By Giancarlo Corsetti, Barry Eichengreen, Xavier Vives and Jeromin Zettelmeyer

The International Economic and Financial Order After the Pandemic and War

CEPR

IESE Business School University of Navarra Banking Initiative

THE INTERNATIONAL ECONOMIC AND FINANCIAL ORDER AFTER THE PANDEMIC AND WAR

The Future of Banking 5

CEPR PRESS

Centre for Economic Policy Research
33 Great Sutton Street
London EC1V 0DX, UK

187 boulevard Saint-Germain
75007 Paris, France

Tel: +44 (20) 7183 8801
Fax: +44 (20) 7183 8820
Email: cepr@cepr.org
Web: www.cepr.org

ISBN: 978-1-912179-73-2

THE INTERNATIONAL ECONOMIC AND FINANCIAL ORDER AFTER THE PANDEMIC AND WAR

The Future of Banking 5

Giancarlo Corsetti
European University Institute and CEPR

Barry Eichengreen
University of California, Berkeley and CEPR

Xavier Vives
IESE Business School and CEPR

Jeromin Zettelmeyer
Bruegel and CEPR

IESE Business School University of Navarra Banking Initiative

With the support of Citi

CENTRE FOR ECONOMIC POLICY RESEARCH

CENTRE FOR ECONOMIC POLICY RESEARCH (CEPR)

The Centre for Economic Policy Research (CEPR) is a network of over 1,500 research economists based mostly in European universities. The Centre's goal is twofold: to promote world-class research, and to get the policy-relevant results into the hands of key decision-makers.

CEPR's guiding principle is 'Research excellence with policy relevance'.

A registered charity since it was founded in 1983, CEPR is independent of all public and private interest groups. It takes no institutional stand on economic policy matters and its core funding comes from its Institutional Members and sales of publications. Because it draws on such a large network of researchers, its output reflects a broad spectrum of individual viewpoints as well as perspectives drawn from civil society.

CEPR research may include views on policy, but the Trustees of the Centre do not give prior review to its publications. The opinions expressed in this report are those of the authors and not those of CEPR.

IESE BUSINESS SCHOOL

IESE is the graduate business school of the University of Navarra. Founded in 1958, the school is one of the world´s most international business schools, with campuses in Barcelona, Madrid, Munich, New York and São Paulo. Consistently ranked within the top ten worldwide, IESE Business School has pioneered business education in Europe since its founding.

For more than sixty years, IESE has sought to develop business leaders with solid business skills, a global mind-set and a desire to make a positive impact on people and society. The school distinguishes itself in its general-management approach, extensive use of the case method, international outreach, and emphasis on placing people at the heart of managerial decision-making.

About the authors

Giancarlo Corsetti is the Pierre Werner Chair and Professor of Economics at the European University Institute and a CEPR Research Fellow. He previously taught at Cambridge University, where he was director of the Cambridge-INET Institute. Before this, he taught at the Universities of Rome III, Yale, and Bologna. He is a leading scholar in international economics and open-economy macroeconomics with contributions on currency values, financial and sovereign crises, and monetary and fiscal policy. He has been a long-serving consultant at the European Central Bank, the Bank of England, and the Banca d'Italia, and a regular visiting professor in central banks and international institutions. He is a fellow of the British Academy.

Barry Eichengreen is George C. Pardee and Helen N. Pardee Chair and Distinguished Professor of Economics and Professor of Political Science at the University of California, Berkeley. He is a Research Associate of the NBER, Research Fellow of the CEPR and a fellow of the American Academy of Arts and Sciences. He is a distinguished fellow of the American Economic Association, a corresponding fellow of the British Academy, and a Life Fellow of the Cliometric Society. He is a past president of the Economic History Association (2010-11). His most recent book is *In Defense of Public Debt* with Asmaa El-Ganainy, Rui Esteves and Kris Mitchener.

Xavier Vives is Chaired Professor of Economics and Finance at IESE Business School. He is a Fellow of the Econometric Society since 1992, the European Economic Association since 2004, and the Academia Europaea since 2012. He is also a Past President of EARIE and current President of the European Finance Association. He was Duisenberg Fellow of the European Central Bank in 2015. His most recent book is *Competition and Stability in Banking*. In 2011-2014 he was Special Advisor to the EU Commissioner for Competition, Mr Joaquin Almunia, and until May 2020 he was Lead Independent Director of CaixaBank.

Jeromin Zettelmeyer is Director of Bruegel since September 2022. Jeromin was previously a Deputy Director of the Strategy and Policy Review Department of the IMF, Senior Fellow at the Peterson Institute for International Economics, Director-General for Economic Policy at the German Federal Ministry for Economic Affairs and Energy; and Director of Research and Deputy Chief Economist at the European Bank for Reconstruction and Development. He is a Research Fellow in the International Macroeconomics Programme of the CEPR and of CESIfo. He has published widely on topics including financial crises, sovereign debt, economic growth, transition to market, and Europe's monetary union.

Acknowledgements

The authors have benefited from the comments of the discussants of the report at the online conference on 30 March 2023, Linda Goldberg, Pierre-Olivier Gourinchas, Robert McCauley, Francesca Monti, Adrian Peralta, Ricardo Reis, and Isabel Vansteenkiste, as well as the conference participants and the conference chairs, Veronica Guerrieri, Lucrezia Reichlin and Fernando Restoy. Particular recognition is due to Paco Ybarra, Hyun Song Shin and Harold James for their contributions. We thank also the commentator at our preparatory workshop on 23 November 2022, Carmen Matutes. Jeromin's contribution draws partially on joint unpublished work with Gon Huertas, Lennard Welslau and Stavros Zenios. We also wish to thank Herbert Barth, Olivier Blanchard, Guillaume Chabert, Grégory Claeys, Zsolt Darvas, Edmund Moshammer, Lucio Pench and Riccardo Trezzi for invaluable comments and suggestions. David Rivero provided useful input to the report, and Max Buchs, Carl-Wolfran Kurt Joachim Horn, Conor McCaffrey, Cecilia Trasi and Lennard Welslau for excellent research assistance. Carlota Monner delivered extremely efficient general support.

The views expressed in this report are those of the authors and should not be taken to represent any of the institutions with which they are or have been affiliated, or the individuals mentioned above.

Contents

About the authors *v*
Acknowledgements *vi*
Conference programme *viii*
List of conference participants *ix*
Foreword *xiii*

Executive summary **1**

1 Introduction **5**
1.1 Macroeconomic trends and stabilisation policies after pandemic and war 7
1.2 The international monetary landscape: Implications of the Russia-Ukraine war, the rise of China, and new digital technologies 10
1.3 The outlook for global banking 14
1.4 Sovereign debt after the pandemic and war 17

2 Macro times are a-changing: Stabilisation policies after Covid-19 and the war in Ukraine **23**
2.1 Introduction 23
2.2 The post-Covid-19 inflation crisis 26
2.3 Do we need a new economic policy model? 43
2.4 Conclusions 57

3 The international monetary landscape: Implications of the Russia-Ukraine War, the rise of China and new digital technologies **61**
3.1 Introduction 61
3.2 Weaponisation of the dollar 63
3.3 China, the renminbi and Sino-US tensions 71
3.4 Digital currencies 76
3.5 Conclusion 82

4 Sovereign debt after the pandemic and the war **83**
4.1 Debt sustainability after the pandemic and the war 84
4.2 EU fiscal rules after the pandemic and the war 99
4.3 Dealing with sovereign insolvency after the pandemic and the war 106
4.4 Conclusion 112

5 Discussions **115**

References *148*

Conference programme

Online conference
Thursday, 30 March 2023

14:00 **Welcome**
Jordi Canals, IESE
Xavier Vives, IESE
Opening speech "Global value chains under the shadow of Covid"
Hyun Song Shin, Bank for International Settlements

14:20 **Macroeconomic stability after the COVID-19 pandemic and the war in Ukraine**
Giancarlo Corsetti, European University Institute
Discussant 1: Ricardo Reis, London School of Economics
Discussant 2: Francesca Monti, UC Louvain
Chair: Veronica Guerrieri, University of Chicago

15:20 **The international monetary landscape: Implications of the Russia-Ukraine war, the rise of China and new digital technologies**
Barry Eichengreen, UC Berkeley
Discussant 1: Robert McCauley, Boston University & University of Oxford
Discussant 2: Linda Goldberg, Federal Reserve Bank of New York
Chair: Fernando Restoy, Bank for International Settlements

16:20 *Break*

16:30 **Sovereign debt after the pandemic and war**
Jeromin Zettelmeyer, Bruegel
Discussant 1: Adrian Peralta, International Monetary Fund
Discussant 2: Isabel Vansteenkiste, European Central Bank
Chair: Lucrezia Reichlin, London Business School

17:30 **Conclusion**
Harold James, Princeton University

17:50 **Closing**
Paco Ybarra, Citi

18:00 *Close of meeting*

List of conference participants

David Aliaga	Research Assistant, IESE, Spain
Steffen Andersen	Head of Research, Danmarks Nationalbank, Denmark
Ron Anderson	Emeritus Professor of Finance, London School of Economics, United Kingdom
Bo Becker	Head of the Department of Finance, Stockholm School of Economics, Sweden
Madalin Blidaru	PhD Student, Rumania
Matias Cabrera	Regulation Manager, BBVA, Spain
Jordi Canals	Professor of Strategic Management, IESE, Spain
Che Chen	PhD Student, IESE, Spain
Giancarlo Corsetti	Professor of Economics, European University Institute, Italy
José De Matos	Vice Governor, Banco de Portugal, Portugal
Barry Eichengreen	Professor of Economics and Political Science, University of California, Berkeley, United States
Alexander Farquhar	Student at the History Department, University of Oxford, United Kingdom
Christian Friedrich	Director of the Financial Studies Division, Financial Stability Department, Bank of Canada, Canada
Josep Gisbert	Assistant Professor, IE Business School and IE University, Spain
Linda Goldberg	Financial Research Advisor on Financial Intermediation Policy Research, Federal Reserve Bank of New York, United States
Veronica Guerrieri	Professor of Economics, University of Chicago, United States
Michael Haliassos	Professor and Chair of Macroeconomics and Finance, Goethe University Frankfurt, Germany
Lazlo Halpern	Professor Emeritus, Institute of Economics of the Centre for Economic and Regional Studies, Hungary
Thomas Harr	Assistant Governor, Head of Economics and Monetary Policy at Danmarks Nationalbank, Denmark
Brit Hecht	Head of EU Digital Public Affairs, BBVA, Spain
Harold James	Professor in European Studies, Princeton University, United States

Julia Kiraly	Professor of Finance and Monetary Policy, International Business School, Hungary
Maksym Komarov	Head of Strategic Analysis, National Bank of Ukraine, Ukraine
Pilar L'Hotellerie Fallois	Counsellor in Permanent Representation of Spain to the European Union, Banco de España, Belgium
Seung Hyun Maeng	PhD dtudent, University of Cambridge, United Kingdom
Carolina Manzano	Associate Professor, Universitat Rovira i Virgili, Spain
Jeremy Martin	Senior Advisor on international economics, finance, and climate, Bank of England, United Kingdom
Fernando Martinez	Case handler, Competition Economist, Spanish Competition Authority (CNMC), Spain
Carmen Matutes	Manager, Waveform Investments, Spain
Robert McCauley	Nonresident senior fellow, Global Development Policy Center, Boston University, United States, and Associate member, Faculty of History, University of Oxford, United Kingdom
Alex Michaelides	Professor of Finance, Imperial College Business School, United Kingdom
Francesca Monti	Professor of Economics, Université Catholique de Louvain, Belgium
Bogdan Munteanu	Regional Manager, Alpha Bank Romania, Romania
Priroska Nagi -Mohacsi	Visiting Professor in Practice at the Firoz Lalji Institute for Africa, London School of Economics, United Kingdom
Yoshinori Nakata	Secretary to the Board, Bank for International Settlements, Switzerland.
Paolo Onofri	Deputy Chairman, Prometeia, Italy
Adrian Peralta	Deputy Division Chief, Research Department, International Monetary Fund, United States
Juan Pérez-Campanero	Group Supervisory Strategy, Grupo Santander, Spain
Matt Peterson	Ideas Editor, Barron's, United States
Andrew Pitt	Global Head of Research, Citi, United Kingdom
Cristian Popa	Senior Advisor, Vienna Initiative Steering Committee, Austria
Salvador Portillo	Financial Regulation Manager, BBVA, Belgium
Lucrezia Reichlin	Professor of Economics, London Business School, United Kingdom

Ricardo Reis	Professor of Economics, London School of Economics, United Kingdom
Rafael Repullo	Professor of Economics and Director, CEMFI, Spain
Fernando Restoy	Chair of the Financial Stability Institute, Bank for International Settlements, Switzerland
Marta Riveira	Director of the Financial Environment Division and UK Economist, Banco Sabadell-TSB Group, Spain
David Rivero	Assistant Professor, UNAV and Research Fellow, Banking Initiative, IESE, Spain
Almuth Scholl	Professor, Department of Economics, University of Konstanz, Germany
Hyun Song Shin	Economic Adviser and Head of Research, Bank for International Settlements, Switzerland
Jorge Sicilia	Director and Head Economist, BBVA, Spain
Serhiy Stepanchuk	Associate Professor in Economics, University of Southampton, United Kingdom
Eduard Talamàs	Assistant Professor of Economics, IESE, Spain
Cedric Tille	Professor of Economics, Graduate Institute of International and Development Studies, Switzerland
Pavlo Tishkov	Senior specialist, National Bank of Ukraine, Ukraine
Juan José Toribio	Emeritus Professor, Department of Economics, IESE, Spain
Francesc Trillas	Professor, Department of Applied Economics, UAB, Spain
Viktor Tsyrennikov	Director of Quantitative Analysis, Promontory Financial Group, United States
Francisco Uria	Global Head, Banking&Capital Markets, KPMG, Spain
Isabel Vansteenkiste	Director General for International and European Relations, European Central Bank, Germany
Xavier Vives	Professor of Economics and Finance, IESE, Spain
Haorui Wang	PhD Student, IESE, Spain
Laurel Yao	Master's student in Banking and Financial Regulation, Universidad de Navarra, Spain
Paco Ybarra	CEO, Institutional Clients Group, Citi, United States
Zhiqiang Ye	PhD student, IESE, Spain
Jeromin Zettelmeyer	Director, Bruegel, Belgium
Jiamin Zhao	PhD student, IESE, Spain

Foreword

This is the fifth report in the series on The Future of Banking, part of the Banking Initiative from the IESE Business School that was launched in October 2018 and is supported by Citi.

The goal of the IESE Banking Initiative is to establish a group of first-rate researchers to study new developments in banking and financial markets, paying particular attention to regulation and competition policy and to the impact on business banking models and the performance of markets. It aims to promote a rigorous and informed dialogue on current issues in the fields of banking and financial markets amongst academics, regulators, private sector companies and civil society.

The first report, published in 2019, assessed the regulatory reform of the banking system after the Great Recession induced by the global financial crisis of 2008–2009, and suggested that the next global crisis might have different origins, possibly in entities that perform the functions of banks but are outside of the regulatory perimeter, or in an emerging market where regulation could well be different from the reformed systems in the West. It concluded that the system had been made more resilient but that further work remained to be done.

The second report addressed the changes in the business models of banks and identified that the challenges that banks faced in the pre-Covid-19 world – mainly low interest rates and digital disruption – will be made more severe in the post-Covid-19 world. Banks have had to deal with an increase in non-performing loans, albeit with temporary relief from strict regulation and with massive liquidity help from central banks. This has accelerated restructuring in the sector.

The third report studied how climate and natural disaster risk is different from other, more familiar forms of financial and economic risk and how banks, asset managers and central banks are beginning to grapple with these risks. Covid-19 has made us aware of the potentially devastating effect of natural disasters and provides a pointer to the effects that climate change may induce. At the same time, the Covid-19 crisis provided a large-scale natural experiment to address this question and put natural disasters, whether they be pandemics or climate catastrophes, on the agenda of private institutions, bank regulators and central banks.

The fourth report dealt with the impact of technology on financial markets and institutions and identified the challenges in three specific areas: payment systems, the use of big data, and trading in markets. Digital technology has presented formidable tests for incumbent financial intermediaries, firms and exchanges, as well as for regulators.

It examined the suitability of central bank digital currency, the trade-offs involved in the massive use of data in terms of efficiency, privacy and market power, and the changes induced by the electronification of financial markets. It investigated how to balance the bright and dark sides of technology to inform regulation.

This fifth report assesses the consequences of the COVID-19 pandemic and the Ukraine war for the international economic and financial order and the global economy. It focuses on three major components: the macroeconomic outlook and the changes needed in the economic policy model, the implications for the international monetary system and the stance of the dollar, and the financial architecture needed to ensure sovereign debt sustainability. A general conclusion is that the pandemic and war have accelerated previous trends which reveal potential conflicts between policy objectives.

The report was produced following the conference on "The impact of the war in Ukraine on the international economic and financial order", which was held online on 30 March 2023, and the presentation and discussion of preliminary work at a hybrid session on 23 November 2022. The conference programme, together with the comments of the six discussants, are included in this report, as well as the concluding speech by Harold James. The team of authors was brought together by Xavier Vives.

The Banking Initiative has benefitted from the keen support of the Dean of IESE, Franz Heukamp, and the former Dean, Jordi Canals. CEPR and IESE are very grateful to the authors and discussants for their efforts in preparing this report, as well as to the conference attendees for their perceptive comments. We are also grateful to Carlota Monner for her extremely efficient organisation of the conference as well as for providing support for the report, and to Anil Shamdasani for his unstinting and patient work in publishing the report.

The views expressed in the report are those exclusively of its authors and do not represent those of CEPR, which takes no institutional positions on economic policy matters. CEPR and IESE are delighted to provide a platform for an exchange of views on this topic.

Tessa Ogden
Chief Executive Officer, CEPR

Xavier Vives
Director, IESE Banking Initiative

May 2023

Executive summary

Following the Covid-19 pandemic, the Russian invasion of Ukraine has emerged as a significant shock to the global economy, particularly to Europe. The resultant escalation in energy and food prices has fuelled inflation and posed the threat of recession, making the macroeconomic outlook quite uncertain. Additionally, the ongoing conflict in Ukraine and the imposed sanctions on Russia could trigger the disengagement of the Western and Chinese economies and financial systems. This, in turn, may have significant implications for the evolution of the international monetary landscape and the viability of sovereign debt.

Several questions arise after pandemic and war: *Should the inherited policy model and institutional framework be changed to control inflation without endangering financial stability? Is policy coordination and cooperation among jurisdictions easier or more difficult? Will the US sanctions on Russia penalise the international dimension of the US dollar? Is the renminbi a feasible alternative to the dollar, US banks and SWIFT as a cross-border financial vehicle? Will sovereign debt be sustainable after the large shocks that the international economy has endured? Should the European Union reform its fiscal rules? Are the credit restructuring mechanisms in place adequate?*

To shed light on the implications for the international economic and financial order and the global economy, this report centres around three major components: the macroeconomic outlook and the changes needed to the economic policy model (Chapter 2), the implications for the international monetary system and the position of the US dollar (Chapter 3), and the financial architecture needed to ensure sovereign debt sustainability (Chapter 4).

The question is whether the pandemic and the Ukraine war represent a structural break that calls for a reassessment of the current economic policy model, particularly given the increased role of the state as an insurer of last resort in a high-debt context, the emergence of China, and the growing geopolitical conflicts. The weaponisation of finance also raises doubts about the global dominance of the US dollar as reserve currency if digital currencies, like the e-CNY, start to be used for cross-border transactions. Furthermore, the emergence of China as global creditor complicates the international coordination of crisis resolution. Another open question relates to sovereign debt and reform proposals to ensure its sustainability, particularly in the European Union, where a key challenge is how to balance discretion with rules.

A general conclusion of the report is that the pandemic and war have accelerated previous trends, namely, the rise of protectionism, regionalisation of finance, decoupling of the West and China, and public debt accumulation. These trends reveal potential conflicts between the objectives of managing inflation, maintaining debt sustainability and ensuring financial stability, while at the same time governments endeavour to safeguard the welfare of their citizens.

A first broad message from the analysis is that a stable fiscal outlook and a credible monetary policy are crucial for resolving the inflation crisis smoothly, but that accomplishing this task may be difficult without addressing financial vulnerability. To achieve macroeconomic stability, it will be necessary to adjust relative prices and wages in response to supply and demand shocks caused by Covid and the Ukraine war. Additionally, it may be necessary to reassess the interaction between monetary, fiscal and regulatory policies to ensure they work together effectively. The objective should be to reduce vulnerabilities, minimise the risk of a confidence crisis, and facilitate deleveraging at minimal economic and social costs.

A second broad message is that the weaponisation of the US dollar has created an opportunity to promote the international use of alternative reserve currencies, with China being the first mover in the development of a digital currency (the e-CNY) for cross-border transactions. Nonetheless, the use of currencies in international monetary and financial transactions tends to evolve gradually; the weaponisation of the dollar and the rise of China will at most make it evolve a little less gradually. However, the polarisation of the international monetary system into two main areas (dollar versus renminbi), due to an increase in geopolitical tensions between the United States and China, might be highly disruptive.

A third broad message is that although debt remains sustainable in most countries, a subset of EU countries will need to undertake significantly more debt adjustment than is currently planned over the medium term. EU fiscal rules need reform to reconcile the sustainability of debt and stabilisation policy while preserving incentives for investment. This is the challenge for the reform initiated by the European Union. For developing economies, debt sustainability requires expanding non-debt-creating financial support, bond contracts linked to climate risks and climate actions, and better coordination among official creditors, including China.

MACROECONOMIC OUTLOOK AND STABILISATION POLICIES

The exit from the current inflation crisis and complex macroeconomic environment presents a challenge to the current policy model. It will be key to realign relative prices and wages according to the supply and demand shocks suffered due to Covid and the war, without feeding expectations of persistent inflation. On balance, there are strong arguments for amending and fixing the policy model, rather than scrapping it altogether and venturing into unknown territory. Both a stable fiscal outlook and a credible monetary policy are essential for a smooth resolution of the inflation crisis, and achieving this may prove challenging without addressing financial vulnerability. This may require reconsidering the interplay between monetary, fiscal and regulatory policies to ensure they complement each other effectively in the task. In a high-debt environment, the aim should be to reduce vulnerabilities to confidence crises and foster deleveraging at

low economic and social cost. A key strategy will be to have central banks backstop government debt, with the treasury in turn ensuring that potential losses in the balance sheet of central banks do not undermine the credibility of monetary policy objectives and mandate.

THE NEW INTERNATIONAL MONETARY LANDSCAPE

The weaponisation of the US dollar raises concerns about future sanctions imposed by the US government and provides a window for promoting the internationalisation of other currencies (for example, the euro and renminbi). However, other Western currencies, gold, barter, and cryptocurrencies (including stablecoins) are at best limited alternatives. Amid geopolitical tensions linked to the Ukraine war, China has made efforts to be the first mover in the global race to develop a cross-border central bank digital currency (CBDC) with the use of the e-CNY and to consolidate the renminbi as an alternative to the dollar, US banks and SWIFT. Even in this case, however, the dollar will retain its dominance for a long while, though it may face weakness 'by a thousand cuts', translating into a lengthy, if gradual, decline.

A more disruptive case would be given by the collapse of relations between the United States and China and threats by both governments to impose secondary sanctions on those jurisdictions engaging with each other. In such a case, countries would have to choose between doing business with the dollar or the renminbi, polarising the international monetary system. This would have large costs for international trading and the stability of the international financial system.

THE SUSTAINABILITY OF SOVEREIGN DEBT

Notwithstanding higher debt and real interest rates, debt remains sustainable in most countries since the difference between the interest rate and the rate of growth remains small. However, a subset of EU countries will need to undertake significantly more adjustment over the medium term than they are currently planning. EU fiscal rules need reform in order to reconcile the sustainability of debt and stabilisation policy while preserving incentives for investment. The reform initiated by the European Commission, which would give country-by-country debt sustainability analysis (DSA) a central role, could be a big step forward, provided that the key remaining challenge – how to reduce discretion and prevent potential abuse of DSAs – is addressed without returning to mechanical rules. The rise of China and other non-Paris Club creditors and the increase in the share of external debt owed to multilaterals is making crisis resolution in developing countries much harder. Addressing this problem requires expanding non-debt-creating financial support to developing countries, bond contracts linked to climate risks and climate actions, and better coordination among official creditors, including China.

CHAPTER 1

Introduction

After the Covid-19 pandemic, Russia's invasion of Ukraine has represented an important shock to the world economy, and to Europe in particular. Price rises in energy and food spurred inflation and threatened recession or even stagflation. Furthermore, the war in Ukraine and the associated sanctions on Russia may provide an impulse for a decoupling of the economies and financial systems of the West and China. The consequences for the sustainability of sovereign debt may be important.

This report examines the implications of the pandemic and the war for economic and financial systems in Europe and the world at large. It concentrates on three major aspects: macroeconomic stability and policy, the international monetary landscape, and the sustainability of sovereign debt.

The recent sequence of shocks – Covid-19 and the Ukraine war – hitting the global economy has changed the macroeconomic outlook from a deflationary scenario with nominal policy rates at the zero lower bound to an inflationary environment in which central banks in many jurisdictions have responded by tightening monetary conditions. Although this inflationary shock was initially expected to be temporary, there are structural risks – growing global geopolitical tensions, high levels of indebtedness (both public and private) – and tail risk events related to climate change that call for revisiting the current economic policy model to reach price and financial stability and ensure a sustainable economic growth. The question arises as to whether the pandemic and war constitute a structural break given the increased role of the state as insurer of last resort in a high-debt context, the emergence of China and geopolitical risk (not to mention the challenge posed by climate change).

The shocks to the world economy, both on the demand and supply side, pose formidable challenges for the conduct of fiscal and monetary policy, and in particular the interaction between both policies. Many questions are on the table concerning the roots of inflation and the appropriate policy to control it. Among them, the question arises of whether the inherited policy model and institutional framework should be changed to avoid repeating the policy mistakes of the 1970s. Are we heading towards a split in macroeconomic performance across regions or towards greater convergence? Is policy coordination and cooperation among jurisdictions easier or more difficult, and more or less necessary? The transition from a low-inflation, low-interest-rate scenario to one with persistent inflation

and higher interest rates is proving problematic, with consequences for financial stability. The demise of Silicon Valley Bank is an indicator of underlying problems in the management of risk, supervision, and regulation of banks when interest rates rise quickly.[1]

The Ukraine war has increased and consolidated the weaponisation of finance. This fact, together with recent developments in information technology (IT) and the growing geopolitical and economic relevance of China, raises questions about the dominance of the dollar and the evolution of the international monetary system. The question arises as to whether the weaponisation of the dollar will penalise its international dimension and whether there are workable alternatives, such as the renminbi or the euro. This is not a minor issue given the decoupling tendencies with the tension between the United States and China, aggravated by Russia's aggression against Ukraine. Another possibility is that digital currencies, such as the digital yuan or a digital euro, will provide alternative means for cross-border transactions. In any case, the potential erosion of the dollar has a macroeconomic dimension given the large public debt accumulated by the United States.

The implications for the future of global banking post-pandemic and war may be important, potentially accentuating regional divergences in bank performance. Cross-border banking has been receding in Western jurisdictions since the global financial crisis (GFC) and global banks are affected by the digitalisation of financial services and by geopolitics. A question is whether geopolitical tensions will accelerate tendencies for regionalisation in global banking together with a potential resurgence of national champions, as the case of the forced merger of Credit Suisse and UBS seems to indicate. A case in point is HSBC, with the proposal to separate its Western and Asian business.

