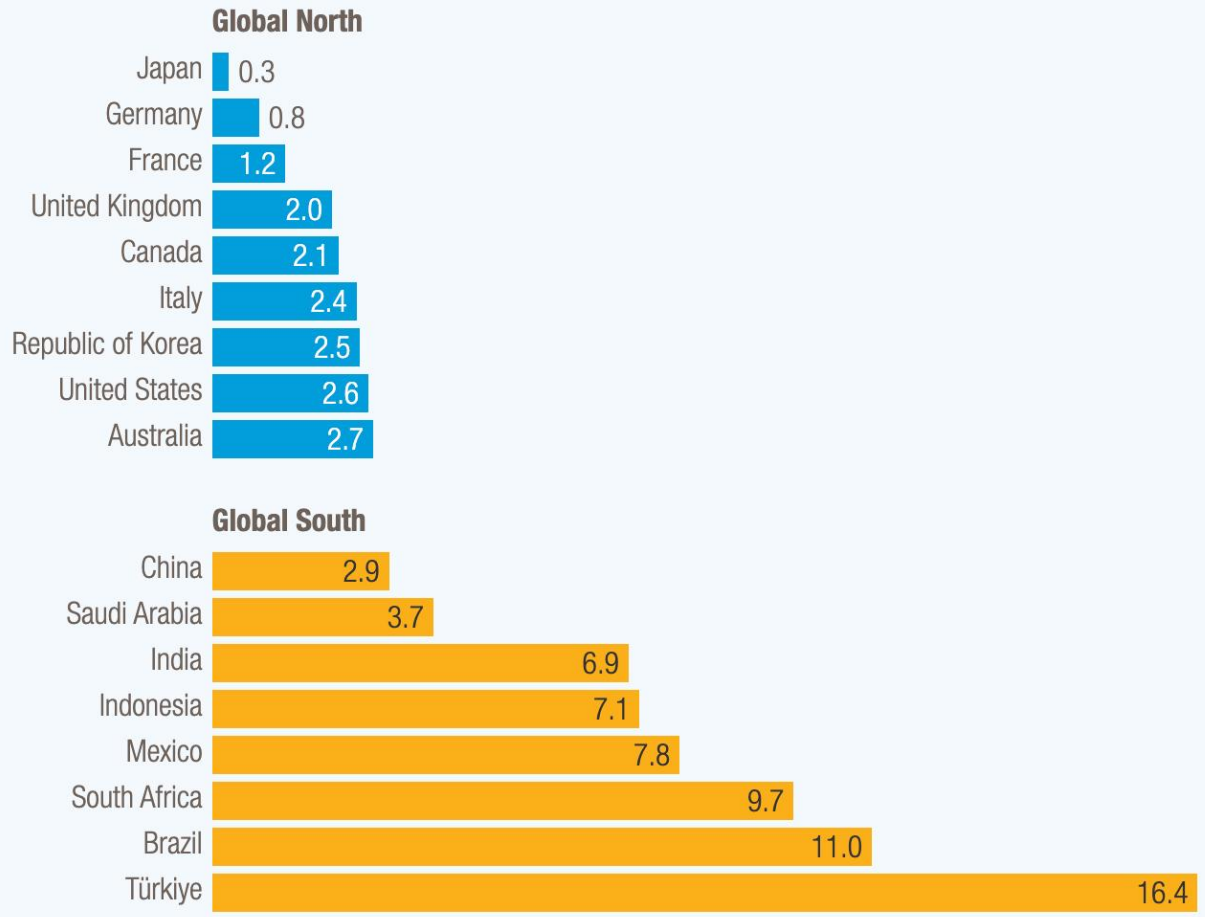
They now account for over 40% of global output and merchandise trade, and attract nearly 60% of global foreign direct investment (FDI). **Yet developing countries hold just 25% of global financial market value.**



Their smaller and less liquid capital markets make it harder for firms to raise money. Many developing countries also remain dependent on foreign banks, paying higher and more volatile interest rates. Advanced economies typically borrow at 1% to 4%, while **many emerging markets pay 6% to 12% for similar government bonds**.

Borrowing costs are higher for the global South

Ten-year treasury yield: global South and global North, percentage, 2015–2025 averages



Source: UN Trade and Development (UNCTAD) based on LSEG DataStream.
Note: Data show the government benchmark bid yield for 10-year bonds in selected G20 economies. Typically denominated in the local currency, these yields reflect the most liquid, domestically issued securities, serving as the primary 'risk-free' rate for each country. They form the baseline cost of long-term sovereign borrowing and influence corporate borrowing costs across their respective economies.

These higher costs undermine investment in infrastructure, innovation and climate resilience.

Targeted reforms needed to strengthen resilience

The Trade and Development Report 2025 outlines a set of practical reforms to reduce financial vulnerability and better align trade, finance and development. These include:

・Fixing the multilateral trade dispute system so rules are enforced and uncertainty is reduced.

・Closing data gaps on trade and investment statistics to better inform and coordinate policies.

・Reforming the international monetary system to limit harmful swings in currencies and capital flows.

・ Strengthening regional and domestic capital markets so developing countries can raise affordable long-term finance.

・Improving transparency in commodity trading and expand access to affordable trade finance, especially for small businesses.

True economic resilience requires strategies that connect trade, finance and sustainability – and ensure developing countries can shape global economic shifts, not just absorb them.

IMI International Monetary Review

Foreboding for World Economy Amid Market Calm*

BY DAVID MARSH AND ANDREA CORREA*

An air of foreboding is hanging over the world economy, with apparent calm on financial markets masking deeper nervousness about the global economic order. That was the underlying message from a meeting of the OMFIF advisory council on 18 September, assembling 32 participants from six continents.

The meeting, chaired by Lord Norman Lamont, who took over as chairman in May, was the first since the death in July of previous incumbent Lord Meghnad Desai. Delegates remarked how Desai would have enjoyed the prevailing atmosphere of cautionary gloom punctuated by intermittent shafts of optimism.

One participant summed up the historical background by saying the world was reverting to a similar state to the end of the 19th century. 'We are at a major turning point. We are seeing much of the post-1945 framework being discarded as we move to a more nation state-, political bloc-defined world.'

US President Donald Trump was a symptom, not the cause. 'The view – or hope – that Trump is an aberration and at the next presidential election the world will revert to its glorious status quo ante is misguide.'

The participant listed the principal points of concern: profound fiscal challenges in most states; a quasi-recessionary economic environment; a demographic challenge; a growing backlash against immigration; and a significant technology revolution. 'The world is becoming extremely volatile. Current politics fails to deal with these challenges. Hence the fragmentation of the centre-ground and the rise of hard-left and hard-right movements.'

Among striking descriptions of the world economy, one North American former central banker said: 'We are leaving an era of plenty and entering an era of scarcity' – bringing inflationary dangers. Another senior participant from Asia opined the world was switching from 'a bout of opulence' to 'a crisis of affordability'.

The meeting covered a wide range of themes.

Large divergence in inflation regimes prevailing across the world

One council member was particularly perturbed by the spectre of potential 'Latin American' conditions in the US and Europe – higher, persistent inflation and persistent challenges such as demographics, climate costs and deglobalisation. He projected a future of 'financial repression' with governments resorting to capital controls and stringent tactics to force central banks to hold down interest rates to avoid ruinous rises in the cost of servicing government debt.

Another speaker said this scenario was overdone. European Union inflation was 2%, while Switzerland was at 0.2% and China was in deflation. It was pointed out that tariffs might have limited effects on inflation – one of the reasons for sanguinity in financial markets.

Trade and finance: risks might not yet be fully priced in

As one speaker said, 'It might be too early to fully price risks. Markets initially view trade wars negatively, but bond markets respond differently'.

The response to Trump's policy was mixed. China can strengthen Asia regionalism, and the EU can boost domestic demand, but it is unlikely to create a strong single market. However, global trade has proven resilient. The meeting was reminded that, 'We're in a better position compared to the 1930s, with most trade flows remaining outside tariffs.

* Published: September 19, 2025

* David Marsh, Chairman of OMFIF

Andrea Correa, Senior Economist of OMFIF.

One important challenge was digital trade, which was growing fast. ‘But the World Trade Organization remains focused on goods.’

On US industrial policy, the Trump administration’s view of a forthcoming US ‘industrial renaissance’ (in areas like shipbuilding and steel) was denounced as a myth. ‘Manufacturing is less than 10% of gross domestic product and increasingly automated.’

Trump’s subsidies (for companies like Intel, Nippon Steel and MP Materials) were seen as reshaping the government’s relationship with the private sector, with a big impact on corporate governance and the quality and robustness of markets.

Public finance clouded by high and rising debt

Speakers showed alarm over the US fiscal outlook, with debt at over 100% of GDP, rising deficits and Trump’s fiscal bill adding more pressure. The threats to the Federal Reserve’s independence underline risks of fiscal dominance. Rising debt service costs with higher rates would create a vicious circle of moves towards an ever-higher debt overhang.

However, one delegate underlined that societies can make political economy choices to free up scarce capacity. ‘Governments’ spending choices influence debt-to-GDP dynamics, and this is something that can be reshaped.’

The conclusion was that domestic policy, human capital investment and a politically difficult focus on a longer-term agenda would help stave off a debt crisis.

The dollar’s supreme world role is intact – for the time being

Deep and liquid capital markets and a lack of alternatives are the main factors bolstering the US position. However, speakers emphasised how the Trump administration is actively promoting dollar depreciation, and this erosion of trust could weaken its long-term value. One veteran currency official summarised the position: ‘For the Trump administration, the reserve currency status of the dollar is not a privilege but a burden.’ Reconciling weak-dollar policies with reserve status would be a challenge.

There was a discussion on a shake-up of international payments through digital assets. This could lead over time to fresh diversification away form the dollar.

Brics grouping constrained by Russian membership

The Brics group of countries has undeniable ambitions, led by a development bank with around $50bn capitalisation and a contingent reserve arrangement designed as an alternative to the International Monetary Fund for members facing currency shortfalls.

China’s efforts to lead this group towards a meaningful challenge to US leadership were constrained by sanctions on Russia, a lack of systemic integration and continued reliance on the dollar. Transactions in local currencies were minimal. The underlying message was that, in the absence of deeper coordination, the Brics group would remain a ‘paper tiger’.

Risks and opportunities for stablecoins

Stablecoins can provide efficiency in transactions and cross-border payments, but also facilitate tax and regulatory evasion and illicit activity. Lobbying pressure for adoption, one speaker said, could be due to the perception that they are the main entry point into crypto trading.

Another view is that, although stablecoins can boost demand for dollars and US Treasury issuance, there was no overriding reason for a significant increase in usage. One member highlighted divergence. ‘The EU and Asia are moving towards central bank digital currencies; the US is tilting towards stablecoins. There’s a missing framework for interoperability across these systems.’

Blockchain is viewed as a scalable new infrastructure for value exchange. The Guiding and Establishing National Innovation for US Stablecoins Act and forthcoming Clarity Bill are expected to accelerate blockchain scaling. It was pointed out that part of the resilience of the US economy is due to the boom in artificial intelligence.

Geopolitical tensions abound

Geopolitics and institutions are approaching a tipping point amid fragmentation of the global order. The Trump 2.0 administration signals a structural break, which was probably already on its way. Institutions such as the WTO, IMF and United Nations are seen as poorly equipped to handle migration, digital trade or new geopolitical alignments.

The meeting concluded that migration and demographics are both cause and effect of large-scale economic and political perturbations. This is symbolised by a shift from ‘peace dividends to war bills’ and a flight to ‘hard’ crisis-proof assets. For global policy-makers, this is an uncomfortable and unpropitious outlook.

January 2026

Vol.13, No.1

APEC and the Global Economy*

BY KRISTALINA GEORGIEVA*

Thank you, President Lee Jae Myung, for the opportunity to share the IMF's latest global economic outlook with APEC leaders, whose economies together represent about 61 percent of global GDP.

As Korea is famous for building ships of all types, let me use a ship analogy.

Imagine a catamaran, cutting steadily through rough waters. This is what the world economy has proven to be: more resilient than many experts predicted, steadied by two hulls: one, sound institutions and policy fundamentals and, two, a dynamic and adaptable private sector. Decades of hard work have resulted in good policy frameworks such as inflation targeting and fiscal rules. Firms across APEC and beyond have quickly adjusted to shocks, with trade and investment frontloading, supply-chain strengthening, and compressed profit margins.

As a result, despite the policy shifts and transformations in geopolitics, trade, technology, and demography, growth has held up so far. Our forecast for global growth is 3.2 percent this year and 3.1 percent next year, slightly down from the 3.3 percent in 2024. For APEC, our forecast is a bit lower—growth of 3.1 percent in 2025 and 2.9 percent in 2026, down from 3.7 percent last year.

We project global inflation to decline further, to 4.2 percent in 2025 and 3.7 percent in 2026; for APEC, we see inflation hovering close to 2 percent in both years—and staying especially subdued in APEC emerging economies.

We recognize the high uncertainty around this outlook. Global economic prospects will depend on easing trade tensions, the scope and speed of AI's impact on productivity, the evolution of financial conditions, and how consumers and firms respond to the policy shifts and transformations underway.

We see four policy priorities: first, fix public finances wherever governments are overstretched; second, preserve financial stability; third, press forward on reforms to lift growth; and fourth, address excess imbalances.

First, the health of governments' finances. We forecast public debt in APEC to exceed 110 percent of GDP next year, with some APEC members at risk of seeing their debt burdens soon exceeding all-time highs registered after World War Two. This trend must be reversed to reduce borrowing costs and build buffers for the shocks yet to come. The good news is that there are enough policy options available to deliver a positive outcome.

Second, on preserving financial stability, the main risk may come from surging private investment in technology, notably AI. Embracing AI to lift productivity is a big plus, but we must guard against over-enthusiasm followed by abrupt reassessment and correction in the financial markets.

Third, on growth—more jobs, more revenue, and higher productivity are globally shared ambitions. Yet, in many economies the main driver of growth—private sector initiative—is held back by red tape, a self-inflicted injury. My call is for a regulatory clean-up to sweep away unwanted legacy rules and nontariff barriers, thereby facilitating more dynamism, more innovation, and more domestic and cross-border commerce.

Finally, on eliminating excess imbalances, we see a task that goes beyond trade policy—vital as that is—to deeper, underlying, macroeconomic factors: external rebalancing requires internal rebalancing. Economies that save too much need to spend more, supported by policies to lift confidence and remove distortions. Economies that consume too much need to save more, including by curbing their fiscal deficits. Rebalancing will be a gradual process, but history has shown that it is essential—and that all parties have skin in the game.

Regional cooperation can facilitate rebalancing and spur growth. As the trade landscape evolves, many economies are turning more attention to the opportunities afforded by regional cooperation and integration—this was evident at this week's highly successful ASEAN summit in Kuala Lumpur, which many of us had the privilege to attend.

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* Published: October 30, 2025

* Kristalina Georgieva, Managing Director, International Monetary Fund

Here at APEC, there are significant economic complementarities and therefore ample opportunities for further cooperation, to benefit individual economies and the world as a whole. Sail forward together—it is the key to wise navigation.

January 2026

Vol.13, No.1

Central Banks

Christine Lagarde: Hearing of the Committee on Economic and Monetary Affairs of the European Parliament*

BY CHRISTINE LAGARDE*

It is a pleasure to be with you again for our regular dialogue.

In recent months we have faced a period of heightened uncertainty. Yet, despite these challenges, the euro area economy has held up well.

This resilience is no coincidence. It reflects, in no small part, the strength of two achievements we sometimes take for granted: our Single Market and our single currency, the euro.

As a foundation for stability and a powerful symbol of European unity, both at home and abroad, the euro is one of Europe's greatest assets.

But in today's geoeconomic world, the likelihood of larger and more diverse economic shocks is expected to remain a constant feature of our environment. This prompts an important question: in this new global landscape, what role should the euro play on the world stage?

I will focus specifically on this question in my remarks today. However, let me first provide an overview of our assessment of the euro area economy and our monetary policy stance.

The outlook for the euro area

Over the first half of the year the economy grew by 0.7% in cumulative terms, thanks to resilient domestic demand. Stronger growth in the first quarter partly reflected frontloading of global trade ahead of expected tariff increases. Growth was lower in the second quarter as this effect reversed.

Sluggish export performance, driven by higher tariffs, a stronger euro and increased global competition, is expected to hold growth back for the remainder of the year. However, the effect these headwinds have on growth should fade next year. At the same time, survey indicators suggest that services continue to grow, signalling some positive underlying momentum in the economy.

Despite softening labour demand, the labour market remains a source of strength and is expected to support consumer spending. Consumer spending and investment should both benefit from our past interest rate cuts feeding through to financing conditions. Investment should also be underpinned by substantial government spending on infrastructure and defence.

As a result, ECB staff expect the economy to grow by 1.2% in 2025, by 1.0% in 2026 and by 1.3% in 2027.

Risks to economic growth have become more balanced as the likelihood of major tariff-related downside risks materialising has fallen, owing to the new trade deal. At the same time, risks remain that renewed trade tensions could further dampen exports, investment and consumption. By contrast, higher than expected defence and infrastructure spending and productivity-enhancing reforms would add to growth. Geopolitical tensions remain a major source of uncertainty.

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* Published: October 6, 2025

* Christine Lagarde, President of the European Central Bank, at the Hearing of the Committee on Economic and Monetary Affairs of the European Parliament, Strasbourg

Inflation remains close to our 2% target. According to Eurostat's flash estimate, it edged up to 2.2% in September, from 2.0% in the previous three months, mainly due to higher energy inflation. Core inflation – excluding energy and food – remained at 2.3%. Indicators of underlying inflation remain consistent with our 2% medium-term target. Real wages have caught up with levels seen before the inflation surge. Nominal wage growth was 3.9% in the second quarter, down from 4.0% in the previous quarter and 4.8% in the second quarter of last year. Forward-looking indicators, including the ECB's wage tracker, suggest that wage growth will moderate further and contribute to easing domestic price pressures.

The ECB staff projections see headline inflation averaging 2.1% in 2025, 1.7% in 2026 and 1.9% in 2027. Inflation excluding energy and food is expected to fall from 2.4% in 2025 to 1.9% in 2026 and 1.8% in 2027, owing to the stronger euro and declining labour cost pressures. Notably, the outlook for euro area inflation remains more uncertain than usual, with a still volatile global trade policy environment responsible for both upside and downside risks. At the same time, as new information has come in, the range of risks on both sides has narrowed.

The ECB's monetary policy stance

With inflation currently at around 2% and expected to remain at around that level over the projection horizon, we can say that the disinflationary process is over. At its most recent meeting, the Governing Council therefore decided to keep its key interest rates unchanged.

We are determined to ensure that inflation stabilises at our 2% target in the medium term. We will continue to determine the appropriate monetary policy stance by following a data-dependent and meeting-by-meeting approach. In particular, we will base our interest rate decisions on our assessment of the inflation outlook and the risks surrounding it, in light of the incoming economic and financial data, as well as the dynamics of underlying inflation and the strength of monetary policy transmission. Therefore, we are not pre-committing to a particular rate path.

The international role of the euro

Let me now turn to the international role of the euro, your chosen topic for today's hearing.

The international standing of currencies evolves slowly. For decades, the US dollar has been the dominant global currency, while the euro has firmly established itself as the second most used currency worldwide. This is evident in our latest report on the international role of the euro.1

However, the world is in transition. Geopolitical shifts and heightened policy uncertainty remind us that no currency's global position is guaranteed. In this changing landscape, there is a unique opportunity to create conditions to strengthen the euro's role on the global stage.

International currencies can appreciate in times of global stress as they attract safe haven inflows. Yet, there is no mechanical relationship between the global status of a currency and its exchange rate.

At the same time, raising the euro's global standing would bring tangible benefits. For instance, greater use of the euro in trade invoicing would reduce transaction costs for exporters and shield prices in the euro area from exchange rate volatility. Moreover, increased foreign demand for euro-denominated assets would lower borrowing costs for households, businesses and governments – in the context of the United States, this is often referred to as the "exorbitant privilege".2

We will not realise the full benefits of a stronger international role of the euro unless we adopt the right policies. To seize the benefits while avoiding the risks, Europe must do its homework and strengthen its foundations.3

First, from an economic standpoint, we need to create the conditions for sustainable growth and investment. Completing the Single Market remains essential to unlocking Europe's full potential. At the same time, we must integrate and deepen our capital markets, taking concrete steps towards completing the savings and investments union, for which an ambitious timetable is critical. We look forward to the European Commission's forthcoming initiatives in this regard, notably the Single Market roadmap and the proposal for strengthening capital market supervision. Moreover, additional steps like joint financing of public goods – such as defence – would help establish a safe and liquid pool of EU public debt. One year on from the publication of Mario Draghi's report on the future of European competitiveness, the time has come to put words into action.

Second, on an institutional level, we must safeguard investors' trust in the institutions and policies that underpin our currency, including by upholding the rule of law and defending central bank independence.

Third, from a geopolitical perspective, we must maintain our commitment to open trade and strike new agreements with global partners. At the same time, Europe must invest in its security to navigate an increasingly uncertain world.

These responsibilities rest, first and foremost, with governments and legislators. The ECB's role is to safeguard price stability, ensure financial stability and improve the financial and payments infrastructure that supports the euro. We are committed to continue supporting an environment in which the euro can thrive.

For example, by extending swap and repo lines to key partners, we safeguard against euro liquidity shortages abroad disrupting the smooth transmission of our monetary policy – which in turn encourages those partners to transact more in euro. Moreover, our work on settling transactions in central bank money using distributed ledger technology supports the development of Europe's digital capital markets, while aiming to enhance wholesale payment systems.4 Likewise, we are working on a digital euro and pursuing initiatives to enhance cross-border payments in euro, which could potentially facilitate international cross-border transactions in the future.

Conclusion

Let me conclude.

The euro was born out of a vision of a stronger and more united Europe. Today, that vision must adapt to meet the challenges posed by profound geopolitical shifts and to seize the opportunities offered by digital transformation.

The euro can be more than the currency of a continent and a symbol of unity – it can become a global anchor of trust. But vision alone is not enough. Europe needs bold reforms to turn this vision into reality. Now is no longer the time to just discuss reforms; now is the time to implement them.

Together, let us move forward with determination to deliver the Europe our citizens deserve and to strengthen the euro for the future.

IMI International Monetary Review

Central Banks are Turning Back to Gold*

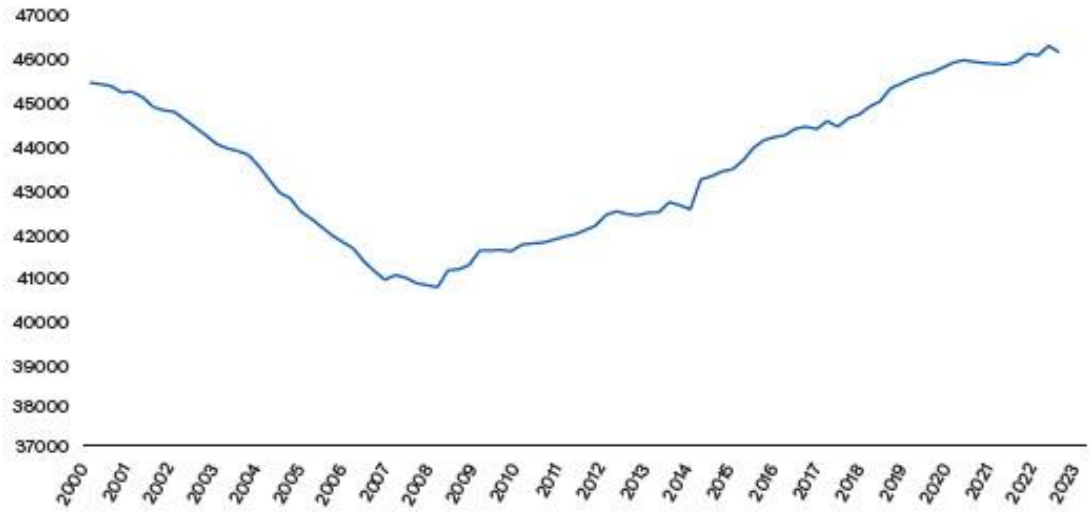
BY MICHAEL PAULUS, ALBERTO TORRES, SUNIL KAUSHIK, NATALIE TSUI AND TOBIAS CHEUNG

It has been more than 50 years since the dollar was unpegged from gold. Nevertheless, it remains a key asset for central banks around the world. Gold's attractiveness has recently increased against a backdrop of rising geopolitical and economic tensions. Will this continue and, if so, what are the implications for the distribution of gold around the world?

Geopolitical events have laid a solid foundation for gold to become prominent once again in the reserve portfolios of central banks, and as a way to settle payments for some countries. As geopolitical risks rise, various countries are setting their own restrictive rules for engagement, creating challenges for the financial system and cross-border trading, and raising concerns about holding offshore assets. Increasingly, central banks are holding gold as a hedge against volatility and geopolitical risk (Figure 1). This will continue to enhance gold's role in the monetary system.

Figure 1. Central banks are increasing gold holdings

(World total in tonnes)



Source: World Gold Council

One of the factors contributing to the rise in the price of gold and its attractiveness for central banks is reduced investor confidence in the dollar. The dollar's share of foreign reserves held in central banks has been declining and gold has benefitted from the trend, thanks to the absence of sanction risk (Figure 2).

The value of gold does not depend on the commitment of any single sovereign, which makes it attractive for central banks. However, it is important to consider dollar holdings within foreign exchange reserves in an historical context. Since the dollar became a floating rate currency in 1974, it has represented as much as 80% of global reserves (in 1977) and as little as 51% (in 1990). Current holdings of the dollar as a percentage of total foreign exchange reserves, at about 60%, are roughly in the middle of the 50-year range.

Figure 2. Current top central bank holders of gold

* Published: September 2, 2025

Ranking	Countries	Tonnes	% of total foreign reserve
1	US	8,133.5	73.2
2	Germany	3,351.5	72.5
3	Italy	2,451.8	69.2
4	France	2,436.9	70.9
5	Russia	2,335.9	30.3
6	China	2,264.3	5.1
7	Switzerland	1,040.0	9.1
8	India	846.2	9.8
9	Japan	846.0	5.4
10	Netherlands	612.5	62.9

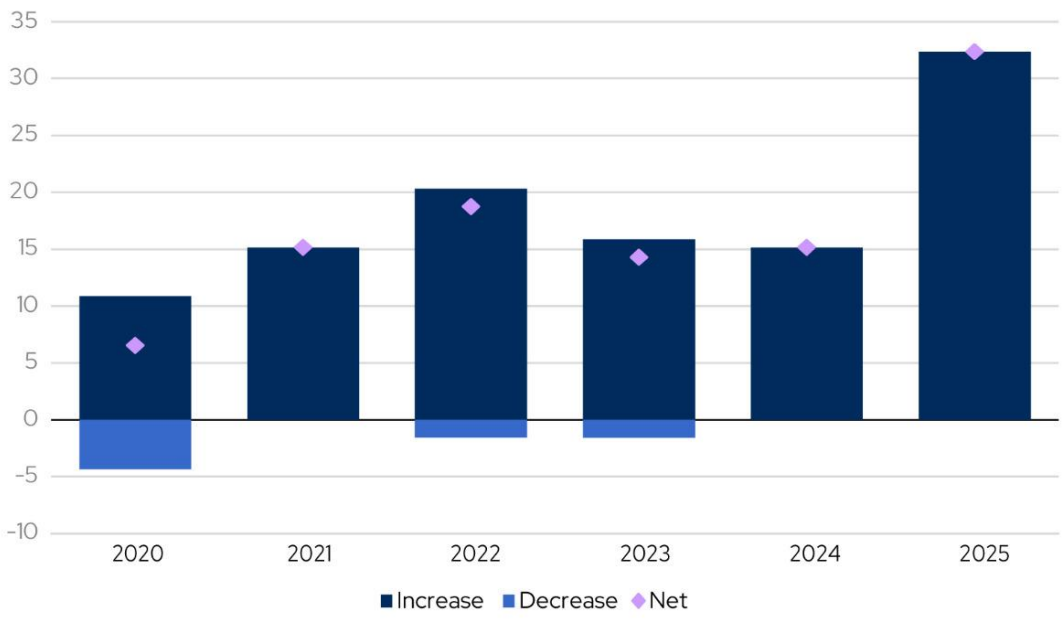
Source: World Gold Council

Note: Data as of July 2024

Gold has proved to be an attractive investment. Returns from gold over the last 20 years have been just slightly lower than S&P 500. Gold also has lower volatility and consequently a higher Sharpe ratio. The rise of gold-backed exchange-traded funds caters to this demand, giving investors liquidity and the ability to trade in small sizes, while still having the comfort of physical gold being held on their behalf.

Figure 3. Central banks are going for gold

Over the next 12-24 months, do you expect to increase, decrease or maintain your allocations to gold? Share of respondents, %



Source: OMFIF Global Public Investor 2025

Location of gold holdings

With geopolitical risks being one of the drivers for holding gold in foreign reserve portfolios, history shows that the location of gold storage is an important consideration. This was amply demonstrated prior to and during the first and second world wars when significant amounts of gold were shipped to the US and the UK, where much of it still remains. However, this is changing.

Physical security and access to a country's gold are increasing concerns. The trend began about a decade ago when some central banks decided to move some of their gold holdings back from the US, the UK and France. The issue gained greater focus when the G7 countries froze Russia's foreign exchange reserves following the invasion of Ukraine in 2022. Concerns intensified when the G7 countries decided to use frozen Russian assets to fund Ukraine's reconstruction efforts.

Since 2022 countries have increased their repatriation. India announced in 2024 that it repatriated about 100 tonnes of gold back to India from the UK. A study from 2024 shows that 68% of central bank respondents keep their gold onshore, compared to roughly 50% in 2020.

However, a significant portion of global gold reserves continue to be stored at the Bank of England and Federal Reserve Bank of New York. London and New York are international gold trading centres. Storing gold in London and New York allows it to be easily lent out or executed in different forms of gold trades.

Shanghai Futures Exchange and Shanghai Gold Exchange are becoming more prominent in the gold trading market. They have their own challenges when compared to markets in London and New York, including a limited product offering, a relatively small gold lending market and the limited participation of international banks and gold dealers. However, for countries not allied to the West and looking for diversification, these Chinese exchanges offer an attractive alternative.

Gold's value is intrinsic; it is not tied to any single sovereign entity. As a result, it is increasingly seen by central banks as a hedge against volatility and geopolitical risk. Given that these risks remain elevated, gold is likely to become a more significant part of central banks' portfolios to preserve value and, if necessary, a means of exchange. The distribution of gold holdings may also become more disbursed, away from the traditional, western financial centres to increasingly reflect the changing geopolitical landscape. In effect, gold has become a growing part of a longer-term strategy for diversifying foreign exchange reserves.

January 2026

Vol.13, No.1

Central Banks Need Modern Supervision Tools for the Stablecoin Era*

BY JILL SHEMIN*

Suptech could fulfill central banks' most critical mandates in the era of tokenised finance.

As tokenised finance accelerates globally, central banks face a critical blind spot. While considerable effort has been invested in crafting regulatory frameworks for virtual asset service providers, far less attention has been paid to the supervisory infrastructure needed to enforce these rules. This gap threatens to undermine even the most proportionate regulatory regimes and the threat is particularly acute in emerging markets where dollar-backed stablecoins are reshaping monetary dynamics at unprecedented speed.

Analysis from the Cambridge Centre for Alternative Finance identifies this challenge as part of a widening 'innovation delta' – the gap between regulators' capacity to supervise financial innovation and the rate of innovation itself. Among the delta's four manifestations, the temporal mismatch proves most acute for supervision: most regulatory reporting relies on quarterly figures while tokenised finance moves in seconds.

The temporal mismatch and visibility problem

Traditional financial supervision operates on periodic reporting cycles designed for an analogue world. Banks submit quarterly returns, regulators conduct annual examinations and supervisory responses unfold over months. This temporal architecture fundamentally mismatches the operational reality of tokenised finance, where stablecoin transactions settle instantly and cross-border flows operate around the clock.

Global stablecoin transaction volumes exceeded $15tn in 2024. To give context, this matches Visa's throughput. Yet unlike Visa, stablecoin flows often remain opaque to central banks unless they employ modern supervision technology. For central banks whose currency is not among the G7, this widening innovation delta coupled with expanding adoption of dollar-backed stablecoins poses an existential threat. The increasing use of dollar stablecoins transcends mere payments innovation; it represents a fundamental challenge to monetary sovereignty and the central bank's ability to guide monetary policy.

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* Published: November 5, 2025

* Jill Shemin, Head of Policy at EMTECH.

The temporal gap creates a particularly acute problem: the loss of necessary visibility into foreign exchange flows. Rapid growth in the stablecoin market – dollar-denominated stablecoins comprise over 80% of the $200bn global market – is bypassing traditional banking oversight, rendering quarterly reports outdated and hindering central banks' ability to manage exchange rates, assess external vulnerabilities and enforce capital controls.

Concern for the erosion of monetary control

In countries experiencing high inflation or currency instability, residents increasingly use dollar stablecoins as stores of value. Without modern supervisory technology and infrastructure, episodes of currency volatility can trigger large-scale capital flight that remains invisible to central banks. Central banks need visibility into these flows to understand their scale, velocity and impact on foreign exchange markets and monetary aggregates.

Nigeria provides a fitting example. In 2024, 20% of Nigerian residents reported that stablecoins account for more than half of their total portfolio, catalysed primarily by desire to access dollars given stringent capital controls. This represents capital flight operating at scale through channels that traditional supervisory tools cannot adequately monitor. In Pakistan, which receives $35bn in formal remittances, stablecoins are increasingly replacing traditional systems. The trends are evident: formal remittances fell from $31.3bn to $27bn in 2023 as flows shifted to unmonitored channels.

This is the crux of a fundamental concern for central bankers: stablecoin adoption and associated dollarisation risk could undermine monetary policy transmission and erode domestic bank deposits. Consider a central bank facing inflationary pressure that raises interest rates to tighten monetary conditions. Traditional monetary policy assumes this will reduce money supply growth and dampen demand. But without proper visibility into stablecoin conversions, the central bank cannot observe whether residents are shifting local currency deposits into dollar stablecoins or using another coping mechanism. By the time quarterly reports reveal the scale of these flows, the policy intervention window has closed. The money hasn't left the economy. It has moved faster than the central bank's capacity to take effective policy decisions.

Building supervisory infrastructure for modern markets

The solution is not prohibition – such bans have proven ineffective and counterproductive – but rather adopting suptech tools that provide visibility into regulated virtual asset activity and stablecoin flows. These tools cannot exist in isolation. They require analytical capability that combines on-chain monitoring with traditional finance surveillance and translates on-chain volumes into meaningful economic signals. Effective supervision demands a comprehensive platform that will integrate data spanning traditional and tokenised finance. What is the dollar-denominated stablecoin value held domestically? What is the velocity of domestic stablecoin holdings compared to traditional foreign exchange reserves? What proportion of remittance flows now occur through stablecoin rails?

Central banks can draw lessons from the fintech industry and leverage the properties of blockchain. Traditional payment providers are integrating stablecoin rails, creating hybrid systems that combine blockchain settlement speed with regulatory clarity. Blockchain-based proof-of-reserve systems shift supervision from periodic checking to continuous monitoring. Cross-chain interoperability protocols aggregate supervisory data, addressing the challenge that stablecoins pose as they operate across multiple blockchain networks.

Urgency of adoption

Suptech development must begin early in the regulatory process, not as an afterthought. Every quarter that central banks lack real-time visibility into stablecoin flows represents a quarter where financial stability risks accumulate unobserved and capital controls develop leakages. For emerging markets, delay compounds these costs and creates adverse selection in regulatory compliance.

Authorities need robust mechanisms for real-time sharing of supervisory information, particularly for the borderless nature of virtual assets and systemic risks. The challenge extends beyond national borders. Cross-border stablecoin flows that appear innocuous in one country may reveal significant patterns when aggregated. Both the Financial Stability Board and the International Organization of Securities Commissions identify cross-border co-operation as critical for effective virtual assets supervision. In their respective reports published in 2025, IOSCO emphasises the need for information sharing across the regulatory lifecycle, including during authorisation,

supervision and enforcement stages. The FSB found that gaps in data quality and limited regulatory reporting by VASPs hinder effective monitoring of financial stability risks.

These concerning weaknesses in implementing FSB Recommendation 3 underscore the urgency for cross-border co-operation in supervision. The value of supervisory data increases substantially when multiple jurisdictions adopt compatible systems. Enhanced international coordination is essential to implement consistent oversight and address regulatory arbitrage risks.

As the CCAF notes in its analysis, without system-level innovation, the innovation delta will continue widening, creating space for regulatory arbitrage, jeopardising consumer protection, inducing financial instability and weakening public trust. For central banks, modern on-chain supervision tools are not merely an efficiency improvement but a necessity for fulfilling their mandates and for emerging markets, maintaining monetary sovereignty.

Modern finance requires modern supervision. Hopefully it will mitigate a modern financial crisis.

IMI International Monetary Review

Strengthening Financial Governance and Cooperation Amid Rapid Technological Transformation*

BY TAO ZHANG*

Introduction

The theme of this session – governance in times of change – is both highly important and deeply relevant. In a world of rapid transformation, we are reminded that markets and economies can only flourish when there is trust. And trust, in the end, is the most valuable currency of all.

Across Asia, we have seen remarkable strides made in financial innovation – from mobile payments to new cross-border connectivity – that are reshaping the global financial landscape. China, too, has contributed important experiences in how technology and finance can be combined. This makes Beijing a highly relevant place to reflect on governance in times of change.

One year ago, in this same forum, I discussed the evolving roles of central banks in navigating macroeconomic challenges and leveraging the digital revolution to maintain financial stability.

This year, I will build on that foundation by focusing on how new technologies, such as tokenisation, can help us reform the governance of the system's core infrastructure, while upholding the timeless principles that ensure money remains stable and trustworthy.

Developments in tokenisation

One of the most notable financial developments in recent years has been the rise of tokenisation. Tokenisation allows money and assets to be represented digitally in programmable form, so that messaging, reconciliation and settlement occur as a single atomic operation.

This is no longer a distant prospect. As of mid-2025:

- More than 20 sovereigns and supranationals have already issued tokenised bonds.
- These issuances have spanned nine different currencies, with volumes exceeding $4 billion.
- The early experience shows that issuance and liquidity conditions can be broadly comparable with traditional bonds, while efficiency gains in settlement and collateral management are beginning to emerge.

Several Asian economies have been among the early movers in this field, piloting tokenised bonds and exploring new forms of faster cross-border payments.

Let me highlight two applications that illustrate the promise of tokenisation.

- First, cross-border payments. Today's transactions often rely on long chains of correspondent banks. Each link adds cost, delay and risk. With tokenisation under sound governance, transactions can flow more directly, with compliance checks embedded from the start and settlement occurring more efficiently. The outcome is faster, cheaper and safer.
- Second, securities settlement. Even in advanced economies, government bond transactions can take days to settle. Tokenisation can shorten this dramatically, freeing liquidity and reducing counterparty risk. By embedding collateral rules and payment-versus-delivery in programmable tokens, settlement can be

* Published: October 28, 2025

* Tao Zhang, BIS Chief Representative for Asia and the Pacific, at the 2025 Financial Street Forum.

instantaneous and automated. This shows how governance and technology, working together, can transform the backbone of the financial system.

These examples demonstrate that tokenisation is not an abstract idea. It is already reshaping how markets operate, and it carries enormous potential for the future.

Why governance is essential

But let me add a note of caution: technology alone does not guarantee stability. Without proper governance, tokenisation could create as many risks as it solves.

- **Fragmentation.** If countries or private actors pursue isolated solutions, we could end up with digital silos that fail to interoperate – raising costs instead of lowering them.
- **Uncertainty.** Without clear legal status for tokenised claims, participants may hesitate to adopt new systems, undermining trust.
- **Risk migration.** Operational, cyber and compliance risks may simply move into new corners of the system if governance does not adapt in a timely and consistent manner across jurisdictions.

In other words, governance is the compass that determines whether new technologies strengthen cooperation or deepen division. The challenge is not simply to innovate, but to innovate together.

Principles that must endure

This is why we must keep sight of enduring principles. Any sound monetary and financial system must satisfy what the BIS calls "the triple test":

- **Singleness:** all forms of money must be interchangeable at par, anchored in central bank money.
- **Elasticity:** liquidity must expand and contract with the needs of the economy, through central banks, banks and other financial institutions working together.
- **Integrity:** the system must be resilient against misuse, compliant with rules and worthy of public trust.

What central banks can do

So, what is the role of central banks in improving governance as tokenisation advances? I would highlight four responsibilities.

- First, articulate the vision. Central banks must explain clearly to markets, policymakers and the public what must be preserved and what can adapt. They must show that while technology changes the form, the essence of money – its singleness, elasticity and integrity – must remain. Clarity of vision not only guides policy but also reassures participants navigating uncertainty.
- Second, lay the legal and regulatory foundations. Innovation cannot thrive without legal certainty. Tokenised claims must be recognised in law and treated consistently across jurisdictions. Digital identity frameworks must be robust, balancing privacy with the need for oversight. Standards for interoperability, messaging and programmability must be harmonised so that national systems can connect across borders. This legal and regulatory scaffolding is what will transform isolated pilots into a coherent system.
- Third, provide the public goods. Only central banks can issue central bank money – the ultimate settlement asset that anchors the system. Beyond issuing money, they must also ensure that settlement infrastructures are resilient to shocks, inclusive of participants and open to innovation. By providing safe rails and common platforms, central banks enable the private sector to innovate on a stable foundation.
- Fourth, foster cooperation with the private sector. Most of the concrete applications will be developed by banks, financial institutions and technology providers. Central banks should not seek to crowd out this innovation. Their role is to set the guardrails, encourage experimentation under proper oversight and ensure that compliance and resilience are embedded in the design. In short, central banks must be both enablers and guardians, opening the door to new possibilities while protecting the trust that is essential for stability.

Together, these responsibilities form a governance framework that balances innovation with stability, experimentation with caution and national authority with international cooperation.

How the BIS can help

But no central bank can carry this burden alone. Because money and finance flow across borders, international cooperation is indispensable. This is where the BIS plays its part.

- **Providing platforms for cooperation.** Through forums such as our bimonthly meetings, regional groups and the Basel-based committees, the BIS brings together central banks from advanced and emerging market economies alike. In these settings, Governors and senior officials share perspectives, test ideas and coordinate responses. This convening power is itself a form of governance, ensuring that national reforms add up to something greater than the sum of their parts.

- **Developing standards and guidance.** The BIS hosts the Committee on Payments and Market Infrastructures (CPMI), which has been at the forefront of global efforts to enhance cross-border payments, harmonise messaging standards and strengthen the safety of market infrastructures. It also supports the Basel Committee on Banking Supervision and other standard setters, whose work provides the guardrails that underpin trust in the global financial system.

- **Fostering practical experimentation.** Through the BIS Innovation Hub, central banks and private firms jointly explore how technologies like tokenisation can be deployed in ways that are safe, resilient and interoperable. The purpose is not to prescribe a single model, but to accelerate learning, reduce duplication and help jurisdictions avoid costly mistakes.

- **Contributing through research and capacity-building.** Our analytical work on financial innovation helps frame the debate with rigorous evidence. Our training programmes and technical assistance spread this knowledge to central banks worldwide, ensuring that capacity is built not only in large economies but also in smaller and emerging market economies. This inclusiveness is vital if reforms are to strengthen the system globally.

In all these ways, the BIS acts as both a forum and a catalyst, helping central banks pursue innovation with confidence while ensuring that national initiatives remain interoperable and coherent at the global level.

Conclusion: cooperation in times of change

Let me conclude by returning to the theme of this forum: international financial governance and cooperation in times of change.

Technology is rewriting what is possible. But governance will determine what is achieved.

By articulating clear visions, laying solid foundations, providing public goods and promoting private innovation, central banks can manage transitions in ways that preserve stability and trust. By working together, we can ensure that reforms avoid fragmentation and instead foster integration.

This is not only a question of efficiency. It is a question of trust and collective responsibility. If we succeed, the financial system of tomorrow will carry forward the strengths of today and embody the spirit of building good governance together that this forum so powerfully represents.

Speaking here in Beijing, I am reminded that good governance is not only a challenge, but also an opportunity.

January 2026

Vol.13, No.1

Economic Resilience

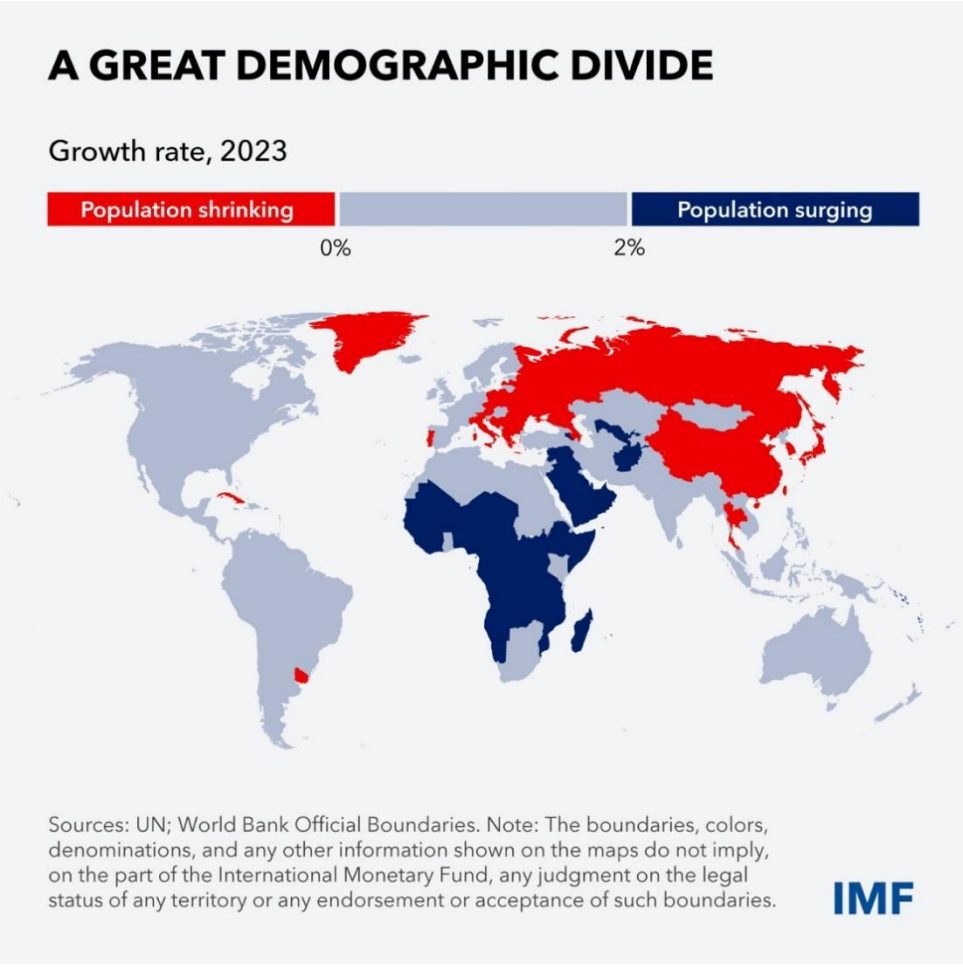
Resilience in a World of Uncertainty*

BY KRISTALINA GEORGIEVA*

Deputy Prime Minister Olavo Correia, thank you, and may my future travels take me to the beautiful shores of Cabo Verde and the soulful melodies of Cesária Évora—or perhaps even to a football victory chant! Congratulations to your national team for qualifying for the World Cup for the first time in your country's history!

Dear Ajay, I cannot think of a better partner to have at the Bank than you! Thank you for your remarks and for your total and tireless focus on jobs.

As you point out Ajay, the world confronts a great demographic divide. Let's look at a world map: first, we see a set of countries grappling with aging and shrinking populations; then, a group in the middle; and finally, large sections of Africa and parts of the Middle East and Central Asia where population growth is surging, as is a youthful workforce.



* Published: October 17, 2025

* Kristalina Georgieva, IMF Managing Director

To our global membership, a very warm welcome—and let me state upfront that any insights I may share with you today reflect the collective wisdom of the IMF's talented and dedicated team coming from 172 countries.

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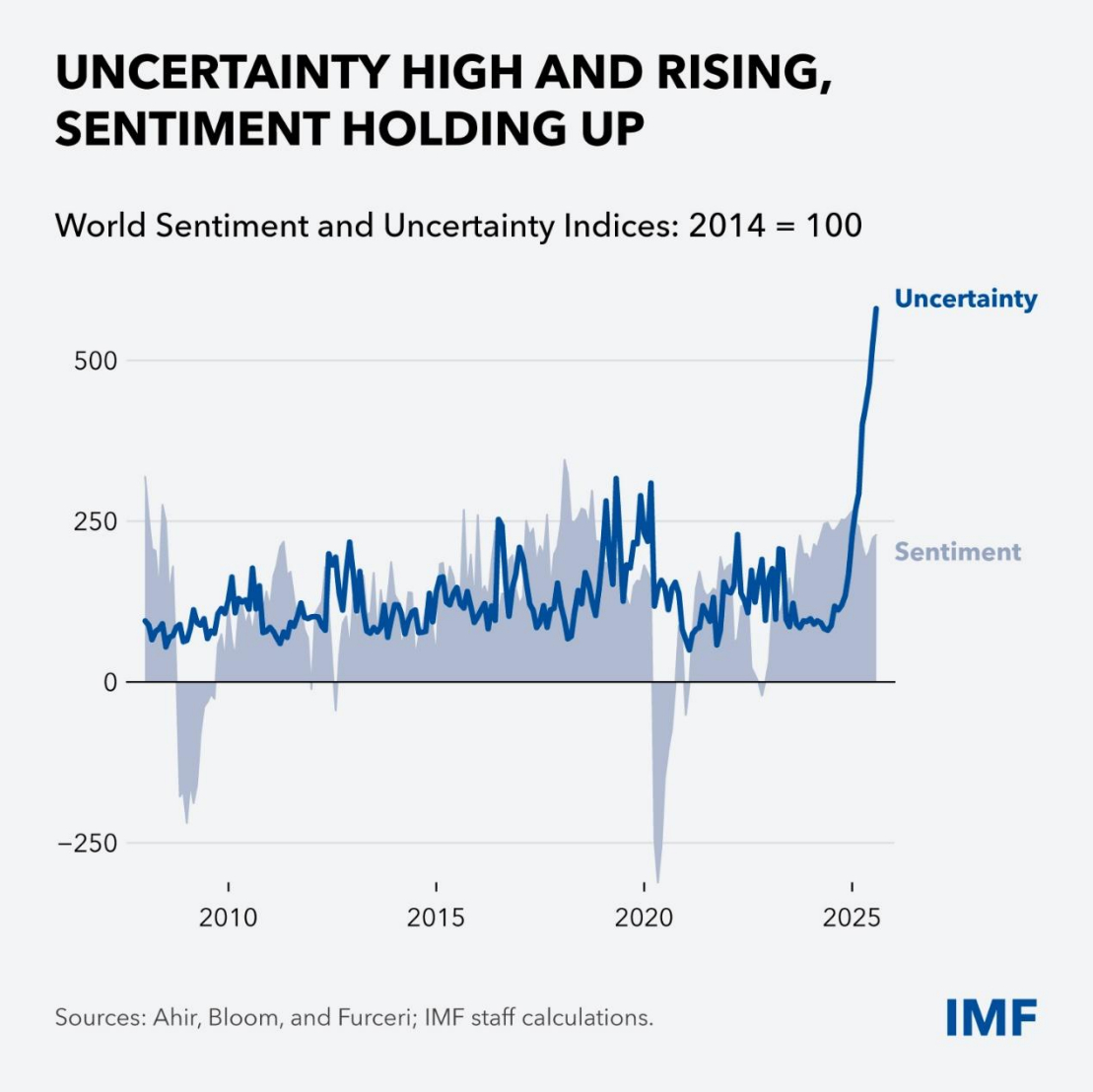
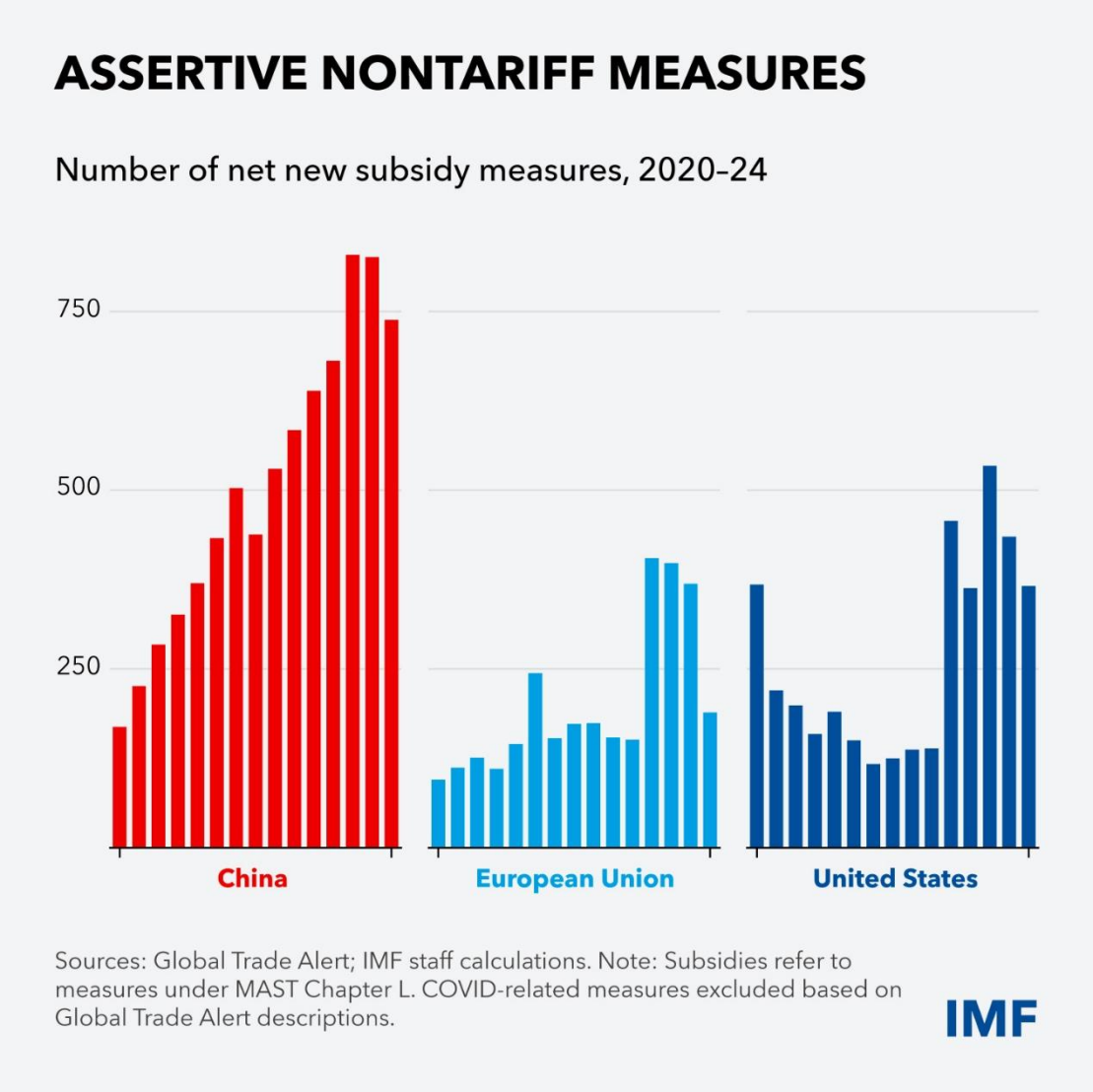
Since we last met here in this big hall on October 25, 2024, uncertainty has shot up-up-up—yet global sentiment is holding. In other words, we have a mix of anxiety and resilience. Today I would like to reflect on both.



First, the anxiety.

From technology to geopolitics to climate to trade, change is unsettling. The world trading system that delivered so much for so many is being shaken to its core—for many reasons, including because the playing field wasn't truly level and the people left behind received too little help in retooling for new and better jobs.

We see assertive nontariff measures ranging from import licensing to export controls and port fees, with subsidy counts capturing only part of the picture. We see non-market industrial policies and exchange rate distortions.



And, of course, we have U.S. tariff rates shooting up this year. But here is a key fact: 188 of our 191 member countries have so far avoided tit-for-tat tariff actions.

Having noted that trade barriers hurt both growth and productivity, and having urged policymakers to preserve trade as an engine of growth, I welcome this restraint by most countries—although surely there will be more changes to come.

At this point, despite all the turbulence, an estimated 72 percent of world trade is still being conducted on most-favored-nation terms: countries take their lowest bilateral tariff rate and offer it to all of their trading partners. Simple, not complex.