The global financial crisis, Covid and the war in Ukraine will leave a legacy of high public debt. The implications of high debt in a low-interest-rate environment are very different from in a high-rate one. Will sovereign debt be sustainable under the current foreseeable macroeconomic outlook? Are the debt restructuring mechanisms in place adequate? How can China be integrated in debt crisis resolution processes and institutions? The situation in the European Union and the euro area in particular is a cause of concern because of the implications for the stability of the euro. Will the European Commission's recent proposal for reforming the fiscal framework in the European Union succeed in creating an effective anchor to ensure debt sustainability, while also allowing room for public investment and output stabilisation?

1 See Vives (2023).

In sum, the pandemic and war have left many open questions regarding economic policy. The present report hopes to shed light on some of the key issues. A preliminary conclusion is that the pandemic and war have accelerated previous trends: protectionism, regionalisation of finance, a decoupling of the West and China, and public debt accumulation. These trends reveal potential conflicts between the aims of controlling inflation, making debt sustainable and maintaining financial stability while the state tries to protect the wellbeing of its citizens.

In the rest of this first chapter, we summarise and complement the analysis and results of the chapters that follow. Section 1.1 reviews the macroeconomic outlook and the changes needed to the economic policy model. Section 1.2 studies the implications for the international monetary system and the stance of the dominance of the dollar. Section 1.3 explores the trends and outlook for global banking. Section 1.4 deals with sovereign debt and reform proposals to ensure its sustainability.

1.1 MACROECONOMIC TRENDS AND STABILISATION POLICIES AFTER THE PANDEMIC AND WAR

What are the roots of the current inflation crisis?

The recent inflationary impulse in most of the Western jurisdictions (say, the United States and the euro area) can be explained as a tale of – at least – two main global shocks (and the policy response to them): the Covid-19 pandemic and the rise in energy prices started in 2021 and aggravated after the Russian invasion of Ukraine. A legacy of loose monetary policy provides fuel for inflation. The first inflationary impulse was the abrupt increase in the demand for goods after the Covid-19 lockdown together with expansive fiscal policies intended to offset labour market disruptions. The Ukraine war also pushed inflation higher due its contribution to the sharp increase in energy prices. The destabilising effect of this shock has been more pronounced in those jurisdictions more dependent on the imports of energy. Divergences between Europe and the United States in terms of loss of competitiveness following the Russian invasion of Ukraine are explained by the higher energy dependence of the former and the currency strengthening of the latter. Indeed, inflation in Europe is explained more by external shocks than in the United States.

The risk of a wage-price spiral

The cumulated effects of inflation increases are now driving nominal wage adjustments across sectors and markets. In this process, the different degree of stickiness of wages and prices might create conflicts regarding the equilibrium level of real wages. Indeed, the dynamics of the wage–price spiral can introduce difficulties in the implementation of monetary policy. Conflicts/disagreement over distribution, reflecting differences between the desired real wage by workers and firms, could generate persistent inflationary pressure, which is incompatible with the central bank target for price stability.

Should the economic policy model be revisited? Are institutional reforms required? What are the main limitations of the current institutional framework?

The current economic policy model was built in the context of the Great Moderation, with price stability as the primary objective. To effectively achieve low inflation in the medium term and a high level of economic growth in the short term, the main economic logic was the need to influence agents' expectations about the future. To anchor expectations, government credibility was based on the explicit separation of the monetary, fiscal, and regulatory policy arms under the premise that the lack of coordination among them would ensure their independence. The monetary policy mandate focuses on price stabilisation, the fiscal policy mandate on anti-cyclical stabilisation and debt sustainability, and regulatory policies focus on the trade-off between financial stability and competition.

Yet, in the aftermath of the global financial crisis, this economic model was put into question. Several drawbacks became clear over time. First, the economy can fall into a liquidity trap when nominal interest rates are close to zero, which shows the limited effectiveness of conventional monetary policy (i.e., shifts in the policy rate) at its zero lower bound to implement the required stimulus for the economy. Second, the theoretical independence among monetary, fiscal and regulatory policies is not so clear-cut in practice. One issue is 'fiscal dominance': in periods of high public indebtedness, monetary policy might be reluctant to tighten the policy rate and, as such, maintain interest rates 'too low for too long', which might turn into a limitation when high-debt economies experience inflationary impulses. Another issue is 'financial dominance': in times of excessive private debt and bank leverage, monetary and fiscal decisions might be driven by the need to contain systemic risk.

What are the key refinements to build an effective model of economic stabilisation?

Most of the institutional reforms after the financial turmoil of the global financial crisis were centred around banking institutions and other financial intermediaries (shadow banks). For instance, regulatory and supervisory independent bodies were transferred back under the umbrella of central banks to place more emphasis on the importance of macroprudential regulation. And the implementation of unconventional monetary policies required, to some extent, some coordination with fiscal policies to stem the global financial crisis and later (e.g., liquidity injection programmes after the Covid-19 outbreak).[2]

Considering the new macroeconomic outlook characterised by short-term inflationary pressure and other structural risks (the climate-finance doom loop, for example), further refinements to the post-GFC economic policy model deserve attention.

2 See Chapter 4 in the first report in the Future of Banking series (Bolton et al., 2019).

The rediscovery of the 'policy mix'

Post-GFC countercyclical fiscal stimulus might be needed when the conventional monetary policy is stuck at its effective lower bound. That is, insufficient monetary response can be compensated by expansionary fiscal budgets. Yet, this policy mix requires careful analysis under some circumstances. As way of an example, a deflationary spiral (in which poor demand lowers prices and the subsequent deflation reduces demand further because of higher real interest rates) might be offset by a fiscal commitment to not cut spending or raise taxes in the future, and the monetary commitment to not react to changes in price dynamics away from its target. This way, fiscal and monetary policies could coordinate to stabilise the economy. Yet, for this strategy to be effective, actions should be temporal and not anticipated by private agents. In the context of the current inflationary impulses, the logic of this policy mix would be a monetary policy keeping their stance in response to a fiscal contraction. However, the implementation of this policy mix (fiscal austerity when monetary policy is contractive) could find strong political opposition.

The need for a monetary backstop in government bond markets

Among the unconventional actions taken by monetary authorities in the aftermath of the global financial crisis, a key role has been played by the central bank backstop in the sovereign debt market (for example, the Outright Monetary Transactions programme of the ECB).[3] The mere commitment that the central bank will intervene by engaging in outright transactions should be a sufficient condition to discourage market speculation. To provide credibility to such a commitment, however, a certain degree of coordination with fiscal policies might be required. This is because bond purchases expand the central bank's balance sheet and, if losses materialise, the treasury should be ready to provide contingent fiscal guarantees. Otherwise, central banks would be forced to 'print money', which could lead to reputational losses and pose a threat to the price stability mandate. Furthermore, to avoid sunspot events and panics, the treasury should commit that the backstop provided will be contingent on a sustainable fiscal path to control excessive debt issuance. Lastly, no effective backstop is possible if inflation expectations are not anchored. If the monetary policy is not credible, the economy becomes vulnerable to sovereign risk crises driven by self-fulfilling expectations of debt debasement via high inflation.

Is there a need for cross-border cooperation? Would cooperative stabilisation policies be effective?

In response to the rising inflation, most central banks have responded globally in the same direction (tightening monetary conditions) but not in a coordinated, timely way. The main risk is that, by maintaining a strictly national focus, central banks do not incorporate possible cross-border spillovers of their actions. On one side, a tightening

3 See the effects of OMT on the credit to SMEs in Ferrando et al. (2023).

of monetary policy in one jurisdiction tends to foster inflation in other locations, which diminishes foreign competitiveness (especially if the monetary contraction is taken by a systemic jurisdiction like the United States). On the other side, if the borrowing conditions of the foreign jurisdiction deteriorate, global risks might arise and accentuate sovereign risk. Although a debt crisis has not yet materialised in Western jurisdictions, some regions in Africa are in default or debt-restructuring.

Low potential effectivity and feasibility constraints might explain the lack of coordination policies for global macroeconomic stabilisation. Coordination requires negotiation and the policy response might not arrive in a timely manner (in particular, if the shock affects jurisdictions asymmetrically at least to some extent). And even if the policy response is coordinated, national governments might free-ride and reduce the scale of the agreed cross-border policy intervention. These reasons motivate the regionalist perspective of 'keeping one's house in order' as the optimal policy action to ensure global macroeconomic stability. In any case, there is still room to revisit open macroeconomic models to assess the gains of policy cooperation.

To sum up, the exit from the current inflation crisis and complex macroeconomic environment presents a challenge to the current policy model. It will be key to realign relative prices and wages according to the supply and demand shocks suffered due to Covid and the war, without feeding expectations of persistent inflation. On balance, there are strong arguments for amending and fixing the policy model, rather than scrapping it altogether and venturing into unknown territory. Both a stable fiscal outlook and a credible monetary policy are essential for a smooth resolution of the inflation crisis, and achieving this may prove challenging without addressing financial vulnerability. This may require reconsidering the interplay between monetary, fiscal and regulatory policies to ensure they complement each other effectively in the task. In a high-debt environment, the aim should be to reduce vulnerabilities to confidence crises and foster deleveraging at low economic and social cost. A key strategy will be to have central banks backstop government debt, with the treasury in turn backstopping the balance sheet of central banks.

1.2 THE INTERNATIONAL MONETARY LANDSCAPE: IMPLICATIONS OF THE RUSSIA-UKRAINE WAR, THE RISE OF CHINA AND NEW DIGITAL TECHNOLOGIES

What explains the dominance of the US dollar as global reserve currency?

Since the end of the Bretton Woods system, the US dollar has been used as the main currency for settlement of international monetary transactions. Among the reasons that explain this are the lack of alternatives and the advantages derived from being the first mover. Network effects mean many market participants do not have incentives to use a different international currency to execute cross-border transactions, while complementarities between the dollar's international role reinforce its dominance.

It was expected that the euro could challenge the dollar, but the incomplete nature of the monetary union, due to structural factors as well as inappropriate institutions, has put into doubt the capacity of the euro as a global currency (for example, because of the lack of a euro area safe asset). The renminbi is still far from constituting a threat to the dollar as global reserve currency. Indeed, it represents less than 5% of total allocated foreign exchange reserves, while only the 2% of cross-border interbank transfers are denominated in renminbi (in contrast, more than 40% of them are in dollars).

The use of the dollar as a vehicle to implement financial sanctions: Will the US sanctions on Russia penalise the international dimension of the dollar?

The pivotal role of the dollar in the international monetary system has allowed US administrations to use it as a strategic tool in response to geopolitical tensions. The United States has historically used financial sanctions in cases involving human rights violations, in defence of democracy, and in situations deemed a potential threat to national security.[4] The recent sanctions on the Bank of Russia in response to the Ukraine war are, however, unusual. The Biden administration has imposed such sanctions without declaring "a threat to the national security of the country" (indeed, Janet Yellen declared that the US government only has the capacity to immobilise Russian central bank assets, not to seize them).[5]

These actions have raised concerns in some jurisdictions (mainly China) about the possibility that the United States could employ arbitrary financial sanctions frequently, and have heightened interest in ways to hedge with alternatives to the dollar and to US banks. Vladimir Putin, in his March 2022 meeting with Xi Jinping, stated that "we are in favour of using the Chinese yuan for settlements between Russia and the countries of Asia, Africa, and Latin America". Use of the euro as an alternative to the dollar would be feasible only if the European Union diverges explicitly from US policies and decides not to cooperate strategically with the United States in the imposition of financial penalties. However, this scenario is unlikely, given EU sanctions imposed in response to the military aggression by Russia against Ukraine.[6]

Before the Ukraine war, the development of digital currencies together with a macroeconomic environment characterised by low interest rates had induced a shift towards nontraditional reserve currencies. This trend, however, may be transitory and could possibly be reversed with the rising interest rates in Western jurisdictions (in the United States, the United Kingdom and the euro area).

4 For instance, BNP Paribas was charged in 2014 with an $8.9 billion fine for illegally processing US dollar financial services to individuals and entities associated with Sudan, Iran and Cuba, countries exposed to U.S. economic sanctions (see www.justice.gov/opa/pr/bnp-paribas-agrees-plead-guilty-and-pay-89-billion-illegally-processing-financial).
5 See www.reuters.com/world/yellen-not-legal-us-government-seize-russian-central-bank-assets-2022-05-18/
6 See www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/sanctions-against-russia-explained/

Is the renminbi a feasible alternative to the US dollar, US banks and SWIFT as a cross-border financial vehicle?

China has sought in recent decades to promote the use of the renminbi for cross-border transactions. Examples are the currency swap agreements between the People Bank of China (PBoC) and foreign central banks and the bilateral agreements with Russia to buy oil and coal in exchange for renminbi. Another remarkable attempt has been the development of the China's Cross-Border Interbank Payment System (CIPS), established in 2015 as an alternative to SWIFT for settling international payments. CIPS facilitates payment orders between correspondent accounts of different financial institutions, which can participate either directly or indirectly. At some point, the increasing relevance of CIPS may transform the international monetary landscape. If Western jurisdictions cooperate in imposing financial sanctions in future geopolitical conflicts (as in the Ukraine war), some targeted countries might turn to CIPS for the settlement of cross-border transactions and, consequently, use the renminbi as their payment currency. If sanctions are imposed on China (directly or via secondary penalties), the scenario would be more disruptive. For instance, restricting access to SWIFT for Chinese banks would leave many jurisdictions with no alternative but to make payments in renminbi using CIPS, reflecting China's dominance of global supply chains. In this most disruptive scenario, the international monetary system would resemble a Venn diagram, with US allies using SWIFT and the dollar for cross-border transactions and other jurisdictions settling international transactions with China through the renminbi and CIPS. Furthermore, what is also unclear is the extent to which global banks in Western jurisdictions would participate in CIPS as intermediaries for clearing international transactions denominated in renminbi. In any case, internationalisation of the yuan would need a liberalisation of the Chinese financial sector, something that is not clear that China is prepared to do.

What is the effectiveness of digital currencies for cross-border transactions?

Many digital currency projects developed in the last decades (cryptocurrencies, mostly) have proved unstable or collapsed, accelerated by the demise of the crypto exchange platform FTX. Alameda Research suffered a run when customers wanted to withdraw their funds following news of trouble at FTX surfacing, only to find out that their funds were backed by the worthless cryptocurrency FTT, issued by FTX. Stablecoins, as currency boards, are subject to runs and are not under the umbrella of a lender of last resort. If crypto-assets and transactions are isolated from the financial system, then they can be left unregulated except for protection against fraud, as in gambling casinos.[7] However, it is not obvious that the crypto world can be isolated from the rest of the financial system. This creates an argument that stablecoin issuers should be regulated as banks.

7 See Vives (2022).

The limitations of stablecoins and plain vanilla cryptocurrencies (where the latter display high volatility) leave central bank digital currencies (CBDCs) as potentially the most attractive alternative for cross-border transactions. China and the euro area have moved further than the United States down this road.

What are the digitalisation steps followed by Chinese authorities to consolidate the renminbi in the international monetary system? What about the euro area?

In addition to the creation of CIPS, China is also exploring the possibility of implementing its CBDC, known as the e-CNY, in cross-border transactions. The PBoC has been conducting tests to assess the opportunities and risks of the cross-border use of the e-CNY.[8] In principle, transactions would be cost-free, but there will be a privacy or lack-of-confidentiality cost for large transactions. More generally, assuming that CBDCs are not interoperable, multi-CBDC arrangements would be required.[9] To this end, the PBoC has been cooperating with the Bank for International Settlement (BIS) and the central banks of Hong Kong, Thailand and the United Arab Emirates to develop a multi-CBDC bridge ('mBridge') involving a corridor through which the e-CNY can be exchanged for other CBDCs when counterparties reside in different jurisdictions.[10] Even if such arrangements are technically feasible, however, it must be noted also that wide circulation of the e-CNY will still have to overcome privacy, security and geopolitical concerns.

The ECB is exploring the potential benefits of a wholesale CBDC which would allow banks to transfer funds directly among themselves and where smart contracts could be built on top of this structure. This could be of use for cross-border transactions and financial services within the euro area itself. But its use in transactions between the euro area and the rest of the world would still have to overcome the interoperability and conversion challenges facing retail CBDCs.

To sum up, the weaponisation of the US dollar raises concerns about future sanctions imposed by the US government and provides a window for promoting the internationalisation of other currencies (e.g., the euro and renminbi). Amid geopolitical tensions linked to the Ukraine war, China has made efforts to be the first mover in the global race to develop a cross-border CBDC and consolidate the renminbi as an alternative to the dollar, to US banks and to SWIFT. Even in this case, however, the dollar will retain its dominance for a long time, though it may face weakness 'by a thousand cuts' translating into a lengthy if gradual decline.

8 An example of the Chinese efforts to build a global renminbi is the pilot test with Hong Kong to build a currency swap facility that allows Hong Kong residents to execute transactions denominated in renminbi in the Mainland by linking Hong Kong's Fast Payment System and the Hong Kong dollar to the e-CNY.

9 See Duffie et al. (2022).

10 In a test between 15 August and 23 September, 20 commercial banks from those regions executed over 160 real-value cross-border and FX transactions through the mBridge platform for $22 million. Among all these payments, the BIS reported that the e-CNY was the most issued and transacted token.

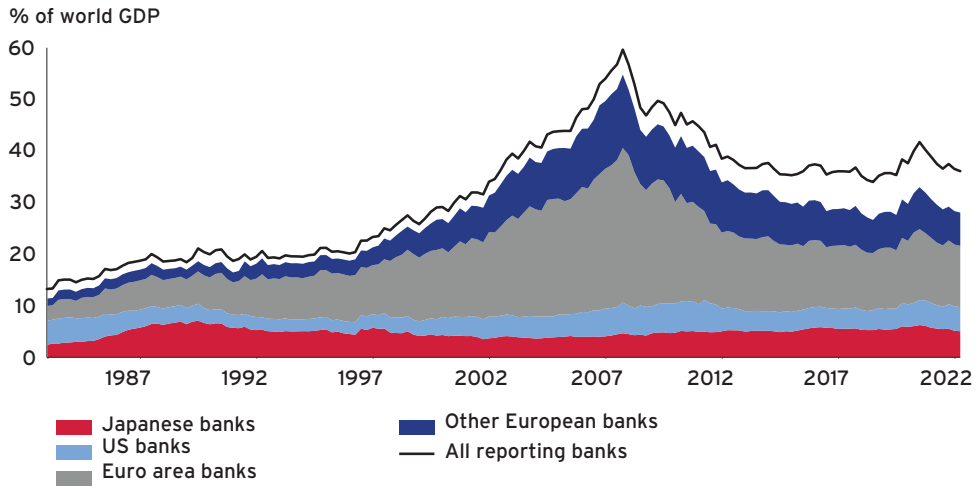
A more disruptive case would the collapse of relations between the United States and China and threats by both governments to impose secondary sanctions for those jurisdictions engaging with each other. In such a case, countries would have to choose between doing business with the dollar or the renminbi, polarising the international monetary system. This would have large costs for international trading and the stability of the international financial system.

1.3 THE OUTLOOK FOR GLOBAL BANKING

Global banking has changed after the global financial crisis

The expansion of financial globalisation before the global financial crisis materialised to a large extent through cross-border banking and foreign bank presence, with banks located in Western jurisdictions at the forefront. The core of the market was offshore. After the global financial crisis, and the regulatory reforms associated with it, bank expansion was constrained and gave way to non-bank financial institutions.[11] The perception is that the globalisation trend has stopped and gone into reverse.[12] Global cross-border bank lending relative to world GDP peaked at the global financial crisis according to BIS data, where we see an important fall in the share of European banks (see Figure 1). Geographically, global banking has become more regional, with many banks reducing the number of territories in which they operate, but with a trend increase in the global reach of Asian banks while global European banks have retrenched.[13]

FIGURE 1 **GLOBAL CROSS-BORDER BANK LENDING RELATIVE TO WORLD GDP**



Source: Shin (2023) with data from IMF, World Economic Outlook; BIS locational banking statistics.

11 See McCauley et al. (2021).
12 Claessens (2017) estimates that cross-border bank claims decreased by 20% from their peak in early 2008 until 2016, with the fall more pronounced in the euro area.
13 See Ceruti and Zhu (2017) and Schoenmaker (2017).

What are the drivers of this retrenching trend in cross-border banking in Western jurisdictions after the global financial crisis?

In the aftermath of the Lehman Brothers failure, emerging economies only experienced a temporary disruption in international capital flows in relation to most advanced markets. Milesi-Ferretti and Tille (2011) link the intensity of this retrenchment to the characteristics of the specific location, with jurisdictions with a higher reliance on bank flows (a clear example is the overbanked European economy) experiencing a stronger collapse. This trend also manifests in terms of foreign bank presence. Claessens and van Horen (2015) report that, although total 'bricks and mortar' operations and exiting foreign banks remained similar after the global financial crisis, entry was significantly reduced, with domestic banks gaining market share (probably with the help of local government financial support). These shifts are associated with the new regulatory framework and tightened supervision faced by European and US banks in the post-GFC era and to the opportunities opened by the retrenchment of some European banks.[14]

Outlook for global banks in the new banking era: How does the digitalisation of financial services affect global banking? Can geopolitical factors accelerate the retrenching trend? What is the impact of geopolitical risks?

After the multiple global shocks that have hit most economies, an open question is how the trends in global banking will evolve. This set of events threatens the profitability and vulnerability of global banks in more of an idiosyncratic than a systemic way (at least so far).

First, Covid-19 has shown how tipping point events (and tail risks) can consolidate the valuation gaps between banking institutions. McKinsey (2021) reports that bank divergence (i.e., the disparity in market-to-book ratios between top and bottom performing banks) has widened and points to geography (i.e., the locations where banks operate) as a major driver of banks' valuation. A bank's core geographic market accounted for about 65% of the standard deviation in price-to-book ratios in 2021. Other sources of divergence are relative scale, segment focus and business models. Covid-19 also accelerated the digitalisation trend, which raises new challenges for the universal global banking model. Bank customers have raised their demand for digital financial services, the significance of physical distance frictions for lending relationship lessens, and technological companies ('BigTech') threaten to gain market share in some segments. The future impact of these changes on the valuation of universal banks is still an open question.

Second, the new macroeconomic outlook characterised by the rise in inflation expectations and tightened monetary conditions threatens to accentuate regional divergences. Although the sharp increase in interest rates has raised margins, the return on equity remains low in relation to previous golden eras. McKinsey (2022) suggests that

14 See Ceruti and Zhu (2018).

the increase in margins leads to reported returns above the cost of equity only for the 35% of banks globally and documents that banks' return on equity globally might fall to 7% by 2026 and below 6% for European banks in the event of a long recession. Emerging Asia, China, Latin America, and the United States will account for about 80% of the estimated $1.3 trillion in global banking revenue growth in the period 2021–2025.

A third factor relates to geopolitical aspects. The Ukraine war has increased inflation pressure from commodity price shocks, especially in Europe due to proximity to the war scenario and greater reliance on Russian energy. Although the direct exposure of systemic European banks to Russia is not huge, indirect exposures might be relevant and lead to counterparty risk. According to the IMF, there was a sharp decrease in market capitalisation for European banks in the first quarter of 2022 after the Russian invasion: while equity prices for US banks fell about 8%, European banks fell more than 20% (IMF 2022a). For foreign non-bank financial intermediaries, the IMF study reports that while US and European investment funds have significant direct exposures to Russian assets, market funds from emerging jurisdictions have lowered their share of Russian debt from 10% in 2014 after the Crimea conflict to 4% in 2022.

The geopolitical tension between the United States and China also threatens the value of the network and of the international business model of global banks. The potential diminished role of the US dollar as the global anchor (reserve currency) for cross-border transactions might increase transaction costs for banks operating in Western jurisdictions. Furthermore, the regionalisation trend might increase if China becomes the first mover in the provision of a wholesale central bank digital currency (e-CNY) for the settlement of international transactions.

Altogether, it is reasonable to think that the current economic environment characterised by geopolitical risks will accelerate the regionalisation trend in global banking, leading to greater divergence among institutions, fragmentation in cross-border transactions, and reinforcement of global US and Asian banks to the detriment of European universal banks. The resolution of global banks, of which the demise of Credit Suisse is a vivid reminder, is a topic we dealt with in our first Future of Banking report in 2019. As the former Governor of the Bank of England, Mervyn King, said: "banks are global in nature but national in death". Although a new regulatory framework for banking was implemented after the global financial crisis, there are still loose ends in the regulation, supervision and resolution of global systemically important banks (G-SIBs). Looking forward, prospects for the coordination of regulators are uncertain. The consideration of banking as a strategic industry, with the forced merger of Credit Suisse with UBS as a recent example, may induce a revival of banking nationalism and the competition of national champions. In this case, governments may put pressure on regulators to defend their turf. In fact, Switzerland wiped out €17 billion of Credit Suisse convertible bonds

(AT1 capital) while preserving a value of €3 billion for shareholders. This runs counter to the usual rule (in place in the European Union, for example) of making shareholders liable first. The case is an example of lack of uniformity across jurisdictions in the resolution of a global bank.

BOX 1 **THE CASE OF HSBC**[15]

HSBC defined itself as "the world's local bank". In the process of becoming one of the largest global banks, it followed an acquisition strategy to consolidate its overseas presence not only in Asia but also in Europe and North America. However, after the global financial crisis the international strategy of HSBC shifted, and the bank attempted to reduce its global reach and consolidate its business operations in Asia. Several factors explain this retrenching strategy. First, reaping benefits from the provision of financial services in Western jurisdictions has become a difficult task after the collapse of Lehman Brothers (with tighter regulation and a weaker demand for credit). For instance, in 2021 HSBC reported that around 65% of annual gross profits came from Asia and only 20% from Europe. HSBC has taken cost-cutting measures to reduce its overseas branch network: about 25% of its UK branches have been closed; the bank sold its Canadian business to Royal Bank of Canada for $10 billion; and it agreed to sell its French retail bank to Cerberus. In contrast, to strengthen its market position in Asia, it announced plans to invest $6 billion in its Asian business operations.

A second factor is possibly related to geopolitics and the potential decoupling between China and the United States. Its largest shareholder, the Chinese insurance company Ping An, advocated spinning off its Asian business to cut costs and improve the bank's performance as well as avoiding the US-China split. HSBC shareholders voted down the proposal, but Ping An is set to continue its campaign. On a related front, HSBC announced its intention to shift the governance structure of the bank, moving executives from London to Hong Kong.

1.4 SOVEREIGN DEBT AFTER THE PANDEMIC AND WAR

How have the pandemic and war impacted the global fiscal outlook? To what extent have they raised fiscal adjustment needs?

The pandemic and war have impacted the fiscal outlook mainly through two channels: by raising public debt ratios, which in most advanced and emerging market economies are now at their highest levels since World War II; and through higher expected real interest rates. In addition, growth is projected to be slower, relative to pre-pandemic expectations, in some of the formerly high-growth emerging market countries. Yet, the impact of these factors on debt-stabilising primary balances projected for 2028 – which capture the capacity of a country to sustain its primary surplus (i.e., tax revenue minus non-interest expenditure, as a share of GDP) – is fairly moderate: they have risen by about 0.6% of GDP in the median advanced economy, 0.8% in the median European country, and 1.3% of GDP in emerging markets for which data are available. Furthermore, for

15 See www.ft.com/content/73b33bdb-d4b2-4b8b-a1e4-3ede6139aaba; www.ft.com/content/1a0ac251-23bc-4274-beba-c33ed831f440; and www.ft.com/content/5e393254-3a78-415c-903c-6de669228c78

most of these countries, the increase was from an extremely low (negative) starting point. Consequently, the primary balance required to stabilise the debt level remains negative for over three-quarters of advanced countries, reflecting the fact that despite significantly higher expected real long-term interest rates, the difference between the interest rate and real GDP growth rate is still negative for the majority of these countries.

Of potentially greater concern is the *gap* between the debt-stabilising primary balance and the projected primary balance at the end of the IMF forecast period (which captures the effort needed to raise the fiscal surplus to the level that will stabilise debt). This is expected to be approximately 1.5% of GDP in advanced and EU countries. However, one quarter of EU member countries are expected to have adjustment gaps of more than 2% of GDP.

A closer look to EU jurisdictions: Should there be concern over debt sustainability in Europe?

A closer look at EU jurisdictions reveals that, for the most part, debt-stabilising primary balances remain modest. The main exceptions are Greece and Italy, which would need to run permanent primary balances in the order or 1.5% of GDP to stabilise debt, and between 2% and 2.5% of GDP to reduce it at a meaningful rate. At the same time, there is a larger set of countries which, conditional on current adjustment plans, do not appear to be on track to reach their debt-stabilising primary balances. Based on their 2022 stability programmes (a three-year fiscal planning exercise), seven EU countries will fail to reach their 2029 minimum debt-stabilising primary balance by 2025. In some cases, considerable additional efforts will be needed. An attempt to quantify the uncertainty around interest rates and growth rates indicates that the probability that the difference between the debt-stabilising primary balance and the 2025 primary balance target is 2% of GDP or more is 70% for the Netherlands, 40–50% for Italy, Romania, and the Czech Republic, and over one-third for Belgium, France, and Spain. Furthermore, according to the latest World Economic Outlook forecasts, the IMF does not expect Belgium, Czechia, Finland, the Netherlands, Poland, Romania, Slovakia or Spain to reach their debt-stabilising primary balance by 2028.

The bottom line is that EU debts likely remain sustainable, but stabilising and reducing debt ratios in the European Union will require more fiscal adjustment than currently planned by governments and expected under the IMF's baseline projections.

Is there a need to reform the EU fiscal governance framework?

National policymakers typically prioritise the immediate advantages of increased spending and/or decreased taxes, neglecting the potential hazards of excessive debt in the future. In the EU context, particularly in the euro area, such hazards have negative spillover effects across countries. This justifies EU fiscal rules designed to contain excessive deficits and debts. The EU has had such rules in place since 1997 in the form of the Stability and Growth Pact (SGP).

Fiscal performance in the EU has not fulfilled the expectations of the SGP. Although the rules have had a mitigating impact on debt by incentivising the maintenance of deficits below 3% of GDP, they did not sufficiently encourage the accumulation of fiscal buffers in good times, and did not help to avoid the euro area debt crisis of 2010–2012.

Some of this poor performance was due to lack of implementation of the rules rather than the rules per se. However, it would be wrong to conclude that the rules are fine and all that needs to change is implementation. First, fiscal rules overlook crucial factors that drive debt, such as economic growth and interest rates, making them inefficient in the sense that they may force some countries to over-adjust and others to under-adjust. Second, lack of compliance with the rules is partly a consequence of their design. The SGP lacks a credible enforcement mechanism, making compliance largely voluntary (although fines are possible, they have never been imposed on countries that repeatedly violate the rules). Rules that are viewed as inefficient are more likely to trigger resistance than rules that are better designed. This resistance is likely to be higher today than when the SGP was created, because high debt levels in some countries have made compliance with the rules much more onerous than it used to be at lower debt levels.

Will the European Commission's proposal for reform of the fiscal rules succeed?

In November 2022, the European Commission proposed a reform centred on the idea of replacing mechanical rules with debt reduction requirements established on a case-by-case debt sustainability analysis (DSA) for all countries with debt above 60% of GDP. Countries with higher "debt challenges" (risks) would need to reduce their debts faster. The Commission hopes that tailoring debt reduction to each country's specific situation will improve compliance with the rules.

While the idea has received support from most member states, some members – led by Germany – have vigorously opposed the move towards DSAs, on the grounds that the analyses are sensitive to the growth and interest rate assumptions that they are fed, and hence prone to manipulation. In response, in late April 2023 the Commission published a set of legislative proposals which would maintain the existing rule that countries with deficits above 3% have to reduce them at a minimum rate of 0.5% of GDP per year, and require the debt ratio of countries with debt above 60% to fall, by the end of a 4–7 year adjustment period, below the level at the start of that period. These and other "safeguards" would apply regardless of the outcome of the DSA.

While these rules would likely serve the objective of preventing abuse of the DSA methodology, they come at a cost: imposing a minimum speed of adjustment on all countries with debt above 60% and/or deficits above 3%, regardless of differences in their fundamentals. This could undermine member state ownership of the new system. A better approach would be to tackle potential abuse of discretion at its root, by reducing discretion in the DSA methodology and subjecting the Commission's forecasts to independent scrutiny.

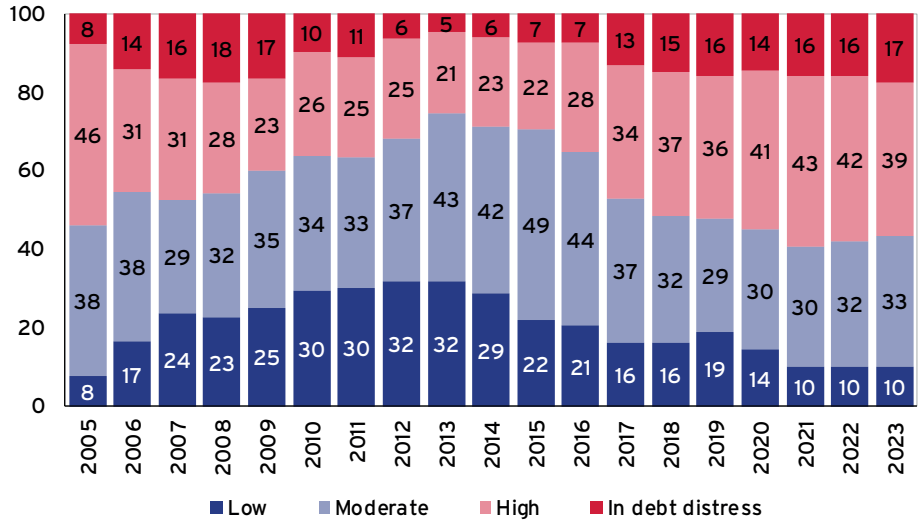
Is the global sovereign debt restructuring regime fit to handle the debt crises prompted by the pandemic and war?

Although sovereign debt pressures in emerging market economies and low-income countries (LICs) have not reached the urgency that prompted the 1980s Latin American debt crisis and the 1997-2005 Highly Indebted Poor Countries Initiative and Multilateral Debt Relief Initiative, debt crisis risks have substantially increased as a result of the pandemic and war. In the case of LICs, this continues a trend towards sharply higher indebtedness that began around 2013 (see Figure 2). Since 2020, several EMEs (Lebanon, Sri Lanka, Suriname) and LICs (Chad, Ethiopia, Ghana, Zambia) have defaulted or requested a debt restructuring, while several others (17% of all LICs) are classified as "in debt distress".

Since the mid-1990s, there has been an informal mechanism for resolving sovereign debt crises involving external creditors case by case, involving an IMF assessment of the country's ability to pay (in the case of LICs, conducted jointly with the World Bank), debt relief from official bilateral creditors coordinated by the Paris Club, take-it-or-leave-it bond exchange offers preceded by negotiations with groups of bond holders, and IMF financial support while a country is seeking to restructure its debts and restore its creditworthiness. An essential condition for the success of this informal mechanism was the willingness of creditors, particularly official creditors organised in the Paris Club, to accept the IMF's assessment of debt relief needs, based on the DSA and the fiscal adjustment assumptions laid out in an IMF-supported programme.

FIGURE 2 **EVOLUTION OF RISK OF DEBT DISTRESS IN LOW-INCOME COUNTRIES**

Percent of PRGT-eligible countries with available debt-sustainability analyses



Note: As of 31 March 2023.

Source: IMF (based on World Bank-IMF debt sustainability framework for low-income countries)

This approach is recently being complicated by two trends. The first is the rise of non-Paris Club countries, particularly China, as the main bilateral creditors for developing economies. These creditors have traditionally restructured on their own, and do not always agree with delegating the assessment of debt relief needs to the IMF. The second trend is the increasing share of multilateral creditors, which normally do not participate in debt relief, in the external debt of low-income countries. The higher this share, the greater the losses that need to be imposed on the remaining creditors. In addition, private finance (particularly bonds) has grown in importance in LICs. Although bonds have been restructured relatively swiftly when they were the main class of credit along with Paris Club debt, they can complicate restructurings when non-Paris Club creditors are also present.

In light of these difficulties, the G20 created a broader official creditor coordination framework in late 2020 – the 'Common Framework'. At the insistence of China, this was limited to LICs. The results have been modest so far. Only four countries have applied for debt relief under the framework, with relief being granted in only one case, and negotiations under the framework have taken much longer than is typical for Paris Club restructurings. Some of these difficulties have been exacerbated by disagreements between China and the G7 countries on the role of multilaterals (both in determining the debt relief envelope and on whether and in what form multilateral development banks should make a contribution in debt restructurings).

These difficulties of resolving debt crises in developing countries imply that prevention becomes even more important. This justifies changes to the architecture of international finance, including promoting non-debt-creating forms of official financial support, debt instruments that automatically adjust debt service in the event of large exogenous shocks (such as climate catastrophes), and debt instruments that encourage debtors to take actions that reduce the vulnerability to such shocks. In addition, new efforts to improve collaboration between China and the G7 are needed.

To sum up, although debt and real interest rates have risen, debt remains sustainable in most countries since the difference between the interest rate and the rate of growth remains small. However, a subset of EU countries will need to undertake significantly more adjustment, over the medium term, than they are currently planning. EU fiscal rules need reform in order to reconcile the sustainability of debt and stabilisation policy while preserving incentives for investment. The reform initiated by the European Commission, which would give country-by-country debt sustainability analysis a central role, could be a big step forward, provided that the key remaining challenge – how to reduce discretion and prevent potential abuse of DSAs – is addressed without returning to mechanical rules. The rise of China and other non-Paris Club creditors and the increase in the share of external debt owed to multilaterals is making crisis resolution in developing countries much harder. Addressing this problem requires expanding non-debt creating financial support to developing countries, bond contracts linked to climate risks and climate actions, and better coordination among official creditors, including China.

CHAPTER 2

Macro times are a-changing: Stabilisation policies after Covid-19 and the war in Ukraine

Kintsugi (金継ぎ, "golden joinery"), also known as *kintsukuroi* (金繕い, "golden repair"), is the Japanese art of repairing broken pottery by mending the areas of breakage with lacquer dusted or mixed with powdered gold, silver, or platinum; the method is similar to the maki-e technique. As a philosophy, it treats breakage and repair as part of the history of an object, rather than something to disguise.[16]

Example *of kintsugi (source: Ruthan Hurwitz)*

Humpty Dumpty sat on a wall,
Humpty Dumpty had a great fall,
All the king's horses and all the king's men,
Couldn't put Humpty together again.
(English nursery rhyme)

2.1 INTRODUCTION

The macroeconomic outlook in advanced countries has changed dramatically and rapidly with the outburst of Covid-19 pandemic and the economic consequences of the war in Ukraine. The challenge of dealing with inflation persistently below target and keeping nominal policy rates near or below zero 'for long' has been replaced by a different set of daunting problems: since 2020, how to avoid a systemic economic collapse at the outburst of the pandemic, supporting both demand and supply; since mid-2021 (when the worst fears about the pandemic had subsided and the vaccination campaign had

16 Source: Wikipedia

significantly progressed), how to address the lasting effect of the pandemic shock and the unintended consequences of the policy response to it in terms of an outburst of inflation that is proving much more persistent than initially anticipated and, looking ahead, financial vulnerability and debt accumulation;[17] and since February 2022, the further stagflationary effects of the Russian invasion of the Ukraine, resulting in an energy and commodity supply crisis, and accelerated deglobalisation.

At the time of writing, there is still considerable uncertainty about how the current *inflation crisis* will be resolved in the foreseeable future. The solution to the *financial fragility and excessive debt* problem is in even more of a state of flux. What is nonetheless already quite clear is that the macroeconomic context in which advanced countries were able to pursue price stability and contain economic fluctuations in the past is no longer there. The economic policy model that has guided the actions of treasuries and central banks ever since the 1980s needs to be carefully reassessed.

This chapter is devoted to reflecting on what has changed, from a macroeconomic perspective, after the sequence of shocks that have recently been hitting our economies. To put this reflection into context, Figures 3 and 4 show the change in policy rates between 2019 and 2022, and the dynamic of public debt since the mid-1990s. The first graph shows the steep rise in policy rates in 2022, as central banks responded (some argue too late)[18] to the surge in inflation. The second graph shows the dynamic of the debt-to-GDP ratio since the mid-1990s in major advanced countries and since the end of the 1990s for the euro area. The figures convey two key features of the current crisis: the steep and ongoing rise in inflation (calling for monetary contraction); and the unprecedented (if late) change in policy rates in 2022 (in particular, a 'brutal' 450 points in the United States), which sent shocks waves through the financial markets and increased borrowing costs for both the private sector and governments. Consider a desirable scenario in which the inflation crisis will be overcome and policy rates will normalise at some point in the not-so-distant future. Even in this rosy scenario for the near term, the high level of debt, the geopolitical and economic consequences of the war in Ukraine, the high uncertainty reflecting the vulnerability of our economy to global health shocks and climate change will remain.

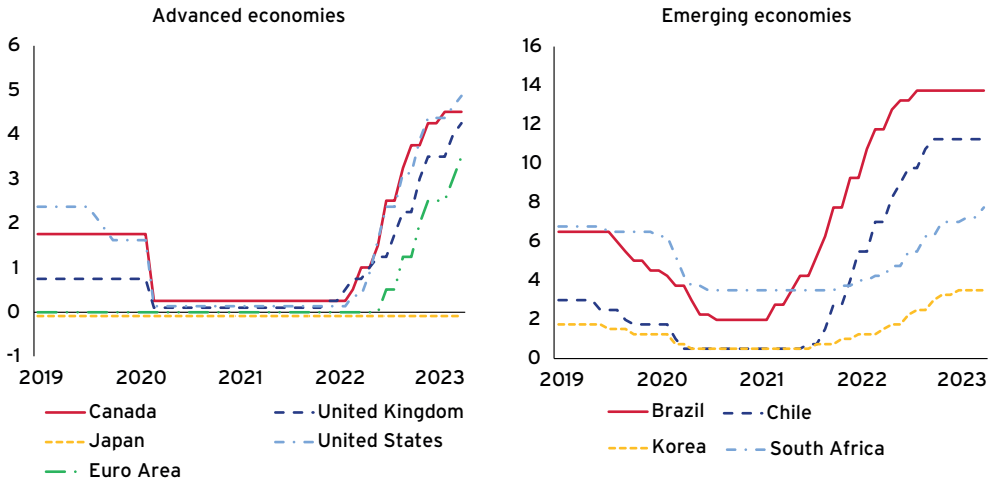
What economic policy model can and should policymakers adopt to maintain full employment, low inflation and fiscal and financial stability in this new context? The model will need to be effective in the face of the emerging challenges of promoting socially inclusive growth, fostering the energy transition, containing the damages from climate change and, last but not least, restoring peace and mending the potentially disruptive geopolitical effects of the war in Ukraine. As we will discuss here, there are

17 See, for example, the discussions in IMF (2022b) and IMF (2023a).
18 See Reis (2022) for a real time assessment of the slow response of monetary policy to the outburst of inflation.

strong arguments in favour of being cautiously conservative – and not abandoning the model that we have constructed and perfected in the last decades. However, the model has displayed some 'cracks' that have fed doubts about its validity and that cannot be ignored.

FIGURE 3 **GLOBAL MONETARY POLICY LIFT-OFF**

Policy rate (%), monthly

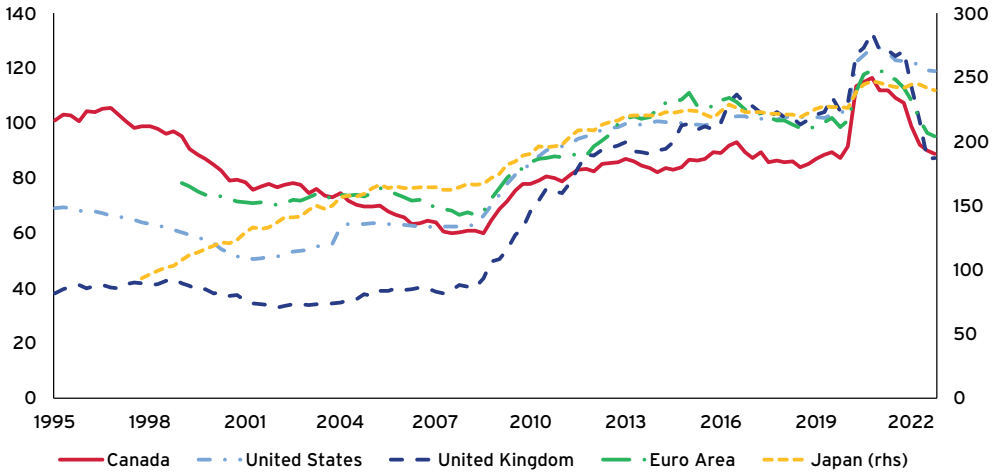


Note: Latest observation: 23 January 2023.

Source: BIS central bank policy rates (www.bis.org/statistics/cbpol.htm).

FIGURE 4 **GLOBAL DEBT LEVELS**

Government debt-to-GDP: Advanced economies



Source: Institute for International Finance.

In the Japanese art of *Kintsugi*, repairing a broken vase and covering the cracks with gold veins reflects its value and significance – it shows its historical endurance. The art of *Kinstugi* conveys the essence of the key message in our report. Appropriately amended and refined, our economic policy model can still provide the foundations for macroeconomic stability. The alternative of dropping the model, in favour of experimenting with so far ill-defined alternatives, is risky. Once broken, unlike *Humpty Dumpty* in the English nursery rhyme, it may still be possible to put the model back together again. But experience warns us that the process will be painful and extremely costly.

The chapter is organised into two parts. The first part takes stock of the debate on the current inflation crisis – inflation is clearly not the only problem our economies face, but since 2022 it has become the focal point of policy efforts to restore stability. Understanding the roots and nature of the burst of inflation in 2022 is clearly an important step towards designing the right cure. The second part draws preliminary lessons for rethinking the economic policy model. This process of rethinking had already started in the pre-Covid-19 period. Many central banks – most notably the Federal Reserve and the ECB – had already engaged in a reconsideration of their policy strategies in light of the risks raised by the effective lower bound (ELB) constraint on their policy rates and the reliance on unconventional balance sheet policies.[19] Central banks and treasuries had already reconsidered the modalities and power of (discretionary) anticyclical fiscal policies, and the need to better target their measures so as to reach (poorer) households and (constrained) firms that can be expected to be more reactive to them. Arguably, these early reflections should not be lost, but they need to be recontextualised in the new macroeconomic and global environment.

2.2 THE POST-COVID-19 INFLATION CRISIS

The first part of this chapter is devoted to an analysis of the macroeconomic developments in advanced countries since 2020. It first discusses the nature of the current inflation crisis in the United States and the euro area from three perspectives: aggregate, sectoral and cross-border (transatlantic). Second, it reconsiders the challenges of disinflation in terms of realigning relative sectoral prices and real wages, rebalancing of fiscal and monetary policy, and reducing vulnerability to tail risk.

2.2.1 From the pandemic to the inflation crisis

We start our analysis by elaborating on three points. First, the inflation crisis arose in a macroeconomic context where the fiscal and monetary stance together (for many reasons) remained persistently expansionary. Second, the expansionary stimulus first pushed goods price inflation well above service and wage inflation, then accommodated a (partial) catch up of the latter. Since goods are tradable, inflation in this sector

19 Board of Governor of the Federal Reserve System (2020); ECB (2021).

quickly became global; over time, the price spillovers to services (largely nontradables) marked the emergence of cross-border differences reflecting country-specific policies and circumstances. Third, the energy crisis after the eruption of the war in the Ukraine widened the divide across regions.

The aggregate perspective: Demand and supply dynamics

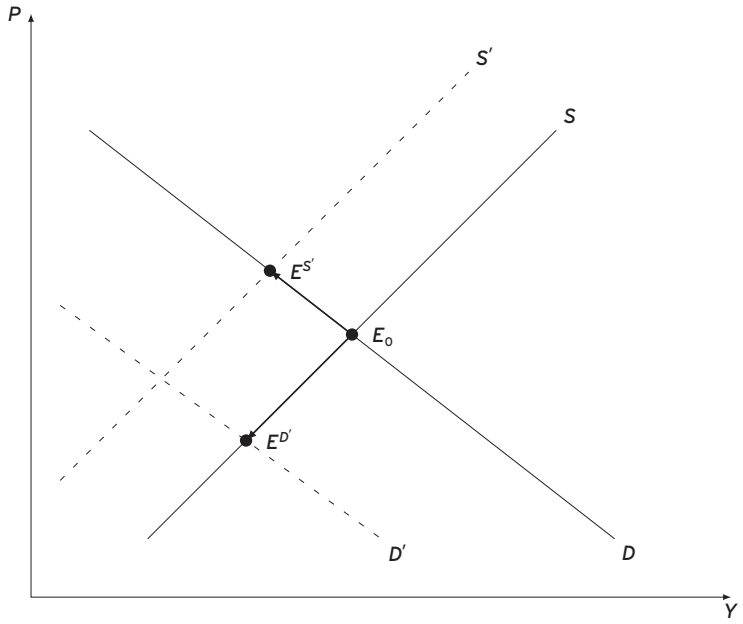
It is customary in economics and policy analysis to draw a distinction between demand and supply shocks. Yet, this distinction is arbitrary – all economic disturbances have both demand and supply effects. This simple fact was dramatically illustrated by the Covid-19 pandemic. At its outburst, in early 2020, the shock caused a rapid and dramatic collapse in demand. The pandemic virtually stopped all forms of social consumption – demand for restaurant, cinemas, house cleaning, and so on quickly disappeared with the first Covid hospitalisations. The drop in demand for many low-wage services forced poorer households to drastically cut their expenditure. In addition, uncertainty about the post-Covid-19 economic prospects motivated firms to put investment projects on hold and caused relatively well-off households to save at unprecedented rates. But the pandemic also had an equally profound impact on supply. The disease and fear of contagion boosted the relocation of labour from workplaces to home, favoured by the diffusion of efficient information and communication technologies (ICT), and disrupted labour services that could not be provided remotely, including the majority of essential services such as health and transportation.[20]

The same is true for the policy response to the shocks. Income transfers sustained aggregate demand – they helped households to maintain reasonable standards of living, containing the collapse in their consumption through the pandemic. These transfers, however, also favoured a reduction in labour supply. Workers resigned and either took time away from work or went into early retirement (also motivated of course by the desire to reduce the risk of contagion).

As suggested by Ascari et al. (2023), to track these effects in an intuitive way, it is useful to rely on a standard aggregate demand (AD) and aggregate supply (AS) model, found in most introductory macroeconomic textbooks. Figure 5 draws AD and AS curves in a graph where the price level is on the y-axis, and output is on the x-axis. Supply is upward sloping: everything else equal, firms are willing to produce more and sell more at higher prices. Demand is downward sloping. Here, the argument is slightly more complex, but essentially rests on the idea that, everything else equal, higher prices reduce the real value of outstanding monetary balances and nominal wealth, causing interest rates to rise and consumption and investment to fall.

20 The demand and supply implications of a pandemic were modelled early on by Eichenbaum et al. (2021) and later by Guerrieri et al. (2023).

FIGURE 5 **AGGREGATE DEMAND AND SUPPLY FROM STANDARD MACROECONOMIC TEXTBOOKS**

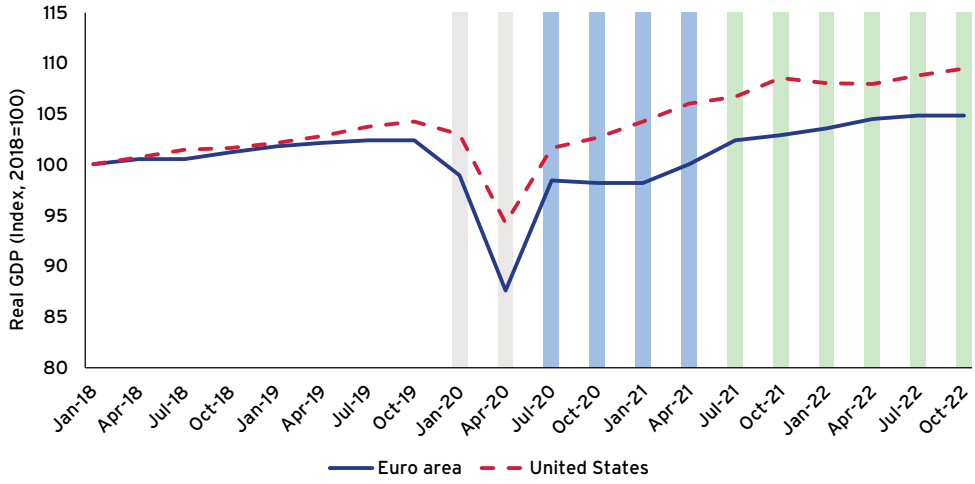


Using this graph, the effects of the pandemic and the related policy response can be illustrated in terms of shifts in both curves. Depending on which shift prevails – demand or supply – in response to shocks and policy impulses, the output and inflationary dynamics of the economy are quite different. When demand movements prevail, output and prices move in the same direction (in the graph, this is illustrated by a shift in AD given AS, which moves the macroeconomy from E_0 to $E^{D'}$). When supply movements prevail, output and prices move in opposite directions (in the graph, this is illustrated by a shift in AS given AD, moving the macroeconomy from E_0 to $E^{S'}$). We will use this simple, textbook economics to track what happened globally since 2020.

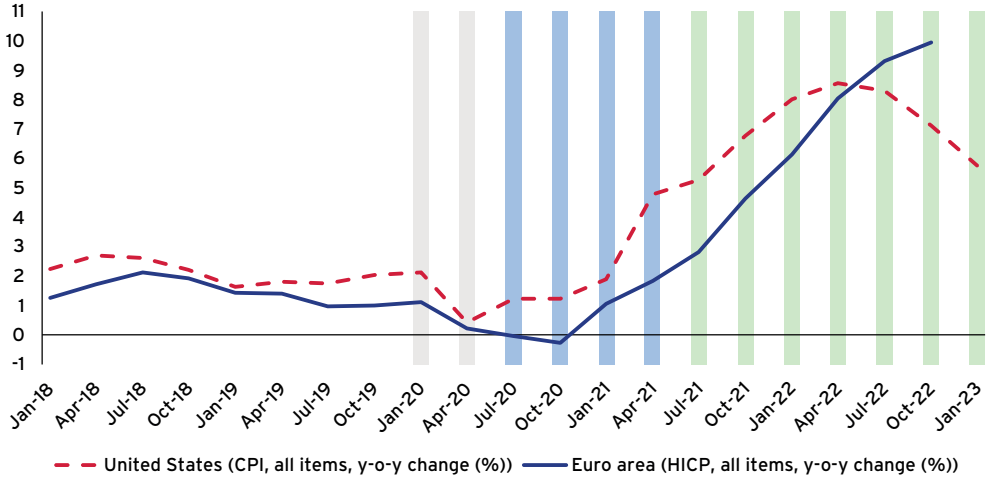
From 2020 onwards, one can distinguish three phases, characterised by distinct relative shifts in demand and supply. The three phases, discussed below, are illustrated by the two panels in Figure 6, which reproduce the graphs in Ascari et al. (2023) plotting GDP (quarter-on-quarter) together with inflation from the beginning of 2018 to mid-2022, for the United States and the euro area.