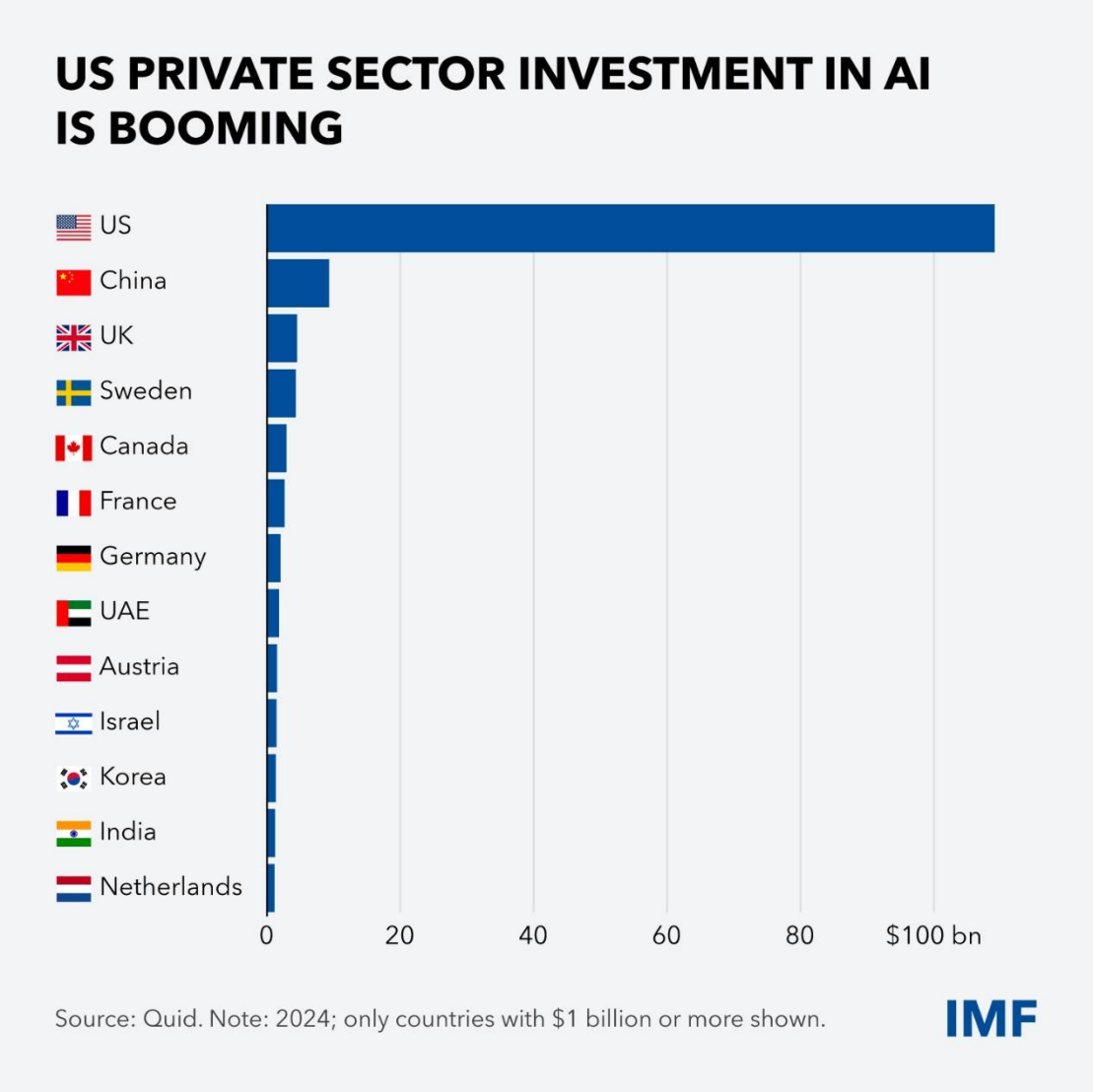
Trade is not a zero-sum game. Provided firms can maintain diversified and robust supply chains, provided governments can retain their strategic autonomy and assist those who lose out from trade, and provided external balances are not unsustainably large, imports and exports enhance welfare. No wonder the current uncertainty around trade policies and the risk of losing trade as an engine of growth are creating anxiety.

So let me rotate to the resilience.

Despite the sweeping policy shifts we have seen this year, and defying many expert predictions, the global economy has held up reasonably well thus far. World growth is projected to slow from 3.3 percent last year to 3.2 percent in 2025 and 3.1 percent in 2026—slower than needed and below what we forecast one year ago, but not a dramatic slowdown.

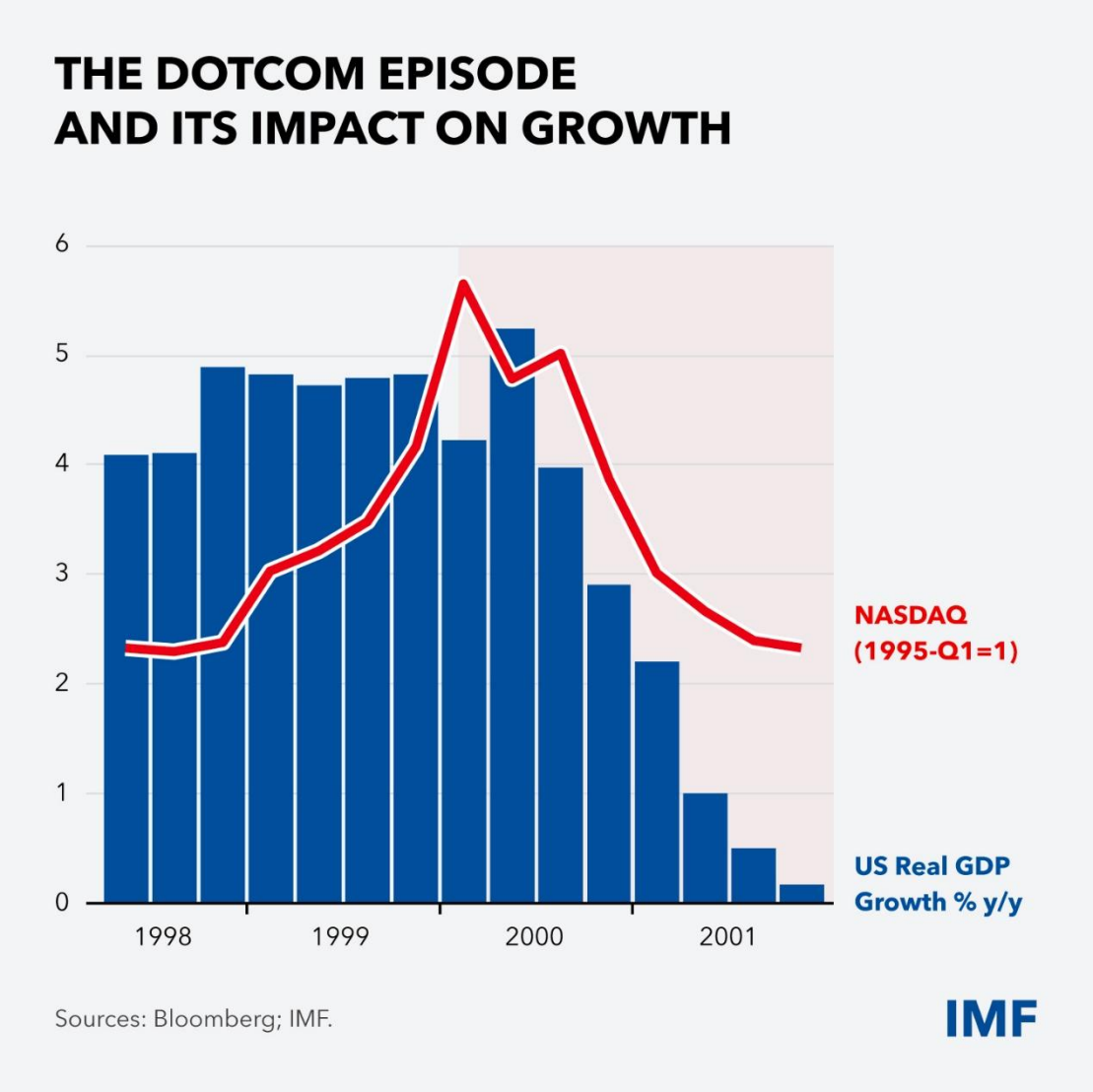
One reason for this resilience has been private sector adaptability, as seen in the import frontloading, the stockbuilding, and the supply-chain strengthening. Years of robust profits have allowed exporters and importers to squeeze margins, cushioning the price impact of higher tariffs on consumers, at least for now.

The other reason is more of a double-edged sword: private sector investment in artificial intelligence, especially in the U.S., is booming. This is propping up U.S. and world growth and delivering supportive financial conditions for all.



This is where optimism—in this case about the genuine potential of AI—risks becoming complacency.

From the railways to the internet, the history of financial market responses to pathbreaking new technologies is a story of overestimation and market correction—here, for instance, we see a snapshot of the dotcom episode and its impact on growth. The world would be wise to manage such risks.



How? We need strong financial sector oversight, alert to excessive risk-taking and the growing links between banks, nonbanks, and crypto, and we need judicious monetary policy.

This and other cross-cutting advice punctuate our multilateral surveillance, where our World Economic Outlook, Global Financial Stability Report, and Fiscal Monitor—all released this week—shine light, lower the temperature, and propose a path forward.

Our bilateral surveillance, delivered via regular consultations with all our member countries—advanced, emerging, and low-income alike—as well as our Financial Sector Assessment Program, distills our multilateral advice into tailored policy recommendations country by country.

In meeting after meeting this week, I have advised finance ministers and central bank governors not only to mitigate the near-term risks but also to look beyond them—preserving independent, accountable, and effective institutions, and finding, capturing, and delivering the opportunity that change always brings.

We see three medium-term objectives:

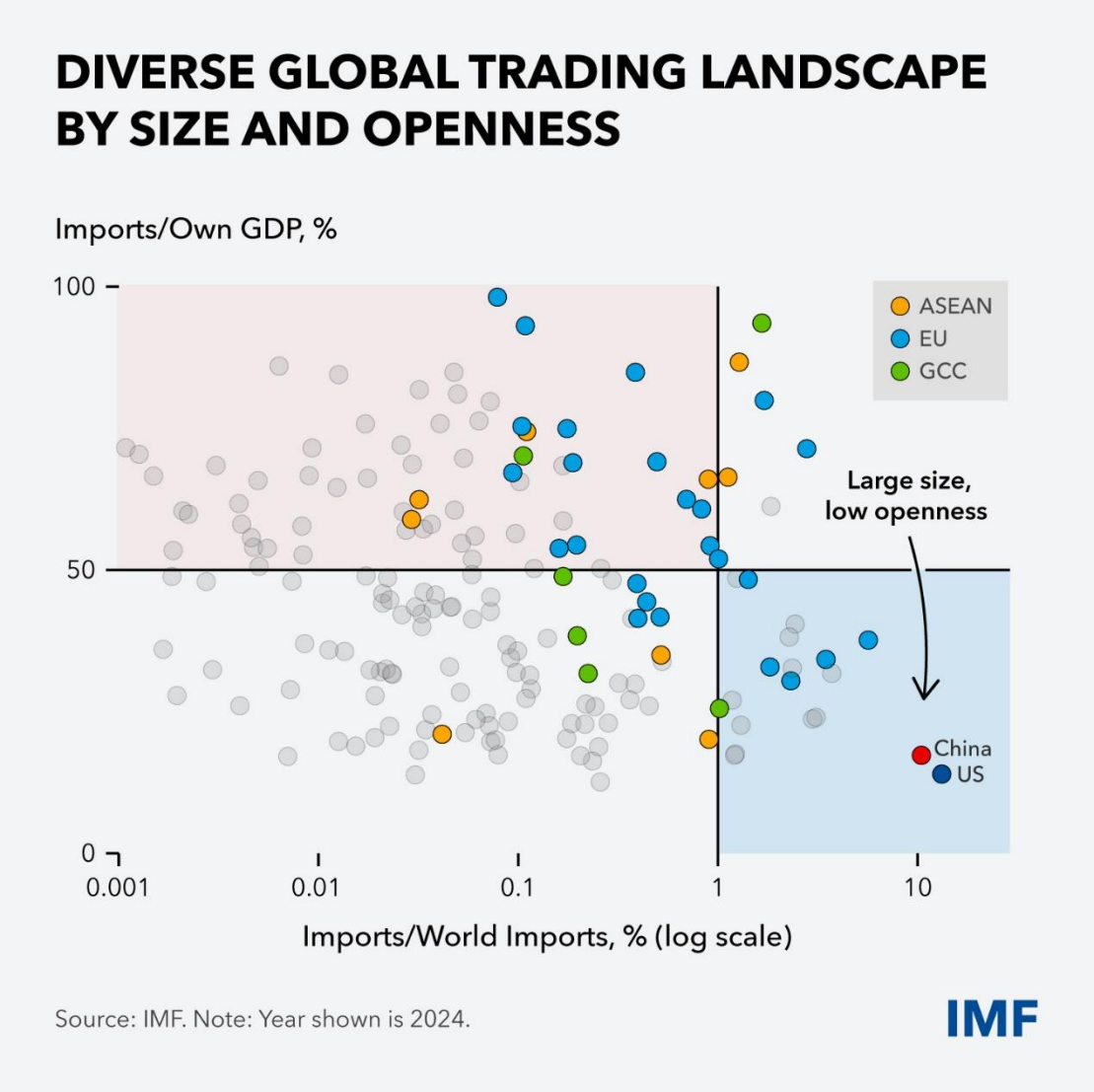
- One, repairing governments' finances. This is necessary so they can buffer new shocks and attend to pressing needs without driving up private sector borrowing costs. No finance minister should simply wait for faster growth to come to the rescue. On the contrary, fiscal consolidation can release resources to support private sector-led growth.

- Two, domestic and external rebalancing. This is necessary to ensure that excessive macroeconomic imbalances do not emerge as a spoiler. We need fiscal consolidation in some places, and policies to lift domestic demand in others.
- And three, lifting trend growth. This is essential for economies to generate more jobs, more public revenue, and better public and private debt sustainability.

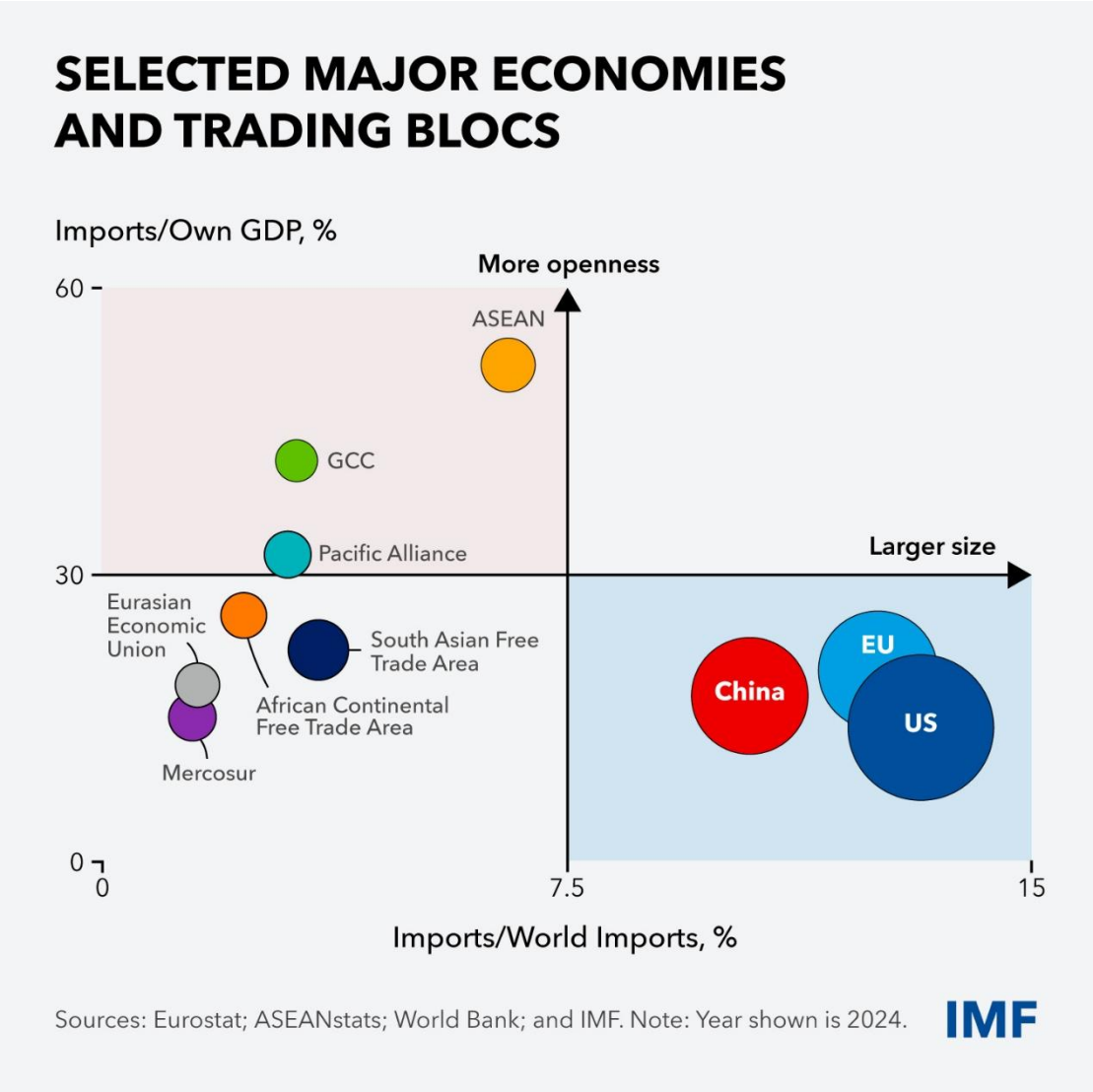
Lifting growth requires three things: one, regulatory housecleaning to unleash private enterprise; two, deeper regional integration; and three, preparedness to harness AI.

Regulatory housecleaning and regional integration are closely interlinked, including because many of the rules and regulations that tie down private enterprise at home also restrict the movement of goods, services, people, capital, and ideas across borders—many regulations double up as nontariff barriers, and nontariff barriers are a key part of the unlevel global playing field.

In this new world of bilateral and plurilateral dealmaking, we see a diverse global trading landscape. Economies that are small and reliant on exports are at the receiving end of others, while those that are large and relatively less open—or control critical inputs to global supply chains—have negotiating power. Looking at this splash of dots showing countries by size of imports and trade openness, the bottom right quadrant is where we find the largest, least open economies.



Many countries are seeking to build strength and find voice through cohesion. Here we see a selection of the world's trading blocs, each enjoying more size and heft than its member countries individually. Our advice to the world's trading blocs? Reduce your internal frictions and press forward with integration for resilience and growth.



Finally, the other potential accelerator of global productivity growth is artificial intelligence. We at the Fund expect real gains, but our estimates are in a wide range—a global productivity growth uplift of 0.1–0.8 percentage points per year.

AI will also take away millions of today's jobs, and policymakers need to help ease the transition. Old professions will fade. New ones will rise: big-data specialists, fintech engineers, machine-learning experts, and so on. Such churn is not uncommon. Recall how the automobile replaced the horse and buggy.

The key to maximizing the productivity gains and managing the fallout of AI is preparedness. Our research finds Singapore, the U.S., and Denmark in the lead, while many others trail behind. As a transmission line for global best practice, the IMF will assist all members, with a focus on managing the macroeconomic implications.

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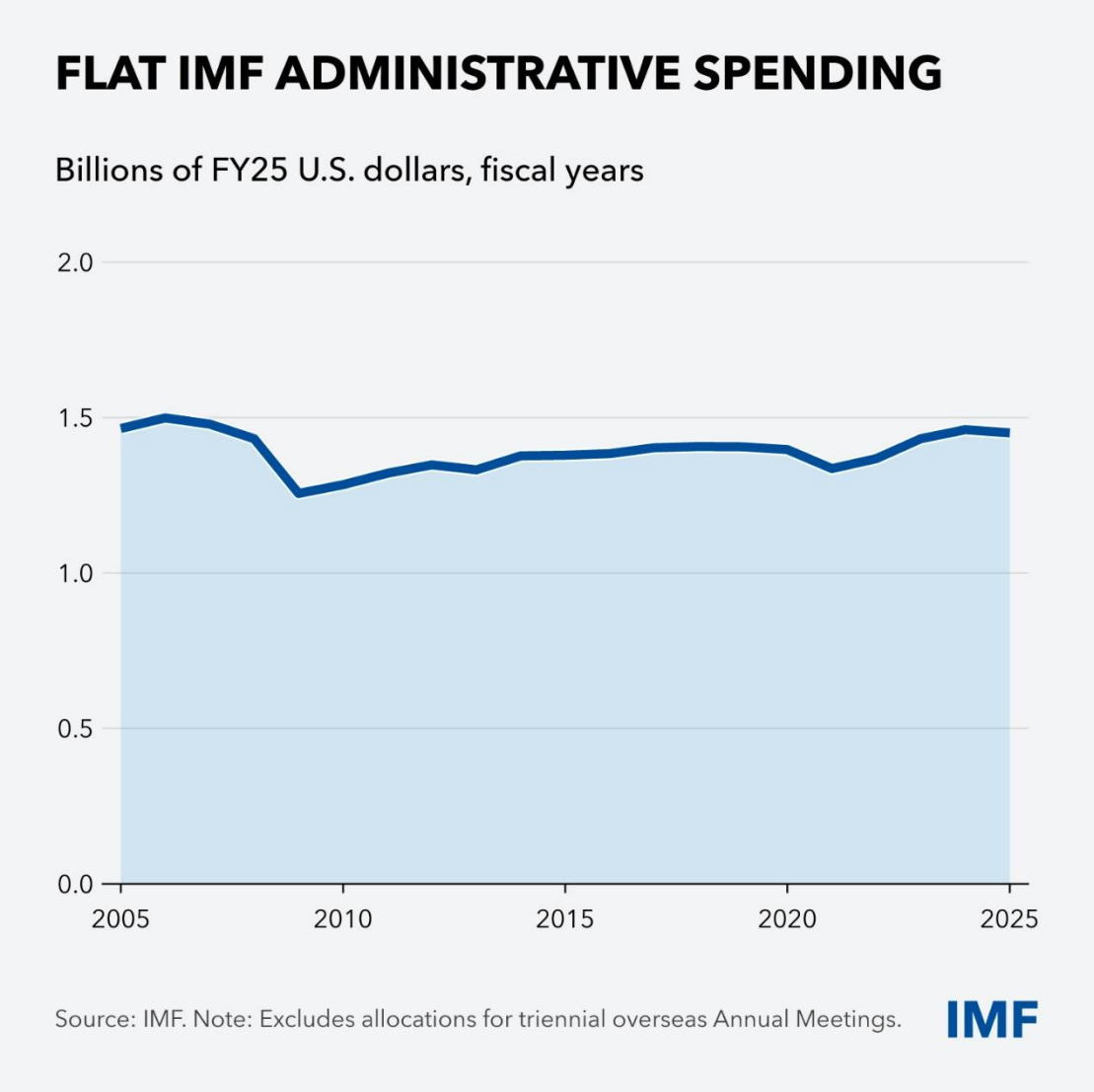
Internally, we are of course pressing forward with AI adoption of our own—including to put more knowledge at the fingertips of our members.

We are enhancing our productivity while preserving our trademark budget discipline. The IMF covers its operating expenses from own revenues—with zero reliance on annual appropriations—and maintains a deep commitment to leanness.

Despite the increasing complexity of the world economy and the expansion of the services we provide to our members, our administrative spending today is about the same size as 20 years ago.



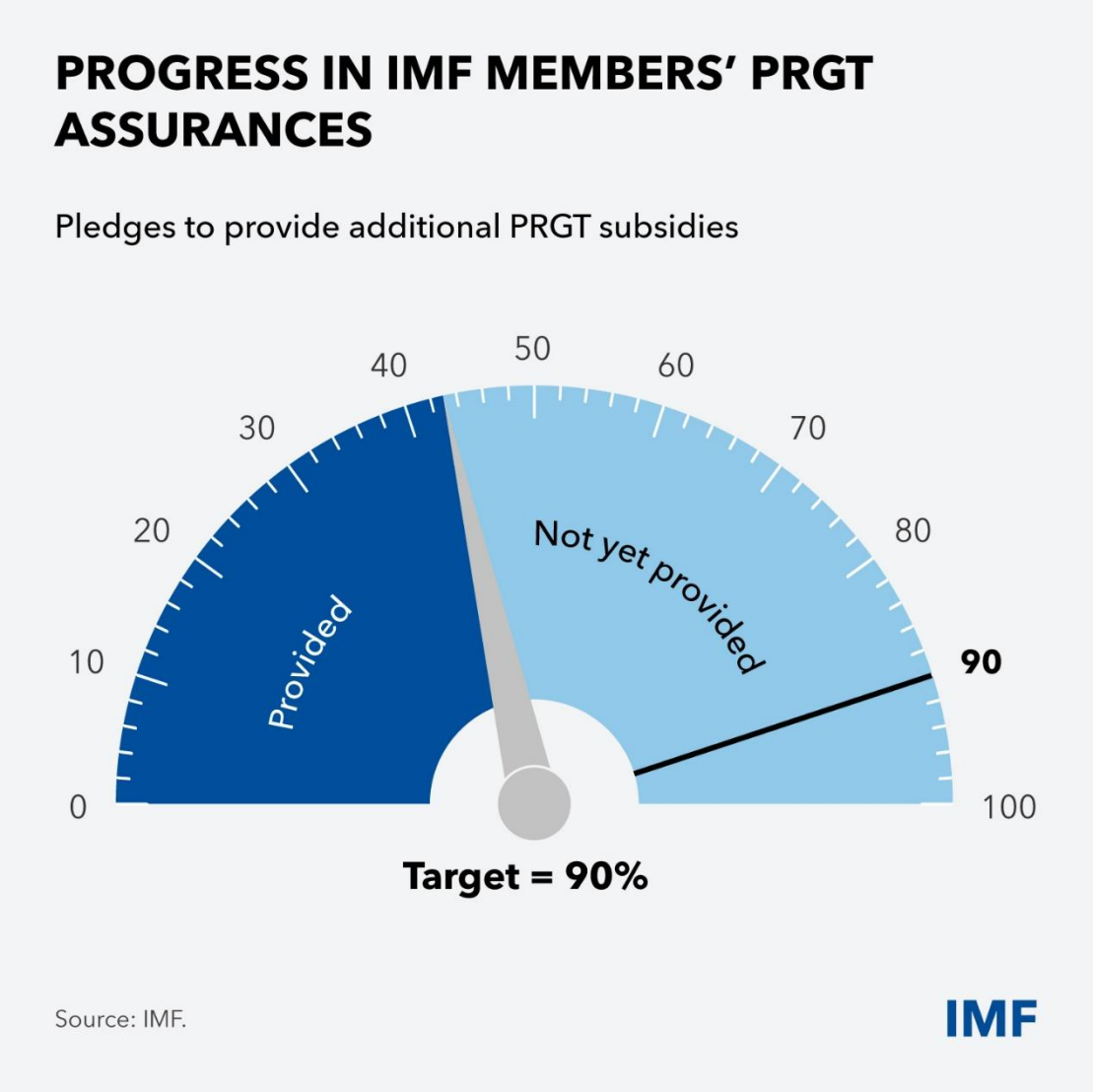
Our work in capacity development includes operational advice, with almost 3,000 projects delivered in the last year; training, with over 500 courses serving over 19,000 officials over the same period; and convening, which last February included our first-ever emerging market conference, in Al Ula, Saudi Arabia, co-hosted with Minister Al-Jadaan.

Our lending activity, anchored by macroeconomic adjustment and conditionality, currently includes programs with 43 countries, with $37 billion approved since last October, of which almost $5 billion has been to nine low-income countries.

In an uncertain world, a well-resourced IMF is essential. In that regard, let me today repeat two requests to our members:

- First: on our quota base. We are pressing to get the 50 percent quota increase agreed last year across the finish line. I ask all member countries that have not yet ratified the increase to please do so expeditiously.
- Second: on our Poverty Reduction and Growth Trust, our main vehicle for concessional lending to low-income countries. We are pressing forward with the reforms agreed last year to put the PRGT on a path to self-sustainability, which include, one, distributing up to $9.4 billion to an interim account over a five-year period and, two, getting to a point where 90 percent of the principal in this account is promised to the PRGT. To

date, 20 countries—most recently India and, just yesterday, China—have provided assurances totaling 43 percent. But broader support from the membership remains essential to reach 90 percent. I ask you for this support.



Finally, there is one further matter that I want to bring to your attention, and that is the Catastrophe Containment and Relief Trust—CCRT—our vehicle to provide grants to help low-income member countries pay debt service owed to us if they face natural or public health disasters. Quite rightly, the CCRT was depleted during the pandemic.

Our ambition must be to remain able to assist our poorest members when they face situations beyond their control. The amounts needed here are in the millions, not billions, and would make a huge difference. So now, as you return to your capitals, I ask you this: please consider opening a discussion on CCRT replenishment, for the greater good.

***

Let me end with something lighter.

In March last year, I gave a speech at Cambridge University on "The Economic Possibilities For My Grandchildren" in which we animated some famous words from the great John Maynard Keynes—here we have that synthetic audio again.

And now, 18 months later, please see our new AI avatar of Mr. Keynes, strolling casually through this very hall!

No better way to end than with this little bit of fun, I think: despite all the anxiety that change brings, let us be optimistic! Let us feel our spirits lifted by the human progress that the coming year will surely bring!

IMI International Monetary Review

John C Williams: Resilience*

BY JOHN C WILLIAMS*

Introduction

I'm going to talk to you today about the U.S. economy and how the Federal Reserve is working to achieve its dual mandate of maximum employment and price stability. I'll also discuss recent actions by the Federal Open Market Committee (FOMC), and I'll give my economic outlook.

Before I go further, I must give the standard Fed disclaimer that the views I express today are mine alone and do not necessarily reflect those of the FOMC or others in the Federal Reserve System.

Turning the Corner

One of the important parts of my job is to travel throughout the Federal Reserve's Second District. It gives me the opportunity to meet with business, community, and government leaders and get a firsthand and in-depth look at the challenges and opportunities facing our region.

In recent years, North Jersey has largely followed the trajectory of the broader U.S. economy: It was hit hard by the pandemic, rebounded quickly, grappled with inflation, and then, over the past year, faced heightened uncertainty stemming from geopolitical events and changes in trade policy.

In fact, if I had to choose one word to describe 2025, it is uncertainty. What's striking is that despite all the uncertainty, the U.S. economy has shown considerable resilience and looks poised to pick up steam next year.