FIGURE 6 **THE THREE PHASES OF THE INFLATION CRISIS**

a) GDP



b) Inflation



Phase 1 – the impact of the Covid-19 shock – runs over the first two quarters of 2020. The economic dynamics are driven by the large collapse in aggregate demand after the outburst of Covid-19 (AD shifts downwards) and a similarly large collapse in supply (AS shifts upwards). In equilibrium, output contracts amid deflationary pressures. In this phase, economic behaviour is mostly driven by fear and anxiety fed by news about the spread and effects of the virus. Especially early on, a systemic collapse could not be ruled out.[21] Yet, our economies did not experience such a collapse. Global and regional

21 The potential aggregate implications of supply disruptions caused by the pandemic are discussed by Bodenstein et al. (2020).

supply chains held up quite well in spite of the pandemic, thanks partly to the diffusion of ICT. Also, given the large drop demand, the contraction in supply potential, which was certainly experienced at the time, did not matter in practice. Households accumulated a large amount of savings.

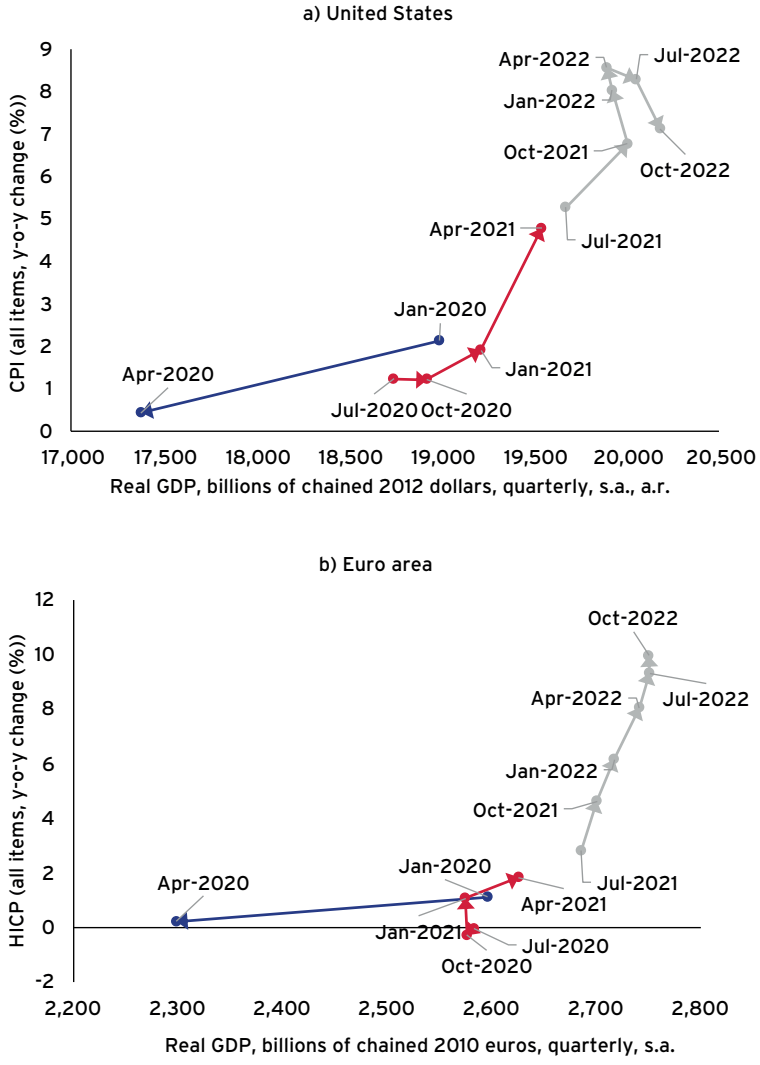
Phase 2 – the rebound upon the reopening of economies – runs from the third quarter of 2020 to the second quarter of 2021. This phase is characterised by the remarkable rebound in demand after the easing of lockdown measures (AD shifts upwards). Progressively relieved of the early fears (with positive news about the availability and effectiveness of vaccines), and counting on continuing income support, households boosted private consumption – catching up at least partially with pre-pandemic levels (in the euro area) or even exceeding them (in the United States). Public spending remained strong. While supply conditions also improved (the AS curve shifts downwards somewhat), the rise in demand brought to light diffuse sectoral supply frictions and constraints. Facing the hike in demand, firms ran down their inventories, but supply could not adjust rapidly enough due to continuing shortages of products/intermediates and labour. Economies experienced labour shortages that varied in intensity across sectors and work typologies, weighing on wage dynamics. So, output rebounded amidst upward price pressures, strongest in the goods sector. It was in this phase that measures of inflation expectations started to rise.[22]

Phase 3 – the 'inflationary crisis' – runs from the second quarter of 2021 to the beginning of 2023, featuring further demand expansion and an outburst of inflation in spite of improving global supply conditions. The outburst of inflation was in part the result of the dynamic build-up of price pressures from the previous phase – persistent high goods inflation spilled over to service inflation as demand rebalanced towards this sector. But it also crucially reflected a macroeconomic stance that has long remained accommodating overall (shifting the AD curve further upwards) and was vastly aggravated by the stagflationary shock from the war in the Ukraine (shifting the supply curve upwards).

Figure 7 offers a different representation of these three phases, plotting inflation against output – a graph familiar from introductory macroeconomics. The two panels in this figure refer to the United States and the euro area, respectively. We use three lines of different colours to trace the dynamic of the economy in the three phases. A key advantage of the figure is that it represents the swing, back and forth, of economic activity in the first two phases, and the upswing running into diffuse supply problems, resulting in an outburst of inflation, characterising the final phase.

22 See, for example, the consumers surveys run by the University of Michigan for the United States and by the ECB.

FIGURE 7 **THE INFLATION CRISIS DRAWS A NON-LINEAR PHILLIPS CURVE**



A tempting interpretation of either panel in the figure is that of a Phillips curve. From an aggregate perspective, conditional on stable and anchored expectations, and abstracting from supply shocks, the curves would trace the effects of excess demand on prices in the two areas, pointing to a strong non-linearity.[23] However, the evidence suggests that inflation expectations over a 3–5-year horizon correlated with headline inflation during the years depicted in the graphs.[24] Moreover, as we discuss below, energy prices hikes

23 Interpreting the figure through the lens of the Phillips curve requires taking a stand on (a) potential output (hence the slack in the economy), (b) expected inflation and (c) supply shocks and other supply shifters. We will discuss these elements at length in the rest of the chapter. On the factors underlying the nonlinearity of the Phillips curve, see Guerrieri et al. (2021) and Benigno and Eggertsson (2023). Note that replacing headline inflation with core inflation would not alter the patterns shown in the figure.

24 See the excellent discussions of the conference version of this chapter by Francesca Monti and Ricardo Reis in the discussions section of this report for a critical assessment of expectations measures.

have clearly raised inflation at any level of slack in the economy. Hence, the increase in prices through 2023 at least in part reflects anticipation of above-target inflation for a few years as well as supply shocks.[25] Yet, all things considered, a key takeaway from the figure is that – arguably for good reasons – the inflationary impulses built up in Phase 2 were *accommodated* by an overall expansionary macroeconomic stance (current and prospective) in Phase 3.

The sectoral perspective: Inflation and relative price misalignment

Using the aggregate AD and AS curves is useful as a descriptive account of the dynamics of inflation, as this resulted from shocks (and their propagation across sectors, time and borders) and policies that moved the two schedules. To understand the drivers of these dynamics and explore the underlying forces, however, we need to dig deeper.

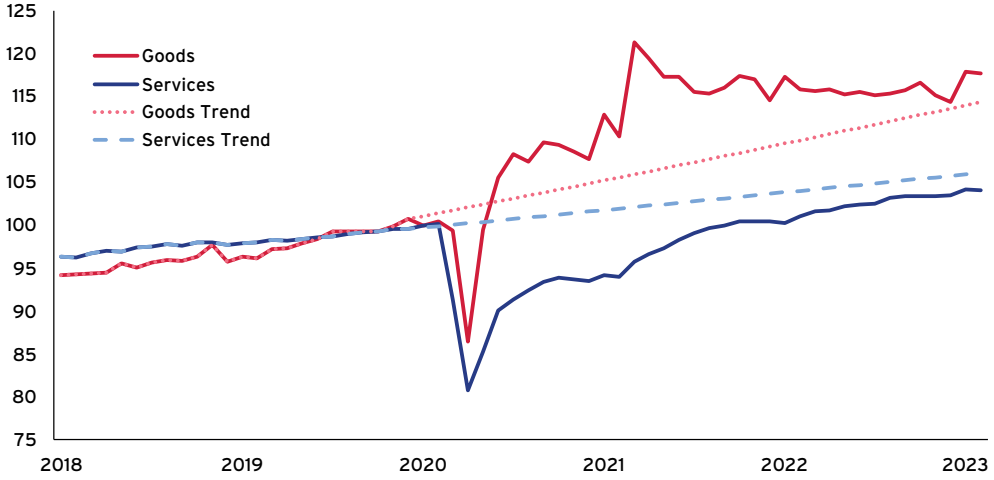
A first important observation is that the three phases in Figure 7 are not independent of each other – each phase sets in motion economic forces that shape the subsequent one. Most importantly, each phase features specific disturbances and imbalances, which, from the pandemic onwards, generated atypical developments in the goods and labour markets. These developments are crucial to understanding the nature of the 2022 inflation crisis, and the trade-offs faced by policymakers in addressing it.

Arguably the most striking effect of the Covid-19 pandemic was the dramatic shift in the composition of consumption baskets away from services into goods, especially durable goods. For the United States, this is shown by Figure 8. Working from home and facing the risk of contagion from most forms of social consumption, households exploited any 'substitutability' between goods and services (for example, by investing in home cinema equipment and subscribing to online streaming platforms to replace nights at the cinema). Especially in the United States, investment in construction added to the demand for goods, driven by a desire to relocate away from city centres to the suburbs.

The shift in the composition of demand had at least three highly consequential effects. First, the cyclical conditions in the goods and service sectors diverged. Against excess demand in the goods sector, there was excess supply in the service sector. The goods sector added to labour market tightness: as firms looked for workers to satisfy the booming demand, vacancies boomed. The service sectors added to unemployment. As a result, measures of the output gap, averaging out the two sectors, remained contained – ceasing to be a reliable indicator of market tightness and a significant predictor of inflationary pressure.

25 According to the Michigan Survey, in the United States inflation expectations at one-year and five-year horizons peaked around the end of the first quarter of 2022. Inflation expectations peaked at 5.5% (one year ahead) and somewhat above 3% (five years ahead). The corresponding peak in Europe occurred later during the year, around October. In the euro area, median (mean) inflation expectations peaked at around 5% (8%) one year ahead, and around 3% (5%) five years ahead in October 2022. Measures of inflation expectations obtained from consumer surveys moved much more than market-based measures.

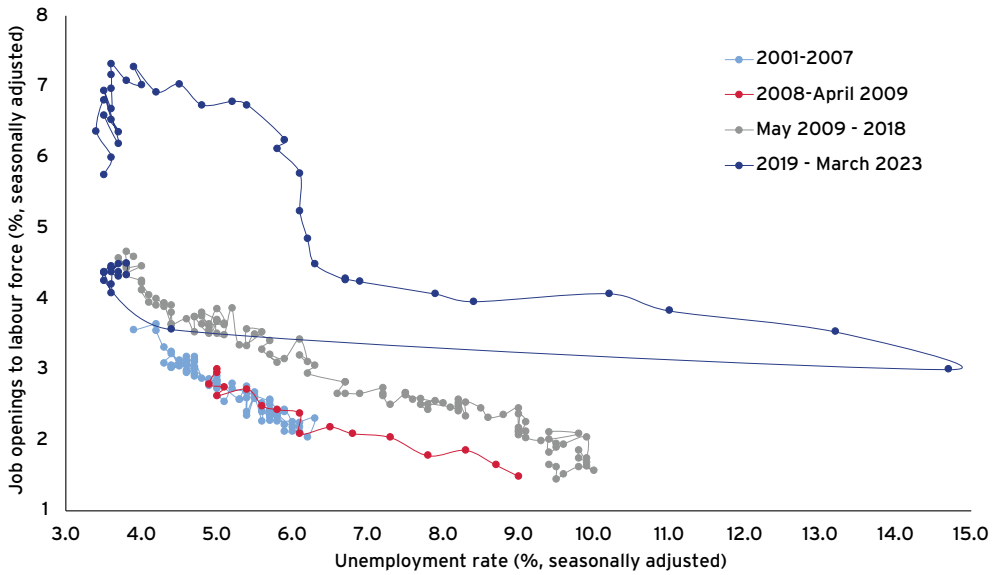
FIGURE 8 **REAL PERSONAL CONSUMPTION EXPENDITURE IN THE UNITED STATES**



Note: Index: January 2020=100.

Second, vis-à-vis the aggregate picture of a demand shift away from services (or more in general, from services and goods involving social proximity) into goods, the shock had highly heterogenous effects, specific to markets, location and goods characteristics. A disaggregated view of the redirection of demand unveils persistent granular differences in the markets for goods, services and, crucially, labour. Since nominal wages tend to be rigid downwards and relatively flexible upwards, very granularly, costs have been rising wherever the labour market has been tight, but have not fallen where the labour market has been slack. This created a fundamental bias driving up production costs. Slowly but steadily in the initial phases, prices and costs started to drift up and accelerated when, as argued above, it became clear that the overall macro stance would remain accommodative for long in the post-Covid-19 period. Hence, while granular differences in market conditions persisted, indicators of market tightness became very strong in the aggregate. Figure 9 plots the ratio of job openings to the size of the labour force against unemployment rates for the United States (monthly data) in the period between 2001 and March 2023 – a version of the Beveridge curve. The anomalous outward shift of this curve with the outbreak of the pandemic is apparent. Labour market tightness has been falling since March 2022, but twelve months later its level remains high.

FIGURE 9 **LABOUR MARKET TIGHTNESS IN THE UNITED STATES, 2001-2023**

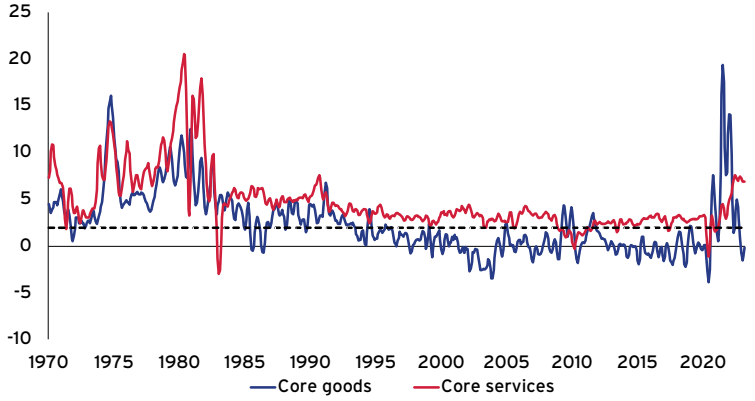


Third, the relative inflation of goods and services, which for many years had been close to zero or negative, shot up, with a positive gap reaching around 15 percentage points in the United States and the euro area by mid-2021 and mid-2022, respectively. The three panels in Figure 10 show inflation in the goods and the service sectors in the United States (using a long time series, starting from the 1970s) and in the euro area (for the euro area, the figure distinguishes between centre and periphery countries). The graphs suggest that the hike in sectoral inflation was a global phenomenon, although its intensity was particularly strong in the United States. The long time series for this country also suggests that the phenomenon was specific to the pandemic. Prior to the Covid-19 crisis, reversals in the relative inflation of goods and services were very rare, small and short-lived.

It is worth reflecting on the global implications of the sharp rise in the demand for goods at the outbreak of the Covid-19 pandemic, supported by strong fiscal measures at a time when global production chain disruptions and labour market dynamics were constraining supply in the goods sector. As opposed to services, goods are to a large extent internationally tradable; hence the excess demand for goods at the national level transmitted across borders. In other words, domestic inflationary impulses in the goods sectors were systematically transmitted at the global level. As explained above, prices initially rose asymmetrically in specific product markets where the mismatch between demand and supply was more pronounced. Moreover, the production of goods is relatively more intensive in energy and commodities. The switch in sectoral demand weighed on the price development in these markets, partly explaining the rise already in 2021. So, goods inflation soon started to drive production costs up across all products and markets, via rising costs of intermediate inputs and rising prices for energy and commodities. The strong demand in the goods market produced cost-push inflation across the board.

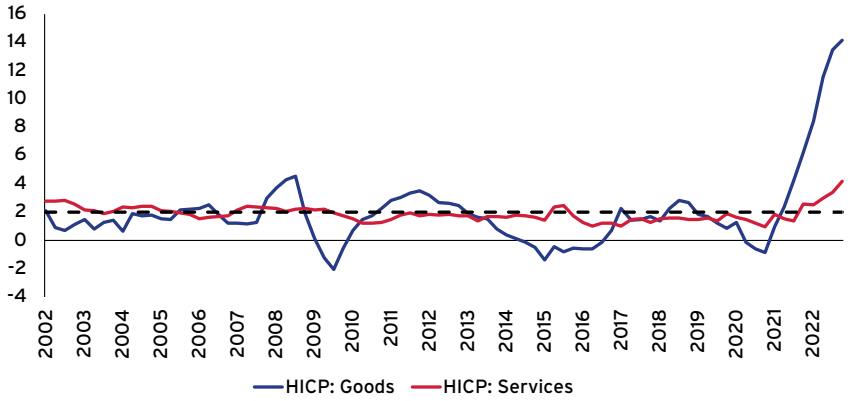
FIGURE 10 **GOODS VERSUS SERVICES INFLATION (PERCENT YEAR-ON-YEAR CHANGE)**

a) United States



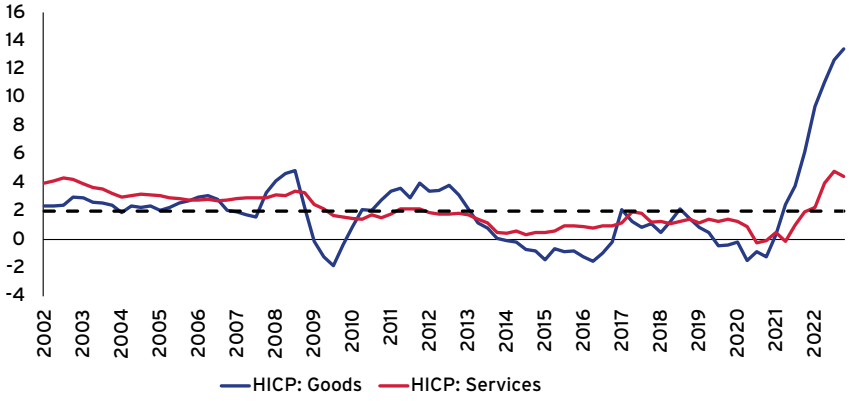
Note: Monthly data; latest observation: 2022m12. Dashed line shows inflation target.

b) Euro area: Core countries



Note: Core countries refer to Austria, Belgium, Germany, Finland, Netherlands, France. Quarterly data. Latest data point: 2022Q3. Dashed line shows inflation target.

c) Euro area: Periphery countries



Note: Periphery countries refer to Cyprus, Greece, Spain, Ireland, Italy, Portugal. Quarterly data. Latest data point: 2022Q3. Dashed line shows inflation target.

In time, price pressures spilled over to the service sector and core inflation, reflecting both higher production costs (of energy and intermediates) and a rebalancing of demand from goods to services. Crucially, the inflation spillovers occurred in the context of a macroeconomic stance that remained largely expansionary, in support of employment and the sectoral reallocation of demand and supply.

Services are non-tradable internationally, hence their price dynamic is more sensitive than goods to local macroeconomic conditions (such as the labour market) and the stance of national fiscal and monetary policy. So, while by mid-2022 the inflation crisis reflected a strong global component, over time notable differences emerged across countries.[26]

The international perspective: The energy crisis and the terms-of-trade divide between the United States and the euro area

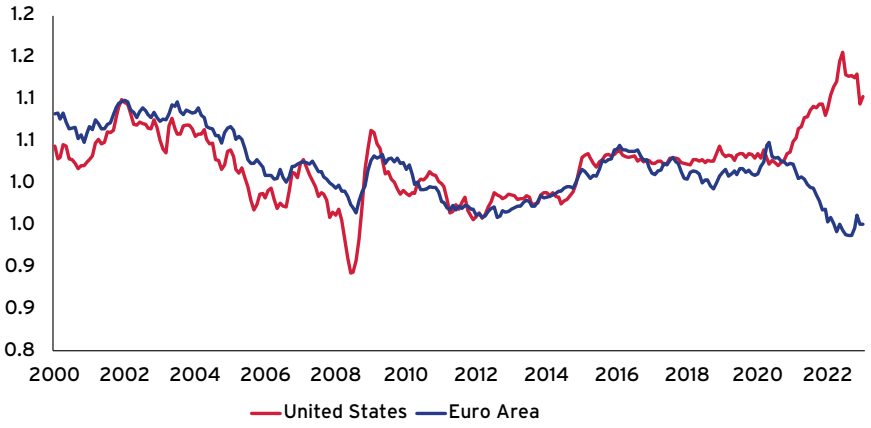
The energy crisis following the Russian invasion of Ukraine added to the divide across regions. Throughout 2022, Europe suffered a pronounced deterioration of its terms of trade, implying a reduction in incomes of its residents and the competitiveness of its industries. The effects of the energy crisis in the United States, which is much less dependent on imports of energy, were much milder. The country as able to keep implementing its deflationary policy in a much more favourable cyclical environment.

Figure 11 illustrates the dramatic divergence in the terms of trade between the United States and the euro area from 2021 onwards. The recent development stands in contrast to the past, when terms of trade in the two areas tracked each other closely (with the notable exception of the years of the global financial crisis). Part of the recent divergence in the figure is driven by the strength of the dollar, that is, it is endogenous to divergent macroeconomic policies.

Monetary policy fights inflation not only by raising rates and keeping 'financial conditions' sufficiently tight, but also by letting the currency appreciate. In the second half of 2022, the anti-inflationary stance of the Federal Reserve worked especially well on the second count. In the United States, imported inflation fell rapidly from its peak in 2022. In part, this was by virtue of improvements in global production networks during the post-Covid-19 reopening of the economy, which made supply bottlenecks less likely. A large role, however, was played by a strong dollar (we will return to a discussion of the exchange rate below; see Figure 15). Figure 12, updated from Corsetti and Trezzi (2023), compares imported (manufacturing) inflation in the United States and Europe from 2018 to the beginning of 2023. The difference across the two lines is a function of the relative contribution of the exchange rate to inflation in the two areas.

26 While inflation rose somewhat even in Japan, at the other extreme Swiss inflation de facto remained at target. This low Swiss inflation is typically explained in terms of (i) less exposure to current energy crisis because of its energy mix (mostly hydro and nuclear power); (ii) the high share of non-energy administered prices; (iii) muted wage pressure; and (iv) a strong Swiss franc, containing imported inflation (e.g., Mandruzzato, 2022).

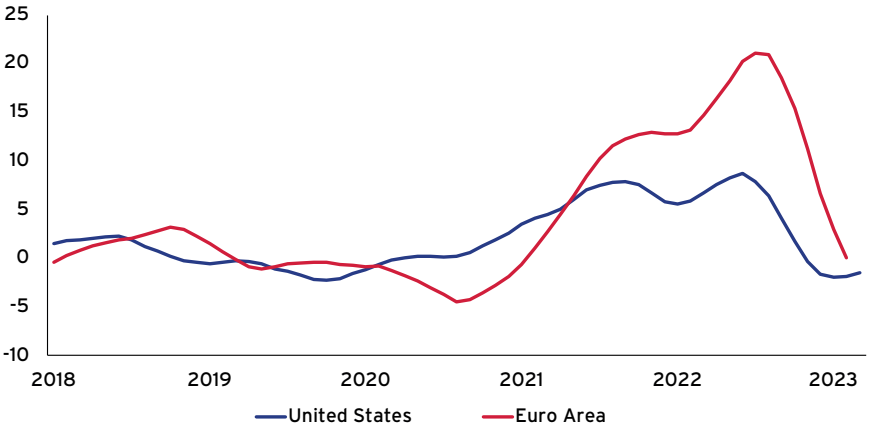
FIGURE 11 **TERMS OF TRADE IN THE UNITED STATES AND THE EURO AREA**



Note: Monthly data. Latest observation: 2022m11.

Source: World Trade Monitor from the CPB Netherlands Bureau for Economic Policy Analysis.

FIGURE 12 **IMPORT PRICES INFLATION EXCLUDING PETROLEUM PRODUCTS (PERCENT)**



Notes: Imported inflation excludes petroleum products and is calculated as a 6-month over 6-month at annual rate. The levels of the series are expressed in US dollars and euros, respectively. The 6-month/60-month changes are calculated following the BEA national accounts procedure.

Source: The source of the raw data is BLS for the US and Eurostat for the euro area.

Already at the end of 2022, US core inflation measures (excluding rents) were close to target. Long-term rates appeared to have peaked already. Market-based expectations of inflation remained anchored. Perhaps surprisingly, real economic activity was holding up quite well despite the disinflationary stance of the Federal Reserve. Other regions in the world, especially Europe, were not as far along in the disinflation process, but were progressing.

2.2.2 Challenges to disinflation policy

While declining *headline* inflation in most countries around the beginning of 2023 was good news, variability and uncertainty has remained high. Headline inflation may be coming down, but underlying inflation, capturing the persistent component net of volatile elements, has remained stubbornly above target. The disinflation process could hardly be expected to be as smooth as many had anticipated at the end of 2022. Below, we discuss three issues that are bound to weigh on the design and assessment of monetary policy.

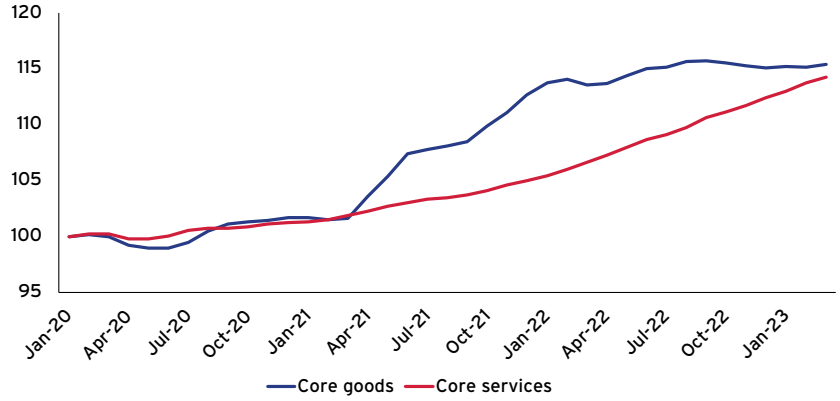
The dynamic correction of misalignment in sectoral prices and wages/profits
The cumulative effect of the inflation crisis on both the relative prices of goods and services and the price level has been substantial in most advanced countries. As shown in Figure 13, by the end of 2022 the prices of core goods remained appreciated relative to the prices of core services in the euro area, while in the aggregate, the wedge in relative prices has become much smaller in the United States – another piece of evidence that the disinflation process is evolving at a different pace across the two regions.