In other words, after navigating through the challenges of 2025, we now appear to be turning the corner. Of course, there's always uncertainty about the road ahead-or, as we say in Jersey, about what's coming down the Turnpike. But over the past year, our local, national, and even global economies have proven to be resilient. Here, that resilience is called "Jersey Strong."

Temporarily Stalled

Before I talk about what I expect for the economy, I want to take a few minutes to tell you more about its current state. I'll focus on the two sides of the Fed's dual mandate: maximum employment and price stability.

I'll start with price stability, which the FOMC defines as 2 percent inflation1 over the longer run. In monetary policy, we rely on the totality of the data-and there is a lot of data. While we haven't had the normal flow of official data in recent months due to the government shutdown, we are able to use a wide array of indicators to monitor how the economy is doing.

What the data tell me is that the effects of trade policies have boosted inflation this year, but these effects have been more muted and drawn out than I originally anticipated. As a result of the tariffs, progress toward the FOMC's 2 percent longer-run inflation goal has temporarily stalled, with the most recent inflation reading of about 2-3/4 percent roughly unchanged from a year ago. While it is not possible to precisely measure the effects of trade policy actions, my estimate is that they have contributed around one half of a percentage point to the current inflation rate.

I do not see any signs of tariffs contributing to second-round or other spillover effects on inflation. In particular, no broad-based supply chain bottlenecks have emerged, shelter inflation has declined steadily, and measures of wage growth point to a continued gradual slowing. This is consistent with reports from around the Second District, where several of my business contacts have noted that, while tariffs continue to drive up their input costs, the pace of price increases has eased slightly.

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* Published: December 15, 2025

* John C Williams, President and Chief Executive Officer of the Federal Reserve Bank of New York

Most importantly, inflation expectations remain well anchored. The New York Fed's Survey of Consumer Expectations (SCE) continues to show that inflation expectations remain well within their pre-Covid ranges.2 This is something I watch closely, because well-anchored expectations are critical to ensuring low and stable inflation.

Gradual Cooling

Turning to the employment side of our mandate, the data show that the labor market has continued to cool, with labor demand softening more than supply. Job growth has been anemic, and the unemployment rate has moved up steadily in recent months. These trends are also occurring in North Jersey, where we've seen slight declines in employment since January, and where many of our regional contacts, including those responding to our business surveys, are reporting job losses.

In addition, survey-based measures of the balance between demand and supply show increasing slack in the labor market. In the Conference Board's consumer confidence survey, a measure of the difference between the share of respondents who think jobs are plentiful and the share of those who think jobs are hard to get has declined throughout 2025. We have seen a similar pattern with the National Federation of Independent Business's survey measure of the difficulty in filling jobs. And the SCE's "job security gap" measure-defined as respondents' job-finding expectations minus their job-loss expectations-has fallen considerably this year.

Many labor market indicators are now at levels we saw prior to the pandemic, a time when the market was not overheated. And although the labor market is clearly cooling, I should emphasize that this has been an ongoing, gradual process, without signs of a sharp rise in layoffs or other indications of rapid deterioration.

Monetary Policy and the Road Ahead

Looking ahead, it is imperative that we restore inflation to our 2 percent longer-run goal on a sustained basis. It is equally important to do so without creating undue risks to our maximum employment goal. My assessment is that in recent months, the downside risks to employment have increased as the labor market has cooled, while the upside risks to inflation have lessened somewhat.

Monetary policy is very focused on bringing these risks into balance. To that end, the FOMC has moved the modestly restrictive stance of monetary policy toward neutral. At its meeting last week, the FOMC decided to lower the target range for the federal funds rate by 1/4 percentage point to 3-1/2 to 3-3/4 percent. The accompanying FOMC statement said that "in considering the extent and timing of additional adjustments to the target range for the federal funds rate, the Committee will carefully assess incoming data, the evolving outlook, and the balance of risks."3 With these actions, monetary policy is well positioned as we head into 2026.

Looking ahead, I expect tariffs will have a largely one-off price level effect that will be fully realized in 2026. I anticipate inflation to decline to just under 2-1/2 percent next year before reaching the FOMC's longer-run 2 percent goal in 2027.

I expect real GDP growth to be about 2-1/4 percent in 2026, well above my forecast for this year's pace of around 1-1/2 percent. This pickup is in part due to the effects of the government shutdown, but it's also fueled by tailwinds from fiscal policy, favorable financial conditions, and increased investments in artificial intelligence.

And I expect the unemployment rate to rise to around 4-1/2 percent at the end of this year, reflecting some additional effects from the government shutdown. With my forecast of above-trend GDP growth, I expect the unemployment rate to gradually come down over the next few years.

Balance Sheet

Before I conclude, I'd like to briefly comment on the Fed's balance sheet. On December 1, the FOMC stopped reducing its holdings of Treasury securities and agency debt and agency mortgage-backed securities.4 With the level of bank reserves now deemed to be ample, the FOMC decided to initiate reserve management purchases to maintain an ample level of reserves. This is the natural next step in the implementation of our ample reserves framework to ensure effective interest rate control.5

With the steady decline in the level of reserves, we have observed upward pressure on repo rates at times in recent months.6 When this occurs, the Fed's standing repo operations can act as a shock absorber by capping pressures on

money market rates resulting from strong liquidity demand or market stress.7 I fully expect that standing repo operations will continue to be actively used in this way.

Conclusion

So, after a year of uncertainty, we will be starting 2026 from a place of resilience. The economy is poised to return to solid growth and price stability.

But, as 2025 has shown, the road may shift in unpredictable ways. In assessing the future path of monetary policy, my views, as always, will be based on the evolution of the totality of the data, the economic outlook, and the balance of risks to the achievement of our maximum employment and price stability goals. We must be ready to adjust our route as needed to reach our destination.

January 2026

Vol.13, No.1

Monetary and Fiscal Policy

Policy Actions Can Reinforce Growth Progress in Many G20 Economies*

BY NICOLAS FERNANDEZ-ARIAS, SHUSHANIK HAKOBYAN

Concerted action on economic reforms can help the G20 achieve the group's collective growth ambitions, but the reforms with the biggest payoff vary across countries

Since the Group of Twenty's foundational Pittsburgh conference in 2009, progress toward its goal of strong, sustainable, balanced, and inclusive growth has been modest.

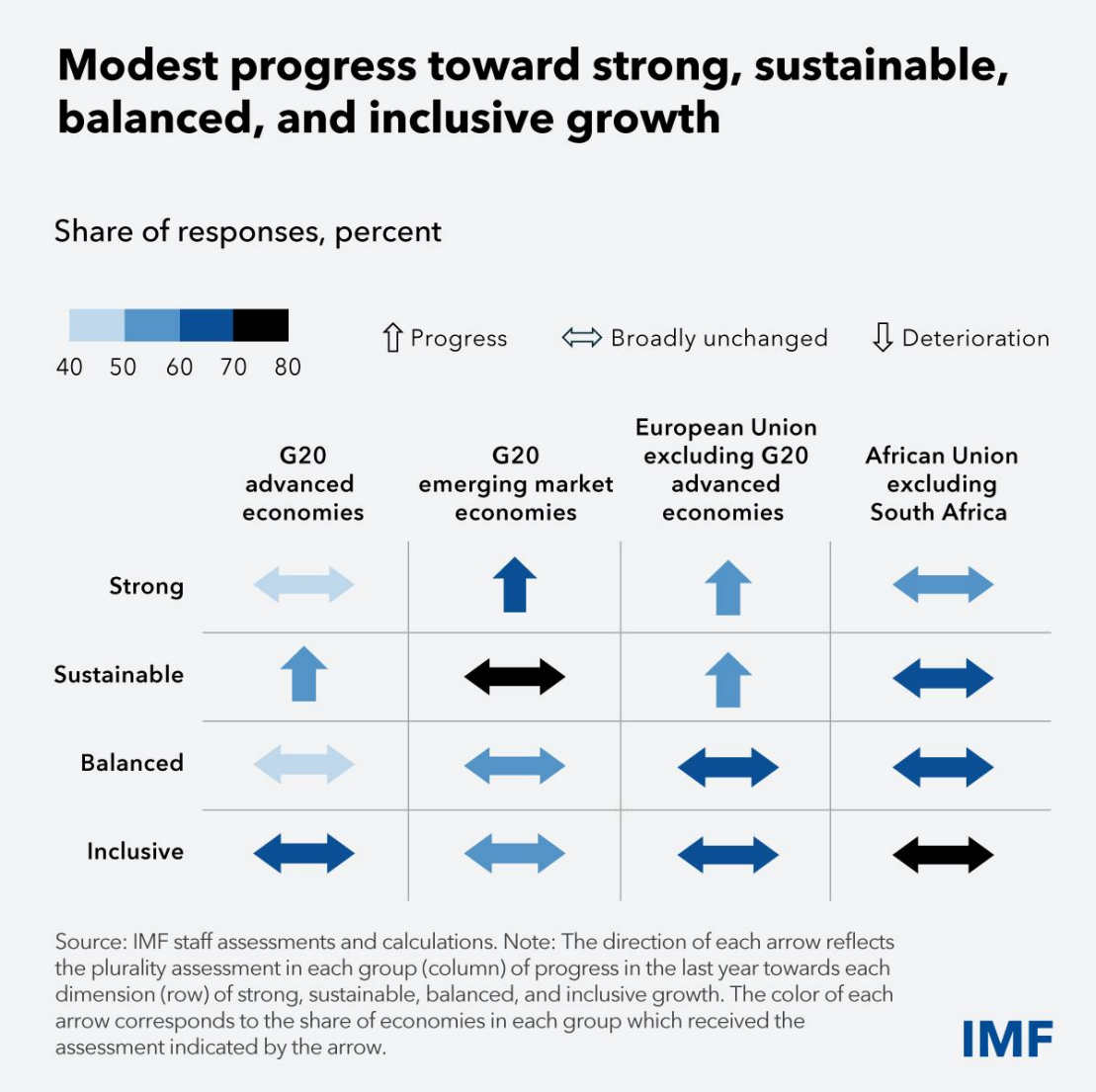
While G20 economies have shown remarkable resilience in navigating multiple shocks, medium-term growth prospects have moderated to just 2.9 percent, the weakest since the global financial crisis. At the same time, disinflation remains incomplete for many, and public debt rose to a record 102 percent of GDP last year. Furthermore, excessive external imbalances are widening again.

Still, there are encouraging signs. Our latest annual report to the group—whose members account for about 85 percent of global economic output—points to some positive developments over the past year.

A survey of IMF country teams indicates that many G20 economies made progress toward stronger growth, including more than half of emerging market economies. Improvement has been substantial in some cases, such as Germany, where growth momentum was supported by reforms to fiscal rules.

Meanwhile, falling inflation and fiscal consolidation efforts are improving the sustainability of growth for most G20 advanced economies and half of the European Union.

* Published: November 19, 2025



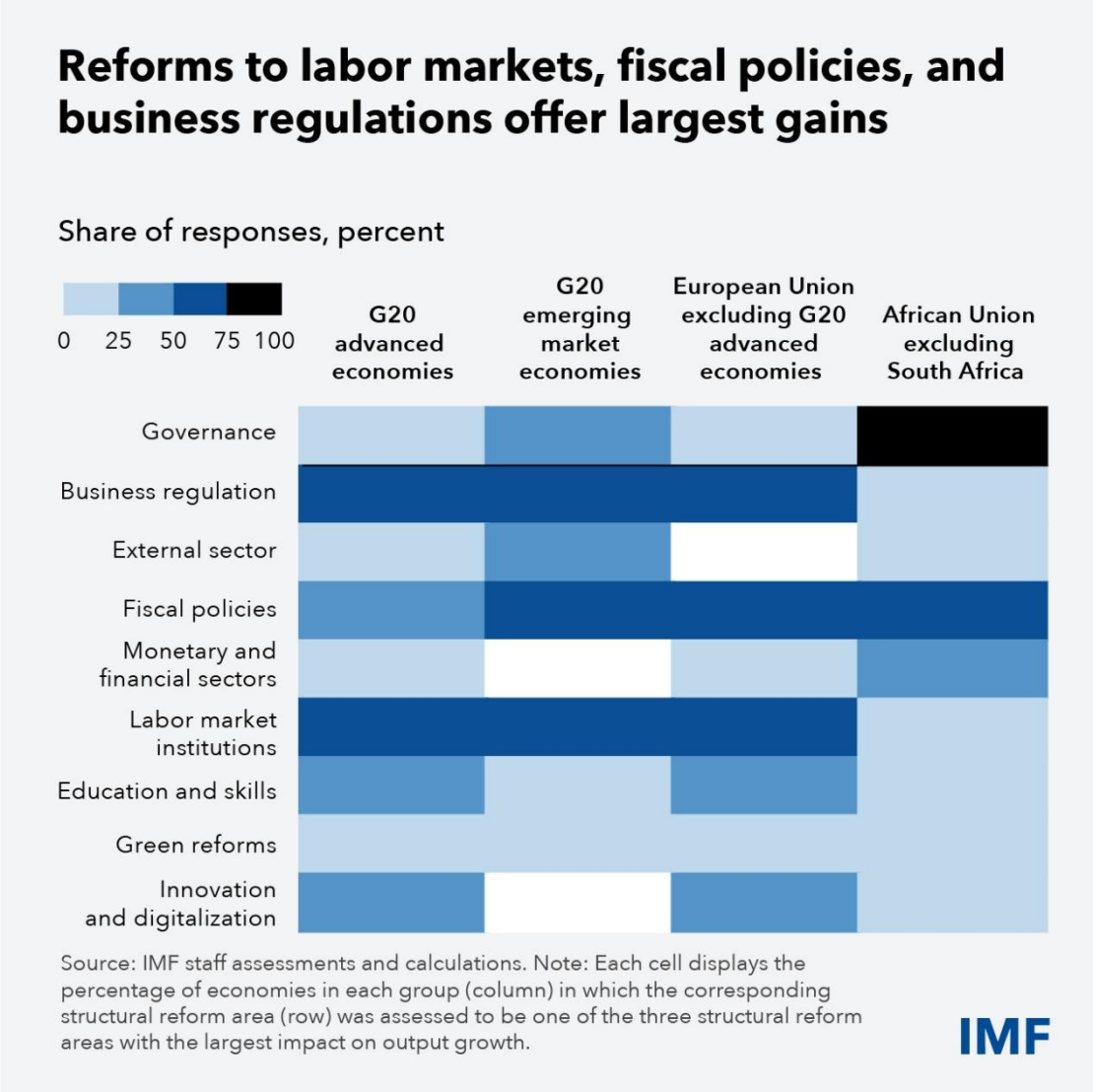
But this is only part of the story. Progress over the past year has been somewhat muted along the final two dimensions:

- Balanced growth—without the buildup of internal or external imbalances, such as increasing reliance on one sector or on external demand—is proving elusive across the G20. Moderate deterioration was assessed in China and the United States because of widening excess current account balances.
- Inclusive growth—ensuring the economy benefits everyone—improved only slightly, particularly in G20 advanced economies and in the African Union, which joined the group in 2023.

With near-term uncertainty remaining high and an extensive list of headwinds, the outlook for securing strong, sustainable, balanced, and inclusive growth in the coming years is challenging. Against this backdrop, it's more important than ever to reinforce momentum, even if it's just tentative, across all dimensions of growth.

Smart fiscal policy is at the center of the challenge. Governments need to rebuild their fiscal buffers to contain rising debt, while meeting growing spending needs. Fundamental economic reforms are also needed to aid domestic rebalancing and foster stronger growth.

Of course, these structural reforms vary across countries. But to help guide prioritization and sequencing, IMF country teams have identified measures with the highest expected growth impact. Reforms to labor market institutions, in addition to improved fiscal policies and business regulations, consistently ranked highest across the G20 and in the European Union.



For African Union members, the largest potential gains lie in foundational governance improvements, as well as fiscal reforms.

The payoff from concerted action by G20 economies would be significant. Simulations suggest that implementing the identified highest-impact structural reforms, alongside recommended macroeconomic policies, could raise growth across the group by about 7 percentage points cumulatively over the next decade. This would benefit emerging market economies the most.

Moreover, debt burdens would decline by more than 8 percentage points of GDP within five years for countries with limited fiscal space, reflecting the combined impact of recommended fiscal adjustments and structural reforms.

And these concerted reform efforts would also support domestic rebalancing by helping narrow current account balances, with large improvements possible for both major surplus and deficit economies.

—This blog is based on the 2025 G20 Report on Strong, Sustainable, Balanced, and Inclusive Growth, prepared by IMF staff.

IMI International Monetary Review

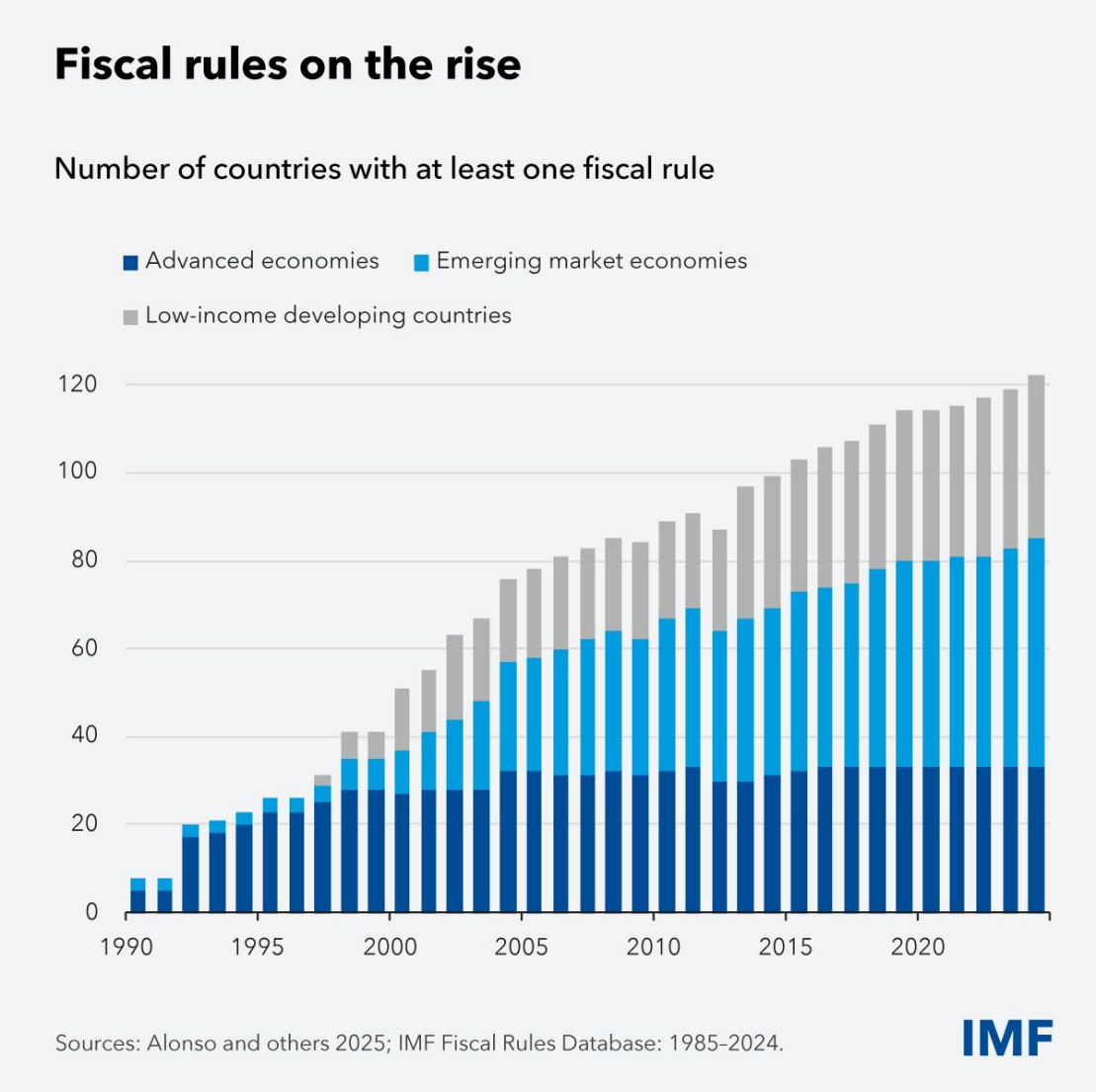
Fiscal Rules Foster Stability as Spending Pressures Grow*

BY ERA DABLA-NORRIS

Countries have increasingly adopted fiscal rules and frameworks that aim to give clarity and predictability to government spending. But these rules have not been as effective in keeping deficits and debt within their intended limits. As we show in a new report, about 40 percent of advanced economies and nearly two-thirds of emerging markets exceed their own fiscal limits.

Strong and effective fiscal rules are essential to address mounting challenges confronting countries—from record debt and increasing spending pressures on defense to aging populations and development and social needs. With these challenges, public finances are being stretched thin. Here fiscal rules can help: they lay out numerical limits on spending, deficits, or debt, and act as guardrails to promote discipline and signal commitment to sound public finances.

This is not a new idea. Fiscal rules have been used since the mid-1980s, and their use has increased over the last two decades. Today, more than 120 countries have them, according to the IMF Fiscal Rules and Fiscal Council database, covering 122 economies and 54 fiscal councils.



* Published: September 25, 2025

Our report tracks the evolution of fiscal rules and how countries comply with them. In the early years, we find that rules were too rigid and constrained responses to economic downturns. Greater flexibility was eventually introduced and proved effective, allowing governments to provide necessary support for ailing economies, particularly in severe crises such as the pandemic. However, the severe shocks were a significant test for fiscal rules, with many countries' deficits and debt exceeding their own limits. More than two-thirds of countries have revised their fiscal rules, often making them more flexible without considerably safeguarding public finances.

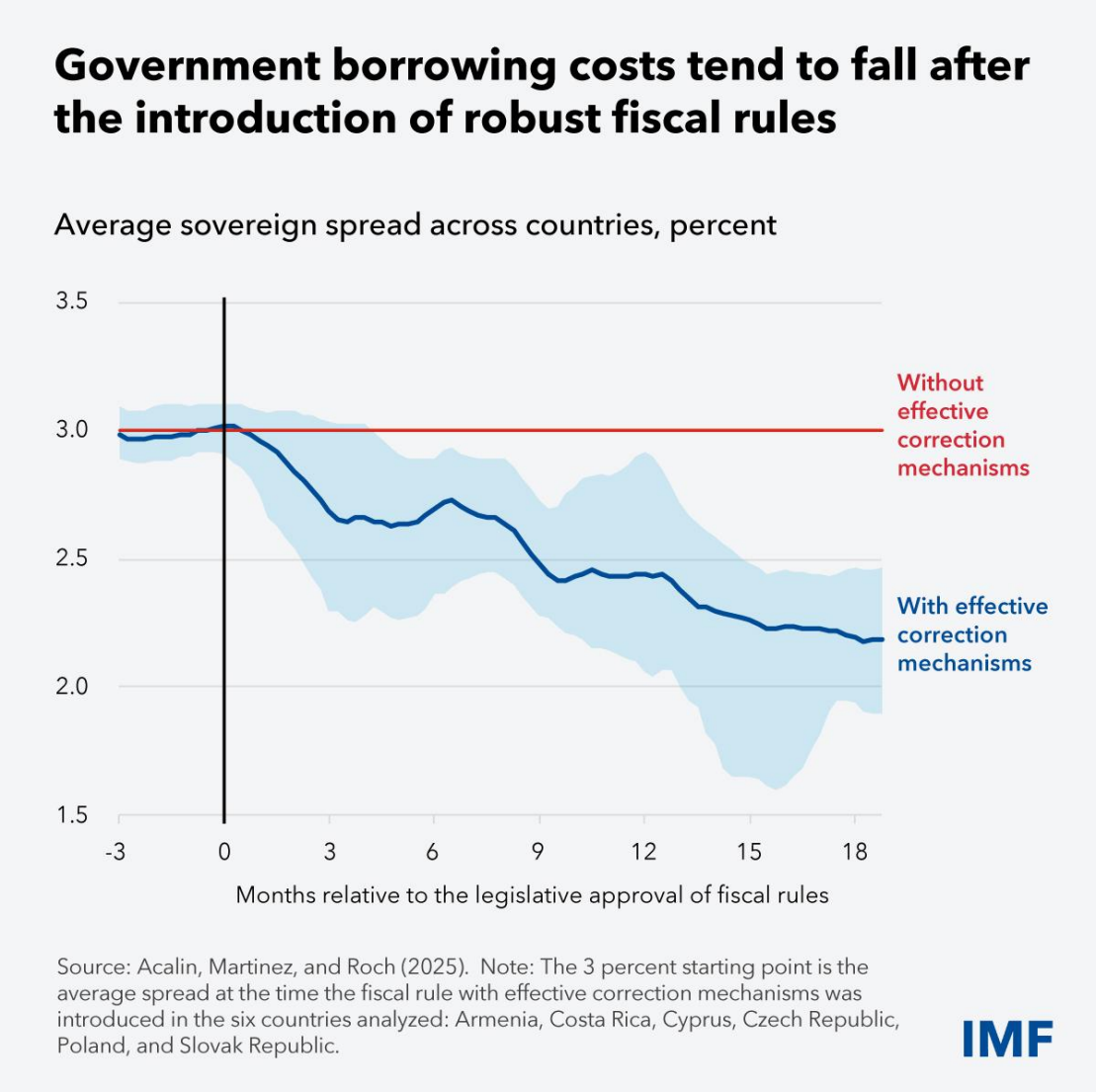
Effective guardrails

For fiscal rules to be effective, they must strike a careful balance: they should safeguard fiscal sustainability while leaving adequate room and flexibility for priority spending. Our analysis shows that effective rules need to have several elements: they are based on a clear and appropriate target or fiscal anchor to guide policy; they have a robust way to correct course when spending pressures or adverse shocks put the rules off track; and there are supportive fiscal institutions to guide and support their implementation.

First, a prudent fiscal anchor—for example a debt-to-GDP ratio or a medium-term budget balance target—should be tailored within a risk framework to a country's debt capacity and exposure to shocks. To be credible, they must be easy to monitor, clearly communicated to the public, and closely linked to annual budgets.

Second, when thresholds are breached, countries need clear procedures to get back on track. Pre-defined triggers, timelines, and policy responses can help return to fiscal rule limits—such as requiring governments to submit fiscal plans or take corrective actions—and restore discipline. Some countries go further, using progressive triggers that activate stricter measures, for example as debt nears critical levels.

This mechanism is not just good policy—it also helps countries lower their financing costs. An analysis of six countries (Armenia, Costa Rica, Cyprus, Czech Republic, Poland, and Slovak Republic) shows that well-designed correction mechanisms helped lower the cost of issuing debt by about 0.3 percentage points within six months and 0.75 percentage points within a year, compared to similar economies without effective fiscal rules.



Third, fiscal rules work best when countries have effective institutions to support and implement them. Specifically, medium-term fiscal frameworks should translate fiscal rules into multi-year plans and align short-term budgetary decisions with long-term debt goals.

Fiscal councils can also act as nonpartisan watchdogs, producing and/or evaluating government forecasts, monitoring compliance, and informing the public about the state of government finances. For example, the fiscal council in the Netherlands assesses government forecasts and evaluates the cost of policy initiatives, while providing valuable information to the public. Our analysis shows that countries with more independent fiscal councils tend to experience smaller deficits and better compliance with rules. The bottom line is this: linking annual budgets with medium-term fiscal frameworks and independent oversight can both strengthen policy credibility and make fiscal rules more effective.

Balancing discipline and spending pressures

Governments are facing increasing and legitimate demands to invest in infrastructure, public services, and economic security. Aging societies will require more spending on healthcare and pensions, and many countries are ramping up defense spending.

Putting in place fiscal rules is not inconsistent with these goals. But careful calibration and design of these rules is very important. Low-debt countries may ease their limits to support growth-enhancing spending as long as their debt remains within debt stabilizing limits. By contrast, high-debt countries need to match any new spending with revenue increases and/or reallocate existing expenditures to avoid adding to fiscal and debt risks.

As these pressures intensify, countries must strengthen—not weaken—their commitment to fiscal discipline and ensure that public finances remain a source of stability, not vulnerability.

IMI International Monetary Review

Working Paper

Does Policy Uncertainty Affect Firms' Exchange Eate Exposure? Evidence from China*

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1. Introduction

Exchange rate risk is a key aspect of firms' daily operations (Bartram, Brown, & Minton, 2010; Bodnar, Dumas, & Marston, 2002). Indeed, exchange rate movements could significantly impact firm performance because of firms' international operations, overseas investments, and market competition (Aggarwal & Harper, 2010; Brown, 2001; He, Liang, & Liu, 2024; He, Liu, & Zhang, 2021b; TondO¨¤´e & Gilles, 2025). Given the influence of exchange rate exposure, prior studies have focused on the magnitude and sources of this exposure.2 This study contributes to the literature by highlighting another important factor affecting variation in firms' ERE (exchange rate exposure): economic policy uncertainty (EPU).