In the 24-month period from January 2020 to December 2022, the overall price level grew by about 15% on both sides of the Atlantic. Because of plausible asymmetries in the cost of adjusting nominal prices down rather than up, there is clearly little or no appetite for a monetary contraction that would undo this sharp rise in the price level and realign sectoral prices by engineering a period of negative inflation. Rather, the key policy problem is how to favour a smooth realignment of prices across sectors and manage their distributional implications across income classes as well as between labour and capital, at minimal costs to society and the economy.

Wage/profit and relative price adjustments cannot occur at once and are likely to take place through rounds of adjustments in wages and prices. These adjustments may well occur alongside a rapid convergence of inflation to target. One could envision a scenario in which core inflation *temporarily* rises for some quarters, while inflation expectations in the medium-to-long run remain well anchored. Note that in this most friendly scenario, the adjustment dynamics posit a challenge to policymakers: short-run wage and price dynamics should not be mistaken for a harbinger of further excessive inflation – they would not require monetary contraction in addition to what is already deployed to anchor inflation expectations. In practice, uncertainty over the required time for the process to take place and for the equilibrium level of real wages and markups to be reached will blur and complicate the assessment.

FIGURE 13 **PRICE LEVEL**

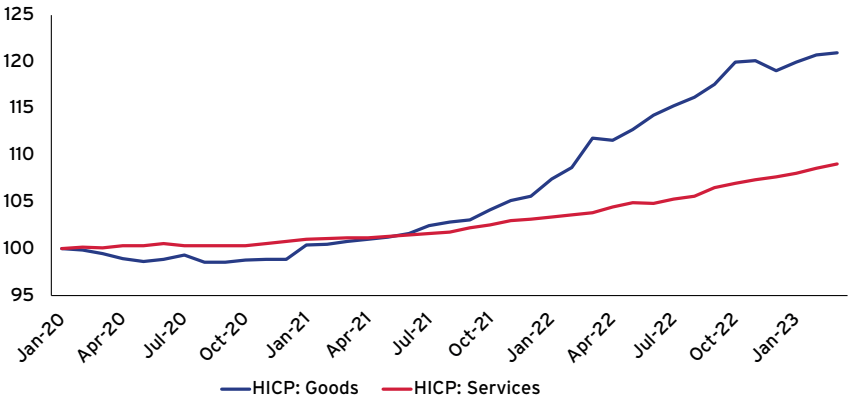
a) United States



Note: Index: 2020m1 = 100.

Source: Core goods: FRED; CPI Commodities less food and energy commodities, seasonal adjusted; core services: FRED; CPI services less energy services, seasonal adjusted.

b) Euro area

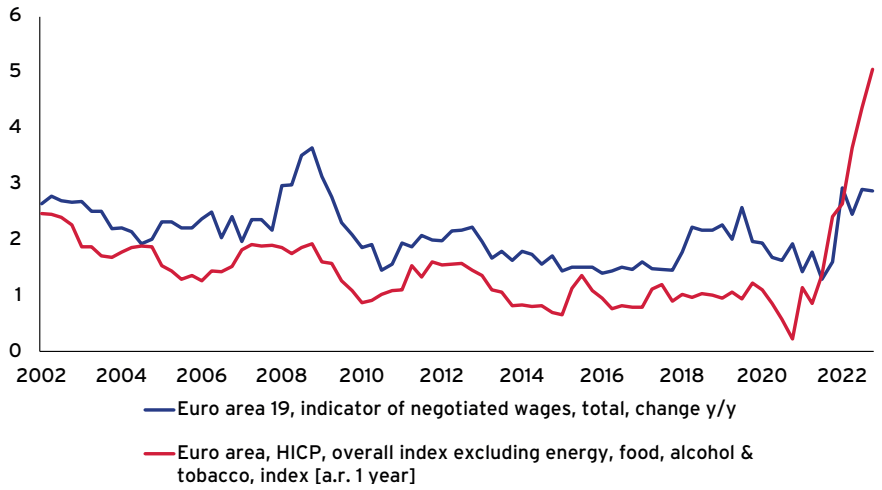


Note: Index: 2020m1 = 100.

Source: HICP goods: ECB Statistical Data Warehouse; HICP Goods, seasonal adjusted; HICP services: ECB Statistical Data Warehouse; HICP Services, seasonal adjusted.

Vis-à-vis the magnitude of the recent price rise, nominal wages had already started to rise in 2022 (see Figure 14, showing the evolution of negotiated wages in the euro area), but further adjustment is potentially in the cards. It would be unreasonable to expect workers not to react with demand for higher nominal compensation. One could argue that a wage adjustment is desirable also from the perspective of economic stabilisation. An adjustment in nominal wages would rebalance income from households with low marginal propensity to spend to those with high marginal propensity to spend. The same could be said for pensions.

FIGURE 14 **GROWTH OF NEGOTIATED NOMINAL WAGES AND HICP IN THE EURO AREA, 2002-2022**



Along the disinflation process, the emergence of disagreement and distributional conflicts can indeed create substantial risk for the conduct of monetary policy. Key insight is provided by the macroeconomic exercise recently modelled in Lorenzoni and Werning (2023a). These authors envision an economy hit by a negative (hence, inflationary) supply shock to an input in production such as energy, scarcely substitutable in the short run. From an aggregate perspective, this shock is akin to a drop in aggregate productivity, hence it implies a reduction in incomes and real wages. The authors also reasonably posit that the input (energy) price is much more flexible than goods prices and that the latter are more flexible than wages. The adjustment of goods prices and wages is not synchronised but staggered over time. Hence, as consequence of the shock, inflation is first concentrated on energy, then spills over to goods and finally to wages, and the adjustment – qualitatively, close to the pattern we have seen in the data since 2020 – takes time.

The key result is that, given the differences in the degree of stickiness of prices and wages (and the fact that prices and wages are adjusted at different times), any unresolved disagreement over distribution will cause the economy to converge to a level of real wages that is a weighted average of workers' and firms' demand. But convergence comes at the cost of positive average inflation – required to 'correct', period after period, the 'excess' demand for nominal wages from workers at the time of renewing their contract. Depending on the size of the distributional conflict (i.e., on the distance between the real wages desired by workers and firms), this wage–price spiral can easily raise inflation well above the central bank's target.[27]

27 See Lorenzoni and Werning (2023b) for a generalisation of the view of inflation as a by-product of a distributional conflict. The analysis of economic dynamics and the design of efficient stabilisation policies when both prices and wages are sticky have been the subject of a large body of literature; see, for example, Woodford 2003 for a discussion of the main theoretical principles.

How should monetary policy be conducted in this context? Lorenzoni and Werning (2023a) construct examples suggesting that it may be efficient for policymakers to accommodate inflation, exploiting the fact that inflation speeds up the process of adjustment in real wages at lower (output) costs relative to forcing wage deflation. To be clear, policymakers can in principle force the economy to operate at whatever inflation target they choose. However, as long as the distributional conflict is unresolved, pursuing a low target creates pressure for a downward adjustment in nominal wages (real wages would still converge to an average of workers' and firms' demand). This would be quite costly since nominal wages are stickier and more challenging to adjust (downwards) than adjusting (upwards) goods prices.[28]

In the 1970s, the wage–price spiral was activated by strong and belligerent unions confronting firms and the government, in a world that was still operating under financial repression (in the form of regulation of financial intermediaries and markets and capital controls, possibly reducing some of the potential disruptive effects of inflation). The costs and benefits of inflation are different today – our societies may be much less tolerant to it. Hence, while unionisation may be on the rise in some areas of the world, it is unlikely that we will experience a re-run of the 1970s. By no means, however, should one conclude that disagreement about distribution would create no macroeconomic risk.

An unpleasant fiscal–monetary arithmetic

Conflicts drive political and electoral outcomes, and hence fiscal policy. In the short to the medium run, they are likely to motivate (temporary or permanent) tax and transfer measures. In response to the energy price peaks in 2022, for instance, a number of governments have subsidised energy consumption for households, containing the scope for wage demand. Indirectly, energy-related subsidies to the industry have the same effects – guaranteeing price competitiveness without reducing other (i.e., labour) costs. Moreover, in some countries, the unions and associations of retirees are politically well represented (if anything because of the demographic and electoral weight of the old), so there will be the pressure on the budget for raising pensions.

Fiscal policy remained expansionary in 2022 on both sides of the Atlantic. In the euro area in particular, the expansionary fiscal stance did not abate after the worst recessionary scenarios associated with the disruptive effects of the war in Ukraine failed to materialise. Labour market indicators all point to extreme tightness – in many euro area countries, participation rates and vacancy ratios are at historical peaks.

28 Remarkably, Lorenzoni and Werning (2023a) also show the logic and dynamics of their wage–price spiral model are relevant not only in economies hit by a stagflationary shock to a productive input such as energy (a scenario in line with the recent development in the euro area), but also in economies hit by demand shocks. In other words, the analysis also provides insight into the experience of countries like the United States, which is much less exposed to the terms-of-trade shock and the energy price crisis hitting Europe but may have embarked on a programme of sustained fiscal expansion. The analysis is qualitatively similar when the economy is hit by a positive demand shock, rather than by a negative shock to the supply of an essential production input. This is because the key effect of excess demand is to make the supply of the input scarce in relative terms.

In the short run, a fiscal stance that remains essentially expansionary complicates the task of the monetary authorities. The need to rebalance aggregate demand offsetting the fiscal pressure may require overly contractionary monetary policy – with the perverse effect of exacerbating distributional issues motivating further spending and tax cuts.

The problem is complex in the euro area, not only because of the differences in the state of public finances and the macro stance across borders but also because, in the aggregate, private spending has not reverted to the pre-Covid-19 trend. The contribution of fiscal spending (G) to aggregate demand (C+G+I) has been comparably more important for supporting economic activity in the euro area than in the United States. Because of the imbalance between private and public demand, a fiscal adjustment dictated by either short-run considerations (disinflation) or long-run concern (debt sustainability with high interest rates) may be quite consequential if not matched by some realignment of private spending. Experience shows that recession may kick in quite rapidly, with unemployment going from a very low to a very high level in a matter of months.

Looking ahead, with a high level of debt, 'fiscal space' remains limited overall. To the extent that disagreement about distribution will end up adding to deficits and the stock of public liabilities, and prevent debt reduction, there could be consequences for price and macroeconomic stability via a different channel than the classical wage–price spiral. An unstable fiscal outlook may destabilise inflation expectations.

The tail risk of financial instability

Financial markets and intermediaries faced an abrupt change in the monetary stance during 2022: an unprecedented hike of 450 basis points in policy rates in the United States, coupled with the prospective withdrawal of liquidity with quantitative tightening. For many months, however, the financial outlook appeared to be remarkably stable. This perception of stability changed abruptly in March 2023.

No doubt, during 2022 financial intermediaries experienced significant losses in their bond portfolios, correlated across institutions of all sizes – including small ones not under the radar of the supervisory and regulatory bodies. The tail risk became apparent with the failure of Silicon Valley Bank and Credit Suisse.

Since the global financial crisis, bank stress tests have become a key instrument in policymaking. Routinely conducted, they are meant to provide the supervisor/regulator with a detailed map of potential risks to financial stability, and, implicitly, the monetary authority with an assessment of the policy space for intervention through conventional measures. Armed with well-conducted stress test results, supervisory and regulation bodies can intervene on specific banks and market segments in a pre-emptive manner; monetary policymakers can manage the trade-offs between macro and financial stability risks. The March 2023 events cast a shadow on the reliability of stress tests in relation to their basic functions.

Financial fragility weighs both on monetary policy and the budget/fiscal outlook, reducing the fiscal space and exacerbating the distribution conflict discussed above. In the euro area, trade-offs are further complicated by asymmetries in the fiscal and debt outlook across countries, which may lead to disruptive fragmentation and instability in the currency union.

The financial turmoil in March 2023 may or may not lead central banks to be much more cautious in delivery raise rates. But at this point, caution would hardly rule out financial and output risk. If lower rates lead markets to revise their expectations about future inflation, unanchored expectations cannot but result in higher long-term yields, with similar effects on current bond prices to a hike in policy rates. The risks created by inflation for financial stability would hardly abate. In a different, equally disruptive scenario, further hikes in policy rates may trigger a financial crisis, dragging down demand (and possibly inflation) and producing large employment costs.

These risks cast a shadow over the soft-landing scenario that many observers hoped for at the end of 2022. As already mentioned, despite successive rate hikes, various measures of core inflation remain quite high at the time of writing and the labour market remains extremely tight, with vacancy ratios often at all-time highs across borders and sectors. With fiscal policy still on an expansionary path, monetary authorities will have to test the space for any required further contraction step by step.

In conclusion, it is worth raising an issue that is likely to weigh on future discussion of the post-Covid-19 inflation crisis. Could it have been possible to sail through the pandemic crisis avoiding a collapse in economic activity within and across borders, while at the same time preserving price stability throughout? Can we consider some inflationary adjustment as a physiological and indeed desirable implication of a successful stabilisation policy? Or, to put it in another way, what would be an efficient benchmark against which to assess recent policies? One may imagine future generations of historians and economists becoming quite intrigued by these questions.

2.3 DO WE NEED A NEW ECONOMIC POLICY MODEL?

The inflation crisis has revived the debate on the economic, political and logical foundations of a 'model' we can rely upon to integrate monetary, fiscal and financial policies in a harmonious and effective way so as to deliver price and macroeconomic stability. The model that shapes much of our view today was progressively developed from the 'conquest of inflation' in the 1980s through its consensus formulation in the Great Moderation. By and large, it survived critical reviews after the global financial crisis. It now needs to be reassessed in the light of current developments.

In this process, the model has already been amended and augmented. But its logical core has remained intact, mandating institutional independence and strong separation of monetary, fiscal and regulatory policy. Without being blind to the interactions of these different policies, the model explicitly rules out coordination among them as counterproductive for their credibility and hence their effectiveness.

The question facing policymakers across the world is whether, after the sequence of large shocks that have hit the global economy since the global financial crisis, this model – appropriately amended – still provides a reliable compass for economic stabilisation, or whether some more change is desirable and/or unavoidable. Recent theory, for instance, has questioned the conventional distinction between monetary and fiscal policy,[29] and the recent experiences may indeed suggest that in practice this distinction is not as sharp as we thought – that there is indeed a large overlap (see, for example, the distributional effects of quantitative easing). Should stabilisation policy in the future, therefore, recognise the need to redefine the boundaries across policies and pursue closer coordination and engagement across decision-making institutions within and across borders? If so, what kind of coordination will be most productive?

This second part of the chapter starts with a review of the model, followed by a reconsideration of the debates in the aftermath of the global financial crisis and an assessment of the challenges in the aftermath of the pandemic and from the ongoing war.

2.3.1 The model of the Great Moderation

It is worth spelling out the logical construction of the economic policy model in its consensus formulation during the Great Moderation. In a nutshell, by targeting low inflation in the medium term, monetary policy *can* stabilise economic activity in most circumstances. There is no need for discretionary fiscal measures; fiscal policy's contribution to anti-cyclical stabilisation is best left to the working of automatic stabilisers such as unemployment insurance and progressive taxation. Freed from the need to fine-tune policies to support aggregate demand, fiscal authorities should then focus on delivering public goods, pursuing redistributive goals and ensuring a sustainable fiscal outlook. The circle is squared by regulation of financial, energy and other markets, in charge of promoting competition and addressing issues in the smooth working of these markets.

Given the separation of each policy in terms of objectives and instruments, monetary and regulation policies are best implemented by independent decision-making institutions, with clear mandates. Coordination of fiscal and monetary or regulatory authorities is not desirable, as it tends to confound responsibilities and may lead to misuse of instruments (e.g., monetary financing of deficits). In other words, coordination erodes the credibility

29 See, for example, Sims (2016).

of the objectives and thus the effectiveness of the policies pursued by each authority. As discussed in the following section of this chapter, the aversion to coordination also extends to cross-border policies. 'Keeping one's house in order' is seen as the most efficient way for countries to contribute to global stability and welfare.

A key merit of the model is to clarify that macroeconomic and price stability is a dynamic goal: low inflation and a high level of economic activity today crucially depend on economic agents' expectations about the future. The need to 'anchor expectations' places a strict joint requirement on monetary and budget policy. Central banks must pursue their mandate of price stability in the medium and long run. Fiscal authorities must guarantee debt sustainability, adjusting their policies consistently with the inflation objectives of the central bank. In practice, the government must raise the structural primary surplus credibly and with sufficient intensity, in response to any rise in the stock of debt. In economic jargon,[30] stability can only be ensured by the combination of an 'active' monetary policy – setting the growth of nominal prices – and a 'passive' fiscal policy – setting the path of deficits and debt accumulation in real terms (i.e., taking the growth of nominal prices as given). In the background of this, it is up to regulatory policy to reduce risks of financial instability that could compromise macroeconomic and financial stability.

The logical construction of the model has a few critical weaknesses nonetheless, which have come into play in the experience of advanced countries since the global financial crisis. First, to the extent that monetary policy ensures a low-inflation environment, nominal interest rates are low on average, leaving little room for expansionary cuts. Monetary policy is therefore subject to an 'effective lower bound constraint' on policy rates that may prevent monetary authorities from delivering the required countercyclical stimulus. Second, the accumulation of high public and private debt exposes independent monetary and regulatory authorities to situations in which political and social pressure create strong incentives to deviate from their primary mandates. On the one hand, when government debt is high, monetary and regulatory authorities – even if formally independent – may be pressured to act in favour of budget sustainability. Monetary authorities may be reluctant to raise rates, for example, keeping them too low for too long. This issue – commonly referred to as 'fiscal dominance' – may be especially relevant when a high-debt economy experiences inflationary shocks, requiring a credible (and timely) monetary response. On the other hand, high private debt, high leverage of financial intermediaries and a high level of interconnectedness in financial markets (especially in conjunction with high government debt) create systemic vulnerability to liquidity and solvency crises. The need to contain the risk of these crises, stemming them at their outset, may also weigh excessively on the conduct of monetary and fiscal authorities. This is commonly referred to as 'financial dominance'.

30 Leeper (1991).

As the implications of these cracks has become progressively more relevant since the global financial crisis, the model has already undergone some significant institutional reforms. In some countries, supervisory, regulatory and resolution powers in the banking sector are no longer in the hands of separate institutions, but have been transferred to bodies operating under the roof of central banks. Central banks have expanded the scope and scale of their unconventional policies, crossing paths with fiscal policy. Macroprudential considerations play a larger role in the design of regulatory measures. Note that all these initiatives respond to the need to manage interactions of different policies.

2.3.2 Rethinking the scope for and limits of fiscal and monetary interactions

From the global financial crisis on, the model of policy interactions has developed in two key dimensions: the rediscovery and reformulation of the policy mix; and the recognition of the importance of the central bank's monetary backstop in the government bond markets. These are discussed below in turn.

The rediscovery of the 'policy mix'

When conventional monetary policy runs into the constraint of the effective lower bound on policy rates, effective stabilisation requires fiscal policy to kick in to deliver a sufficiently expansionary macroeconomic stance. The underlying model was put forward a long time ago, in the classical theory of economic policy, with the formulation of the theory of the 'policy mix'. Jim Tobin illustrated the mechanism with the image of the 'funnel'. Stimulus originates from two taps – M (for 'monetary') and F (for fiscal) – flowing into the funnel from the top; the amount of nominal spending that flows into the economy (from the bottom of the funnel) is determined by the joint contribution of M and F. The same aggregate stimulus (i.e., nominal demand) can be generated via loose money and a tight budget, or vice versa. Coming out of the funnel, the flow, so to speak, splashes over aggregate supply, which determines how much of it goes into prices and inflation and how much into economic activity.[31] We have implicitly used this model when noting that, in the recent inflation crisis, monetary disinflationary efforts may be relatively ineffective if budget policies keep being expansionary.

Looking at post-global financial crisis experience, the funnel image clarifies why the social value of countercyclical fiscal expansions is highest when policy rates are stuck at their effective lower bound and inflation remains stubbornly below target. An insufficient M can be compensated by opening the F tap more. It follows that maintaining ample 'fiscal space' in normal times to pursue expansionary budgets in these critical situations is crucial for sustainable stabilisation. In other words, the tail risk of a deep downturn strongly motivates the build-up of precautionary budget savings – keeping spending under control and/or maintaining tax revenues – during expansionary phases of the cycle.

31 See the recent discussion by Bartsch et al. (2020).

To be fair, the original idea of the policy mix also came with a warning about relying too much on substitutability between M and F. Notably, Arthur Okun pointed out that monetary and fiscal instruments may not work the way we expect when we stretch the use of these instruments away from their norms. Hence it pays to do our best to keep our policies, in his words, "in the middle of the road", where M and F interact remaining within known boundaries. Implicitly, this means monitoring and acting on any kind of imbalance (excessive leverage, current account deficits and the like) that raise the need for sharp and deep adjustment.[32]

Extreme circumstances may nonetheless motivate some radical change in the way we think of the policy mix (clearly at odds with Okun's wisdom). A case in point is provided by recent theories reconsidering how F and M interactions can jointly stabilise an economy at risk of experiencing a deflationary spiral.[33] This risk arises because, with rates at the effective lower bound, low demand generates deflation and this translates into high real interest rates, depressing demand and prices even further. To avoid this outcome, recent papers argue, the fiscal authority could (temporarily) scale up its deficits, 'committing' to neither raise taxes nor cut spending in the future. This means that, everything else being equal, debt is no longer sustainable and financial markets may start to charge a risk premium. Vis-à-vis these deficits, however, suppose that the central bank, again temporarily, commits to guarantee the face value of the outstanding government liabilities in nominal terms (to rule out outright default risks). This means that the central bank commits (again temporarily) not to react to any change in price dynamics away from its target. The central bank de facto lets the economy run hot with the deficits and accepts a temporary rise in inflation – the function of which is to reduce the real value of public debt in line with the present discounted value of primary surpluses.

According to this new perspective on the 'policy mix', in special circumstances, the monetary and fiscal authorities may find it beneficial to act together in ways that are particularly 'bad' in normal circumstances. The budget creates 'unsustainable' debt; the central bank de facto monetises this 'unsustainable' debt. For this strategy to work, however, the bad mix must be temporary and strictly limited to helping the country out of the exceptional circumstances that motivate it. At the exit, the model prescribes a return to normality, with an 'active' monetary policy and a 'passive' fiscal policy. Moreover, the maturity of the outstanding nominal government liabilities must be long enough (for inflation to produce the require dent on their real value) and/or the government must be able to keep large spending commitments in the future fixed in nominal terms. Finally, these policies should not be anticipated by private agents.

32 Bartsch et al. (2020).
33 Bianchi et al. (2022); Corsetti et al. (2019).

Remarkably, in light of this model, one possible interpretation of the current outburst of inflation is that this is a consequence of the large fiscal response to the pandemic: in advanced countries, a massive fiscal expansion via spending, transfers and government guarantees for firms prevented a deflationary collapse of the global economy; inflation is needed to rebalance, if only partially, the fiscal outlook vis-a-vis the growth of (nominal) public liabilities.

The same model, however, could also be brought to bear on the problem of addressing the 'exceptional circumstances' of an inflation crisis. Indeed, logically, the policy prescription above should also work in this new context, in reverse. Running budget surpluses without adjusting future tax and/or spending (in addition to reducing debt dynamics) raises the real value of the outstanding stock of public debt. Holding monetary policy constant (i.e., if policymakers do not relax the stance of monetary policy in response to a fiscal contraction), the price level will need to fall – contributing to lowering inflation.[34]

In either case, the new policy mix rests on a temporary violation of the 'good behaviour' rules, which may be hard to manage in practice. A spending spur may be difficult to rein in once lobbies and political groups taste the benefit of soft budgets. Fiscal austerity when monetary policy is already contractionary is bound to run into strong political opposition. Moreover, the prescriptions of the new policy mix are clearly at odds with Okun's wisdom of keeping instruments close to our experience. The experience of the last decades suggest that both very large deficits and sharp austerity surpluses are bound to have adverse implications for the supply side of the economy, in terms of investment, credit to the economy, firm dynamics and labour supply (they may also raise complex political economy problems), which may undermine the objectives of the policies and raise sustainability issues. Some may argue that the 'funnel model', in its original formulation, still provides the compass one needs to guide economic policy also in exceptional circumstances.

The monetary footprint on debt management: Monetary backstop

An important by-product of the post-global financial crisis experience is the diffuse awareness of the role of central banks in backstopping the government bond market. In the aftermath of the crisis, it became apparent that most central banks – implicitly or explicitly – stood ready to intervene in the government debt market and prevent increases in borrowing costs based on arbitrary yet self-validating expectations of rising risk premia. The leading example is the creation of the Outright Monetary Transactions (OMTs) programme by the European Central Bank in 2012. The prompt interventions by the Bank of England in the UK bond market in the aftermath of the disruptive budget announcement by the (short-lived) Truss government in 2022 is another one. Most strikingly, the Federal Reserve intervened both in September 2019 and in March 2020 to address unexpected malfunctioning of the US treasuries market.

34 Niepelt (2004).

A successful monetary backstop does not necessarily require the central bank to engage in actual purchases of government bonds. Although in the process of providing such backstop central banks may engage in some bond purchases, this policy should not be identified with quantitative easing (which is usually pursued with different objectives in mind). A backstop ideally works as a credible 'threat to intervene' that discourages market speculation (in economic jargon, it prevents market investors from coordinating their expectations on a high borrowing cost equilibrium).

For this threat to be credible, however, fiscal and monetary authorities need to reach a mutual understanding on two key points. First, even if a backstop works without any effective purchase of government bonds, markets must expect the central banks to act if challenged. This is the issue: purchasing government bonds exposes a central bank to the risk of balance sheet losses. If these losses materialise, the need to make good on own liabilities – essentially, banks' reserves – would force monetary authorities to 'run the printing press'. As should be well understood, central banks do not go bankrupt, since they can pay out their nominal monetary liabilities by issuing more of them. But a forced hike in the monetary base is hardly compatible with a price stability mandate. Unless the treasury stands ready to provide contingent fiscal guarantees on the central bank balance sheet (i.e., transferring money to the central bank in case of losses), investors may doubt the monetary authorities' determination to take the risk of missing out on their price stability mandate and intervene in the bond market.[35]

Second, while a well-designed monetary backstop can rule out self-fulfilling sovereign risk crises, stability ultimately depends on fiscal policy. The treasury must understand that, conditional on the backstop, debt must remain on a sustainable path. If this is not the case, a central bank's engagement in the government debt market cannot but destabilise inflation expectations.[36] Once in a regime of debt monetisation, not only does the inflation rate necessarily grow above target. Most crucially, the economy actually remains vulnerable to belief-driven crises. Self-fulfilling expectations of debt distress turn into self-fulfilling expectations of high inflation that drive up both nominal and real borrowing costs for the government.[37]

These are major risks facing advanced and some emerging market countries. A credible understanding between fiscal and monetary authorities on how to act together to contain vulnerability to expectations-driven crises – and the adoption of appropriate instruments and strategies to address market malfunctioning via liquidity provision – is an essential building block of a reliable economic policy regime in the years to come.

35 Corsetti and Dedola (2016).
36 See, for example, Bianchi (2021).
37 Calvo (1988).

2.3.3 Monetary strategies in the transition from a deflationary to an inflationary environment

In the pre-Covid years, with inflation stubbornly below target, central banks tried to raise growth and price dynamics with multiple (unconventional) instruments (quantitative easing, average inflation targeting, forward guidance). With the benefit of hindsight, one may argue that there are limits to what monetary policy can accomplish in the aftermath of deep financial crises, such as the global financial crisis.[38] The question is whether, in the context of large crises, backstopping (together with the treasury) financial markets and preventing disruptive deflationary spirals – which we know would be economically and socially costly – is a sufficiently ambitious goal for monetary authorities, relative to engaging in repeated attempts to re-establish 'normal conditions' with the implementation, on an ever-increasing scale, of unconventional policies.[39]

The recent experience highlights the problems that may arise once central banks engage in strategies specific to a 'low-inflation environment', such as forward guidance and quantitative easing, and then face a hike in inflation. How can the central bank break its commitment to keep rates low for long at the very early sign of inflation while remaining credible? How easily can a central bank take away the 'monetary punch bowl' from market participants and let asset prices adjust sharply?[40]

With the outburst of inflation in 2021 and 2022, the debate on monetary policy has revolved around the issue of whether reducing the size of the central bank balance sheet is a precondition for successful disinflation policies through conventional policies. One side of the debate stresses that the effects of hikes in policy rates would be muted if liquidity (quantitative easing) remains abundant; the other side points to potential financial disruptions.

Over many years, financial markets have been operating in an environment with low interest rates and abundant liquidity; portfolio and investment strategies have adapted to the new environment. Balance sheet policies ended up supporting the expansion of private and public debt, depressing credit spreads while boosting asset and housing prices (associated to mortgage lending) – according to the consensus view, distorting price signals. A policy of 'low rates for long' has arguably created incentives to take on maturity risk in portfolio strategies.

38 Drawing on his experience as governor of the central bank of Japan, for instance, Shirakawa (2023) notes that (while consequential for asset prices) the 2013 'Great Monetary Experiment' had at best modest effects on growth and inflation, despite a rise of the central bank balance sheet from 30% to 120% of GDP.

39 Rajan (2023).

40 As noted by Rajan (2023), markets have become accustomed to 'monetary rescues' at least since the early 2000s, when Greenspan formalised the idea that monetary policy is better suited to minimise the cost of asset price bubble bursts than to prevent bubbles from developing in the first place. The uncomfortable political dimension of the problem is that, most often, the institutions and people that suffer most from the correction (e.g., pension funds) are not necessarily the ones that benefitted the most from the upswing in asset prices (nor the richest groups in society).

Moreover, a first-order effect of quantitative easing is a significant shortening of the maturity of public debt in the hands of investors.[41] Over the years, even if – helped by central bank policies – treasuries could and did issue relatively long-term debt, from the vantage point of the consolidated public-sector budget constraint (netting out cross positions between the treasury and the central bank), the average maturity of public debt did not rise correspondingly.

Households, firms and especially financial intermediaries are likely to need time to readjust their portfolios and investment strategies to the new financial environment. An aggressive quantitative tightening would reduce liquidity and lead to a change in the maturity of bond portfolios held by market participants. Along the disinflation process, with rising policy rates driving borrowing costs up to both the government and private agents, investors may be unwilling to absorb long-term bonds without hiking risk premia.

Quantitative tightening at a slow pace, however, raises a different problem. With the value of long-term bonds falling in response to hikes in interest rates and term premia, central banks suffer sizeable balance-sheet losses. Holding bonds to maturity would not help – long positions in bonds are financed with (short-term) banks reserves that are rolled over at the higher interest rates. Whether or not bonds are held to maturity, central banks experience a loss of revenue, implying that they will have to cut transfers to the treasury or, in limit cases, they will have to rely on the treasury for recapitalisation.

2.3.4 Economic policy in a high-debt environment

The policy model that still shapes our thinking about stabilisation is de facto structured around returning inflation to target and keeping it there. As stressed in the first part of this chapter, however, it is hard to think of a successful disinflation policy without some form of prospective fiscal consolidation (spending cuts or higher taxes) complementing monetary policy in containing aggregate demand in the short run and, most crucially, ensuring the stability of the fiscal outlook for the years to come. As argued above, this is key prerequisite for the inflation targeting model to be effective.

The level of public liabilities after the Covid-19 years and the potential for distributional conflict after the inflation crisis are a challenge to the model. The primary surpluses required to stabilise debt at the current level may be difficult to achieve and sustain on political and economic grounds.

One may take comfort in the idea that, after the current inflation crisis subsides, the world will go back to the 'secular stagnation' scenario, with real interest rates (r) below the growth rate (g), creating more 'fiscal space'. A negative r–g, the argument goes, would contribute to containing the debt-to-GDP dynamic, facilitating deleveraging while creating moderate space for deficit spending. But this would be cold comfort – a stagnation scenario will likely be associated with other negatives, especially stagnant

41 See UK Parliament (2021).

productivity growth. Governments facing a negative r–g may still be pressured to run very large deficits for economic or social reasons, to the extent that it would prevent deleveraging. Furthermore, governments with high debt may face high risk premia that, even if the safe real rate is low, could systematically destabilise the fiscal outlook.[42]

The fiscal pressure on monetary policy will hardly abate – sticking to the principles discussed above will be challenging. At best, given the high stock of outstanding debt, the most virtuous policies may require a certain amount of 'gambling' along any feasible adjustment paths.[43] Managing macroeconomic and price stability in the coming years will require a good dose of pragmatism. However, to be effective, pragmatism cannot be unconstrained. The independence and mandates of central banks may come under scrutiny again and again, but for the foreseeable future, neither should be abandoned or watered down.

It is important to stress that the alternative of letting inflation run would hardly be a solution. Even if unexpected inflation can provide some short-term fiscal relief, giving in to a regime of high and variable inflation would eventually lead markets to charge an inflation premium, i.e., higher interest rates. Not only would this raise government borrowing costs and worsen the fiscal outlook, but worse, as argued above, a regime of debt monetisation would likely increase vulnerability to belief-driven crises (i.e., arbitrary disruptive hikes in borrowing costs or even loss of market access).

2.3.5 Do we need more international policy coordination?

Central banks' responses to the inflation crisis, whether or not slow at the first signs of inflation, have gathered pace since mid-2022. At the time of writing, there is little sign that monetary measures have been implemented other than with a strict national focus. Some observers have raised concerns about potentially adverse effects of these policy decisions, which were taken with little or no attention to cross-border spillovers, on two accounts. First, everything else equal, a monetary contraction in a country tends to raise foreign inflation (via the exchange rate channel) and may reduce foreign activity (if the contraction in global demand offsets potential gains in foreign competitiveness). When the contraction originates in a systemically important country like the United States, it has additional adverse spillovers, by driving risk premia up and deteriorating borrowing conditions in global markets.[44] If central banks play blind to these cross-border spillovers, the argument goes, their decisions may result in an excessive worldwide contraction.[45] Second, and relatedly, deteriorating borrowing conditions magnify the risk of turmoil in

42 See the discussion in Blanchard (2023a; 2023b).
43 See, for example, Cochrane (2023), Corsetti and Mackowiak (2022) and Jeanne (2023).
44 Rey (2013); Miranda-Agrippino and Rey (2020).
45 See Caldara et al. (2023) for an analysis of excessive credit and activity contractions at global level from 'synchronous monetary tightening'.

sovereign and external debt markets, especially – but not exclusively – among emerging market economies and less-developed economies.[46] The spill back from a widespread debt crisis would further worsen the world outlook. This provides a further motivation for pursuing coordination with the goal of moderating global risks.

Remarkably, at the start of 2023, economic activity at the global level has remained resilient, at least relative to expectations in 2022. To some extent, strong US demand and relatively high commodities prices have helped weather the adverse effects of rising borrowing costs. This does not mean that the risks are over. While one of the most dreaded consequences of the monetary contraction – a widespread debt crisis – has not materialised, the number of countries already in default or restructuring is growing, especially in Africa. The war in Ukraine seems to be far from over; so is the risk of an upsurge of the pandemic. If anything, the case for cross-border coordination may now be even stronger.

Revisiting the academic case for cross-border cooperation

Why are disinflation policies carried out in an uncoordinated way? A review of the academic work on the topic may provide key insight.[47] In some ways, the current debate echoes the one in the 1970s. At that time, vis-à-vis large global shocks (oil prices) and currency turmoil (after the demise of Bretton Woods in 1971), the case for cooperation rested on the need to sustain economic activity through coordinated management of global demand.[48] In the language of the 1970s, countries had to take responsibility to become the 'locomotives' or 'engines' of global growth.

Without questioning the desirability of cooperative stabilisation policies, many observers had strong doubts about their effectiveness and feasibility. On the one hand, negotiating a coordinated response to shocks typically takes too long for this response to be timely. The response may come too late, when the effects of the shocks have already subsided – reducing the effectiveness of any coordination effort. On the other hand, even if agreement on a coordinated expansion could be reached in a timely manner, individual governments would still face the incentive to delay costly measures, or reduce their scale, so as to essentially free-ride on what other governments do. Together, these reservations amounted to a 'too little, too late' criticism.

Soon after, however, new criticisms questioned the idea that coordination was desirable in the first place. The classical argument was formalised by Rogoff (1985): to the extent that cooperation is effective in internalising cross-border demand spillovers, it reduces the credibility of the anti-inflationary stance of national monetary authorities vis-à-vis their domestic firms and unions, and thus vis-à-vis international investors. Rather than helping avoid excessive unemployment, coordination ends up being counterproductive, in

46 See Obstfeld and Zhou (2022) for a recent reassessment of this risk.
47 See Eichengreen (2014) for a historical assessment.
48 The foundations were laid out in Cooper (1969).

that it frustrates disinflation efforts – it results in more inflation and more unemployment. It could be said that this argument resonated in the minds of policymakers then and does so now, explaining at least in part why it is hard to find examples of cooperation around disinflation policies in recent decades.

Another criticism has been put forward more recently by economists relying on new open economy macro (NOEM) and New Keynesian dynamic macro models. In many exercises carried out using these models, the welfare gains from cross-border cooperation turn out to be extremely small. Bringing this theoretical result to bear on the actual conduct of monetary policy, Obstfeld and Rogoff (2022) raised the question: why bother with complex coordination negotiations, if at the end of the day our economies are nearly as well off just pursuing inward-looking policies? To be fair, the theoretical prediction of 'small gains from cooperation' – like many other theoretical results – does not hold in general.[49] Yet at least since the late 1990s, this prediction combined with Rogoff's point has given significant academic support to the idea that 'keeping one's house in order' is the best way to ensure global macroeconomic and price stability.

From the vantage point of the current inflation crisis, 'keeping one's house in order' has indeed become a compelling goal for central banks. All agree on the major risk they are currently facing – that of losing control on inflation expectations and entering a destabilising regime of high and variable price dynamics. The experience of high inflation in the 1970s and disinflation in the 1980s is brought to bear on this risk. Once inflation dynamics feed on themselves, stabilisation is very costly in terms of employment and growth. In this context, the lesson from open macro can be interpreted as a warning against any kind of distraction (say, attempting to pursue coordinated contractions) that may dilute the focus of central banks away from their primary domestic mandate. However, it is worth pointing out that internalising spillovers does not necessarily lead to milder national monetary contractions. One may also argue that, in response to an energy shock, a relatively strong stance on inflation in a large country may help cool down the global demand for – and hence the price of – energy, reducing the global stagflationary impulse from this input.

Looking forward, nonetheless, it may be useful to reconsider the lessons from academic work on open macro models in a more comprehensive manner. Theory suggests that gains from cooperation are not negligible, i.e., they are comparable with the costs of the business cycle, when countries have a large stock of net foreign liabilities/assets.[50] With outstanding debt/asset positions, monetary measures clearly have cross-border spillovers since they affect the relative net wealth of debtor and creditor countries. Most crucially, uncoordinated inward-looking policies are inefficient – exchange rates are misaligned, global output remains too low. By addressing these inefficiencies, cooperation may improve social welfare in both debtors' and creditors' countries.

49 See Bodenstein et al. (2020) for a recent reconsideration.
50 Bodenstein et al. (2020).

When the current high inflation has been sufficiently tamed, the high stock of public and private debt worldwide may weigh on the search for a new international policy compass. These theoretical results strengthen the case for finding feasible ways to internalise spillovers. Rather than explicit coordination of conventional monetary and fiscal policies, however, the demand for coordination may be expected to drive initiatives to strengthen the international financial architecture, structuring institutions providing international liquidity and assistance, and policies designed to manage currency misalignment and global imbalances.

Dollar strength as a matter of common concern

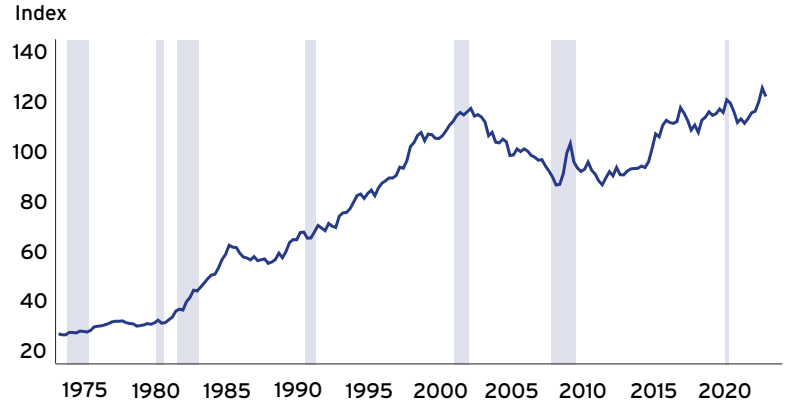
In the aftermath of the US disinflation efforts in the first half of the 1980s, the dollar was extremely strong, in part reflecting a similar mix of tight money and lose fiscal policy that is currently pursued by the United States. Ultimately, the strength of the dollar motivated a coordinated action to correct the over-appreciation – the Plaza Accord. There is ample evidence that a strong dollar systematically worsens borrowing and financial conditions throughout the world on top of and above the effects of rate hikes in the United States, with inflationary and contractionary consequences in emerging market and less-developed economies. The is also evidence of a 'dollar cycle' that reflects not only monetary policy, but also fluctuations in the risk appetite of investors and/or flight-to-safety in response to uncertainty shocks.[51]

Could history repeat itself? Will major central banks, after pursuing disinflation policies independently of each other, face the need to engineer a coordinated initiative on exchange rate misalignment in the coming months? As shown in Figure 15, in multilateral terms, the dollar reached an all-time high in October 2022. Since November 2022, it has been falling somewhat, initially because positive news on inflation suggested that the Federal Reserve would revise its policy of steep rate hikes. Future developments will obviously reflect policy decisions elsewhere, particularly in the euro area.

Two questions are in order. First, will market forces alone be able to realign the dollar, as monetary policies in leading regions of the world gradually converge at the end of their contractionary cycle? If they do, coordination may not be necessary. Second, and more fundamentally, how concerned should policymakers be about misalignment? For instance, why hasn't the all-time peak of the dollar produced harsher consequences worldwide?

51 Obstfeld and Zhou (2022).

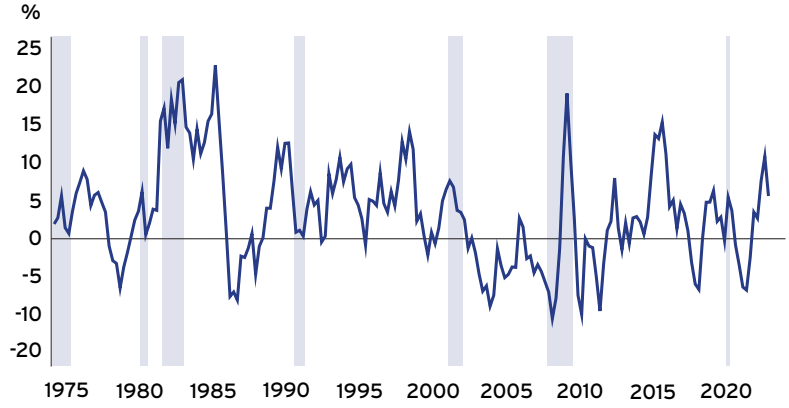
FIGURE 15 **NOMINAL BROAD DOLLAR INDEX**



Note: The chart shows the level of the nominal broad dollar index. The shadowed areas indicate NBER recessions.
Source: Board of Governors of the Federal Reserve.

Three observations may explain why the economic and financial effects of dollar appreciation remained relatively contained between 2021 and 2022. First, while in terms of its level the dollar was at a peak in November 2022, dollar movements (i.e., changes) have not been dramatic by historical standards – even around the outbreak of the pandemic in 2020, when uncertainty was very high, motivating a flight to quality/safety. Figure 16 shows that that dollar rate of appreciation (from trough to peak) during the recent inflation crisis was actually lower than the rate of appreciation in other crisis periods (for example, during the debt crisis in the 1980s). In 2022, for instance, the dollar's annual appreciation peaked at 11%, compared with 22% in 1982 and almost 23% in 1985.

FIGURE 16 **NOMINAL BROAD DOLLAR INDEX (YEAR-ON-YEAR CHANGE)**



Note: The chart shows the year-over-year change in the nominal broad dollar index. The shadowed areas indicate NBER recessions.
Source: Board of Governors of the Federal Reserve.

Second, in contrast to the 1980s, the majority of countries no longer build policy strategies around currency regimes with limited exchange rate flexibility – from straight pegs to moving bands. This is not to downplay the still diffuse aversion to large currency movements. But with the diffusion of inflation targeting, at least to some extent, exchange rates have been playing their role as a shock absorber. Lastly, many countries have reduced their reliance on the issuance of dollar-denominated debt, while simultaneously enlarging their domestic market for debt denominated in domestic currency. This change – even if in part reversible – has reduced the exposure of their economies to adverse balance sheet effects from currency movements. These observations may suggest that the global policymakers are somewhat more tolerant of currency 'misalignment'.

Relative to the 1980s, however, the level of cross-border financial interconnectedness of markets and intermediaries is much higher, and so is leverage of intermediaries and private and public debt. Even relatively mild shocks could ignite a massive flight-to-safety and feed a dollar rally, with potentially disruptive effects on financial and real markets and potential geopolitical consequences. National monetary authorities may be called on to deliver prompt, coordinated liquidity interventions, extend guarantees to private actors and official institutions, or even adjust their conventional monetary instruments.

Some targeted initiative for cooperation may be initiated by the United States itself. The country has long enjoyed significant benefits from its unique position in the global economy as the dominant supplier of a safe asset. With its larger external debt, and vis-à-vis rising geopolitical challenges, the goal of preserving these benefits may motivate the hegemon country to promote and to engage in cross-border cooperation to a much larger extent than in recent times.[52]

2.4 CONCLUSIONS

2.4.1 The post-Covid-19 inflation crisis

This chapter has argued that the nature and drivers of the post-Covid-19 inflation crisis are best understood by integrating three perspectives: aggregate, sectoral and cross-country. From an aggregate perspective, inflation reflects a macroeconomic stance that has remained quite expansionary after the outburst of the pandemic, accommodating a strong nominal demand in excess of supply. In the first quarter of 2023, demand is still strong and disinflation will have to take place through a period in which the monetary stance will have to remain contractionary. The sectoral perspective highlights the fact that the global outburst of inflation was ignited by a strong shift in demand from services into (durable) goods during the pandemic, running into the emergence of diffuse supply bottlenecks and creating asymmetric labour market conditions – tight in some market, slack in others. Since wages are relatively rigid downwards and relatively flexible upwards, the shift in demand eventually resulted in a rise in wage costs driven

52 Marin (2022).

by labour market tightness. Moreover, goods are tradable and intensive in commodities. National demand cumulated globally, creating a common driver of (relative) prices and costs reflecting supply constraints. Over time, the hikes in good prices started to spill over to services, favoured by a macro stance that remained expansionary. The sectoral perspective clarifies that by its own dynamic, the inflation crisis developed through a misalignment in relative (sectoral) prices and wages. Both will have to realign. From a cross-border perspective, the energy crisis – in part preceding the war in the Ukraine, but exacerbated by the conflict – created a divide across the Atlantic and across regions with different dependence on gas and oil. Terms of trade movements translated into loss in income. In the euro area, disinflation will have to take place together with a real adjustment in purchasing power.

The nature and drivers of the inflation crisis raise the issue of whether and to what extent the macroeconomic adjustment to the Covid-19 pandemic could have taken place without undermining price stability. The depth of sectoral swings in demand and prices caused by the pandemic created an atypical macroeconomic environment in which the conventional approach to stabilising aggregate output gaps and the price level was far from reliable. Monetary policy is not in the best position to correct relative prices. In 2023, however, in the aftermath of the pandemic and the energy crisis, the inflation crisis appears to be evolving along relatively more familiar lines.

We highlight three key challenges to stabilisation policy in the coming quarters.

1. Stabilisation will have to foster the realignment of prices and wages after the Covid shock and the war while preventing inflation from becoming persistent. A catching-up of nominal service prices and wages relative to goods is to a large extent unavoidable and arguably desirable, but in the process, disagreement and conflict over the distribution of the costs of the inflation crisis may arise. The risk is that this disagreement/conflict translates into persistent inflation.

2. Disagreement about distribution is most likely to be reflected in the budget. Social and economic considerations may motivate redistributive policies via taxation and subsidies, and the energy transition and sectoral reallocation may motivate measures targeted to support corporates. To the extent that these policies will be financed by deficits, they will end up aggravating the fiscal and monetary arithmetic that, through the first quarter of 2023, has resulted in an overall expansionary macro stance. The risk is that an unstable fiscal outlook translates into an unstable macro outlook, feeding expectations of inflation variability.

3. The hike in policy rates and term premia has magnified the tail risk of financial turmoil, by causing correlated losses on the balance sheet of financial intermediaries. This risk suggests caution in implementing quantitative tightening, and highlights the need to design instruments and policies that may be activated contingent on the emergence of financial stress.

2.4.2 Do we need a new economic policy model?

The two recent crises have further challenged the way policymakers envision and manage policy interactions. The analysis in this chapter has called attention to five dimensions of this challenge: the need to rethink the function and role of the 'policy mix'; the design of an effective monetary backstop for government debt; the integration of balance sheet policies in the policy model; and the desirability of international policy coordination.

1. The stabilisation of large negative shocks requires the joint contribution of both fiscal and monetary policy. In situations of severe macroeconomic and financial stress, implementing an effective policy mix rests on the availability of ample fiscal space (i.e., the ability to borrow without suffering a sharp deterioration of borrowing costs and condition). Ample fiscal space in tail-risk situations, however, requires the systematic build-up of fiscal buffers during upturns.

2. The level of public (outstanding and contingent) debt across advanced economies is currently high enough that vulnerability to belief-driven crises should not be ignored even in traditionally stable countries. The post-global financial crisis experience has clarified that fiscal and monetary authorities share the common goal of and responsibility for shielding the government debt market from the destabilising effects of these crises. The key strategy consists of central banks backstopping government debt, with the treasury offering contingent balance sheet support to the central bank.

3. Macroeconomic and financial tail risk is to a large extent endogenous to market behaviour, as market participants 'over-react' to news and shocks, or coordinate their beliefs around an equilibrium path of the economy plagued by instability. Fiscal, monetary and regulatory policy institutions will be required to manage and contain tail risk via liquidity interventions, market-making of last resort, as well as contingent balance sheet and income guarantees (which may or may not be used ex post).

4. In an environment of high debt creating vulnerability to beliefs-driven crises, the policy model centred around price stability – flexible inflation targeting – continues to provide a reliable compass for stabilisation strategies. A monetary backstop for government debt, liquidity provision, market-making of last resort and (contingent) balance sheet policies cannot be successfully implemented in an environment where inflation expectations are not well anchored. If inflation expectations *are* anchored, instability driven by self-fulfilling expectations of debt distress can be addressed through a (fiscally backed) monetary backstop. If inflation expectations are *not* anchored, nominal and real borrowing costs may be hiked, driven by self-fulfilling expectations of high inflation.

5. While international policy coordination is unlikely during disinflation, it may nonetheless become desirable to correct exchange rate misalignment and address international liquidity problems that may arise along the disinflation process.

In conclusion, recognising the importance of policy interactions in delivering stability is not an argument for questioning the independence of monetary and regulatory authorities or mandating explicit coordination across policy decision makers. Recent crises have nonetheless shown that there are contingencies for which effective stabilisation requires defining a common ground for action and an effective mode of collaboration that does not undermine the credibility of different policies.

In the years to come, a key test of this mode of collaboration will likely be (public and private) deleveraging. High debt reduces fiscal space and weighs on private (investment) spending. Fiscal authorities will have to optimise the trade-offs between budget consolidation and growth. In this process, a monetary backstop shielding government debt markets from adverse dynamics in borrowing costs (as explained above) will be a key pre-requisite to avoid the need for harsh austerity measures, which are bound to be counterproductive as they cut into economic activity and investment.

CHAPTER 3

The international monetary landscape: Implications of the Russia-Ukraine war, the rise of China and new digital technologies

3.1 INTRODUCTION

Three sets of factors – financial sanctions on the Bank of Russia; the rise of China, the renminbi and US-Chinese tensions; and innovation in the digital sphere – have raised questions about the future of the international monetary system. The questions are far-reaching, since these developments collectively constitute the sharpest shock to the status quo since the collapse of the Bretton Woods system 50 years ago.

Unavoidably, the answers are less clear than the questions. How the structure of the international monetary system evolves will depend on not just the shock but also the response of market participants and policymakers. That evolution will depend not only on exchange rate, capital account and monetary policies – the levers that most immediately affect the international monetary system – but also on policies in other areas, from financial regulation to data privacy and foreign policy. Predictions encompassing this wide expanse are fraught.

The next three sections of this chapter consider, sequentially, the consequences of financial sanctions on Russia, the rise of China, and the growing importance of digital technologies. These sections are followed by a conclusion summarising the implications for the future of the international monetary and financial system.

We start with how the dominance of the dollar as a unit of account, store of value and means of payment in cross-border transactions enhances the effectiveness of US financial sanctions. Given recent events, recourse to financial sanctions by the United States will almost certainly cause countries contemplating the possibility that they or their trading partners may at some point be subject to such measures to explore alternatives to the dollar, to US banking services and to SWIFT. The result will almost surely be some increase in the use of other currencies for completing transactions and as a form in which to hold reserves. But the currencies and banking systems of countries that cooperate with the United States in the application of sanctions are not viable alternatives in this context. Gold and barter constitute only limited alternatives, since they are awkward and

costly vehicles for transactions. Moreover, counterparties otherwise in a position to use them may be deterred by the threat of secondary sanctions. All this suggests that changes in the international monetary landscape due to US 'weaponisation' of the dollar are likely to be slower and less far-reaching than pundits sometimes suggest.

China's renminbi, its banking system and its Cross-Border Interbank Payments System (CIPS) could be an alternative in this setting. China has remained studiously neutral in the conflict between Russia and the West, thus providing a hedge for countries contemplating the possibility that they too at some point might become subject to sanctions. Growing recourse to financial sanctions by the United States and its allies is likely to encourage additional banks to sign up as participants in CIPS so as to acquire the capacity to make and accept cross-border payments in renminbi. Although CIPS is still only a pale shadow of the US Clearing House for Interbank Payments (CHIPS), it is growing rapidly. Given time, its development could be consequential on current trends.