Research has shown that government policies have various effects on firms' operations. Firms face substantial uncertainty regarding regulations, taxation, and market competition, which has significant effects on corporate decisions (Altig et al., 2020; Bhattacharya, Hsu, Tian, & Xu, 2017; Guceri & Albinowski, 2021). In the context of exchange rate exposure, EPU is an important source of risk, as it may lead to increased uncertainty vis-`a-vis firms' international operations or their ability to hedge exchange rate risks. Recent studies show that firms use hedging tools more intensively in response to increased EPU (Nguyen, Kim, & Papanastassiou, 2018), while EPU deters cross-border acquisitions (Cao, Li, & Liu, 2019).

Using data from all Chinese listed firms for the period 2010–2020 and the EPU index developed by Baker, Bloom, and Davis (2016), we empirically examine the relationship between EPU and exchange rate exposure. The choice of country is dictated as the weak evidence of previous studies on the exchange rate exposure in US corporations,3 the rising of Chinese economy in the world economy, and many Chinese firms intensively involved in global market. Thus, Chinese data is more likely to reduce the estimation noise as Chinese firms are more sensitive to the unexpected exchange rate movements (He et al., 2021b). More importantly, China provides an important setting to investigate the impact of policy uncertainty on exchange rate exposure. During our sample period, China implemented a series of market-oriented reform, leading to a great uncertainty in economic policy. For instance, ZTE, the second-largest Chinese telecom provider in more than 160 countries and regions, became a representative victim of substantial trade policy uncertainty triggered by Sino-US trade conflicts in 2018 and 2019, with supply chains disrupted and stagnation in production and sales. It shows that uncertainty on China's trade policies, not only on its implementation, but also on its impact on firms engaging in international market. Finally, few studies have examined Chinese firms' hedging behavior, even though they actively participate in derivatives transactions.

We begin our analysis by examining EPU's effect on aggregate exchange rate exposure—measured by the average exposure of all Chinese listed firms. Specifically, we conduct a vector autoregression (VAR) analysis with aggregate exposure and use the EPU index and other macro-economic controls. Our results suggest that one standard deviation increase in the EPU index is associated with a 3.366 % increase in aggregate exposure, accounting for 12.751 % of the sample mean (sample mean: 0.262).

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Next, we estimate EPU's effect on firm-level exchange rate exposure. Specifically, we model the extent of a firm's exposure in quarter t as a function of EPU, as well as a set of firm-level controls in year t-1. The empirical evidence shows that EPU has a positive and statistically significant effect on firm-level ERE. One standard deviation increase in EPU leads to a 0.022 (0.028 × 0.785) increase in exchange rate exposure. Further, we find that operational hedging ameliorates EPU's impact on exposure, while there is no such evidence for financial hedging. Our results suggest that firms' financial hedging is inadequate in emerging-market economies, e.g., China, whereas operational hedging can provide better protection during high-EPU periods.

Similar results are obtained using alternative measures for EPU and exchange rate exposure, different specifications, various macroeconomic controls and extending the sample to cover COVID-19 pandemic period. To examine whether EPU's impact depends on the policies themselves, we employ several EPU indices developed by Huang and Luk (2020), e.g., fiscal, monetary, and trade policy. The results show that fiscal and trade EPU have a stronger effect in driving firms' exchange rate exposure.

Our findings suggest a positive relationship between exchange rate exposure and policy uncertainty. However, they do not rule out the possibility of omitted variable bias, such as economic uncertainty as an explanation. We conduct two additional tests to alleviate endogeneity concerns. First, we use residual EPU, after controlling for a variety of macroeconomic variables, and foreign countries' EPU as an alternative independent variable (Kaviani, Kryzanowski, Maleki, & Savor, 2020). Second, we search for instrumental variables; specifically, we use the number of geological disasters as the instrument for EPU. To keep its society stable and its economic performance competitive, the Chinese government has enacted various policies concerning disaster relief and social stability and has postponed controversial policies that may aggravate tensions. Consequently, the Chinese government is likely to remain consistent in its economic policy. This highlights that EPU has a significantly positive effect on firms' exposure.

To uncover the channels through which policy uncertainty affects exchange rate exposure, we investigate three possibilities. First, firms have different levels of international involvement. Government policies have a direct impact on the revenue and costs of firms' international business. For such firms, an increase in EPU increases uncertainty regarding their international prospects, which could translate into higher exchange rate exposure. Second, elevated EPU may foster an opaque information environment conducive to insider rent-seeking by weakening external monitoring and blurring performance accountability (Hossain, Raghunandan, & Rama, 2020; Maffett, 2012). Information opacity and governance mechanisms are often compromised, reducing the detectability of selfserving actions (Jensen & Meckling, 2019). Managers may exploit policy uncertainty to justify rent seeking decisions by attributing poor outcomes to external factors rather than personal failure. For instance, Duchin and Schmidt (2013) find poorly governed firms are more likely to engage in empire-building and value-destroying mergers during high uncertainty periods. If EPU significantly increases insiders' rent-seeking activities, leading to a large cash flow volatility, we expect high-EPU periods to be associated with high exposure. Finally, studies show that firms actively adopt risk management tools to manage currency risk. For instance, Bodnar, Giambona, Graham, Harvey, and Marston (2011) find that macro conditions may affect firms' willingness to hedge foreign exchange risk. If high uncertainty increases the use of both financial and operational hedging, we should observe a muted positive or negative relationship between policy uncertainty and exchange rate exposure.

To test whether EPU influences firms' exposure by increasing the risks of firms' international operations, we construct three proxies for firms' involvement in international operations: the ratio of foreign-currency loans to total loans, firms in industries that are subject to intense international competition, and the ratio of overseas revenue to operating income. We expect EPU's impacts to be more pronounced in firms heavily reliant on foreign revenue or international borrowing. Consistent with this hypothsis, we find that the relationship between EPU and exchange rate exposure is significantly stronger for firms dependent on overseas revenue and foreign-currency loans, as well as those in highly competitive industries. It suggests that an increase in EPU increases the risk for firms' international operation prospects, which translates into higher ERE.

To test whether policy uncertainty induces corporate insiders to seek private benefits, we examine whether there are more self-serving transactions during high-EPU periods. We compare harmful related party transactions, other account receivable,4 executive compensation between high- and low-EPU periods, and find more self-serving transactions in the former period. Further, we examine whether EPU's positive impact is moderated by better governance or corporate transparency.5 We find consistently significant interactions between EPU and proxies for

corporate governance and information disclosure. This is consistent with the idea that EPU increases insiders' rent-seeking activities, leading to increased cash flow volatility in response to unfavorable currency movements.

If EPU encourages firms to conduct more intensive risk management, we should observe a positive relationship between EPU and financial hedging and operational hedges. Interestingly, we find that firms increase their use of financial derivatives, while reducing their multinational activity. Given the inadequate role of financial hedging against exchange rate exposure in China, our findings support the notion that EPU might depress corporate oversea investments, hence minimizing the role of operational hedging against exchange rate risks.

Our study makes two important contributions to the existing literature. First, we contribute to the growing body of research on the determinants of firms' exchange rate exposure (e.g., Doidge, Griffin, & Williamson, 2006; Dominguez & Tesar, 2006; Froot, Scharfstein, & Stein, 1993). While prior studies have identified determinants such as business operations, capital market access, and passthrough mechanisms (Bartram & Bodnar, 2012; Flood Jr & Lessard, 1986; Hodder, 1982), few have examined the role of macroeconomic policy factors. We extend this line of research by demonstrating that EPU constitutes a significant source of exchange rate exposure. Moreover, in contrast to the established view that financial hedging effectively mitigates foreign exchange risk (Allayannis & Weston, 2001; Bartram et al., 2010; Hutson & Laing, 2014), our findings indicate that in emerging markets with underdeveloped derivatives markets, such as China, operational hedging is more effective than financial hedging in alleviating EPU-induced exchange rate exposure.

Second, our research contributes to the literature on the effects of EPU on firms' decisions and performance. Existing studies have largely focused on how policy uncertainty influences corporate investment, dividend policies, credit spreads, and innovation (Bhattacharya et al., 2017; Bloom, 2009; Bonaime, Gulen, & Ion, 2018; Farooq & Ahmed, 2019; Francis, Hasan, & Zhu, 2014; Julio & Yook, 2012; Kaviani et al., 2020). However, little attention has been paid to whether and how EPU affects firms' exposure to exchange rate fluctuations. Our study bridges these two strands of literature by demonstrating that policy uncertainty increases the risks related to international operations, likely through diminished prospects for overseas investment and increased complexity in managing foreign-currency cash flows, thereby elevating exchange rate exposure.

Notably, we provide novel evidence that EPU influences insider rent-seeking activities, which subsequently exacerbates firms' vulnerability to exchange rate movements. We further show that better governance mechanisms can curb such self-serving behavior, thereby attenuating the positive effect of EPU on exchange rate exposure. Thus, our study underscores the importance of robust corporate governance as a key mechanism for reducing firms' sensitivity to EPU-induced exchange rate exposure.

The remainder of the paper is organized as follows: Section 2 reviews the relevant literature. Section 3 describes our data sources and summary statistics. We present our main findings in Section 4. Section 5 presents our robustness tests and addresses endogeneity concerns. Section 6 explores possible channels through which EPU may affect firms' exposure. Finally, Section 7 concludes this study.

2. Institutional background and literature review

2.1. Institutional background

China underwent several market-oriented exchange rate reforms in recent decades. Before July 2005, China adopted a fixed exchange rate regime, pegging RMB to the value of the USD. From 1994 to 2005, the RMB exchange rate held a value around 8.28. To mitigate the impact of USD on formulating RMB exchange rate policy, on 21 July 2005, the People Bank of China (PBOC) released an announcement that a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies would be adopted. The basket should be composed of currencies of the countries to which China has a prominent exposure in terms of foreign trade, external debt, and foreign direct investment. The daily trading price of USD/RMB exchange rate was allowed to fluctuate within a band of 0.3 % around the central parity. And the trading bandwidth of the RMB against the USD was extended to 0.5 % on 18 May 2007. During the 2008–2009 Global Financial Crisis, RMB was de facto pegged to the U.S. dollar with RMB/USD rate fluctuate between 6.82 and 6.84.

The market-oriented reform was resumed on June 19th, 2010, when the authorities announced that [Further Reform the RMB Exchange Rate Regime and Enhance the RMB Exchange Rate Flexibility] and re-emphasized that

[China has moved into a managed floating exchange rate regime based on market supply and demand with reference to a basket of currencies]. The trading bandwidth was further widened to 1 % on 14 April 2012 and 2 % 17 March 2014. IMF also confirmed China's exchange rate reform, and classify defacto regime from "crawl-like arrangement" to "other managed arrangement" in 2014.

To further increase the role of market forces on formulating RMB exchange rate, On 11 August 2015, the PBOC made an announcement claiming that it would [improve quotation of the central parity of RMB against U.S. dollar]. Under the new RMB/USD central parity quoting mechanism, banks were asked to submit quotes to the China Foreign Exchange Trading System (CFETS) daily before market opens considering the closing rate of the inter-bank foreign exchange market on the previous day, in conjunction with demand and supply condition in the foreign exchange market and exchange rate movement of the major currencies.6

The revamp of the central parity quotation system represents a major step taken by China in the transition process toward RMB exchange rate flexibility (Cheung, Hui, & Tsang, 2018). Fig. 1 shows the time varying volatility of the RMB exchange rate against four SDR major currencies. With a series of market-oriented reforms in the Chinese foreign exchange market, RMB spot exchange rate has departed from its previous trend of unilateral appreciation, becoming increasingly unpredictable and exhibiting more significant fluctuations, especially after "811 exchange rate reform" in 2015. The world witnessed a significant increase in volatility of the exchange rate of RMB against USD and other major currencies.

Panel A of Fig. 2 illustrates the time-varying volatilities of the USD and RMB exchange rate indices.7 Preceding the year 2010, movements in the RMB index closely mirrored the fluctuations observed in the USD index, particularly during the Global Financial Crisis of 2008–2009, owing to the de facto pegging of the RMB to the U.S. dollar. Subsequent to the resumption of reforms on June 19th, 2010, the volatility pattern of the RMB exhibited notable deviations from that of the USD. Notably, RMB index volatility began to significantly surpass that of the USD after 2015, specifically in July 2018 and May 2019. To further elucidate these dynamics, we computed the ratio of RMB index volatility to USD index volatility, and the results are presented in Panel B of Fig. 2. Consistently, our findings indicate that, on average, this ratio remained substantially below 1 before 2010. However, post-2010, the ratio ranged from 0.23 to 3.26, signifying an independent and heightened volatility of the RMB index in relation to the USD index.

With the increased flexibility of the RMB exchange rate, Chinese enterprises find themselves increasingly susceptible to exchange rate risk. A survey conducted by the People's Bank of China in 2011 in the regions of Shandong, Zhejiang, and Qingdao revealed that, in the face of RMB appreciation exceeding 10 %, no firms surveyed could withstand such impact. Furthermore, 40 % of these enterprises had not implemented any risk management measures for mitigating exchange rate risk, and 24.28 % expressed skepticism regarding the efficacy of foreign exchange derivatives launched by banks in reducing exposure to exchange rate fluctuations (Li, Guo, & Zhao, 2011). The repercussions of the escalating volatility in the RMB exchange rate are also discernible in the financial statements of listed companies. As indicated in Appendix B, prior to 2010, less than 60 % of listed companies disclosed the extent to which exchange rate movements influenced the company's cash flow. This percentage witnessed a rapid increase, reaching 80 % after the year 2020.

2.2. Literature review

2.2.1. Determinants of exchange rate exposure

It is important to understand the sources of exchange rate exposure's variation because foreign exchange rate risk shapes international trade, equity costs, and international investments (Carrieri, Errunza, & Majerbi, 2006; Choi, Hiraki, & Takezawa, 1998; Hekman, 1985). Adler and Dumas (1984) were among the first scholars to theoretically define the concept of foreign exchange rate exposure and implement it in the context of public firms. This strand of the literature has continued to grow through the discussion on exchange rate exposure's determinants. First, exchange rate exposure is related to business operations. Enterprises with overseas revenues and international borrowing are more susceptible to exchange rate fluctuations (Dominguez & Tesar, 2006; He & Lilian, 1998; Hutson & Laing, 2014). Exchange rate changes—resulting in increased short-term cash flow volatility—make firms more likely to give up investment opportunities, which results in underinvestment problem (Froot et al., 1993). Underinvestment makes companies with high leverage ratio or good growth opportunities more vulnerable to currency-related risks. Liquidity alleviates underinvestment problems—it reduces the likelihood of financial distress,

thereby mitigating cash flow fluctuations due to exchange rate changes (He et al., 2021b; Hutson & Stevenson, 2010; Nance, Smith Jr, & Smithson, 1993; Wei & Starks, 2013). Second, firms' operational and financial hedging can reduce exposure. For instance, Nance et al. (1993) claim that there are economies of scale in the area of hedging cost. Lower hedging cost and greater hedging benefits incentivize large enterprises to conduct hedging activities, resulting in lower exchange rate exposure. Wei and Starks (2013) argue that it is more difficult for companies in financial distress to enter the financial market to manage exchange rate risk via foreign exchange derivatives, inevitably amplifying the effect of exchange rate fluctuation. Hedging costs are particularly high in emerging-market countries due to their lack of hedging tools, which leads to significant exposure to unfavorable currency movements (He et al., 2021b).

Finally, macroeconomic factors are also relevant to firm-level exchange rate exposure, as they influence firms' international operations and hedging activities considerably. Chaieb and Mazzotta (2013) demonstrated that the foreign exchange rate exposure of multinational and domestic firms varies with the host country's macroeconomic condition, increasing during economic downturns. Underdeveloped financial markets and limited financial openness make it more difficult for firms to hedge risk through pricing (Campa, Gonzalez, ´ & Mínguez., 2006; Devereux & Yetman, 2010). Additionally, financial instability could increase financial derivatives' cost (Ehlers & Packer, 2013).

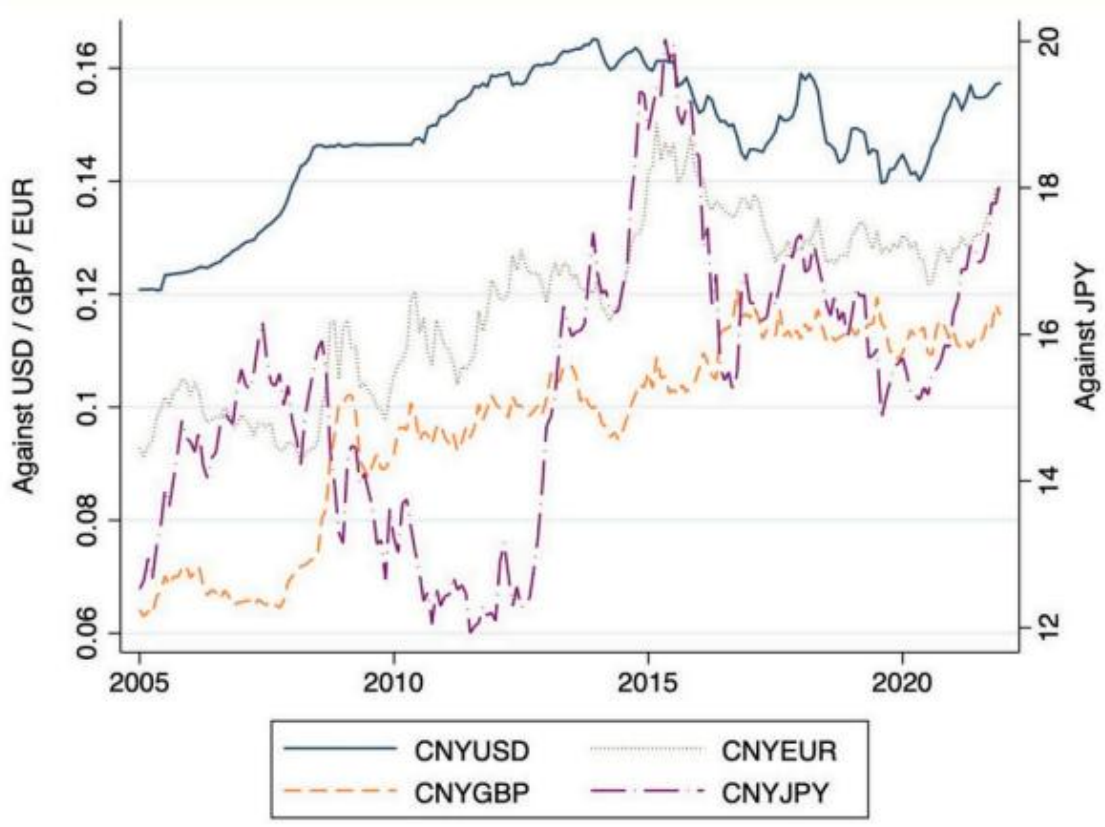


Fig. 1. RMB Spot Exchange Rates.

Note: This figure shows the time trend of RMB spot exchange rate against other SDR currencies, namely USD, EUR, JPY, GBP.

We contribute to this ongoing discussion by showing that EPU—a factor that has not been investigated in prior studies—is an important source of exchange rate exposure variation, even after controlling for traditional determinants and macroeconomic conditions. We show that EPU has a direct effect on the revenue and costs of firms' international business and induces insiders' to pursue self-serving transactions, thereby amplifying the effect of exchange rate movements on firms' value. Moreover, consistent with recent studies (Nguyen et al., 2018), we find that EPU increases firms' use derivatives. However, the underdevelopment of derivative markets limits financial hedging's role in mitigating exposure.

2.2.2. EPU and corporate outcomes

Policy uncertainty is relevant to real economic outcomes, affecting corporate investment (Bloom, 2009; Bonaime et al., 2018; Julio & Yook, 2012), corporate cash holding (Han & Qiu, 2007), dividend policy (Farooq & Ahmed, 2019), bank lending (Francis et al., 2014), merging-and-acquisition decisions (Bonaime et al., 2018), initial public offering decisions (Çolak, Durnev, & Qian, 2017), credit spreads (Kaviani et al., 2020), and corporate innovation (Bhattacharya et al., 2017). EPU also impacts corporate governance and can worsen conflicts between controlling and minority shareholders by incentivizing controlling shareholders to engage in tunneling (Ongsakul et al., 2021).

We establish an important link between the two aforementioned research strands. However, the relationship between EPU and exchange rate exposure has been largely overlooked in previous studies. Nguyen et al. (2018) find that EPU is positively related to firmlevel foreign direct investment, while firms use more derivatives when EPU increases. Consistent with Nguyen et al. (2018), we find that EPU increases the use of derivatives; however, the use of derivatives does not mitigate EPU's effects on firms' exchange rate exposure in emerging markets (e.g., China). In addition, EPU is negatively related with corporate overseas investments, thereby reducing the effect of operational hedging on firms' exchange rate exposure.

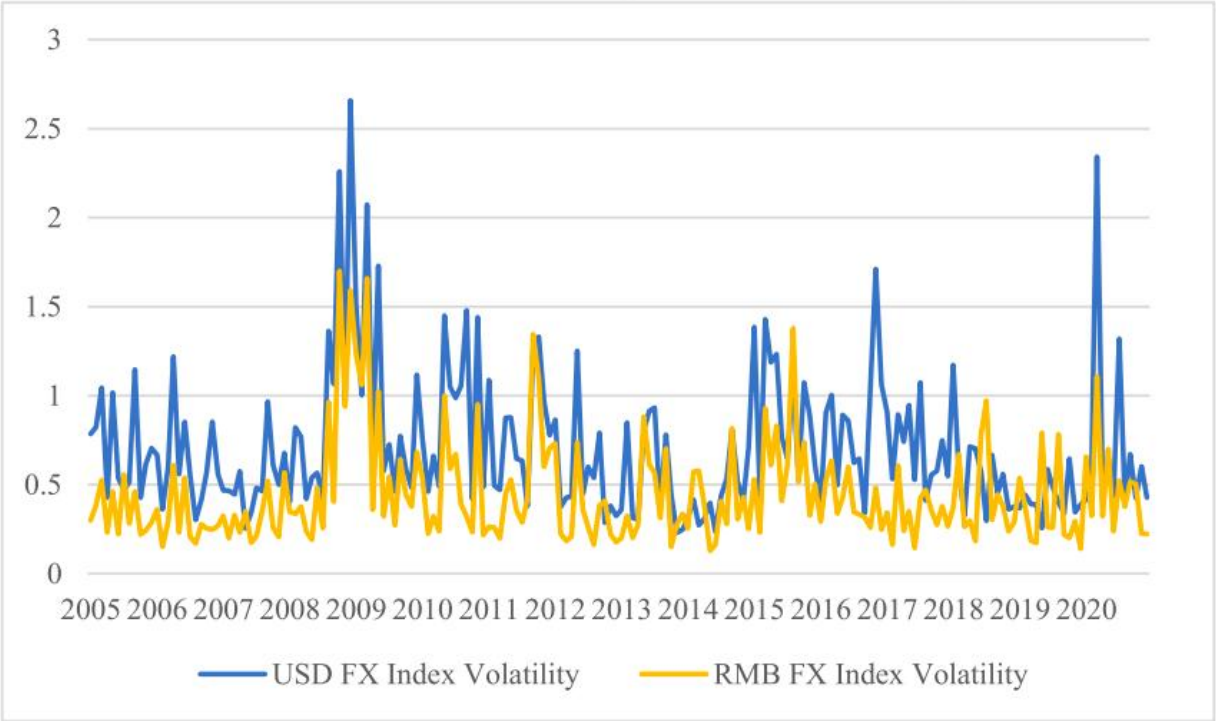
3. Data and variables construction

3.1. Measures of economic policy uncertainty

Using contents of news article, BBD construct news-based economic policy uncertainty (EPU) indices for world major economies. To measure China's EPU index, BBD performs text searches on a Hong Kong-based English-language newspaper, the South China Morning Post (SCMP). Specifically, beginning in 1995, the number of China-related articles containing at least one term from each of the three term sets (i.e., economics, policy, and uncertainty) is registered each month. This count is then scaled by the number of total SCMP articles that month. The resulting index is normalized to have a mean value of 100, from 1995 to 2011. Following the literature, we average the monthly BBD index in each quarter and take the logarithm as our primary measure (EPU).

Note that the SCMP may not fully capture the wide range of EPU in China. Further, it is difficult to construct an EPU index with different policy categories based on a single newspaper (Huang & Luk, 2020). Using the same BBD news-based method, Davis, Liu, and Sheng (2019) construct the EPU index (EPU_ML) based on two mainland Chinese newspapers: the Renmin Daily and the Guangming Daily. Moreover, Huang and Luk (2020) construct an overall EPU index (EPU_H&L) and uncertainty indices for four policy categories using 10 Chinese mainland leading newspapers. We include these alternative measures of China news-based EPU index for a robustness.

Panel A USD and RMB Exchange Rate Index Volatility Trend



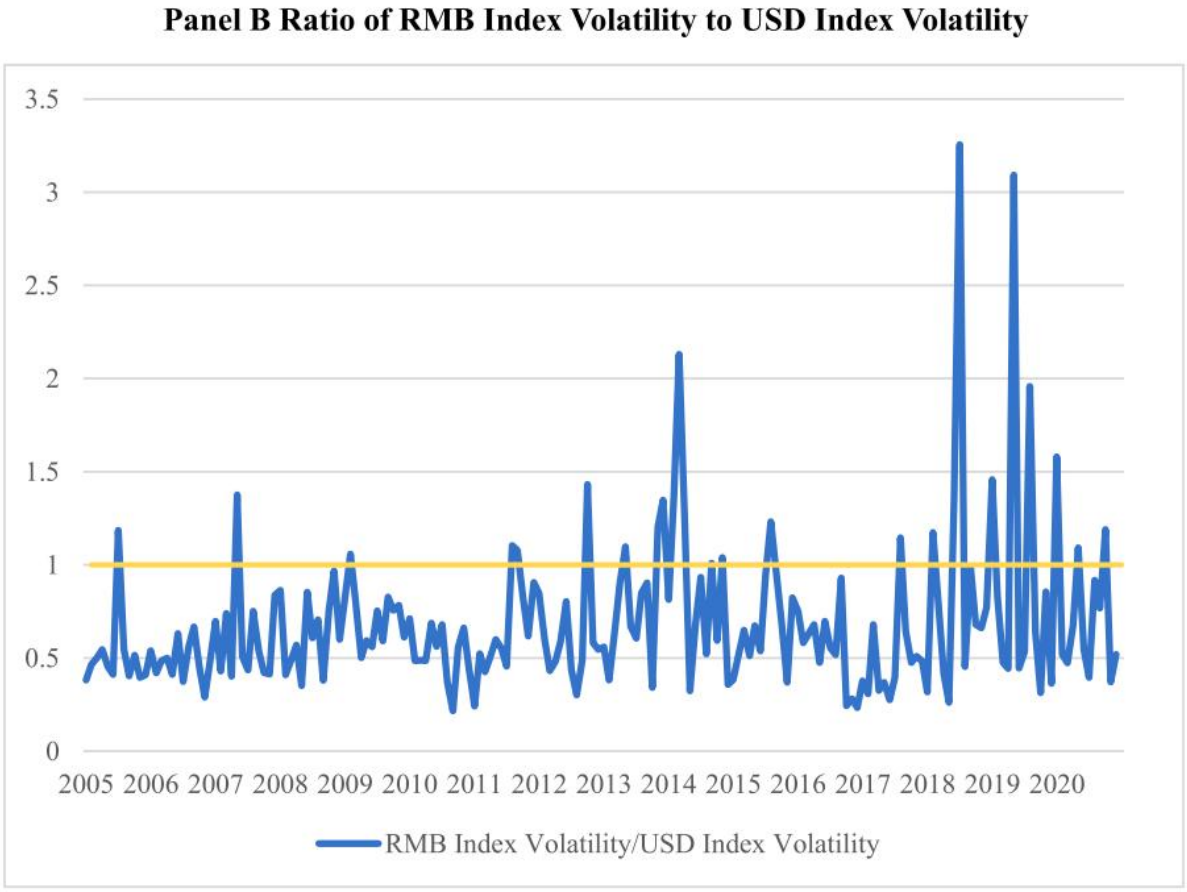


Fig. 2. Comparison of the Volatility of RMB Exchange Rate Index and USD Exchange Rate Index.

Note: Panel A displays a chronological representation of the volatility in the USD exchange rate index and RMB exchange rate index. In order to make the comparison results more intuitive, Panel B presents the ratio of RMB exchange rate index volatility to USD exchange rate index volatility. The volatility is measured by the monthly standard deviation of daily USD exchange rate index and RMB exchange rate index. RMB exchange rate index is estimated manually according to the rules issued by CFETS on the end of 2021, due to the limited data availability. The base periods of USD exchange rate index and RMB exchange rate index are Mar. 1973 and Dec. 2014, respectively.

Panel A USD and RMB Exchange Rate Index Volatility Trend.

Panel B Ratio of RMB Index Volatility to USD Index Volatility.