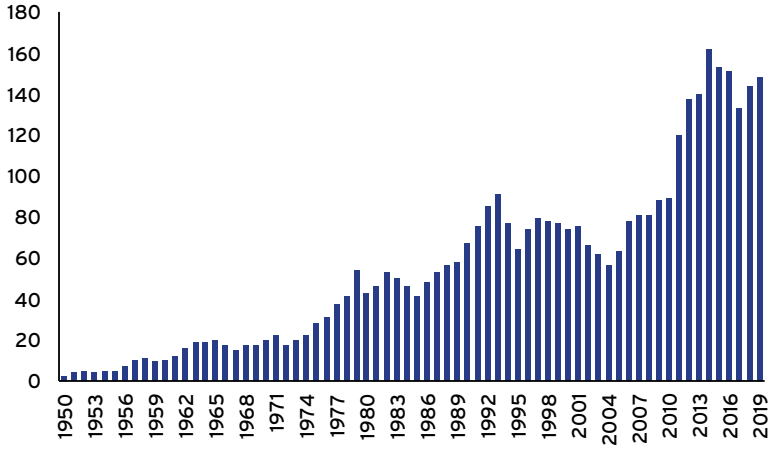
Current trends can change, of course. If the United States and allied countries make even more aggressive use of financial sanctions, then more banks and countries will move towards CIPS in order to hedge their bets. If the United States and allied countries sanction China itself – an alarming prospect that is not entirely inconceivable – China would presumably retaliate in kind. Countries would then have to choose between participating in two largely siloed payments systems, a prospect with more radical and, almost certainly, damaging consequences for the international monetary landscape.

Of the available digital innovations, central bank digital currencies (CBDCs) show the most promise for revolutionising international finance, since plain-vanilla cryptocurrencies are too volatile and 'stablecoins' are either unlikely to be stable or unable to scale. It is argued that the first major central banks to issue a CBDC will enhance the international role of their currencies (at the expense of the dollar, assuming that the Federal Reserve is not first). Retail CBDCs could do so by reducing the cost of cross-border payments. But, aside from the very smallest transactions, the costs of retail payments are already low. Commercial banks and payments companies are already experimenting with distributed ledgers and other technologies that promise to reduce these costs still further. Moreover, for retail CBDCs to compete, they would have to be accepted outside the issuing country, or it would be necessary for a group of issuers to create a conversion platform (an 'mBridge') capable of processing large volumes of conversion operations. Wholesale CBDCs could have quite far-reaching implications, since they promise to automate a variety of cross-border financial transactions. But since settlement would still in the CBDC that is native to the platform, this CBDC would again have to be accepted by non-residents, or else it would have to be exchangeable through an mBridge. Neither condition is certain. In any case, both market integrity and systemic stability concerns are likely to discourage central banks from going down this road.

3.2 WEAPONISATION OF THE DOLLAR

The United States is not the only country to have imposed sanctions on Russia, and specifically to bar banks from doing business with Russian entities including the Bank of Russia, along with pressuring the Society for Worldwide Interbank Financial Communication (SWIFT) to stop transmitting instructions for cross-border transfers from Russian banks. Sanctions were imposed in response to Russia's invasion of Ukraine by a coalition of Western countries, where 'Western' should be understood as referring to a political and geostrategic grouping as opposed to a physical location.[53] The United States is far from the only country to have resorted to financial sanctions (see Figure 17). That said, US financial sanctions draw disproportionate attention for two reasons. First, the dollar's dominant role in cross-border financial transactions means that US sanctions are exceptionally consequential. Second, US sanctions were unprecedented in that they were imposed under different circumstances, or at least with a different rationale, than earlier sanctions imposed by Washington on other countries.

FIGURE 17 **FREQUENCY OF FINANCIAL SANCTIONS, 1950-2019**



Source: Global Sanctions Database.

The extent of dollar dominance is well known.[54] It continues to account for nearly 60% of allocated foreign exchange reserves worldwide. It is the currency of denomination for 65% of international debt securities and 55% of international bank loans. It is on one side of nearly 90% of all foreign exchange transactions. Along all these dimensions, the

53 Thus, 'Western' countries imposing sanctions include Australia, New Zealand, South Korea and Singapore, among others.
54 A convenient summary, from which statistics in this paragraph are drawn, is ECB (2022).

dollar's international share far exceeds the share of the United States in global trade and GDP. Its share also far exceeds that of the second most important international currency, the euro.[55] Only as a payment currency (as captured through payment instructions sent through SWIFT) does the euro come close.[56]

In considering whether this situation might change, it is necessary to have a view of why the dollar is so dominant. One view emphasises the continued absence of attractive alternatives. For decades after World War II – really, for the better part of 50 years, up to the turn of the century – only the United States had deep and liquid financial markets open to the rest of the world, enabling central banks and other foreign entities to freely accumulate, hold and use securities and bank deposits denominated in dollars. Other countries whose currencies might have played similar roles, such as Germany and Japan, discouraged their international use – Germany for fear that the capital inflows associated with Deutsch mark purchases might weaken the Bundesbank's monetary control and be inflationary; Japan owing to worries that an open capital account would interfere with the industrial policies of its Ministry of Industry and Trade.

The euro was supposed to change this, but in practice has made only marginal inroads. There is a shortage of AAA-rated public-label bonds that central bank reserve managers and corporate treasurers hold as the bedrock of their portfolios. Only a handful of European sovereigns have AAA ratings. A large fraction of their issuance has been absorbed by the ECB through its asset purchase programmes or must be held by Europe's own banks to meet their capital and reserve requirements, leaving little available for use by the rest of the world.[57] EU member states have so far been reluctant to follow up the €800 billion NextGenerationEU borrowing programme, launched in response to the Covid-19 pandemic, with additional tranches of EU bonds. Table 1 shows the implications. US Treasury debt in the hands of the public, by comparison, is on the order of $25 billion – an order of magnitude larger even after netting debt held by the Federal Reserve and by US commercial banks as reserves.

Similarly, the renminbi is supposed to challenge the dollar. It is supposed to do so both because of the growing footprint of the Chinese economy – China is now the number one national exporter and number four national foreign investor by value, and is forecast to overtake the United States in terms of aggregate GDP by 2035 – and because the authorities in Beijing are actively promoting cross-border use of the currency.[58] For the moment, however, the renminbi remains leagues behind the dollar on all the aforementioned dimensions. It accounts for less than 5% of total allocated foreign exchange reserves, international debt securities, international loans, foreign exchange

55 The World Bank puts the US share of global GDP circa 2022 at 15% at international prices and at roughly 20% at current exchange rates (which may be more relevant when considering cross-border transactions, since purchasing power parity-adjusted exchange rates put heavy weights on the prices of nontraded goods).

56 SWIFT data show that 10% to 15% of international payments using the euro are for cross-border payments within the euro area itself.

57 Details are in Eichengreen and Gros (2020). Present calculations add EU debt issued starting in 2020.

58 The data on FDI outflows for 2021 are from UNCTAD (2022). These place China only a hair behind Germany and Japan and number two status, after the United States.

turnover and global payments. China retains capital controls, and whether – and if so, how quickly – it can internationalise its currency in their presence is an open question. Current Chinese leadership has taken steps to suppress the private sector, and uptake of the renminbi will slow if the country backtracks from developing a market economy. Geopolitical tensions between China and the West may discourage Western companies from doing business with Chinese suppliers and investing in the country, creating less need to use the renminbi as a vehicle for such transactions. Vladimir Putin's invasion of Ukraine serves as a reminder of the ability of an authoritarian leader to arbitrarily change the rules of the political and financial game, which may in turn discourage central bank reserve managers and corporate treasurers from utilising the services of Chinese banks and parking their reserve balances in Shanghai.[59]

TABLE 1 **STOCK OF DEBT OUTSTANDING AVAILABLE FOR THE REST OF THE WORLD (NOT HELD BY EURO AREA RESIDENTS)**

	Not held by Eurosystem , MFIs or insurance companies			Not held by euro area residents		
	End 2021	End 2019	End 2014	End 2021	End 2019	End 2014
DE	601	678	1,157	178	395	837
FR	730	736	931	503	517	707
NL	46	64	184	15	29	128
AT	85	77	94	30	24	35
Total 'safe' euro area assets in euros	**1,462**	**1,555**	**2,365**	**726**	**965**	**1,706**
EU supranationals	237	215	424	173	159	355
Total 'safe' euro area assets in euros	**1,699**	**1,770**	**2,789**	**899**	**1,123**	**2,062**
USD/euro exchange rate	1.1	1.1	1.2	1.1	1.1	1.2
Total in USD	**1,869**	**1,947**	**3,347**	**989**	**1,236**	**2,474**
Total 'safe' euro area assets (no supranationals) in USD	**1,608**	**1,711**	**2,839**	**799**	**1,061**	**2,047**

Note: The numbers in the first five rows are expressed in billions of euros, the numbers in the last row are in billions of US dollars.

Source: Own calculations based on ECB Statistical Data Warehouse (securities holding statistics, PSPP breakdown history and government finance statistics).

All this is to say that the euro and the renminbi are far from providing viable alternatives to the dollar as a leading international currency. In this view, it is the absence of alternatives that accounts for the persistence of dollar dominance.

59 More on this in Section 3 below.

A second view is that alternatives exist in principle but not, for historical reasons, in practice. Dollar dominance is locked in by the currency's history and first-mover advantage. Even if there exist viable alternatives, banks, firms and governments lack incentives to move towards them. That the dollar was the first mover and is the incumbent international currency creates network effects and thick-market externalities.[60] The fact that others use dollars makes it convenient for you to do likewise. If your customers and suppliers – that is to say, others in your network – make and accept payment in dollars, it will be inconvenient and disruptive for you to insist on making or accepting payment in a different currency. You may lose custom as a result. This network effect locks in the dollar's dominant status, the existence of feasible alternatives notwithstanding.

Relatedly, there are synergies or complementarities between use of the dollar not by different agents but across domains and functions.[61] If banks and firms making payments across borders predominantly use dollars, then it will make sense for central banks to hold dollar reserves so that the authorities will be able to act as dollar lenders of last resort to those banks and firms in times of dollar stringency.[62] Similarly, if the central bank holds dollar reserves, banks and corporates will have additional incentive to borrow abroad in dollars, knowing that the central bank can come to their assistance in periods of dollar stress.

In this second view, then, steps taken by European and Chinese authorities are unlikely – try as they may – to significantly dent dollar dominance.

A final view is that these arguments about deep structural roots of dollar dominance are overblown. The ongoing rise of alternatives, together with the abrupt shock of US sanctions, could in this third view precipitate a shift to alternatives. Given the starting point of dollar dominance, the implications for the pricing of assets and liquidity of markets in different currencies, for the associated trade and investment flows, and for the leverage of Federal Reserve policy over the global economy could be far reaching.

It is against this backdrop that the US sanctions on Russia served as a wake-up call. It is important to be precise about the nature of the message. In point of fact, the United States has not seized the assets of the Bank of Russia. The US executive order only prohibits US banks from transacting with Russia's central bank and other sanctioned Russian entities. Secretary Yellen reiterated in May 2022 that the United States does not have legal authority to seize and redeploy official Russian assets, only to immobilise them.[63] That said, the Biden administration decided in the summer of 2022 to use half of the $7 billion of foreign reserves seized from the Afghan central bank to provide essential banking, financial and economic services to the Afghan people, while avoiding

60 The relevant literature on this topic includes Krugman (1980; 1984), Matsuyama et al. (1993) and Eichengreen et al. (2018).
61 These are highlighted by Farhi and Maggiori (2018) and Gopinath and Stein (2021).
62 See Das et al. (2022) on this point.
63 Lawder (2022).

the Taliban government, and to potentially use the other half to compensate the families of 9/11 victims. This raises the possibility that the United States may ultimately find ways around Secretary Yellen's reservations and that seizure and redeployment of central bank assets may become more frequent.[64]

In addition, the United States has imposed financial sanctions on foreign entities before, including central banks, but only when declaring that their policies constituted a threat to the national security of the country. Technically, President Biden was required under the provisions of the 1977 International Emergency Economic Powers Act, which amended the 1917 Trading with the Enemy Act, to declare that the policies of the target country "constitute an unusual and extraordinary threat to the national security and foreign policy of the United States". Biden made such a statement and declared a national emergency in April 2021 in response to Russian cyber-attacks, when the United States froze assets of individuals and corporations. He did so again when imposing sanctions on the Afghan central bank. But he did not do so in February 2022, presumably because Russia's attack on Ukraine was not a direct attack on the United States or its nationals. This is the sense in which action against the Bank of Russia is unprecedented. Foreigners may conclude that these steps augur more frequent and indiscriminate US use of financial sanctions. This in turn may motivate them to hedge their bets by seeking out alternatives to the dollar and the US banking system.

There is little evidence of this in the data yet. The IMF's Currency Composition of Foreign Exchange Reserves database shows no fall in the share of dollars in allocated (identified) foreign exchange reserves between 2021 Q4, before Russia's invasion of Ukraine and the associated sanctions, and 2022 Q2, the latest release at time of writing. In fact, the dollar's share rose slightly, from 58.8% to 59.2%. Meanwhile, the euro's reserve share fell from 20.6% to 19.8%, while that of the renminbi rose only marginally from 2.8% to 2.9%. This increase in the dollar's reserve share might be dismissed as a figment of the concurrent appreciation of the dollar exchange rate, although the strength of the currency in part reflected the dollar's status as a safe haven and cannot therefore be dismissed as exogenous with respect to the events in question. In other words, the strength of the dollar exchange rate is itself testimony to continued strong demand for dollars.

64 The half of the money intended for services to the Afghan public will be administered through a Swiss foundation, insulating it from US litigation by the families of 9/11 victims and others. In August 2022, a federal magistrate in New York, citing the sovereign immunity enjoyed by a foreign state and its central bank, ruled that she lacked the power to turn over the remaining half to the families of 9/11 victims. Further appeals to higher courts will now follow, and the ultimate outcome remains uncertain.

This trend – or lack thereof – is more striking when placed against the backdrop of the longer-term decline in the dollar's share of allocated foreign exchange reserves. That share declined from 71% in 1999 to 59% today – that is, at an average rate of ½% per annum.[65] The nominal value of reserves held in dollars is down in recent quarters, but this reflects the extent to which central banks have been forced to use their reserves in foreign exchange market intervention in support of their currencies. Against this backdrop, there is little evidence of a trend break in the first half of 2022. Similarly, the share of global payments denominated in dollars is up from 39.9% in January 2022 to 42.3% in November, while the shares denominated in euros and renminbi are down from 36.6% to 36.1% and from 3.2% to 2.4%, respectively. Again, exchange rate changes may be part of the story. Be this as it may, there is no evidence of large-scale movement away from the dollar in recent quarters.

A portion – roughly a quarter – of the longer-term shift away from dollar reserves has been a shift towards the Chinese renminbi, reserves of which have risen from zero to some $325 billion.[66] But most of the shift away from the dollar has been a shift towards the currencies of smaller countries that have not traditionally played an international role. These include the Australian dollar, the New Zealand dollar, the Canadian dollar, the South Korean won, the Singapore dollar, the Swedish krona, the Norwegian krone and the Danish krone. There has also been a shift toward the Swiss franc, which already had a traditional role as a subsidiary reserve currency.

Structural and cyclical factors plausibly lie behind this shift towards nontraditional reserve currencies. On the side of structure, the rise of electronic platforms and algorithms has made it easier to trade these currencies. Automated market-making algorithms match buyers and sellers; automated liquidity-provision algorithms provide incentives to lend these currencies when they are in demand. Indicative of these developments, bid-ask spreads against the dollar are now comparable to those on the euro, yen and sterling. Adding these currencies to central bank reserve portfolios provides diversification benefits, insofar as the issuing economies are commodity exporters, unlike the euro area and Japan, and insofar as the strength of their currencies is correlated with that of the Chinese economy (the leading commodity importer), making them an attractive alternative to the renminbi itself.[67]

65 Arslanalp et al. (2022a) show that this trend is largely a function of the declining number of countries that peg their currencies to the dollar, along with the declining share of the United States in global trade – developments that one may or may not wish to extrapolate into the future. To be sure, some of this trend decline could be attributed to anticipatory diversification away from the dollar by central banks anticipating the possibility of US sanctions. The Bank of Russia, for example, diversified away from US Treasury securities in favour of other financial and real assets following the country's annexation of Crimea in 2014 – and before its invasion of Ukraine. Arslanalp et al. (2023) find no evidence for the hypothesis that sanctions prompted shifts between dollars and other currency reserves, although they may have encouraged a modest movement by central banks into gold (more on which below).

66 More on this below. To put this $325 billion figure in context, recall that identified dollar reserves, circa 2022 Q2, were $6.5 trillion.

67 The renminbi itself may be harder to access (as discussed subsequently) and its cyclical fluctuation is suppressed by the Chinese authorities, on both grounds enhancing the appeal of these proxy currencies.

In terms of cyclical factors, near-zero or even negative interest rates on traditional reserve currencies may have encouraged reserve managers to search out higher yields in smaller economies. Now that interest rates in the United States, the United Kingdom and the euro area (if not yet in Japan) are rising, this trend may slow or reverse. Similarly, the sheer accumulation of reserves, whose value in many emerging markets came to exceed what was needed for likely market interventions, may have encouraged reserve managers to invest the excess in less liquid assets. Now that reserves have been run down, in part, by interventions in support of weak currencies, this trend may reverse as well.

In any case, note that all of the countries whose currencies are on this list are also on board with sanctions against Russia. Hence, Moscow and other governments potentially in its position will not benefit from diversifying in their direction. All of the countries in question, with the qualified exception of Singapore, are political democracies. This is surely not a coincidence – democratic systems apply checks and balances on arbitrary action by the executive and, for that matter, the central bank, and make currency policies more predictable.[68] This tells us something about the likely scope for shifting the centre of gravity of the international monetary and payments system towards the renminbi or the currency of another country with a non-democratic form of governance.

This assumes, of course, that governments on this list, along with the members of the euro area, see eye to eye with the United States when it comes to future sanctions. This is by no means guaranteed. Recall how European countries did not join the United States when the Trump administration imposed new sanctions on Iran starting in 2018. If this kind of episode is repeated, the euro might be viewed as an attractive alternative means of payment and source of reserves for countries contemplating being in US crosshairs.

Recall, however, that euro area banks conducted little if any business with Iran from late 2018 for fear of being subjected to secondary sanctions (being barred, in consequence, from doing business in the United States). Europe established a barter mechanism, the Instrument in Support of Trade Exchanges (INSTEX), to bypass the financial system entirely and exchange medicines and other essential supplies for Iranian energy.[69] But INSTEX was able to complete only one transaction, in early 2020, causing it to be denounced as useless by the Iranian central bank in early 2021.[70] This is a reminder that barter trade is inefficient, and that arranging it is resource-intensive. It is also evidence that the threat of secondary sanctions can be a powerful tool working to limit movement away from dollar payments. Further support for these conclusions can be found in the fact that Chinese banks have been reluctant, post-February 2022, to be seen as busting US sanctions on Russian entities.[71]

68 And the exception to the rule, Singapore, is famous for sound and stable financial governance.
69 For details, see Aftalion (2019).
70 Motevalli (2021)
71 Again, more on this below.

Finally, there is the possibility that financial sanctions will encourage central banks to substitute gold for foreign exchange reserves. Gold can be held at home, insulating it from seizure. The Bank of Russia accelerated its gold purchases following Russia's annexation of Crimea in 2014, doubling tonnes held by the time of the attack on Ukraine. In 2022, it confirmed that its gold reserves were entirely vaulted at home.[72] Considering the top ten annual increases in the share of gold in reserves since the turn of the century, fully half of these cases coincided with the threat or actual imposition of sanctions.[73]

Gold vaulted at home may be protected from seizure, but it has limited utility for trade settlements and financial transactions. Shipping gold by air, sea or land is costly, involving as it does costs of insurance and security as well as transport. Shipping $1 billion of gold by road requires six 20-foot trucks.[74] The transaction requires a willing foreign counterparty, who may be leery of secondary sanctions. Iran chartered aircraft to transport Venezuelan gold to Tehran in return for refinery equipment, chemicals and technicians to aid in gasoline production.[75] But it is hard to find other examples, perhaps because flying jet aircraft on a 14,000 mile roundtrip is rather more expensive than sending a message through SWIFT.[76]

Gold can be used in financial transactions. It can be swapped for currencies. It can be posted as collateral when borrowing. But gold held at home, as opposed to in the vaults of the Federal Reserve Bank of New York, the Bank of England or the London Metal Exchange, will not be acceptable to financial counterparties, since delivery is uncertain. The G7 imposed a ban on Russia exports of gold as part of its sanctioning programme. US Treasury guidance issued shortly after the imposition of financial sanctions stated that American individuals, including gold dealers, distributors, wholesalers and financial institutions, are barred from buying, selling or facilitating gold-related transactions involving Russia. The defence bill passed by US Congress in December 2022 requires the imposition of penalties on foreign entities that sell gold physically or electronically in Russia itself.

In sum, the dominance of the dollar as an international unit of account, store of value and means of payment accentuates the power of US financial sanctions. At the same time, recourse to financial sanctions by the United States is bound to lead other countries contemplating even the remote possibility that they might similarly end up in US crosshairs to seek alternatives to the dollar, US banks and SWIFT as vehicles for cross-border payments. Over time, this may result in some increase in use of other currencies in settling payments and as forms in which to hold reserves. But insofar as

72 Bank of Russia (2022).
73 Details are in Arslanalp et al. (2023). These authors look at all countries that purchased gold and raised its share in reserves by at least 5 percentage points over the period. Of a total of 15 such cases, fully eight were subject to sanctions.
74 An entertaining account is Keating (2022).
75 See Lava and Bertenstein (2020) for an account.
76 A second example was when Russian-chartered planes picked up gold in Venezuela following intensified US sanctions in 2017 and delivered it to Mali, where it was refined before being resold in the United Arab Emirates for dollars and euros (Chon, 2022). This too illustrates the specialised nature of such transactions.

other countries cooperate with the United States in the imposition of sanctions, their currencies and banking systems do not offer alternatives. Gold and barter are awkward vehicles for payments. And even counterparties prepared to utilise them may be deterred by US threats of secondary sanctions.

What about China and the renminbi? China is a large economy extensively involved in global trade and investment. It is not party to Western sanctions on Russia. It is actively seeking to foster cross-border use of its currency. If it comes to loggerheads with the United States, it may choose to ignore the threat of secondary sanctions. But is its currency a viable alternative to the dollar?

3.3 CHINA, THE RENMINBI AND SINO-US TENSIONS

China has been taking steps to encourage international use of the renminbi since at least 2009, when it expanded its renminbi settlement pilot project to Shanghai and four cities in Guangdong Province, the People's Bank of China (PBoC) signed a series of currency swap agreements with foreign central banks, and PBoC Governor Zhao Xiaochuan advocated moving away from the dollar as the vehicle for international monetary transactions. The subsequent five years saw a series of measures liberalising the access of qualified offshore financial institutions to Chinese financial markets and assets, allowing them to put their accumulated renminbi to work and thereby encouraging them to accept payment in that form. However, 2015 then witnessed financial turbulence and capital outflows, causing the authorities to tighten controls, slowing the pace of liberalisation. To all appearances, the authorities nonetheless remain committed to renminbi internationalisation. But whereas some policymakers, notably in the PBoC, had previously seen renminbi internationalisation and its concomitant – capital account liberalisation – as a way of forcing the pace of financial reform, there was now a recognition that, for liberalisation to proceed safely, financial reform had to come first.[77]

While China has made a concerted effort to promote international use of its currency, the fact that it began from a standing start a decade ago means that the renminbi remains far behind the dollar as a form in which to hold reserves, denominate international bonds and loans, and make interbank payments. Another indication of its status is that the majority of Belt & Road loans extended by China's policy banks have been denominated and transferred in dollars,[78] this being what foreign contractors demand. Much attention has been paid to public announcements in which Beijing and foreign governments commit to settling bilateral transactions in their respective national currencies. Thus,

77 Eichengreen and Xia (2019).
78 AidData (2021).

Russian Finance Minister Anton Siluanov and PBoC Governor Yi Gang signed an agreement in 2019 to use their respective national currencies in their countries' bilateral trade.[79] Similarly, on a visit to Saudi Arabia in December 2022, President Xi Jinping told Gulf leaders that China "would work" to buy oil and gas in exchange for renminbi.

But what governments use to finance state trade, when seeking to advance geopolitical agendas, may not also appeal to firms seeking to maximise profits when engaged in market transactions. The progress – or lack thereof – of CIPS, China's alternative to SWIFT, illustrates these points.[80] As noted above, more than 50% of international bank loans are denominated in dollars, while the share of renminbi-denominated international loans is negligible; more than 40% of cross-border interbank transfers are denominated in dollars, compared to barely 2% in renminbi. The dollar benefits from a large installed base of users (see preceding arguments). But it also benefits from an efficient payments infrastructure that permits domestic and foreign banks to transfer dollar funds across borders, at low cost, on their own accounts as well as those of their clients.

At this point, something of a digression into the structure of the US interbank payments system is required. The Federal Reserve System began moving funds electronically (using telegraphy) between member banks as early as 1915 (giving the United States exactly a one hundred year head start over China). The communications system was eventually moved to a proprietary computer-based telecommunications network and opened to non-member depository institutions in 1980. The Federal Reserve System maintains accounts for US financial institutions as well as US branches of foreign banks maintaining an account with a Federal Reserve Bank. Fedwire, the Federal Reserve's real-time gross-settlements system, clears transactions in real time (as soon as payment instructions arrive). Thus, transactions in opposite directions between pairs of financial institutions are not netted (there is no delay or window of time in which to accumulate offsetting transactions); Fedwire is a gross (as opposed to net) settlement system. It is relative fast, but expensive because more actual funds transfers are required to take place; and it is used mainly for relatively small value transactions, which makes it less consequential in the present context. It processes roughly 750,000 transactions daily.

CHIPS was created in 1970 by eight members of the New York Clearing House Association (New York City-based banks doing business with one another) for clearing large-value payments. Today, some 50 financial institutions participate directly. These number both US banks and US branches of foreign banks, including the US branches of four Chinese

79 Rosen (2022) reports (without citing sources) that, starting in April 2020, Russia accepted renminbi in payment for oil and coal exports to China. But it is revealing that when Russia first moved away from asking for dollars in payment for its exports to China, it moved toward accepting euros, which have wider utility and whose use is not limited by Chinese capital controls (Yeung and Goh, 2022).

80 The discussion that follows draws on Eichengreen (2022).

banks. (No Russian banks participate directly.) Participating banks clear payments amongst themselves and on behalf of other financial institutions, who thus participate indirectly in the system. Direct participants hold shares in the parent company, the Clearing House Payments Company LLC.

CHIPS settles payments between banks over the course of the trading day, netting offsetting payments when possible. These practices finalise transactions while also limiting the need for actual transfers of funds. CHIPS uses a prefunded model – that is, banks use Fedwire to send balances from their account at the Fed to the CHIPS account at the Federal Reserve. The balances in the CHIPS Federal Reserve account serve as backing for CHIPS's book-entry system, over which direct participants settle payments. When CHIPS closes at the end of its trading day, the outstanding balances of participants are paid out with an actual transfer of funds over Fedwire.[81] CHIPS processes 500,000 transactions daily, with an average value of more than $3 million per transaction, coming to some $1.8 trillion in total per day.