3.2. Measures of exchange rate exposure

We use firm stock returns' sensitivity to changes in the foreign exchange rate, controlling for market return, as a proxy for exchange rate exposure (Bartram et al., 2010; He & Lilian, 1998; Hutson & Laing, 2014). Specifically, we empirically assess foreign exchange exposures using the following regression model:

$$Rid = \alpha i + \beta iRmd + \gamma iRsd + \varepsilon id\#$$

where Rid is the daily stock return in excess of the risk-free rate, whereas Rmd is the daily return of the stock market index in excess of the risk-free rate. The risk-free rate is the three-month benchmark saving rate released by the People's Bank of China (PBOC). The market index is the CSI300 of China's stock market. Rsd is the log difference in the daily RMB weighted index (Rsd is positive when exchange rate index rises). Following He, Li, and Liu (2022), we construct the RMB weighted index using the SDR currency basket (USD, EUR, JPY, and GBP) weighted by annual bilateral trade volume in the four foreign currencies. All data are drawn from Bloomberg and the PBOC. Our sample spans from 2010Q3 to 2020Q4.9

To create a quarterly series of estimated exposure for each firm, we estimate exposure over a series of four-quarter windows, according to Eq.(1). Specifically, γit is the exchange rate exposure coefficient of firm i in quarter t, estimating a four-quarter window, from the current quarter to the following three quarters. Following Wei and Starks (2013) and He, Liu, and Zhang (2021a); He et al. (2021b), we take its absolute value.

3.3. Other variables

Given a large set of potential determinants of foreign exchange exposure, we include various firm-level and macroeconomic controls suggested by prior studies in our regression.

Bodnar, Franco, and Wong. (2003) find that large firms have considerable exposure in the international environment and face higher exchange rate exposure. In contrast, He and Lilian (1998) find that firm size is negatively related with exposure, as large firms are more motivated to hedge exchange rate risks (He et al., 2021b; Hutson & Laing, 2014). We use the logarithm of a firm's total assets (size) as the proxy of its size. Highly indebted firms and firms with inadequate liquidity are vulnerable to financial shocks and are therefore more likely to hedge the foreign exchange risk (Nance et al., 1993; Wei & Starks, 2013). We use the debt-to-asset ratio (leverage) to measure leverage and the quick ratio (quick) as the proxy of firm liquidity. Growing firms that have more serious underinvestment problems require a stable cash flow and are more sensitive to foreign exchange rates' fluctuations (He & Lilian, 1998; Wei & Starks, 2013). We use book-to-market value of equity (BM) as a proxy of a firm's growth opportunities. Firms' international involvement has direct and significant effects on their exchange rate exposure (He & Lilian, 1998; Hutson & Laing, 2014). We use foreign sales (overseas) and foreign loans (floan), both scaled by total asset, as proxies for a firm's international involvement. We also control for several macroeconomic variables to address the underlying concern that our results may be driven by general economic conditions or economic uncertainty (Bhattacharya et al., 2017; Bonaime et al., 2018; Kaviani et al., 2020). The macroeconomic variables in our main results include inflation, interest spread, business cycle, foreign currency bank loan, and exchange rate fluctuation. All consistent variables have been winsorized at both the 1 % and 99 % levels. We provide a detailed description of all variables used in Appendix A.

3.4. Summary statistics

Table 1 presents the summary statistics on our main variables. Overall, the average exposure (absolute value of γi) is 0.262, consistent with the findings of He et al. (2021b). Table 1 also presents the summary statistics on EPU indices and control variables. All variables show significant variations over our sample period. We divide the sample into high- and low-EPU periods based on the median EPU value (as shown in Table 2). It shows that mean (median) values of exchange rate exposure increase from 0.238 (0.182) in low EPU periods to 0.280 (0.207) in high EPU periods. Both the mean and median tests for the differences are statistically significant, suggesting that policy uncertainty and exchange rate exposure are positively correlated.

In Fig. 3, we plot the average firm-level exchange rate exposure in each quarter via the quarterly EPU. Clearly, both plots have similar patterns, suggesting that high-EPU periods are accompanied with high exposure. The correlation between EPU and average exposure is 0.428, which is statistically significant at 1 % confidence level. This positive correlation seems to be pervasive over whole sample periods. Additionally, EPU spikes around the events that are ex ante expected to cause an increase in EPU, e.g., the National Congress of the Communist Party of China in 2012Q4 and 2017Q4, the US-China trade conflict in 2018Q2, and the COVID-19 pandemic in 2020Q1. It also exhibits substantial variations between these important events. Fig. 3 suggests that EPU has an independent impact on firms' exchange rate exposure.

Table 1
Summary Statistics of the Main Variables.

Variable	Observation	Mean	Std. Dev.	25th percentile	Median	75th percentile
Economic Policy Uncertainty Index						
EPU	41	5.543	0.758	4.970	5.557	6.134
EPU_R	41	0.000	0.259	−0.212	0.009	0.195
EPU_ML	41	5.046	0.517	4.636	4.870	5.402
EPU_H&L	41	4.951	0.142	4.841	4.957	5.034
EPU_fsc	41	4.875	0.334	4.670	4.866	5.026
EPU_mn	41	4.818	0.379	4.521	4.849	4.989
EPU_ec	41	4.735	0.537	4.300	4.814	5.091
EPU_trd	41	4.974	0.641	4.551	4.812	5.242
Firm-level Exchange Rate Exposure						
Exposure	101,008	0.262	0.286	0.090	0.196	0.360
Firm Control Variables						
size	29,677	3.535	1.342	2.561	3.371	4.310
leverage	29,677	0.426	0.212	0.256	0.417	0.584
quick	29,702	2.045	2.576	0.724	1.206	2.184
BM	26,868	0.937	0.983	0.350	0.607	1.110
floan	29,722	0.031	0.112	0.000	0.000	0.000
overseas	29,722	0.112	0.194	0.000	0.007	0.141
Macro Control Variables						
CPI	41	2.634	1.191	2.000	2.300	2.900
IntSpread	41	2.371	0.777	1.842	2.321	2.987
FGDP	41	0.524	0.133	0.417	0.537	0.642
Exloan	41	0.020	0.042	−0.013	0.017	0.053
REER	41	0.005	0.022	−0.004	0.003	0.019

Note: The data are from the third quarter of 2010 to the fourth quarter of 2020. Economic policy uncertainty index data are quarterly time series data. Firm-level exchange rate exposure data are quarterly panel data. Firm control variables data are yearly panel data, which are obtained from the annual financial statements of the previous year. Macro control variables are quarterly data.

Table 2
Descriptive Statistics for Exposure in High- and Low-EPU Categories.

	Observations	Mean	Median
High EPU	59,524	0.280	0.207
Low EPU	41,484	0.238	0.182
Difference (High-Low)		0.041	0.026
Diff(t-stat/z-stat)		24.251***	21.415***

Note: Descriptive statistics for exposure, separately for periods of high- and low- EPU, based on the time-series median. Student's *t*-test and the Wilcoxon-Mann-Whitney *U*test are used to examine the significance of the differences in the means and medians of exposure between the two groups, defined by EPU. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

To conduct a formal test of the relationship between the average exposure and policy uncertainty, we estimate a quarterly VAR model with average exposure, EPU, and macroeconomic controls.10 Our VAR model is as follows11:

$$Yt = \beta 0 + \beta 1 Yt - 1 + \varepsilon t\#$$

where Yt is a vector of endogenous variables, including the natural logarithm of BBD's measure of EPU (EPU), growth rate of RMB real effective exchange rate index (REER), interest spread between China and United States (IntSpread), onshore and offshore USDCNY exchange rate spread (ExchSpread), foreign currency bank loan growth rate (Exloan), fixed asset investment growth rate (FixInv), international trade deficit (Deficit), growth rate of producer price index (PPI), and the average ERE level.

To isolate an EPU shock's effect on average exposure, we further impose an order with which shocks propagate through the variables in our VAR analysis. Specifically, the average exposure impulse response function (IRF) is estimated in the following ordering system: the natural logarithm of EPU, REER, IntSpread, ExchSpread, Exloan, FixInv, Deficit, PPI, and average exposure.12

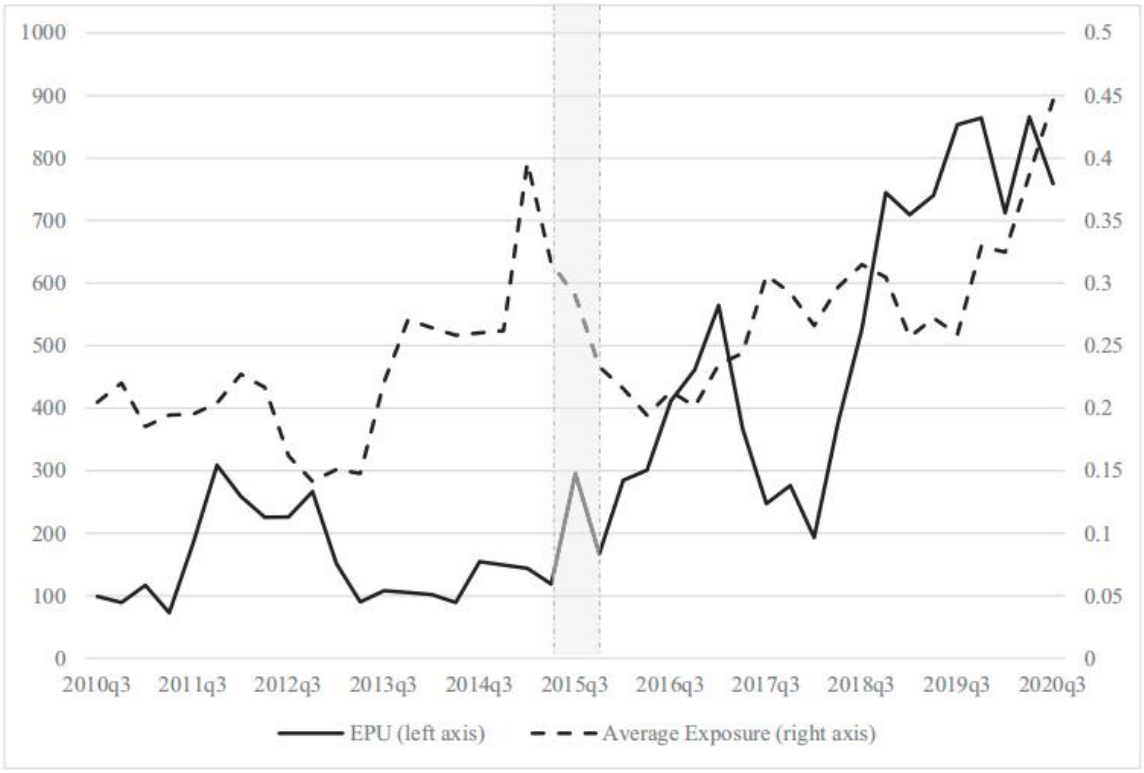


Fig. 3. Average Exchange Rate Exposure and Economic Policy Uncertainty Index.

Note: This figure shows the time trend of economic policy uncertainty (left axis) and the average exchange rate exposure (right axis), where economic policy uncertainty is the original value without logarithmic transformation. The shaded area in the figure indicates the period of the 811 exchange rate reform in the third quarter of 2015.

The estimated IRF in Fig. 4 shows that EPU shocks have a positive significant impact on average exchange rate exposure, lasting up to four quarters. A 1 % increase in EPU is associated with an estimated 1.605 % increase in average exposure over the second quarter. This effect is economically large, considering that the mean of exposure is 0.262. One standard deviation increase in EPU is associated with a 1.481 % increase in average exposure, accounting for 6 % of the sample mean. This implies that on average, EPU will amplify currency movements' impact on firms' fundamental values.

4. Empirical results

4.1. Main results

Next, we explore the relationship between policy uncertainty and exchange rate exposure using firm-quarterly panel regressions. We model a firm's exposure in a given calendar quarter as a function of the level of economic uncertainty in the prior quarter, controlling for lagged firm-level and macroeconomic variables. Our primary regression specification is as follows:

$$|\gamma_{i,t}| = \alpha 0 + \alpha 1 EPU_{t-1} + \alpha 2 controls_{i,t-1} + \theta_i + \epsilon_{i,t\#}$$

where $\gamma_{i,t}$ is the estimated exchange rate exposure of firm i in quarter t. EPU_{t-1} is the natural logarithm of the average of the BBD index in quarter t-1. $controls_{i,t-1}$ are the firm-level controls and macroeconomic variables described above. Firm-level variables are measured in the fiscal year ending in the previous year, while macroeconomic variables are measured in the prior quarter. θ_i captures the firm fixed effects and $\epsilon_{i,t}$ donates the error term. All t-statistics are clustered at the firm level.

Table 3 presents the results on the relationship between EPU and firms' exchange rate exposure. EPU's coefficients are positive and statistically significant at the 1 % confidence level, confirming our expectation that EPU is associated with higher exposure. This result remains unchanged when we include an array of firm-level

determinants of exposure and macroeconomic variables, as well as quarterly time and firm fixed effects. The marginal effects associated with EPU coefficients in the full specification (Column 4) suggest that one standard deviation increase in the EPU index is associated with a 0.022 (0.028 × 0.785) increase in exposure. Given that the average of exposure is 0.262, a 0.022 increase in exposure is economically large, corresponding to 8.4 % of the sample average.

Regarding the control variables, we find negative and significant (at the 1 % level) sign on the coefficients of quick ratio (quick).

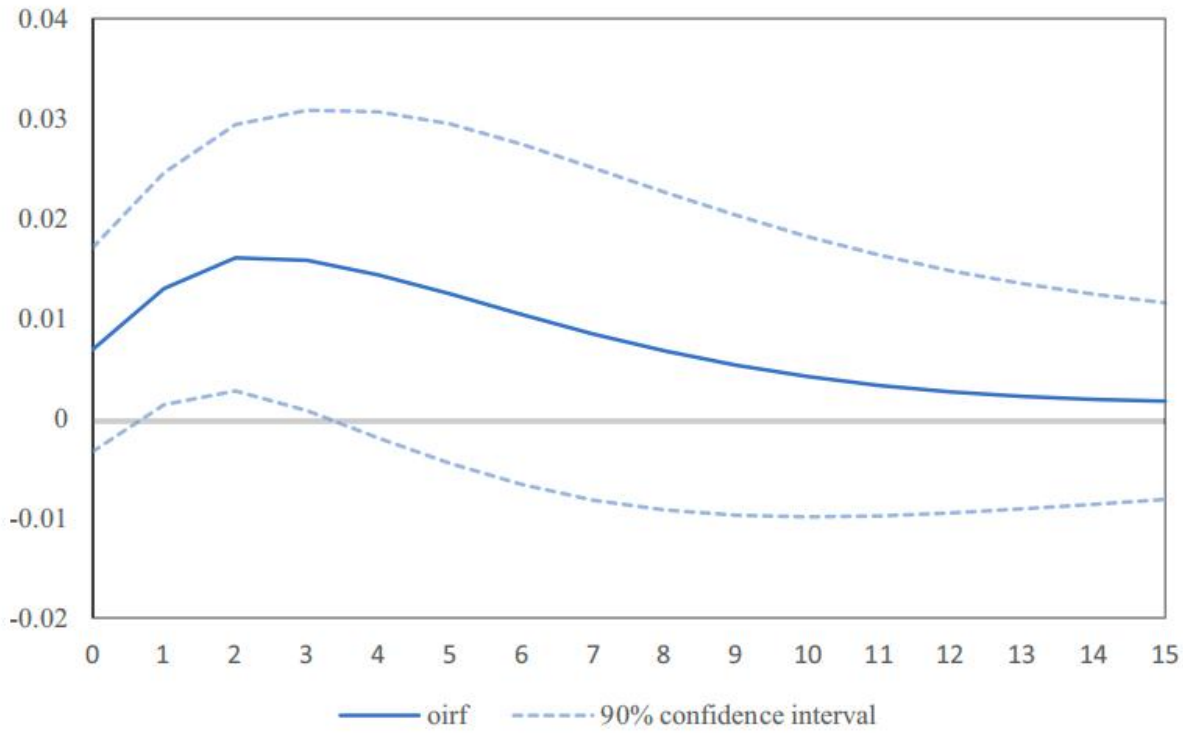


Fig. 4. Response of Exposure to an Economic Policy Uncertainty Shock.

Note: The average exposure impulse response function is estimated from the VAR (1) model in the following order: the natural logarithm of economic policy uncertainty index from Baker et al. (2016), growth rate of RMB real effective exchange rate index (REER), interest spread between China and United States (IntSpread), onshore and offshore USDCNY exchange rate spread (ExchSpread), foreign currency bank loan growth rate (Exloan), fixed asset investment growth rate (FixInv), international trade deficit (Deficit), growth rate of producer price index (PPI) and average level of exchange rate exposure. The solid line represents the orthogonalized impulse response of exposure to an economic policy uncertainty shock, whereas the dashed lines represent the upper and lower boundaries of the 90 % confidence interval, respectively. The eigenvalues of the VAR (1) model are all located inside the unit circle, implying that the model passed the stationarity condition test. The Granger causality test shows that economic policy uncertainty is statistically significant at the 10 % level (P = 0.0925) in the equation of the average exposure, implying that economic policy uncertainty is the Granger cause of exchange rate risk exposure.

Consistent with previous findings (Hutson & Laing, 2014; Nance et al., 1993), firms with adequate short-term liquidity are less exposed to currency movements, as liquidity can substitute for hedging, reducing the sensitivity to the cash-flow volatility caused by exchange rate shocks. The book-to-market ratio (BM) is significantly positive (at the 1 % level); consistent with hedging theory (G´eczy, Minton, & Schrand, 1997; Guay & Kothari, 2003; Huang, Huang, & Zhang, 2019), firms with greater growth opportunities have strong incentives to hedge cash-flow risk caused by exchange rate fluctuations, hence exhibiting a lower exposure. Oversea sales (overseas) and foreign loan (floan) are found to be insignificant in all specifications; this is consistent with Choi and Jiang (2009) and He et al. (2021a). Most macroeconomic variables exert significant effects on firms' exposure. For instance, the coefficients of interest spread (IntSpread) (0.007, with a t-statistic of 3.39) and REER (REER) (0.388, with a t-statistic of 7.93) show a strong positive relationship between foreign exchange market conditions and firms' exchange rate

exposure—consistent with the hypothesis positing that the volatility of foreign exchange markets leads to higher exposure to currency movements. We also find that economic conditions—e.g., inflation rate (CPI) and fixed investment (FGDP)—have a significant effect on exposure.

Overall, the results in columns (2)–(4) confirm that neither firm characteristics nor macroeconomic conditions explain the relationship between policy uncertainty and exchange rate exposure. However, it is still possible that we do not fully control the economic conditions or foreign exchange market volatility, or that this result is driven by certain policies generating uncertainty. We address these issues in the following sections.

4.2. The effects of hedging

Hedging is a strategy for firms to cope with foreign exchange risk. Bartram and Bodnar (2007a, 2007b) argue that foreign exchange rate exposure is largely minimized if firms can manage exchange rate risk rationally via operational or financial hedging. The former involves multinational operations to diversify currency revenue, match revenue and cost in the same currency, and increase operational flexibility to shift their operations across countries (Bodnar et al., 2002; Hutson & Laing, 2014). The latter involves a range of foreign currency derivative usage (Aggarwal & Harper, 2010; Allayannis, Lel, & Miller, 2012). Numerous empirical studies have examined the relationship between foreign exchange exposure and the usage of operational and financial hedging tools. For instance, Pantzalis, Simkins, and Laux (2001) find that the geographical dispersion of a firm's international actives is negatively related with exchange rate exposure. Allayannis and Weston (2001) show that foreign currency derivatives comprise an effective instrument to hedge against exchange rate fluctuations.

Hedging decisions arise from balancing costs and benefits. If EPU has a significant impact on firms' exchange rate exposure, its effects should be lower when the risk is preemptively hedged. We should observe that such policy uncertainty shocks enhance the benefits of hedging, mitigating the impact on exchange rate exposure. To measure financial hedging, we use an indicator variable, drvtv, which equals 1 if a firm reports the usage of currency derivative in a year, and 0 otherwise (Allayannis & Weston, 2001; Hutson & Laing, 2014). As for the measure of operational hedging, we use "brdth," which equals 1 if the number of continents where a firm has subsidiaries is >3, and 0 otherwise, as Pantzalis et al. (2001) find that breadth can capture the geographical dispersion of a firm's international involvement.13 Empirically, the dummy indicator for hedging, drvtv or brdth, and its interaction with EPU are incorporated into our benchmark regression.

Table 3
Baseline Results: EPU and Exposure.

Dependent Variable: Exposure				
	(1)	(2)	(3)	(4)
EPU	0.023***	0.024***	0.024***	0.028***
	(14.60)	(10.37)	(10.17)	(11.25)
size		0.002	0.002	0.004
		(0.45)	(0.46)	(0.65)
leverage		0.009	0.009	0.013
		(0.56)	(0.55)	(0.77)
quick		−0.006***	−0.006***	−0.006***
		(−7.93)	(−7.93)	(−7.71)
BM		0.012***	0.012***	0.008**
		(3.52)	(3.51)	(2.07)
floan		0.010	0.010	0.012
		(0.81)	(0.83)	(0.97)
overseas		0.013	0.013	0.013
		(0.72)	(0.70)	(0.70)
CPI				−0.005***
				(−5.35)
IntSpread				0.007***
				(3.39)
FGDP				−0.087***
				(−2.78)
Exloan				−0.061*
				(−1.72)
REER				0.388***
				(7.93)
Constant	0.127***	0.104***	0.105***	0.121***
	(13.93)	(7.33)	(7.37)	(6.43)
Firm FE	Yes	Yes	Yes	Yes
Quarter FE	No	No	Yes	Yes
No. firms	3616	3431	3431	3431
Observations	100,836	94,507	94,507	94,507
Adj-R^2	0.102	0.089	0.089	0.090

Note: A detailed description of the variables is given in Appendix A. The sample period is from the third quarter of 2010 to the fourth quarter of 2020. t-statistics are clustered at the firm level and appear between parentheses below the coefficient estimates. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

Panel A of Table 4 presents the results. The first two columns report that the interaction of EPU and drvtv is insignificant, suggesting that financial hedging activities have no significant impact on the nexus of EPU and exchange rate risk exposure. Consistent with the findings of He et al. (2021a), Chinese firms have a limited ability to financially hedge against unfavorable currency movements, mostly due to underdeveloped currency derivative markets in China.14 Column (3) and (4) report that the interaction between EPU and brdth is significantly negative, suggesting that operational hedging can moderate EPU's impact on exposure. This supports the findings of Pantzalis et al. (2001), who find that operational hedges provide better protection against adverse currency movements, compared with financial hedging.

A potential concern is that firms may adjust their hedging behavior in response to prior exposure shocks, which could limit its immediate effectiveness. Such delayed effects of financial hedging may help explain the relatively weak moderating effect observed in the short term. To address this concern, we incorporate the first-order and second-order lagged terms of financial hedging and EPU.15We find that the interaction terms between financial hedging and EPU, both contemporaneous and lagged, are statistically insignificant. Moreover, the absolute magnitude of the negative coefficient for the lagged interaction term is smaller than that of thecontemporaneous term. These results suggest that the use of derivatives appears to play only a modest role in mitigating firms' exchange rate exposure, indicating a relatively weak hedging effect in the context of elevated EPU.

4.3. Heightened exchange rate volatility

Obviously, unusual exchange rate fluctuations will increase firms' exposure to currency movements. To examine whether EPU's positive effect on exposure survives during times of heightened exchange rate volatility, we focus on the 811 reform. The 811 reform represents one of China's key steps in the transition toward RMB exchange rate flexibility; however, the RMB experienced a short period of high volatility during this time. We calculate the standard deviation of the exchange rate index of SDR currency for the period 2015Q3–2016Q2 (811 reform); we find that the index increases from a mean of 0.471 in other periods to 0.601 in the aforementioned periods.

Columns (1) and (4) show that the positive relationship remains significant at the 1 % level or better. The coefficients are several times larger than those in benchmark regressions (Table 3), indicating that EPU has a pronounced impact on exchange rate exposure during high exchange rate volatility periods.

Note that the benefits of hedging might weaken in times of heightened exchange rate volatility, as firms conduct selective hedging—they hedge currency risk only when they believe the exchange rate will change to their detriment. Selective hedging is found to be inadequate because exchange rate movements are largely unexpected in short periods with heightened exchange rate volatility (Bodnar et al., 2011). Using a sample of US firms around the crisis (2007–2008), Hutson and Laing (2014) find that financial hedging lost its effectiveness during the study period, whereas operational hedging remained robust as a risk management tool. To test the role of hedging in times of heightened exchange rate volatility, we include proxies of hedging, drvtv, brdth and their interaction terms with EPU in the regression. Consistent with the results in Panel A of Table 4, both drvtv and its interaction term, EPU × drvtv, are still not significant in both sub periods (Columns (2) and (5)). This is unsurprising, as derivative markets are underdeveloped and firms suffer a high hedging cost in China. Financial derivatives fail to hedge against exchange rate risks, while firms experience direct ERE following an increase in EPU.

The interaction term EPU×brdth becomes no longer significant during the year after the "811 Reform" (Column (3)). While it remains significant at the 10 % level during the year after the outbreak of the COVID-19 pandemic, albeit offering only modest mitigation of EPU-related exchange rate exposure (Column (6)). This partial attenuation of international operations' effectiveness may indicate that international operations are generally insufficient to fully hedge firms' exchange rate risks when exchange rates are largely unpredictable in the short term. A possible explanation is that international operation is a longer-term hedging technique and primarily plays a role on longer-term exposures (Muller & Verschoor, 2006).

5. Robustness

5.1. Alternative specifications

To verify the robustness of our main results (Table 5), we first consider alternative measures of exchange rate exposure. Starting in 2015, the China Foreign Exchange Trade System (CFETS) has published an RMB currency

index, which is an aggregate proxy for the Chinese RMB exchange rates against a basket of currencies from 13 countries, including both emerging and developed economies. The index is the average of the daily CNY Central Parity Rate, weighted by the international trade denominated with each foreign currency. In 2017, the CFETS increased the number of currencies in the basket from 13 to 27. Thus, we construct a trade weighted index for currencies of developed, emerging, and whole countries according to 27 currencies in the CFETS basket. Specifically, using Eq.(1) and a different weighted RMB index, we estimate the firms' exposure to the exchange rate of all currencies (Exposure_a), developed economies' currencies (Exposure_d), and emerging economies' currencies (Exposure_e). Subsequently, we estimate EPU's effect on these three alternative measures (Table 5).

Columns (1)–(3) in Table 5 show that EPU is significantly associated with higher exposure in the three alternative measures. Interestingly, the EPU coefficients in developed currencies (Column 2) are almost three times larger than those of the exposure to emerging-market currencies (Column 3). This suggests that Chinese firms are more susceptible to the movement of developed countries' currencies.

We also examine the sensitivity of our main results vis-a-vis ` alternative specifications. In Column (4), we further move the EPU ahead two quarters and examine whether the EPU in quarter t-2 influences exposure in quarter t. To address the possible estimation error, we re-estimate Eq.(2) by weighting each sample as the inverse of its standard error, and report the results in Column (5).16 It could be argued that absolute exposure produces truncation bias. Thus, following Dominguez and Tesar (2006), we take the square root of $|\gamma_{i,t}|$ as the independent variable and re-estimate our baseline equation (Column 6). To address the concern that the relationship between policy uncertainty and exchange rate exposure is simultaneous (Bartram & Bodnar, 2012; He, Liu, Wang, & Yu, 2020), we also conduct generalized methods of moments to re-estimate the results in a dynamic panel setting (Column 7). As potential cross-sectional and serial correlation may bias our error term (Petersen, 2009), we re-estimate our baseline equation by clustering the standard errors at both the firm and calendar-quarter level (Column 8). Columns (9) and (10) demonstrate that EPU exerts a statistically significant positive influence on exchange rate exposure both prior to and following the RMB Exchange Rate Formation Mechanism Reform implemented on August 11, 2015. This persistent effect, however, manifests within distinct structural regimes, as confirmed by the Chow test which identifies significant structural breaks between the pre-reform and post-reform periods.

Following Robinson (1988) and Chevalier and Ellison (1997), we run a semi-parametric regression of exchange rate exposure on EPU, allowing for an unconstrained functional form. Column (11) reveals that exposure is more sensitive to EPU increases in the tail of the distribution, with a sharper rise in exposure beyond a certain EPU threshold. To further refine this analysis, we introduce an indicator for EPU in the top 25 % decile. As shown in Column (12), during high EPU periods, the marginal impact on exchange rate exposure strengthens significantly, underscoring the heightened risk enterprises face in such conditions. To address concerns of omitted variable bias, Column (13) adds four market sentiment control variables (PE ratio, NewAcct, TrnOvr, and VIX),17 while Column (14) controls for exchange rate volatility using the quarterly standard deviation of the CFETS RMB Exchange Rate Index (CNY Vol). To eliminate the influence of time trends on the key variable, Column (15) applies first-differencing to EPU. Additionally, Column (16) regresses EPU on the logarithmic transformation of quarterly trend variables and their polynomial terms, using the residual series (EPU_detrend) as the adjusted core explanatory variable. All results remain qualitatively unchanged and confirm that EPU has a significantly positive impact on firms' exchange rate exposure.

Table 5
Robustness Tests.

Panel A: Alternative Specifications

Dependent Variable: Exposure	CFETS Currency	Advanced Economy Currency	Emerging Economy Currency	Two Quarter Forward	WLS	Square Root	System GMM	Double Cluster
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPU	0.032*** (11.28)	0.057*** (19.03)	0.015*** (6.76)	0.022*** (11.16)	0.016*** (10.39)	0.014*** (11.25)	0.028*** (11.15)	0.028** (2.08)
L. exposure							0.379*** (4.72)	
Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	94,507	94,507	94,507	86,788	94,507	94,507	91,308	94,507
Adj-R^2	0.113	0.097	0.101	0.130	0.116	0.090		0.090
	Before 2015Q3	After 2015Q3	Nonparametric series regression	EPU 75th percentile Indicator	Controlling Market Sentiment	Controlling Exchange Rate Volatility	EPU First-order Difference	Detrended EPU
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
EPU	0.089*** (14.18)	0.045*** (5.13)	0.075*** (25.04)	0.004* (1.66)	0.048*** (14.10)	0.026*** (10.46)		
ΔEPU							0.020*** (7.04)	
EPU_detrend								0.029*** (11.97)
EPU 75p Indicator × EPU				0.009*** (19.22)				
Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	No	Yes	Yes	Yes	Yes	No
Observations	41,825	59,857	94,507	94,507	94,507	94,507	94,507	94,507
Adj-R^2	0.237	0.132		0.094	0.103	0.091	0.087	0.089
Chow test: LR chi2 (13): (9) = (10)	13,424.38***							
Unit Root-Test Z (t):							−4.885***	−1.455*

Panel B: Alternative Variable Measures

Dependent Variable:	Exposure							Expo
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPU	0.021*** (7.10)							0.072*** (12.21)
EPU_ML		0.042*** (10.09)						
EPU_H&L			0.049*** (4.43)					
EPU_fsc				0.006* (1.69)				
EPU_mn					0.012*** (2.57)			
EPU_ec						−0.004 (−1.36)		
EPU_trd							0.017*** (7.85)	
More Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	94,507	94,507	94,507	94,507	94,507	94,507	94,507	99,535
Adj-R^2	0.116	0.117	0.116	0.116	0.116	0.116	0.116	0.290

5.2. Alternative variable measures

While our main specification controls for several macroeconomic variables, it is possible that the measure of EPU is still related with other macroeconomic factors. To further isolate EPU's impact, we consider several commonly used proxies for macroeconomic un- certainty (Aastveit, Natvik, & Sola, 2017; Rossi & Sekhposyan, 2015) and include them in our baseline regression (Column 1 of Panel B).18 Our test relies on BBD's measure of EPU as our primary EPU index. One concern is that this index may not fully capture the EPU in China, as BBD only

uses the SCMP to extract news content. Additionally, BBD is not able to construct category-specific EPU indices. In this section, we introduce two additional EPU indices to confirm the positive relationship between EPU and firms' exposure, comparing EPU's effects across different policy categories.

Following BBD's compilation strategy, Davis et al. (2019) construct the EPU index (EPU_ML) based on two Chinese mainland newspapers: the Renmin Daily and the Guangming Daily. Huang and Luk (2020) select 10 Chinese mainland newspapers19 and construct an overall EPU index (EPU_H&L) and uncertainty indices for four policy categories—fiscal (EPU_fsc), monetary (EPU_mn), trade (EPU_trd), and exchange rate and capital account policy (EPU_ec).

The results reported in Table 5 's Panel B uniformly confirm that overall high EPU is associated with high exposure (Columns (1)– (3)); the result is economically large. The coefficient of EPU_ML is 0.042, suggesting that a one standard deviation increase in EPU_ML is associated with a 0.022 (0.517 × 0.042) increase in exchange rate exposure, corresponding to 8.225 % of the sample average. To access which policy category index is likely to drive our results, we run our regression separately using the EPU indices for each policy category, constructed by Huang and Luk (2020). Columns (4) and (7) show that the fiscal (EPU_fsc) and tradepolicy uncertainty (EPU_trd) have strong positive impacts on firms' exposure. This is not surprising, since trade policy plays a key role in firms' international operations, while fiscal policy (both tax and government purchase) is directly relevant to firms' operational cash flows. Monetary policy uncertainty is also positively related with firms' exposure (Column 5), while we find no evidence that exchange rate and capital account EPU is related with corporate exchange rate exposure (Column 6). A possible explanation is that monetary policy plays a key role in driving uncertainty (Bonaime et al., 2018), while exchange rate and capital account policy changes infrequently, and are relatively less important sources of EPU.

In column (8), we construct alternative measure by utilizing the financial statement data disclosed by publicly listed companies. Under the assumption of constant tax rates and discount factors, the exchange rate exposure of a firm is reflected in the impact of exchange rate fluctuations on the expected future cash flows. Bodnar et al. (2002) argue that the current pre-tax profit can serve as a proxy for expected future cash flows. Therefore, the exchange rate exposure of a firm can be expressed as:

$$\gamma_i = R_i + (R_i - C_i)\left(\frac{1}{r} - 1\right) \quad (4)$$

where Ri and Ci represent the proportion of foreign currency revenue and foreign currency cost, respectively, and r denotes the pre-tax sales profit margin. The proportion of foreign currency revenue and the pre-tax sales profit margin can be obtained from the financial statements of publicly listed companies. However, due to the limitations of China's financial statement disclosure system, data on the proportion of foreign currency cost at the firm level are unavailable. We thus resort to an industry-fitting method, with industry data derived from the non-competitive input-output table published by the National Bureau of Statistics.

This method of inferring expected future cash flows from the annual reports disclosed by firms primarily captures the exchange rate risk associated with the firm's import and export transactions. It has certain limitations in that it fails to account for the impact of economic exposure, such as market competition, factor allocation, strategic transformation, and macroeconomic shocks, on the firm's exchange rate risk. Moreover, it does not incorporate the various exchange rate risk management practices that firms may adopt in response to exchange rate risks. Column (8) reports the results, and EPU remain a highly positive impact on cash-flow based exposure.

5.3. Endogeneity

A major empirical challenge is to identify policy uncertainty's causal effect on firms' exchange rate exposure. We can safely dismiss the possibility of reverse causality because firms' exposure is clearly too small to influence a country's EPU. Hence, the main challenge is identifying whether EPU is correlated with other factors that simultaneously affect firms' exposure. We conduct two additional tests to alleviate these endogeneity concerns.

First, BBD's EPU index may be contaminated by economic uncertainty, which has a large impact on firms' exchange rate exposure but is unrelated to EPU. Although we control for a large number of economic condition and foreign market condition variables, concerns remain regarding the EPU index (Gulen & Ion, 2016; Kaviani et al., 2020). Thus, we introduce additional tests, using the residual EPU as an alternative independent variable (Kaviani et al., 2020). Specifically, the residual EPU is estimated as follows:

$$EPU_t = \delta_0 + \delta_1 EPU\_foreign_t + \sum \delta_n Macro\ Factors_t + EPU\_R_t\# \quad (5)$$

EPU_foreign is foreign countries' uncertainty index, measured as a principal component factor with the largest eigenvalue extracted from the logarithm of the seven EPU indices of foreign countries—the United States, the United Kingdom, Japan, the European Union, India, South Korea, and Russia. Note that China maintains close trade relationships with said countries. Economic shocks that affect these economies could impact the Chinese economy. Macro Factorst include the same macroeconomic variables in our baseline regression.

EPU R provides a cleaner measure of EPU by taking out the part of EPU only reflecting economic uncertainty. Columns (1) and (2) of Table 6 report the estimation results. In both specifications, the coefficients are positive and statistically significant at the 1 % level. The coefficients are higher than those reported in Table 3. This suggests that measure errors influence the relationship between policy uncertainty and exchange rate exposure but EPU still has a significantly positive impact on exposure.

Second, to further alleviate endogeneity concerns, we propose a novel instrument variable—the number of geological dis- asters—for EPU. Various studies have found that natural disasters have a significant impact on countries' political stability and legitimacy (Abney & Hill, 1966; Cavallo, Galiani, Noy, & Pantano, 2013; Gasper & Reeves, 2011; Quarantelli & Dynes, 1977). The politicization of natural disasters is common, as disaster-related issues—e.g., victims' and society's grievances and government relief efforts—give a rise to intensified political contestation and social conflicts. China has a party-centric political system emphasizing the need to keep society stable and economic performance high (Yang, 2022; Zhao, Seibert, Thomas, & Lumpkin., 2010); thus, to deal with natural disasters, the Chinese government enacts policies focusing on disaster relief and social stability.Thus, while China incurs20 great expenses when natural disasters occur, the government is likely to remain consistent in economic policy.21

Compared to other natural disasters, geological disasters are unpredictable and have major adverse effects (Geller, Jackson, Kagan, & Mulargia, 1997). During our sample period, the number of geological disasters ranged from around 3000 in 2018 to more than 100,000 in 2006. We use the natural logarithm of the number of geological disasters in a year (Disaster) as the instrumental variable for EPU and report our two-stage least-squares results in Table 6.

Columns (3) and (4) show that EPU has a positive and statistically significant effect on firms' exposure (second stage). The EPU coefficients (0.094 and 0.098) are larger than those in specifications without instrumental variables. First-stage regressions show that Disaster is negatively and significantly associated with EPU in both specifications. The F-statistics for the first-stage regressions are >10 and t-statistics for the instrumental variables are >3.6, which is enough to conclude that a weak instrumentation problem is unlikely.

Column (5) reports the results of using EPU R as an alternative EPU measure. With Disaster as the instrument, the coefficient of EPU R is positive (0.116) and significant at the 1 % level (t-statistic = 3.42), in line with the EPU results. These results support that policy uncertainty has causal positive effects on firms' exchange rate exposure.

Table 6
Endogeneity.

Second Stage					
Dependent Variable: Exposure					
	(1)	(2)	(3)	(4)	(5)
EPU			0.094***	0.098***	
			(3.89)	(3.21)	
EPU_R	0.071***	0.082***			0.116***
	(27.20)	(27.17)			(3.42)
Firm Control	No	Yes	Yes	Yes	Yes
Macro Control	No	No	No	Yes	No
Firm FE	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes
Double Cluster	No	No	Yes	Yes	Yes
No. firms	3616	3431	3431	3431	3431
Observations	100,836	94,507	94,507	94,507	94,507
First Stage					
Dependent Variable:			EPU	EPU	EPU_R
Disaster			−0.579***	−0.762***	−0.467***
			(−4.97)	(−5.87)	(−8.02)
F value			24.73***	34.49***	64.36***
Adj-R^2			0.485	0.709	0.492

Note: Columns (1) and (2) report the results of fixed-effect regressions of Exposure on the residuals of EPU on *EPU_foreign* and a series of macro variables that are consistent with baseline regression. Columns (3)–(5) report the results of a two-stage least squares test, with the number of geological disasters (unit: 10,000) as the instrumental variable. Taking Column (4) as an example, the Cragg-Donald Wald F statistic is 43,063.03 and the Kleibergen-Paap Wald rk F statistic is 34.21. The two statistics are both larger than the Stock-Yogo weak ID test 10 % critical values 16.38. t-statistics appear in parentheses below coefficient estimates. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively.

6. Why does policy uncertainty affect exchange rate exposure?

In this section, we investigate the channels through which policy uncertainty affects exchange rate exposure. We examine whether EPU's positive effect on exposure differs across firms. We focus on three reasons. First, firms differ in the extent of their international involvement. If international involvement is not equally costly across firms, we should observe cross-section variations in exchange rate exposure as a response to increased EPU. Second, EPU could encourage managers to believe they can engage in self-serving dealings without immediate consequences, thus increase exposure risk in poorly-governed firms (He et al., 2021a). Third, EPU in- fluences firms' willingness and cost to hedge. Higher uncertainty could incentivize managers to engage in risk management (e.g., Nguyen et al., 2018). Nevertheless, EPU is associated with higher hedging costs, thereby preventing firms from actively managing currency risks.

6.1. International operations

The direct exposure is a crucial factor in determining currency risk (He et al., 2021b; Wei & Starks, 2013). For enterprises with international operations, the impact of EPU is particularly pronounced. These multinational corporations must navigate more complex strategic landscapes, such as adjusting pricing models or supply chain relationships, when faced with elevated EPU. This complexity leads to a greater susceptibility to exchange rate volatility compared to purely domestic counterparts. Thus, the positive relation between policy uncertainty and exchange rate exposure is more pronounced for firms heavily involved in international business. To test this hypothesis, we construct proxy for firms' involvement in international operations and its impact on the relationship between policy uncertainty and exchange rate exposure. Specifically, we use firms' foreign sales ratio as our first measure of international operations (overseas) to quantify firms' revenue received from international markets. We report the estimates in Columns (1) and (2) in Table 7. We focus on the coefficient of the interaction term, EPU×overseas, which captures how foreign revenue affects the EPU's effect on exposure. EPU × overseas coefficient is positive and statistically significant at the 1 % level. These results confirm that firms with high foreign revenue are more sensitive to EPU changes.

International industry competition is another important source of exchange rate exposure. Williamson (2001) posits that industries structures and competition environments differ. Industry competition plays a vital role in firms' exchange rate exposure, as firms facing high foreign competition have high demand elasticity; thus, their revenue is more sensitive to currency movements. To measure international industry competition, we use the procedure of Griffin and Stulz (2001) and He et al. (2021b), while the excess return of the Chinese industry is regressed on that of its US counterpart. A negative coefficient indicates that China industry's performance is worse when the US industry does better relative to its market. We define a dummy variable, cmpt, that equals 1 if the coefficient is significantly negative and 0 otherwise. Columns (3) and (4) in Table 7 report the results. The coefficients ofthe interaction term, EPU × cmpt, are positive and highly significant. The effect is also large: the response of exposure to EPU in highly

competitive industries is 34.6 % (0.009/0.026) larger than that in low-competitiveness industries. This supports the hypothesis that industry competition amplifies EPU's effect on exchange rate exposure.

Table 7
International Operation.

Dependent Variable: Exposure	Foreign Sales Ratio		Market Competition		Foreign Currency Loan	
	(1)	(2)	(3)	(4)	(5)	(6)
EPU	0.018***	0.023***	0.021***	0.026***	0.024***	0.029***
	(7.51)	(8.78)	(8.48)	(9.61)	(10.19)	(11.27)
EPU × overseas	0.048***	0.047***				
	(5.15)	(5.12)				
EPU × cmpt			0.009**	0.009**		
			(2.42)	(2.36)		
EPU × floan					−0.019	−0.017
					(−1.24)	(−1.12)
overseas	−0.254***	−0.253***				
	(−4.89)	(−4.82)				
floan					0.118	0.108
					(1.37)	(1.26)
Firm Control	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Macro Control	No	Yes	No	Yes	No	Yes
No. firms	3431	3431	3431	3431	3431	3431
Observations	94,507	94,507	94,507	94,507	94,507	94,507
Adj-R^2	0.090	0.091	0.089	0.090	0.089	0.090

Note: Columns (1) and (2) report the interaction between EPU and overseas operations. Columns (3) and (4) report the interaction between EPU and market competition. Columns (5) and (6) report the interaction between EPU and foreign currency loans.

Finally, we use the ratio of foreign loan over total loans (Floan) as our third measure of international operations. Many emerging- market economies raise debts invoicing in foreign currency and inevitably must make timely repayments on principal and interest. Their cash flows are sensitive to large adjustments in exchange rate movements (Salomao & Varela, 2022). On the other hand, foreign debt works as a hedging tool to smooth cash flow volatility caused by foreign operations. The coefficients ofthe interaction term, EPU × floan, are both insignificantly negative (Columns (5) and (6)). This suggests that firms' foreign currency loan reduce the policy un- certainty and exchange rate exposure relationship, but the effect is not significant.

Overall, these findings are consistent with our hypothesis that a firm's international involvements strengthen the relationship between policy uncertainty and exchange rate exposure.

6.2. Rent-seeking

In emerging markets characterized by weak market discipline, such as China, rent-seeking activities by corporate insiders are widespread. EPU may lower the barriers to self-serving behavior by managers, thereby increasing cash flow volatility. First, elevated EPU can foster an opaque and low-quality information environment, which amplifies insiders' informational advantages and creates opportunities for rent-seeking (Aboody, Hughes, & Liu, 2005; Maffett, 2012; Nagar, Schoenfeld, & Wellman, 2019). For instance, Chen, Chen, Wang, and Zheng (2018) show that firms respond to policy uncertainty by reducing both the quantity and quality of disclosures. Similarly, Hossain et al. (2020) find that managers can exploit the increased opacity and market turbulence induced by EPU to mislead stakeholders.

Second, since managerial performance is often evaluated relative to peers rather than solely on absolute outcomes (Scharfstein & Stein, 1990), EPU introduces an exogenous and systematic noise that complicates performance attribution. This allows managers to blame unfavorable outcomes on external policy shocks rather than on their own decisions, facilitating a "blame-sharing" effect among peers (Garofalo & Rott, 2018). Consequently, EPU creates a more lenient environment for decision-making failures and raises the propensity for rent-seeking during high-uncertainty periods.22Duchin and Schmidt (2013), using a sample of 9854 mergers from 1980 to 2009, show that poorly governed firms are more likely to engage in empire-building and value-destroying mergers during high-uncertainty periods.

Third, heightened EPU makes it more difficult for shareholders and investors to accurately assess whether performance fluctuations arise from managerial actions or exogenous policy effects (Baum, Caglayan, Ozkan, & Talavera, 2006). As rent-seeking activities often do not directly affect accounting-based performance metrics, insiders may be incentivized to pursue such actions under the assumption that their evaluated performance will not be penalized (Jensen & Meckling, 2019). Managers may resort to opportunistic strategies, such as earnings

management or strategic litigation, to obfuscate firm-specific information and conceal rent-seeking activities (Ali & Hirshleifer, 2017).

If this hypothesis holds, we should observe more rent-seeking activities during periods of high EPU. This would in turn translate into greater firm exposure, as cash flow volatility increases when firms are subjected to adverse exchange rate shocks. In Panel A of Table 8, we compare the averages (median) of proxies for insiders, rent-seeking activities for both high- and low-EPU periods (based on the mean EPU). Following the literature (Cheung, Raghavendra Rau, & Stouraitis, 2006; He & Rui, 2016; Jiang, Lee, & Yue, 2010; Roulstone, 2003; Shleifer & Vishny, 1997), we consider three corporate activities that are most likely associated with self-dealing transactions or risky business activities—related-party transactions (RPTs), other accounts receivables, and executive compensation23—scaled by the prior year,s total sales.Note that corporate insiders can use RPTs to either prop up or tunnel a corporation.Thus, we only focus on tunneling-motivated RPTs that harm the interests of minority shareholders (Cheung et al., 2006; Jian & Wong, 2010). More specifically, we perform an event study using all RPT events and estimate announcement cumulative abnormal returns over the event window of [— 1,1]. We classify RPTs as harmful if the cumulative abnormal return [— 1, 1] is negative.

Table 8
Rent-seeking.

Panel A: Tunneling in High vs Low EPU Period

Variable		High EPU	Low EPU			Diff (High-Low)	Diff (t-stat/z-stat)
		Obs	Value	Obs	Value		
Harmful RPT	Mean	26,515	0.310	15,364	0.257	0.053	11.772***
	Median		0.064		0.042	0.022	11.542***
Other Receivables	Mean	59,672	0.031	43,463	0.030	0.001	5.395***
	Median		0.014		0.014	0.000	1.999**
Executive Compensation	Mean	46,778	0.235	35,067	0.226	0.009	5.475***
	Median		0.149		0.141	0.008	6.536***

Panel B: Conditioning on Corporate Governance Proxies

Dependent Variable: Exposure	Duality of General Manager and Board Chairman	Shareholding of Institutional Investor	Analyst Coverage
	(1)	(2)	(3)
EPU	0.026***	0.043***	0.033***
	(10.19)	(9.92)	(12.71)
EPU × dual	0.008**		
	(2.06)		
EPU × instown		−0.033***	
		(−4.86)	
EPU × analyst			−0.001***
			(−5.33)
dual	−0.052**		
	(−2.28)		
instown		0.170***	
		(3.97)	
analyst			0.004***
			(4.69)
Firm Control	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Macro Control	Yes	Yes	Yes
No. firms	3431	3431	3431
Observations	94,507	94,402	94,507
Adj-R^2	0.090	0.090	0.091

Note: Panel A reports the descriptive statistics for Harmful RPT, Other Receivables, and Executive Compensation separately for periods of high- and low-EPU based on the time-series median. Student's t-test and the Wilcoxon-Mann-Whitney Utest are used to examine the significance of the differences in the means and medians of these indicators between the two groups defined by EPU. *, **, and *** indicate significance at the 0.1, 0.05, and 0.01 levels, respectively. All the variables are winsorized at the 5 % and 95 % levels. Panel B shows the impact of corporate governance on the nexus between EPU and ERE. Column (1) reports the interaction between EPU and *dual*, a dummy that equals 1 if the general manager is also a chairperson, and equals 0 otherwise. Column (2) reports the interaction between EPU and *instown*, which indicates the proportion of institutional investors' shareholding. Column (3) reports the interaction between EPU and *analyst*, which indicates the number of analyst teams following the firm in the current year, with missing values replaced by 0.

Our results show that the averages of harmful RPTs, other accounts receivables and executive compensations are 0.310, 0.031, and 0.235, respectively, in low-EPU periods, and 0.257, 0.030, and 0.226, respectively, in high-EPU periods. The last two columns of Panel A reveal that the differences between low- and high-EPU periods are

statistically significant at the 1 % confidence level. Hence, our findings are consistent with the hypothesis that insiders engage more in rent-seeking during high-EPU periods.

If rent-seeking is an important channel through which policy uncertainty affects exchange rate exposure, this effect will be moderated by better corporate governance. As well-governed firms largely mitigate insiders' rent-seeking (He & Rui, 2016; Shleifer & Vishny, 1997), the relationship should be significant weaker (less positive) for such firms. To test this prediction, we include the following corporate governance proxies and their interactions with EPU (one-by-one) into our benchmark regressions: CEO serving as the board chairman (dual), the percentage of institutional investors' shareholding (instown), and the number of analysts following the firm (analyst). The first indictor is proxy for corporate internal governance. Dual are positively related with insiders' entrenchment and allow them to seek extra private benefits of controls (Claessens, Djankov, Fan, & Lang, 2002; He, Cheng, & Wen, 2019). We expect that its interaction with EPU is positive, as the positive effect of EPU is more pronounced in poorly-governed firms. The remaining two indicators represent the strength of external governance. If the external governance mechanism works well—e.g., transparency mit- igates information asymmetry, institutional investors play an active role on corporate monitoring—insiders' rent-seeking activities are presumably constrained.24 Thus, their impact on EPU should be negative, as improved external governance reduces the link through rent-seeking.

Column (1) of Panel B reports that the coefficient of EPU×dual is significantly positive, thus confirming that EPU has a stronger impact on exposure for firms with poor internal governance. The last two columns of Panel B show that the interactions between our two external governance proxies and EPU are all negative and statistically significant at the conventional confidence level. These findings suggest that the relationship between policy uncertainty and exchange rate exposure is meaningfully related to firms' external governance. Overall, our results show that insiders' rent-seeking is a channel through which EPU impacts firms' exchange rate exposure.

6.3. Risk management

Table 4 shows that firms' hedging activities—particularly operational hedging—can mitigate adverse currency movements' impact on firm value. Note that proactive hedging can significantly mitigate EPU's impact. If firms hedge heavily because of an increased EPU, we should observe their cash flows are less sensitive to currency movements. However, we find a significant positive relationship between EPU and exchange rate exposure. It may suggest that Chinese firms are unlikely to adopt preemptively hedging strategies to cope with the increased exposure arising from EPU. 25 Nevertheless, we take a further step to examine firm's hedging strategy during high-EPU periods.

If policy uncertainty prompts Chinese firms to engage in exchange rate risk management, we expect high-EPU periods will be associated with a more intensive use of hedging tools. To test this prediction, we conduct a multivariate analysis to examine whether EPU increases the likelihood of financial and operational hedging. Specifically, in line with Nguyen et al. (2018), we use the following logit model specification:

$$Hedge_{it} = \beta_0 + \beta_1 EPU\_Y_{t-1} + \beta_2 controls_{i,t-1} + \pi_i + \epsilon_{i,t}\# \quad (6)$$

where Hedgeit refers to drvtvit or brdthit.drvtvit is a dummy variable that equals 1 ifa firm report the usage of currency derivatives in year t, and 0 otherwise. brdthit is a dummy variable that equals 1 if the number of continents where a firm has subsidiaries is >3 at year t, and 0 otherwise. EPU Yt— 1 is the average of EPU in year t-1. We control for the firm-specific variables used in the benchmark spec- ification. Additionally, we include crslist, PERGDP, and VIX. Their detailed descriptions are reported in appendix. πi captures the in- dustry fixed-effect.

Columns (1)–(3) in Table 9 shows the results of financial hedging. The estimated coefficients of EPU Yt—1 are positive and sta- tistically significant at the 1 % confidence level. Specifically, one standard deviation increase in EPU is associated with a 62.870 % (0.758 × (e0.604 — 1)) increase in the likelihood of using financial derivatives, indicating that listed companies in China are more likely to purchase foreign exchange derivatives in response to high EPU. This result is consistent with Azad, Fang, and Hung (2012), Bartram, Brown, and Fehle (2009), Kim, Mathur, and Nam (2006), and Nguyen et al. (2018). Considering the vital role of stable and predictable cash flows in alleviating underinvestment problems and reducing the possibility of financial distress, as well as the accumulation of payment to corporate tax (Nance et al., 1993; Smith & Stulz, 1985), the incentives for smoothing the volatile cash

flows caused by high- EPU shocks are increased, despite of the fact that only a minority of firms can engage in financial hedging activities due to the un- derdeveloped foreign exchange derivatives market in China.

Interestingly, unlike financial hedging, operational hedging has the opposite results. Columns (4)–(6) show that the EPU has a negative and statistically significant effect on operational hedging. Specifically, one standard deviation increase in EPU is associated with an 8.308 % (0.758 × (e0.104 — 1)) decrease in the likelihood of adopting operational hedging. Operational hedging involves risk sharing and the transfer of international operations across regions. Our restuls suggest that heightened economic policy uncertainty prompts firms to adopt a more conservative strategy, focusing on some important markets. Consistent with previous findings, operational hedging is a long-term project and difficult to initiate due to short-term influencing factors such as EPU (Aretz & Bartram, 2010; Hoberg & Katie Moon, 2017; Kim et al., 2006). In comparison, financial hedging is more simple, flexible, and suitable for hedging short-term exposure (Chowdhry & Howe, 1999). Beber, Brandt, and Kavajecz (2009) observe that firms manage to increase the derivatives trading volume in time to cope with high uncertainty and unwind these derivatives positions shortly after. Furthermore, with revenue expectations being disrupted by EPU, corporate overseas investments are deferred and even depressed temporarily during high-EPU periods, thus minimizing the moderating effect of operational hedging.

Table 9
Risk Management.

Panel A: The impact of EPU on hedging						
Dependent Variable:	Financial Hedging			Operational Hedging		
	(1)	(2)	(3)	(4)	(5)	(6)
EPU_Y	0.785***	0.715***	0.604***	−0.323***	−0.337***	−0.104**
	(5.91)	(5.04)	(3.08)	(−7.70)	(−7.85)	(−2.24)
size		0.221**	0.224**		0.111*	0.117*
		(2.52)	(2.55)		(1.83)	(1.90)
leverage		0.161	0.141		1.125***	0.880***
		(0.18)	(0.16)		(3.69)	(2.77)
quick		−0.073	−0.073		0.106***	0.093***
		(−1.25)	(−1.25)		(7.05)	(5.96)
BM		−0.203*	−0.206*		−0.031	0.018
		(−1.72)	(−1.73)		(−0.51)	(0.30)
floan		0.553	0.553		1.509***	1.702***
		(0.96)	(0.96)		(6.43)	(7.13)
overseas		2.645***	2.646***		0.875***	0.854***
		(8.45)	(8.47)		(4.33)	(4.15)
crslist		0.295	0.291		−0.039	−0.099
		(0.64)	(0.62)		(−0.18)	(−0.44)
PERGDP			−1.478			8.966***
			(−0.46)			(13.15)
VIX			0.007			0.052***
			(0.41)			(13.37)
Industry FE	No	Yes	Yes	Yes	Yes	Yes
No. firms	3502	3075	3075	3500	3430	3430
Observations	25,917	21,894	21,894	25,900	25,395	25,395
Pseudo R^2	0.023	0.100	0.100	0.012	0.039	0.059

Panel B: Reserve Causality Tests for Financing Hedging				
Dependent Variable: $Exposure_t$				
	(1)	(2)	(3)	(4)
EPU_{t-1}	0.013***	0.011***	0.013***	0.011***
	(4.42)	(2.72)	(4.41)	(2.71)
$EPU_{t-1} \times H_tH_{t+1}$	−0.003	−0.005		
	(−1.07)	(−1.62)		
$EPU_{t-1} \times H_tN_{t+1}$	−0.001	−0.001		
	(−0.20)	(−0.18)		
$EPU_{t-1} \times N_tH_{t+1}$	0.004	0.002		
	(1.41)	(0.73)		
H_tH_{t+1}			−0.014	−0.024
			(−0.77)	(−1.30)
H_tN_{t+1}			−0.003	−0.003
			(−0.21)	(−0.17)
N_tH_{t+1}			0.023	0.011
			(1.43)	(0.67)
Firm Control	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Macro Control	No	Yes	No	Yes
No. firms	3147	3147	3147	3147
Observations	22,876	22,876	22,876	22,876
Adj-R^2	0.105	0.137	0.105	0.137
Wald test (p-value)				
H1:$EPU_{t-1} \times H_tH_{t+1}$=0	0.283	0.105		
H2:$EPU_{t-1} \times N_tH_{t+1}$=0	0.157	0.466		
H3:$EPU_{t-1} \times H_tN_{t+1}$=$EPU_{t-1} \times H_tH_{t+1}$	0.408	0.180		
H1: H_tH_{t+1}=0			0.440	0.194
H2: N_tH_{t+1}=0			0.154	0.504
H3: H_tN_{t+1}=H_tH_{t+1}			0.559	0.257
H2 and H3 Jointly	0.274	0.325	0.316	0.437

Note: Panel A reports EPU's impact on derivatives usage and operational hedging. Columns (1)–(3) represent the results of the logit model where the dependent variable is drvtv. Columns (4)–(6) represent the results of the logit model where the dependent variable is brdth. In order to make the data frequency uniform, EPU is adjusted as annual average. To maintain consistency with the frequency of hedging data, Panel B presents the tests for potential reverse causality in financial hedging decisions using annual data. Both the dependent Exposuret and independent variables EPUt − 1 are constructed as annual averages of their quarterly counterparts. HtHt+1 denotes the category of hedging firms, those that engage in hedging activity both in the current period (t) and the subsequent period (t + 1). HtNt+1 denotes the category of hedge quitters, those that hedge in the current period but discontinue hedging in the next period. NtHt+1 denotes the category of hedge starters—those that do not hedge in the current period but initiate

hedging in the next period. Wald tests are employed to formally test the hypotheses concerning the causal relationship between EPU, exposure, and hedging transitions, with the P-values reported.

One might be concerned that EPU not only directly affects firms' exchange rate exposure, but also indirectly influences their financial hedging decisions through its impact on such exposure. This suggests a potential reverse causality issue: elevated EPU in- creases exchange rate exposure, which in turn leads firms to intensify financial hedging as a reactive measure to mitigate these effects, rather than employing it proactively as part of a strategic risk management approach. The insignificant coefficients of the interaction term, EPU × drvtv, in Table 4 could arise as financial hedging acts as an endogenous response to increased exposure.

To test the for the possibility of reverse causality, we implement methodology of Allayannis and Weston (2001), and classify firms each year into one of four mutually exclusive categories based on their hedging behavior:

1. Non-hedgers: Firms that do not hedge in either the current or the next period (NtNt+1).
2. Hedge quitters: Firms that hedge in the current period but discontinue hedging in the next period (HtNt+1).
3. Hedge starters: Firms that do not hedge in the current period but initiate hedging in the next period (NtHt+1).
4. Persistent hedgers: Firms that hedge in both the current and the next period (HtHt+1).

Dummy variables representing these four hedging transition categories are constructed. Specifically, to avoid multicollinearity, we generate interaction terms between the last three category dummy and EPUt − 1 , which are thereafter incorporated into our regression of Exposuret. Specifically, we estimate the following cross-sectional regression:

$$Exposure_t = \psi_0 + \psi_1 EPU_{t-1} + \psi_2 EPU_{t-1} \times H_t H_{t+1} + \psi_3 EPU_{t-1} \times H_t N_{t+1} + \psi_4 EPU_{t-1} \times N_t H_{t+1} + \psi_5 controls_{i,t-1} + \theta_i + \epsilon_{i,t} \quad (7)$$

Our empirical strategy is predicated on specific testable implications derived from the hypothesized reverse causality. If firms' exchange rate exposure is significantly amplified by EPU, then firms initiating hedging in the subsequent period (NtHt+1) should exhibit a stronger impact of EPU on their exposure in current period compared to firms remaining unhedged (NtNt+1). We expect the coefficient of the interaction term EPUt − 1 × NtHt+1, denoted Ψ4 , to be positive.

Conversely, if firms choose to forgo hedging because their exposure is less susceptible to EPU fluctuations, then firms discontinuing hedging in the next period (HtNt+1) should exhibit a weaker impact of EPU in current period relative to firms maintaining their hedge (HtHt+1). Formally, this implies the coefficient of EPUt − 1 × HtNt+1 , denoted Ψ3 , should be smaller than that of EPUt − 1 × HtHt+1, denoted Ψ2. We also control for the same set of control variables as in the previous specifications, denoted as controlsi,t − 1 , as well as firm fixed effects θi.

Based on the foregoing analysis, we implement Wald tests to evaluate the following three hypotheses:

H1: The coefficient of EPUt − 1 × HtHt+1, denoted Ψ2, equals 0, indicating that hedging does not significantly mitigate the amplifying effect of EPU on exposure.

H2: The coefficient of EPUt − 1 × NtHt+1, denoted Ψ4 , equals 0, indicating that the decision to initiate hedging is unaffected by the impact of EPU on exposure.

H3: The coefficient of EPUt − 1 × HtNt+1, denoted Ψ3 , equals the coefficient of EPUt − 1 × HtHt+1 , denoted Ψ2 , indicating that the decision to discontinue hedging is unaffected by the impact of EPU on exposure.

Panel B of Table 9 presents the results of our fixed-effects regression analyses and the corresponding Wald test p-values for each hypothesis. Column (1) includes firm-level control variables, while Column (2) incorporates both firm-level and macroeconomic controls. Consistent with our prior findings, the results indicate that financial hedging fails to significantly mitigate the amplifying effect of EPU on firms' exchange rate exposure. Consequently, we cannot reject Hypothesis 1 (p-values = 0.283 and 0.105).

Furthermore, Wald tests reject the linear restrictions under H2 and H3: we reject H2 (that the decision to initiate hedging is un- affected by the impact of EPU on current exposure.) at the 1 % level (p = 0.157 and 0.466), and also reject H3 (that the decision to discontinue hedging is unaffected by the impact of EPU on current exposure) at the 1 % level (p = 0.408 and 0.180). Jointly, we cannot reject the null hypothesis of no reverse causality (p = 0.274 and

0.325) at the 1 % level. The results reveal that hedge quitters do not show significantly weaker sensitivity than persistent hedgers and hedge starters do not exhibit significantly greater sensitivity than persistent non-hedgers, suggesting that the decision to initiate or cease hedging is not likely driven by opportunistic timing based on exposure levels. Robustness checks regressing Exposuret on hedging dummies (Columns (3) and (4)) confirm these patterns. Collec- tively, our analysis demonstrates that financial hedging fails to mitigate EPU-driven exposure amplification among Chinese firms, consistent with our findings in Section 4.2.

Taken together, the hedging strategies currently employed by Chinese firms remain relatively underdeveloped. Specifically, as arelatively flexible hedging instrument, financial hedging has gained recognition vis-a-vis EPU shocks but it has limited impact on the nexus between EPU and exposure; thus, financial hedging is inadequate in the Chinese context. Although the moderating effect of operational hedging on the nexus between policy uncertainty and exchange rate exposure is statistically significant, as a long-term project, operational hedging is depressed by EPU in the short term, which could minimize its moderating function.

7. Further evidence

7.1. Heterogeneity tests

The relationship between EPU and exchange rate exposure may exhibit sectoral differences. For example, exporters benefit from RMB depreciation, while importers face cost pressures. Compared with private firms, state-owned enterprises (SOEs) may benefit from implicit government support and are therefore less likely to be influenced by EPU. We thus conduct additional heterogeneity tests to examine whether the EPU-exposure relationship varies across industry, firm size and ownership. Column (1) and (2) of Table 10 reveal that exchange rate exposure in manufacturing firms is more significantly impacted by EPU compared to service firms. Column (3) and (4) shows that large firms are more sensitive to EPU than smaller firms. This is consistent with the notion that manufacturing and large- size firms, involved in more international trade and directly exposed to currency conversion risks, are more responsive to exchange rate fluctuations and a wider range of economic policy uncertainties. Whereas, service firms and small-size firms, primarily dealing in non-tradable goods or business conducted in a single currency, exhibit lower sensitivity. Column (5) and (6) reveal that the coefficients for state-owned and private firms show little variation, indicating minimal differences in their exposure to EPU.

The exchange rate of the RMB against the US dollar has traditionally been a critical concern for Chinese firms. For a long period in the past, the RMB was effectively pegged or crawling to the US dollar. However, with the multiple market-oriented reforms ofthe RMB, the currency has gained more independence (Ilzetzki, Reinhart, & Rogoff, 2019). Given the majority of international trade is invoiced in dollars, we also delve deeper into the impact of EPU on the exchange rate exposure to USD and other currencies. Specifically, we focus on USD, and our currency index excluding USD—against the RMB. We re-estimate the respective exchange rate exposures using Eq.(1) and employ these new exposure measures as the dependent variables in the regression analysis outlined in Eq.(3). Columns (7) and (8) present the effects of EPU on the exposure to exchange rate fluctuations against USD and other currencies. It shows that Chinese firms' exposure to USD exchange rate fluctuations is more sensitive to EPU than their exposure to other currencies.

7.2. Sample period extension: 2010–2023

We begin our analysis using data from the period from 2010 to 2020. We focus on this period as we wish to avoid any potential effects of the COVID-19 pandemic crisis of 2020–2023. In this section, we expand the temporal scope to include the entire 2010–2023 period for a more comprehensive analysis, with particular emphasis on the impact of the COVID-19 pandemic. The robustness check presented in Table 11 reveals persistent statistical significance of EPU in amplifying exchange rate exposure. To further explore the impact of the COVID-19 pandemic, this paper constructs the variable CovidCase to measure the fluctuating severity of the current epidemic situation. CovidCase is defined as the daily new confirmed cases of COVID-19 in China (including Hong Kong, Macao, and Taiwan), measured in thousands. The results from column (4) to column (6) show that the interaction terms between CovidCase and EPU are positive and significant, indicating that during the pandemic, the sensitivity of corporate exchange rate exposure to EPU is greater. This finding underscores that economic policy uncertainty during the pandemic has a more significant impact on enterprises.

Table 10
Heterogeneity Analysis.

Dependent Variable: Exposure	Sector		Size		Ownership		Currency	
	Manufacturing Industry	Service Industry	Large-size Firms	Small-size Firms	State-owned Firms	Private Firms	Exposure to USD	Exposure to Other Currencies
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPU	0.026***	0.019***	0.026***	0.017***	0.028***	0.026***	0.042***	0.028***
	(8.28)	(3.15)	(5.91)	(5.38)	(7.99)	(7.33)	(13.91)	(11.32)
Firm Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macro Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. firms	2221	383	1964	2411	1003	2428	3431	3431
Observations	58,902	9251	49,676	44,823	35,684	58,823	94,507	94,507
Adj-R^2	0.092	0.120	0.083	0.142	0.067	0.089	0.144	0.091
Coefficient	0.007*		0.009**		0.002			
Difference Test	(0.080)		(0.020)		(0.340)			
(*P* value)								

Note: Table 10 presents heterogeneity tests based on sector, size, ownership and currency. Columns (1) and (2) present regressions grouped by whether the sample firms are in the manufacturing or services sector. Columns (3) and (4) group the regressions based on firm size, using asset size as the criterion. Columns (5) and (6) group the regressions by ownership type, distinguishing between state-owned and private enterprises. Columns (7) and (8) reflect the impact of EPU on exchange rate exposure to USD and other currencies. The last row displays the results of the coefficient difference tests, with the corresponding P - values in parentheses.

Table 11
Sample Period Extension and the Effect of Confirmed COVID-19 Cases.

Dependent Variable: Exposure								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EPU	0.009***	0.020***	0.034***	0.023***	0.029***	0.036***	0.034***	0.035***
	(7.26)	(12.83)	(20.13)	(16.78)	(18.46)	(20.61)	(20.13)	(20.14)
EPU × CovidCase				0.013***	0.009***	0.015***		
				(19.38)	(19.97)	(25.28)		
CovidCase				−0.088***	−0.065***	−0.100***		
				(−20.11)	(−20.76)	(−25.61)		
EPU × drvtv							−0.002	
							(−0.22)	
drvtv							0.003	
							(0.04)	
EPU × brdth								−0.014*
								(−1.81)
brdth								0.084*
								(1.74)
size		−0.018***	−0.004*		−0.013***	−0.005**	−0.004*	−0.004*
		(−8.90)	(−1.94)		(−6.65)	(−2.30)	(−1.89)	(−1.89)
leverage		0.026***	0.028***		0.035***	0.033***	0.028***	0.028***
		(2.66)	(2.93)		(3.65)	(3.54)	(2.93)	(2.93)
quick		−0.002***	−0.003***		−0.002***	−0.003***	−0.003***	−0.003***
		(−3.64)	(−4.91)		(−3.13)	(−4.19)	(−4.91)	(−4.89)
BM		0.085***	0.040***		0.063***	0.032***	0.040***	0.040***
		(14.20)	(6.69)		(10.63)	(5.36)	(6.69)	(6.71)
floan		0.012	0.006		0.008	0.006	0.006	0.006
		(1.10)	(0.57)		(0.77)	(0.54)	(0.60)	(0.60)
overseas		0.015	0.022**		0.014	0.019*	0.022**	0.023**
		(1.32)	(1.96)		(1.24)	(1.73)	(2.00)	(2.07)
Macro Controls	No	No	Yes	No	No	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. firms	5320	5054	5054	5320	5054	5054	5054	5054
Observations	171,304	160,229	160,229	171,304	160,229	160,229	160,229	160,229
Adj-R^2	0.064	0.076	0.098	0.077	0.091	0.105	0.098	0.098

Note: Table 11 extends the temporal scope to encompass the 2010–2023 period for comprehensive analysis. To further investigate the impact of the COVID-19 pandemic, Panel A of Table 11 introduces the variable *CovidCase* to measure the severity of the epidemic. In Columns (4) to (6), *CovidCase* is defined as the daily number of new confirmed COVID-19 cases in China, measured in thousands. Panel B reports the regression results of the hedging effects under two scenarios: across the entire period and during the peak of the pandemic. Columns (7)–(8) report the regression results across the entire period. Columns (9)–(11) report the regression results for the COVID-19 pandemic peak period, specifically from 2019Q4 to 2022Q3. More specifically, Column (9) reports the benchmark regression results. To test the role of hedging, Column (10) reports the interaction between EPU and *drvtv*. Column (11) reports the interaction between EPU and *brdth*.

Columns (7) and (8) present the hedging effects based on updated data. The results show that operational hedging significantly mitigates the impact of EPU on exchange rate exposure, whereas financial hedging does not exhibit such a significant effect, which is consistent with the results in Table 4.

7.3. Alternative explanation

One may concern that EPU may increase investor risk aversion, for instance heightened discount rates for foreign cash flows, and hence lead to higher discount rate for firms with foreign operations. As a result, the positive relationship between EPU and exchange rate exposure be driven by investors risk aversion. There is no theoretical basis for valuing firms with foreign cash flows at a discount relative to those without. The choice of asset pricing model in the context of foreign cash flows has not yet been formulated (Cravino & Levchenko, 2017; Jia & Li, 2020). To examine whether EPU is associated with higher discount rate for firms with foreign operations, we thus take a firm characteristic-based method relating firms' stock returns to EPU and firm's foreign cash flows, along the lines of Daniel and Titman (1997) and Bolton and Kacperczyk (2023).26 Specifically, we estimate the following model:

$$Ret_{i,t+1} = \alpha_0 + \alpha_1 EPU_t + \alpha_2 EPU_t \times FrgnOpr_{i,t} + FrgnOpr_{i,t} + \alpha_3 Control_{i,t} + \theta_i + \epsilon_{i,t} \quad (8)$$

where the dependent variable Reti,t+1 is the return on stock i in quarter t + 1. To capture firms' foreign operations, we construct three proxy variables for FrgnOpri,t based on foreign sales, foreign debt, and foreign ownership. Overseasi,t measures firm's foreign sales ratio, Fcashit, a binary indicator equaling 1 if firm holds material foreign-currency revenues or debt obligations, and 0 otherwise. Noting that overseas investors may exhibit greater risk aversion in response to EPU, we introduce an additional variable, QFIIprci,t, to capture this effect. Specifically, QFIIprci,t represents the ownership stake of qualified foreign institutional investors, measured as the percentage of total outstanding shares. We employ an interaction-term approach to examine whether investors demand a higher risk premium for firms with foreign operations, specifically testing if EPU increases these firms' discount rates. If this hypothesis holds, we should observe a statistically significant and positive coefficient for $\alpha 2$.

Table 12
Alternative Explanation: Investor Risk Perceptions.

Dependent Variable: $Ret_{i,t+1}$						
	(1)	(2)	(3)	(4)	(5)	(6)
EPU	0.219***	0.160**	0.218***	0.159**	0.219***	0.160**
	(2.70)	(2.14)	(2.70)	(2.14)	(2.70)	(2.13)
EPU × Fcash	0.001	0.000				
	(1.15)	(0.77)				
EPU × overseas			0.013	0.009		
			(1.20)	(0.86)		
EPU × QFIIprc					0.310	0.291
					(1.68)	(1.52)
overseas	0.020***	0.022***	−0.049	−0.027		
	(2.70)	(2.93)	(−0.82)	(−0.45)		
floan	−0.002	−0.002	−0.002	−0.002		
	(−0.34)	(−0.36)	(−0.30)	(−0.32)		
QFIIprc					−1.517	−1.437
					(−1.42)	(−1.30)
size	−0.036***	−0.036***	−0.036***	−0.036***	−0.036***	−0.036***
	(−4.95)	(−5.02)	(−4.95)	(−5.03)	(−4.95)	(−5.03)
leverage	0.017	0.013	0.016	0.013	0.017	0.022
	(1.00)	(0.77)	(0.99)	(0.76)	(1.00)	(1.40)
B/M	0.025***	0.027***	0.026***	0.027***	0.026***	0.027***
	(2.99)	(3.11)	(3.01)	(3.12)	(3.00)	(3.08)
E/P	−0.010**	−0.011**	−0.010**	−0.011**	−0.010**	−0.011**
	(−2.07)	(−2.37)	(3.01)	(−2.35)	(−2.09)	(−2.40)
Beta	−0.071	−0.051*	−0.071	−0.051*	−0.071	−0.051*
	(−1.46)	(−1.70)	(−1.47)	(−1.71)	(−1.46)	(−1.70)
Mom	0.001	0.008	0.001	0.008	0.001	0.008
	(0.05)	(0.50)	(0.05)	(0.50)	(0.05)	(0.50)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Macro Control	No	Yes	No	Yes	No	Yes
No. firms	3242	3242	3242	3242	3242	3242
Observations	92,964	92,964	92,964	92,964	92,964	92,964
Adj-R^2	0.132	0.161	0.132	0.161	0.133	0.161

Note: Table 12 examines the competing channel of investor risk perceptions. $Overseas_{i,t}$ measures firm's foreign sales ratio. $Fcash_{it}$ is a binary indicator equaling 1 if firm holds material foreign-currency revenues or debt obligations, and 0 otherwise. $QFIIprc_{i,t}$ represents the ownership stake of qualified foreign institutional investors, measured as the percentage of total outstanding shares. The dependent variable $Ret_{i,t+1}$ is the return on stock i in quarter t + 1. $size_{i,t}$ is the logarithm of the firm's total assets in the end of previous year; $leverage_{i,t}$ is the debt-to-asset ratio in the end of previous year; $BM_{i,t}$ is ratio of total value of assets to market value; $E/P_{i,t}$ is the ratio of net earnings per share in the end of previous year; $Beta_{i,t}$ is the estimated coefficient derived from the CAPM using daily data from the preceding year; $Mom_{i,t}$ is the cumulative return over the 6 quarters from t-6 to t-1. Macro Controls are captured to control the general economic conditions, consistent with our previous regression model. The t-statistics in parentheses are reported using standard errors adjusted for within firm and time clustering.

Following the literature, firm-level controls Controli,t include sizei,t, leveragei,t, BMi,t, E/Pi,t, Betai,t, Momi,t (Brogaard & Detzel, 2015; Carhart, 1997; Fama & French, 1992; Fang & Peress, 2009). sizei,t is the logarithm of the firm's total assets in the end of previous year; leveragei,t is the debt-to-asset ratio in the end of previous year; BMi,t is ratio of total value of assets to market value; E/Pi,t is the ratio of net earnings per share in the end of previous year; Betai,t is the estimated coefficient derived from the CAPM using daily data from the preceding year; Momi,t is the cumulative return over the 6 quarters from t-6 to t-1. Macro Controls are captured to control the general economic conditions, consistent with our previous regression model. We also control for both firm and time fixed effects.

Throughout all specifications, we find a positive and statistically significant effects of EPU on individual stock returns, consistentwith the existing literature (Belo, Gala, & Li, 2013; P´astor & Veronesi, 2013) that investors require higher return premium for elevatedEPU. Notably, regardless of whether Overseasi,t, Fcashit, or QFIIprci,t is used to proxy for firms' foreign operations, the coefficients of interaction term between these measures and EPU (α 2) are statitically insignificant. There is no significant premium associated with level of foreign operations during high EPU periods. Our results suggests that EPU doesn't increase investor risk aversion toward firms with foreign cash flows.

8. Conclusion

We propose a novel and significant influence factor, economic policy uncertainty, affecting firms' exposure to exchange rate fluctuations. By focusing on China, a typical emerging-market country, we find an economically positive and highly statistically significant relationship between EPU and exchange rate exposure. Moreover, this positive relationship is more pronounced in heightened exchange rate volatility periods. Operational hedging manages to mitigate EPU's impact on firms' exchange rate exposure, whereas financial hedging has a negligible impact, probably due to the high hedging cost and underdeveloped foreign exchange derivatives market in China.

Our main results remain robust after integrating alternative measures and different specifications, while addressing possible endogeneity concerns. We examine three potential channels of EPU's impact on exposure: international operations, rent-seeking, and risk management. Our results show that EPU has a more pronounced impact on the exposure of firms heavily reliant on foreign revenue or international borrowing. This suggests that higher EPU increases risks for firms' international operations, which translates into higher exposure.

We also find that EPU increases insiders' rent-seeking activities. Better governance can constrain insider's self-serving transactions, thereby moderating EPU's positive impact on exchange rate exposure. Lastly, we also find that Chinese listed firms tend to engage in financial hedging more intensively in response to high EPU, whereas operational hedging declines. Given the inadequate role of financial hedging in emerging markets, operational hedging is particularly important to mitigate EPU's impact on exchange rate exposure.

Our study highlights important insights for emerging market economies, which often rely on export-driven growth and are in the midst of economic changes. These markets tend to experience high and unpredictable corporate exposure to exchange rate fluctua- tions, a point emphasized by Chue and Cook (2008). They are also particularly sensitive to shocks from economic policy uncertainty. To address these challenges, strong corporate governance and advanced hedging techniques are essential for reducing exchange rate risks and handling policy uncertainty shocks.

Declaration of competing interest

This manuscript has not been published or presented elsewhere in part or in entirety and is not under consideration by another journal. We have read and understood your journal's policies, and we believe that neither the manuscript nor the study violates any of these. There are no conflicts of interest to declare.

Appendix A. Variable definition

Variable	Variable Description	Data Source
Economic Policy Uncertainty Index		
EPU	Logarithm of quarterly BBD index based on the South China Morning Post	BBD economic policy uncertainty index official website[a]
EPU_R	Residual EPU	
EPU_ML	Residual China mainland EPU index constructed by Davis et al. (2019), based on the Renmin Daily and the Guangming Daily	
ΔEPU	First-differencing EPU	
EPU_detrend	Residual series obtained from regressing EPU on the logarithmic transformation of quarterly trend variables and their polynomial terms	
EPU_H&L	Residual China EPU index constructed by Huang and Luk (2020), based on 10 Chinese mainland leading newspapers	Chinese economic policy uncertainty index official website[b]
EPU_fsc	Residual fiscal policy uncertainty index	
EPU_mn	Residual monetary policy uncertainty index	

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(*continued*)

Variable	Variable Description	Data Source
EPU_ec	Residual exchange rate and capital account policy uncertainty index	
EPU_trd	Residual trade policy uncertainty index	
Firms' Exposure to Exchange Rate Risk		
exposure	The sensitivity of a firms' stock return to the change of SDR currency exchange rate, controlling for market return estimated by Eq.(1)	Bloomberg database (exchange rate data); CSMAR and Wind database (stock data)
Firm Control Variables		
Firm Control Variables for Exposure		
size	Firm's size, measured by the logarithm of the firm's total assets (units: 100 million yuan) in the end of previous year	CSMAR database
leverage	Firm's leverage, measured by the debt-to-asset ratio in the end of previous year	CSMAR database
quick	Ratio of current assets minus inventory to current liabilities	CSMAR database
BM	Ratio of total value of assets to market value	Wind database
floan	Ratio of foreign currency loans to total loans	Wind database
oversea	Ratio of overseas revenue over operating income	Wind database
E/P	Ratio of net earnings per share	CSMAR database
Beta	Estimated coefficient derived from the CAPM using daily data from the preceding year	CSMAR database
Mom	Cumulative return over the 6 quarters from t-6 to t-1	CSMAR database
Macro Control Variables		
CPI	Consumer Price Index quarterly average growth rate (%)	RESSET database
IntSpread	Interest spread between China and US measured by the difference between the yield to China Bond 5 Year CDB Bond and US Treasuries	Wind database
FGDP	The ratio of fixed asset investment to GDP	Wind database
Exloan	Foreign currency bank loan growth rate	Wind database
REER	Growth rate of RMB real effective exchange rate index	Wind database
Additional Macro Factors		
EPU_foreign	A principal component factor with the largest eigenvalue extracted from the logarithm of the seven EPU indices of the United States, United Kingdom, Japan, European Union, India, South Korea, and Russia	BBD economic policy uncertainty index official website[c]
GDP	GDP growth rate	
IndValue	Industrial added value growth rate	
Imprt	Import volume growth rate	
Exprt	Export volume growth rate	
FrgRsv	Logarithm of foreign exchange reserve	
FscRvn	Fiscal revenue growth rate	
FscExp	Fiscal expenditure growth rate	CSMAR and Wind database
M2	M2 growth rate	
RetSale	Total retail sales of social consumer goods growth rate	
FixInv	Fixed assets investment growth rate	
Intrst	One-year deposit interest rate	
PPI	Producer price index growth rate	
USDCNY	Exchange rate of USD to CNY	
Instrumental Variables		
Disaster	The number of geological disasters (unit: 10,000)	China Statistical Yearbook
Other Variables		
drvtv	Dummy variable; equals 1 if a firm reports the usage of currency derivatives, and 0 otherwise.	CSMAR database
brdth	Dummy variable; equals 1 if the number of continents where a firm has subsidiaries is >3, and 0 otherwise.	Wind database
cmpt	Dummy variable; equals 1 if foreign industry return has a significant (at the 10 % level) negative effect on China's industry return in the same industry, and otherwise 0.	CSMAR database
Harmful RPT	Ratio of the aggregate amounts of related-party transactions within the current year, which is harmful to the total sales in the previous year.	Wind database
Other Receivables	Net amounts of other receivables in the current year scaled by the total sales in the previous year.	Wind database
Executive Compensation	Percentage of total executive compensation to the total sales.	Wind database
dual	Dummy variable; equals 1 if the general manager is also a chairperson, and equals 0 otherwise.	CSMAR database
instown	The dummy variable instown is the proportion of institutional investors shareholding.	Wind database
analyst	Dummy variable; the number of analyst teams following the firm within the current year, with the missing value replaced by 0.	CSMAR database
crslist	Dummy variable; equals 1 if ABH share cross-listed code is not null, and equals 0 otherwise.	CSMAR database
PERGDP	Annual growth rate of per capita GDP	CSMAR database
VIX	Annual S&P 500 Volatility Index (the Fear Index).	CSMAR database
CovidCase	Severity of the epidemic; daily number of new confirmed COVID-19 cases in China, measured in thousands	Wind database
Fcash	Dummy variable; equals 1 if firm holds material foreign-currency revenues or debt obligations, and equals 0 otherwise.	CSMAR database

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(*continued*)

Variable	Variable Description	Data Source
QFIIprc	Ownership stake of qualified foreign institutional investors, measured as the percentage of total outstanding shares	CSMAR database
NN	Dummy variable; equals 1 if firms that do not hedge in either the current or the next period, and equals 0 otherwise.	CSMAR database
HN	Dummy variable; equals 1 if firms that hedge in the current period but discontinue hedging in the next period, and equals 0 otherwise.	CSMAR database
NH	Dummy variable; equals 1 if firms that do not hedge in the current period but initiate hedging in the next period, and equals 0 otherwise.	CSMAR database
HH	Dummy variable; equals 1 if firms that hedge in both the current and the next period, and equals 0 otherwise.	CSMAR database

[a] http://www.policyuncertainty.com/china_epu.html
[b] https://economicpolicyuncertaintyinchina.weebly.com
[c] http://www.policyuncertainty.com/china_epu.html

Appendix B. Frequency on firms reporting the impact of exchange rate movements on cash flow

Year	No. of Listed Firms	No. of Reporting Firms	% of Reporting Firms
2010	1911	1152	60.28 %
2011	2182	1397	64.02 %
2012	2328	1549	66.54 %
2013	2330	1600	68.67 %
2014	2450	1731	70.65 %
2015	2668	1940	72.71 %
2016	2894	2190	75.67 %
2017	3331	2572	77.21 %
2018	3436	2720	79.16 %
2019	3639	2895	79.55 %
2020	4071	3283	80.64 %

Data availability

Data will be made available on request.

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