Payments settled through CHIPS are denominated in dollars, since the dollar is the currency of settlement of the members of the New York Clearing House Association. CHIPS can nonetheless be used for international payments, since both US banks and US branches of foreign banks participate directly. For example, a US bank seeking to remit a payment to an account holder in another country will first transfer funds to a US bank participating directly in CHIPS, which will transfer the payment to the US branch of the appropriate foreign bank. If the foreign account holder is a customer of the same directly participating foreign bank, then the foreign bank credits the customer's account in his/her home country.[82] If not, that foreign bank will generally have a correspondent or agency relationship with the foreign account holder's bank.[83] In this case, both the small US bank initiating the payment and the foreign bank of the ultimate recipient are indirect participants in the clearinghouse.

One can see how relying on CHIPS for settling international payments may be a source of discomfort for countries potentially at loggerheads with the United States. US banks could be prohibited by their government from using CHIPS to transfer funds to banks of the foreign country in question.[84] CHIPS could be required by US law to enforce the ban. Because CHIPS (and its foreign counterparts, such as CHAPS in the UK and its equivalents in the euro area) actually moves money between the accounts of entities headquartered in different countries, finding a way around these clearinghouses is more difficult than finding a way around SWIFT, for which alternatives – from fax transmission to encrypted email – exist.

81 This last set of transactions are possible because Fedwire closes 90 minutes later than CHIPS; see also the earlier footnote on Fedwire.
82 The receipt will presumably be in dollars, though the account holder can presumably instruct his bank to exchange those dollars for local currency at the prevailing exchange rate.
83 Or at worst it will have a correspondent relationship with a bank that, in turn, has a correspondent relationship with the final customer's bank.
84 The Federal Reserve could be similarly instructed by the US Treasury in the case of Fedwire.

China has been working since 2015 to develop an equivalent set of rails for renminbi payments, the Cross-Border Interbank Payments System. Prior to CIPS, it was awkward for a foreign bank or firm to make payments to an onshore Chinese entity using renminbi. Foreign firms may have acquired offshore renminbi (CNH), which they hold in a renminbi-denominated bank account. To make a payment, those CNH first have to be converted into onshore renminbi (CNY), a transaction which must be executed by an official Chinese clearing bank, generally an offshore branch of one of the four big Chinese banks, as designed by the Chinese authorities for each of the principal global financial centres. The CNY can then be transferred from the offshore branch of the official clearing bank to its onshore branch, and from there to the correspondent bank of the ultimate recipient using China's domestic China National Advanced Payments System (CNAPS).

CIPS, which is modelled after CHIPS, essentially cuts out the official clearing bank. It allows the offshore bank, if it is an indirect participant in CIPS, to transfer funds for authorised purposes to a directly participating bank, which then transfers the funds to the correspondent bank of the ultimate recipient.[85] Better still, if the offshore bank is itself a direct participant, it can itself transfer the funds to the correspondent bank. One unverified source (Wikipedia) lists HSBC, Standard Chartered, the Bank of East Asia, Deutsche Bank, Citi, ANZ and BNP Paribas as direct participants in CIPS. One can see how this arrangement might facilitate – to pick a case not entirely at random – Chinese payment in renminbi for oil imports from Saudi Arabia, a country that maintains accounts with these international banks.

But it is important to view CIPS in comparative context. Its website claims 76 direct members and 1,300 indirect members. CHIPS, by comparison, has ten times that number of participating banks. CHIPS processes 40 times as many transactions daily. In March 2022, daily volume on CIPS was RMB 385 billion ($45.6 billion), compared to $1.8 trillion on CHIPS.[86] CIPS is growing rapidly: the value of transactions processed is said to have increased by 75% between 2020 and 2021.[87] Still, as a set of rails for transactions utilising China's banks and currency, it remains eons behind the US banking system and the dollar.[88]

85 Participating banks are obliged to ensure that payments comply with China's capital controls. This may obligate them, for example, to obtain prior approval for payments from the Chinese authorities. These requirements can be thought of as analogous to the anti-money-laundering and know-your-customer rules to which Western banks using SWIFT and CHIPS are subject.

86 This is according to Yeung and Goh (2022). CIPS has its own messaging system, but indirect participants appear to send and receive instructions exclusively through SWIFT. Yeung and Goh report that some 80% of all payments through CIPS use SWIFT messaging. SWIFT and CIPS signed a memorandum of agreement in 2016 under which SWIFT messaging could be used for CIPS cross-border payments. At that time, SWIFT messaging supported only Latin characters; it now supports Chinese characters, ensuring compatibility with messaging on China's domestic payments system. To this end, SWIFT established a unit in Beijing in 2019 in order to provide local language services and meet local regulatory requirements.

87 Figures are cited in Jin (2022).

88 Some observers imagine the creation of a joint Russian-Chinese clearinghouse or platform, or integration of China's renminbi-based and Russia's rouble-based systems. It is not obvious that China has an interest in this. Chinese control of the resulting joint system would be diluted. Western banks would have additional grounds for hesitating to participate in CIPS. China for its part has no reason to do transactions with Russia in rubles, which this hybrid system would permit, given the currency's limited convertibility and utility.

Another illustration of the point is that the much-vaunted growth of renminbi foreign exchange reserves very heavily reflects the accumulation of renminbi balances by Russia, whose circumstances are special – and which believes that China is strong enough to effectively shelter its reserves from the United States. The Bank of Russia in fact holds a third of all renminbi foreign reserves,[89] suggesting that the unit has even less general appeal as a reserve currency than indicated by the headline numbers. Some argue that China can enhance the reserve-currency role of the renminbi by allowing it to be used for making trade-related payments and settling only a limited range of financial transactions – that is, even in the absence of capital account convertibility.[90] But they also suggest that the process of currency internationalisation under such constraints is likely to be slow.

More widespread application of financial sanctions, not just by the United States but also by allied countries controlling access to the European and Japanese payment and banking systems, would change this picture. This would drive the targeted countries, left with no other alternative, towards China, CIPS and the renminbi, the direction in which such measures evidently drove Russia. It is not obvious, however, that such sanctions would have a similarly powerful effect on third countries, as opposed to those directly sanctioned.

But the imposition of sanctions on China itself would be a different matter. One can imagine the United States and its allies imposing secondary sanctions on China were they to see the country openly flaunting Western sanctions on Russia. One can also imagine scenarios, involving a conflict over Taiwan for example, where the United States and its allies directly barred China from accessing SWIFT and Western banking systems.

In this situation, countries trading with China would have no alternative but to make payments in renminbi using CIPS, and to accept reminbi in payment using CIPS. It is tempting to imagine that a country such as India would then settle its transactions with China using renminbi and CIPS, and its transactions with the West using dollars and CHIPS. The two currency zones and payments systems would overlap – the overlap being the nonaligned countries. The international monetary landscape would resemble a Venn diagram.

This assumes, of course, that countries continuing to do business with China would not themselves be subject to secondary sanctions by the West as a result of the practice – and that countries doing business with the United States would not then be sanctioned by China. We know from the history of trade wars how such a process of tit-for-tat action and reaction can spiral out of control; the result in this case would be a sanctions war as

89 For details see Arslanalp et al. (2022b). The Bank of Russia held 17% of its foreign exchange reserves in renminbi in January 2022, the last occasion on which it reported the composition of its reserve portfolio. Since it has been unable to sell its dollars and euros since that time, and since there are no reports of it selling gold, it is plausible that the composition of its reserve portfolio has not changed since (Stognei, 2023). The author reports estimates that Russia's National Wealth Fund holds 30% of its investment portfolio in renminbi assets.

90 This is argued in Eichengreen et al. (2022).

opposed to the more familiar trade war. Likely, there would be no neutrals in a shooting war between the United States and China, just as there are no atheists in foxholes. There would be no overlap between the two currency and payments systems. But in this dire scenario, this lack of monetary overlap would be the least of our problems.

Along with developing CIPS, China is also making strenuous efforts to roll out its central bank digital currency, known as the e-CNY. This observation directs us in turn to the third set of factors with the potential to reshape the global monetary landscape.

3.4 DIGITAL CURRENCIES

Digital currencies are lauded by their champions as the next big thing, and as having revolutionary implications for the operation of domestic and international monetary systems. Recent events have thrown more than a bit of cold water on this enthusiasm. The prices of plain vanilla cryptocurrencies such as Bitcoin have been volatile. Their recent weakness suggests that the earlier crypto-mania was fuelled in significant measure by zero interest rates, which made it cheap for crypto entrepreneurs to fund their endeavours while leading investors into this digital space in search of yield. It follows that if zero interest rates are over, crypto-mania is over. In addition, the tendency for transactions to migrate to crypto exchanges such as FTX and Binance highights the high costs and long lags entailed in individual on-chain crypto transactions.[91] The collapse of FTX and some of its competitors is also a reminder of the lack of transparency and integrity of certain institutions operating in the crypto sphere and of the absence of a lender of last resort to entities subject to run risk.[92] El Salvador and the Central African Republic may have enshrined Bitcoin as legal tender, but take-up has been extremely limited. In the context of cross-border transactions, cryptocurrencies were used to transfer nearly $100 million in donations to the Ukrainian government in the early days of the Russian invasion.[93] But it is hard to think of many other legitimate uses of these digital units.[94]

While some of those donations to Ukraine were in the form of Bitcoin and Ethereum,[95] units whose value fluctuates, others were in the form of stablecoins such as Tether and USD Coin, which are designed to maintain a 1:1 parity to the dollar. Stablecoins avoid the volatility of plain vanilla cryptocurrencies, assuming that they are indeed fully backed by liquid collateral. This enhances their appeal for cross-border transactions. Thus, in December 2022 the United Nations High Commissioner for Refugees (UNHCR) set up

91 Such exchanges, supposedly with their own reserves of the relevant coins, were structured to match buyers and sellers and move crypto credits, as opposed to actual coins, between accounts, facilitating credits at low fees. As we have been reminded, however, an exchange is only as sound as its actual reserves, and its bookkeeping is only as solid as, well, its bookkeeping.

92 Readers will recall how FTX attempted to act as lender of last resort to other smaller exchanges, while Binance offered to act as lender of last resort to FTX. How did that work out for you?

93 Note that the non-profit recipient, Aid for Ukraine, operated through FTX.

94 Illegitimate uses such as money laundering, tax evasion and terrorist finance are another matter.

95 Tonelli (2022).

a blockchain-based programme to transfer USD Coin to Ukrainians displaced by the war. USDC tokens marshalled by the UNHCR will be credited to the digital wallets of recipients. They can be converted into local currency at MoneyGram outlets in Ukraine, or held securely on the recipient's mobile phone if he or she travels across borders.

Leaving aside its purported stability, USD Coin shares the other disadvantages of the ilk. Its sponsors assert that it is fully backed by dollars and other "approved investments", but its reserves are only attested to, not audited, by the accounting firm Grant Thornton, LLP. Members of the managing consortium include representatives of the crypto exchange Coinbase, on which USD Coin is traded, creating the potential for divided interests. USD Coin may be regarded as one of the more reliable stablecoins, but the decision of UNHCR to partner with the Stellar Development Foundation, which supports the network on which USD Coin is traded, is not uncontroversial.[96]

How should the authorities address the issues raised by these new digital units? One answer is that if crypto transactions are isolated from the conventional financial system, then they can be unregulated. Banks, brokerages, investment advisers, money managers and retirement funds that are part of the regulated financial infrastructure would be prohibited from holding and trading cryptocurrencies or lending to crypto firms. Crypto trading will then pose no threat to the traditional financial system, and crypto platforms and exchanges need not come under the aegis of the U.S. Securities and Exchange Commission or its foreign analogues. Innocent users will still be safeguarded by fraud and consumer protection laws applying to all commercial entities (as evidenced in US government indictments of the managers of FTX). However, the regulatory authorities will otherwise bear no responsibility, implicitly or explicitly, for these platforms. Nor will the latter benefit from the central bank's lender-of-last-resort services.[97]

In this scenario, private-label stablecoins will be used for cross-border payments. But to what extent is unclear. Stablecoins do not obviously have significant cost and speed advantages over conventional transfer services, such as MoneyGram or Western Union, that do not yet use blockchain but are moving in that direction. The underlying blockchains are difficult to scale, resulting in high transaction fees, especially in periods of peak demand. There already exist scores of stablecoins circulating on different blockchains, indicating limited acceptability of any one and resulting in costly fragmentation of the stablecoin payments sphere. And stablecoin platforms, having only recently having been created and remaining unregulated, do not have reputational advantages over regulated banks and money transfer services such as Western Union, which has existed for 175 years.

96 Verma (2022).
97 Baker (2022).

In any case, the premise that crypto transactions can be effectively isolated from the conventional financial system is dubious. Imagine that a bank lends to a nonfinancial firm, which then lends to a crypto exchange. Failure of that crypto exchange could lead to bankruptcy for the nonfinancial firm, resulting in distress for the bank.[98] Then there is the fact that stablecoin issuers hold their collateral in the form of bank deposits and short-term treasury securities.[99] Thus, a run on a large crypto platform that forces it to liquidate its bank deposits could create problems for a bank or its insurer. A run that led a large crypto platform to liquidate its holdings of treasury securities could create problems for the stability of the treasury market. Finally, the fact that stablecoin issuers in many cases are not transparent about the form in which they hold collateral and its quality can trigger a Diamond and Dibvig-style run, with consequences that spill over to other financial markets.[100] This perspective suggests that stablecoin issuers will have to be regulated in the interest of financial stability. Having many of the characteristics of banks, they will have to be regulated like banks, bequeathing the same compliance costs.[101] This makes it unlikely that they will revolutionise the existing international interbank market.

The limitations of plain vanilla cryptocurrencies and stablecoins leave CBDCs as the most likely variant to see widespread use in cross-border transactions. China is in the vanguard of countries piloting a retail CBDC that can be held and used by individuals, while the ECB has shown interest in a wholesale CBDC that would circulate among banks, securities depositories and payments providers.[102] China's retail CBDC is distributed by the central bank to commercial banks and other digital payments providers such as Alipay and WeChat Pay, which download it to their customers' digital wallets. The ECB's prospective wholesale CBDC would circulate only among financial institutions, which could use it with finality in interbank transactions without having to go through clearinghouses or other payments networks. The Federal Reserve System, on the other

98 It might be argued that due diligence by the bank and its regulators will prevent it from lending to a financial firm that will put the bank in this position. But this may be wishful thinking.

99 Some stablecoins (e.g., Tether) hold, in addition, less liquid or more volatile forms of collateral such as commercial paper and corporate bonds. In addition to these fiat-back stablecoins, there exist stablecoins backed by crypto assets and managed by pre-programmed algorithms that adjust supply to demand. The market capitalisation of these last categories is small, however, relative to that of fiat-backed stablecoins.

100 The reference is to Diamond and Dybvig (1983). Analyses such as Financial Stability Board (2020; 2021) consider multiple channels, such as negative wealth effects from problems in the stablecoin sphere to negative confidence effects spilling over to other digital assets. Contagion to other crypto assets would seem most plausible in the case of crypto-backed assets of the sort discussed in the preceding note.

101 MacDonald and Zhao (2022) discuss the parallels between DeFi lending platforms on which stablecoins are hypothecated as collateral and fractional reserve banks. In the same way principal lent by a bank can be redeposited by the borrower, to be lent again by the bank, stablecoins lent by a lending platform can be deposited back to the lending platform by the borrower, after which they can be lent again. The result is a multiplier and leverage effect whose extent is determined by reserve requirements, in the case of the bank, and collateral requirements, in the case of the lending platform. Similarly, in the same way that banks engage in maturity transformation, borrowing short from their depositors but lending long, lending platforms generally promise to redeem stablecoin deposits on demand but lend at longer maturities. The problems for stability that can result are well known from the banking literature.

102 See Panetta (2022a) and Ledger Insights (2022). The PBoC has also made provision for wholesale, large-value interbank transactions using its CBDC, though it appears to be concentrating on retail deployment.

hand, is moving more slowly. The question in the present context therefore is whether a Chinese or European CBDC would enhance the ease and reduce the cost of financial transactions across borders sufficiently to displace the dollar as the leading international currency.

Both the ECB and PBoC are contemplating cross-border applications. The PBoC is conducting tests of cross-border use of the e-CNY.[103] Its cross-border pilot test with Hong Kong has entered its second stage, linking Hong Kong's Fast Payments System and the Hong Kong dollar to the e-CNY, thereby enabling Hong Kong residents to use the currency on the Mainland. The next stage will then be for the e-CNY to also be accepted outside the Mainland. (For the moment, one still must be resident in China in order to use it.) The PBoC is also cooperating with the Bank for International Settlements and other central banks in a multi-CBDC bridge (mBridge) project that involves creating a dedicated corridor where the e-CNY can be exchanged for other CBDCs when counterparties reside in different countries.[104]

Using the e-CNY, including across borders, is cost-free in principle, giving it an advantage over the interbank market and existing money transfer services. The cost of developing the infrastructure allowing funds to be transferred is borne by the central bank out of seigniorage. Saying that using the e-CNY is cost-free *in principle* alludes to the fact that there could be a cost in terms of privacy foregone. The e-CNY is officially designed so that the identity of those engaged in low-value transactions is shielded from the PBoC and other government agencies, although larger transactions will have details about the counterparties attached. Confidentiality concerns may be a deterrent to use of the e-CNY by banks, firms and individuals not resident in China, and even to some Chinese residents themselves. Note, however, that large-value transactions going into or out of Chinese banks must already be reported to the Chinese authorities under know-your-customer and anti-money-laundering rules and in order to comply with Chinese capital controls.

To supplant or even compete with the dollar as a global currency, the e-CNY would have to circulate widely and be used in transactions outside China itself. Privacy and security concerns may discourage this, as noted. Such concerns would extend to not only individuals but also governments: recall how Huawei's 5G technology was banned by various Western countries over data privacy and national security concerns. Other governments may suppress use of the e-CNY in order to prevent the equivalent of de facto dollarisation, where residents substitute a foreign currency for the domestic unit, eliminating the ability of the central bank to manage monetary conditions and the economy. Though the cost of cross-border transfers might be lower, due to the

103 For clarity, note that the e-CNY does not use distributed ledger technology or run on a permission-free or even permissioned blockchain; rather, it uses the central bank's proprietary encryption technology.

104 See BIS (2022a). There is also the possibility of multiple CBDCs running on a single blockchain, although as noted, the e-CNY, like other early CBDCs, does not use distributed ledger technology or run on a blockchain. As I have written elsewhere (Eichengreen, 2021), there are also difficult questions about whether multiple central banks could agree on the governance and protocols needed for day-to-day operation of such a corridor or shared blockchain.

existence of more efficient payment rails and PBoC subsidisation, that cost might not be dramatically lower, given that the costs of transfers using interbank markets and money transfer services are not that high, and banks and money-service providers are also experimenting with new digital technologies.

The ECB's wholesale CBDC approach could be more of a threat. Banks could transfer funds among themselves in the form of CBDC, with immediate finality of payments and without the intermediation of a private or central bank-run settlement mechanism. This might have advantages over existing clearing systems such as CHIPS, Fedwire and Target 2.

In addition, smart contracts could be built on top of this wholesale CBDC structure. A smart contract is a self-executing computer code that triggers an action under pre-specified conditions. It can automate market functions and transactions and cut out the role of traditional financial intermediaries, such as banks and security depositories. When the underlying code is publicly available, smart-contract components can be combined to execute different functions.[105] Complex transactions can then be performed by a single smart contract. Participants need the native coin associated with the ledger on which the smart contract resides to incentivise others to execute the contract. The resulting transactions are settled through the transfer of the coin associated with the ledger, in this case the CBDC.[106]

One can imagine how cross-border services currently provided by bank and nonbank financial institutions might be automated and delivered using smart contracts. Trade credit for merchandise imports and exports could be provided without a letter of credit. Payment against delivery could be dispatched to foreign component suppliers without the buyer having to send instructions to his bank. Currencies could be traded without engaging a foreign exchange specialist to initiate the trade. Quarterly interest payments could be transferred to foreign holders of international debt securities without the services of a custodian. If smart contracts are indeed the wave of the future, then cross-border transactions are likely to take place using wholesale CBDCs capable of supporting this technology. Given the relative speed with which the Federal Reserve and the ECB are moving, this could advantage the euro over the dollar.

But would central banks be complacent about seeing smart contracts built atop their digital infrastructure? That the code used to construct smart contracts is open source allows is said to limit the risk of manipulation.[107] However, the fact that proof of work and proof of stake are highly centralized in so-called decentralised public blockchains

105 This feature known as 'composability'.

106 The leading blockchain on which smart contracts are currently written is Ethereum, whose native coin, Ether, has the disadvantage of price volatility; hence the argument for substituting a CBDC. However, whereas participants need Ether to interact with the network (to incentivise those on the network to execute the smart contract), on the application layer participants can run arbitrary smart contracts, where currencies may be backed and therefore exhibit limited volatility.

107 BIS (2022b).

may open the door to self-dealing stratagems.[108] One can imagine smart contracts being used to create post-modern analogues to the opaque credit default swaps (CDS) and synthetic collateralised debt obligations (CDOs) that were at the root of the subprime crisis. Individual investors might incur losses from unappreciated provisions. Smart contracts that trigger other smart contracts might unleash a cascade of transactions, resulting in a crisis. Central banks would be enabling these behaviours and results by issuing wholesale CBDCs.

Advocates of this new technology will counter that wholesale CBDCs would circulate only among regulated banks and payments providers subject to fraud and consumer protection laws and central bank oversight; hence excesses would be reined in. In a scenario where the wholesale CBDC crowded out private-label stablecoins, it would crowd out the worst unregulated financial excesses. Perhaps. But it is worth recalling that the many of the worst excesses associated with origination and distribution of the complex derivative securities at the heart of the subprime crisis occurred inside the regulatory perimeter. Regulators were simply unable to keep up with this complex financial engineering.[109] In the case of open source smart contracts and CBDCs, regulators will presumably have access to more and better information than they did in the documentation of CDS and CDOs. The issue is not only access to information, however, but also ability to process it. And if a wholesale CBDC circulated across borders – if it was used in settlements between domestic and foreign banks – foreign banks would be able to enter into and even construct smart contracts on this platform. Again, it might not be realistic to assume that their regulators could keep up.

In sum, it is widely believed that the first major central banks to issue CBDCs will enhance the international role of their currencies, presumably at the expense of the dollar. Retail CBDCs could reduce the cost of cross-border payments relative to transfers conducted via bank wire and commercial payments companies. But, aside from very small transactions, the costs of bank wires and commercial money transfers are already low – contrary to popular presumption. Banks and payment companies are themselves experimenting with distributed ledgers and other new digital technologies. Retail CBDCs might reduce the costs of cross-border transactions still further, but they would have to be accepted outside the country of issuance, or an mBridge capable of processing a large volume of transactions would have to be created. Wholesale CBDCs have more far-reaching implications insofar as they promise to automate a wide variety of cross-border financial transactions. But since settlement would again be in the native CBDC of the ledger or platform supporting the smart contract, that CBDC would have to be acceptable to foreign counterparties, or else it would have to be exchangeable through an mBridge. Neither condition is certain. In any case, market integrity and systemic stability concerns may discourage central banks from going too far down this road.

108 Aramonte et al. (2021).

109 To be sure, the investment banks involved in these operations were formally outside the regulatory perimeter, at least before the crisis. But many of their securities market-related operations were still subject to SEC oversight.

3.5 CONCLUSION

The United States, the dollar and the US banking system are the pivots of the international monetary and financial system. US sanctions on the Bank of Russia, the rise of US-Sino tensions and innovations in the digital sphere raise questions about whether and for how long this will remain the case. Changes in the global balance of economic, financial and political power away from the United States and towards China point to a gradual erosion of dollar dominance over an extended period.[110] But the United States and the dollar retain advantages: a large installed base of users, deep and liquid financial markets, and a relatively stable and predictable political and regulatory environment. China may be poised to become the single largest economy, but cross-border transactions denominated in renminbi are an order of magnitude smaller than those denominated in dollars, Chinese capital markets are incompletely open to the rest of the world, and the political outlook is clouded.

More frequent use of financial sanctions may prompt a more intense search for alternatives to the dollar and the US banking system. But other Western currencies, gold, barter and cryptocurrencies (including stablecoins) are at best limited alternatives. There is likely to be more scope for countries concerned about US weaponisation of the dollar to substitute the renminbi. Cross-border interbank transactions through CIPS are growing, and they are likely to grow more rapidly the more recourse the United States takes to sanctions. But the use of currencies in international monetary and financial transactions tends, under most circumstances, to evolve gradually. The most that is likely to result from US weaponisation of the dollar and the rise of China is that it will evolve a little less gradually.

A breakdown in relations between the United States and China would greatly complicate the outlook for the dollar and the global financial system. Overt actions helping Russia to circumvent US sanctions or a US-China conflict over Taiwan could lead Washington to impose sanctions on Beijing, Beijing to retaliate, and both governments to threaten secondary sanctions on countries engaging with the other. This would force third parties to decide whether to do business with the United States using the dollar, or with China using the renminbi. Global money and finance, along with everything else, would be split into separate spheres. The transition would be disruptive, and the endpoint would be disastrous. Its likelihood is for geopolitical strategists, not economists, to decide.

Thus, our base case remains one in which dollar dominance erodes gradually, despite three new developments shaking the global monetary landscape. But other cases are possible. That's life. That's economic analysis.

110 Notice here the first rule of forecasting: give them a forecast or give them a date, but never give them both.

CHAPTER 4

Sovereign debt after the pandemic and the war

This chapter describes the sovereign debt landscape and architecture – European and global – emerging from the pandemic and the war in Ukraine. By 'landscape', we mean sovereign debt burdens and creditor composition. By 'architecture', we mean policy frameworks and institutions, both formal and informal, that are supposed to prevent and resolve sovereign debt crises.

The pandemic and the war have changed the sovereign debt landscape and architecture both directly and by interacting with pre-existing trends, through four main channels.

The first is through its macroeconomic impact, described in Chapter 2. Compared to 2019, deficits and debts have risen sharply. Monetary policy has tightened in response to a sharp rise in inflation. The expectation of tighter monetary policy over the medium and possibly long term, higher debt and deficits, and well-anchored inflation expectations over the medium term have led to a rise of long-term real interest expectations of 1.5 to 2 percentage points, both in advanced countries and in emerging markets. This worsens debt dynamics, reduces fiscal space, and raises debt sustainability concerns in some countries. Some emerging market and developing countries have been pushed into default. While a generalised debt crisis is not imminent, the risk has substantially increased.

Second, the pandemic and the war have changed the fiscal architecture of Europe, forcing the European Union to set aside the Stability and Growth Pact (SGP) – the fiscal policy framework created in the 1990s to constrain debt and deficits while allowing some room for countercyclical fiscal policy. At this point, it is unlikely that the SGP will return in anywhere near its pre-pandemic form. The question is what will replace it. The answer to that question is significant because a credible framework that provides policy commitment and anchors market expectations could allow the European Union to gradually reduce debt, without resorting to excessive austerity.

Third, the pandemic and the war have brought to the fore and amplified coordination difficulties in the restructuring of sovereign debt in developing countries. These difficulties primarily reflect longer-term trends, including the emergence of China as by far the largest official bilateral creditor to developing countries, the increasing role of bond finance in these countries, and the increasing share of multilateral credit in the external debt of many low-income countries. The pandemic and the war have led to

innovative attempts to coordinate official creditors that are members of the Paris Club (the main official creditor forum since the 1950s) with those that are not (such as China, Brazil, India and Saudi Arabia), but have also complicated the problem by generating a much larger set of countries that may require debt relief, and against a more difficult geopolitical backdrop.

Fourth, the war has demonstrated the negative consequences of fossil-fuel dependence in resource-poor regions and strengthened the commitment to decarbonisation in both Europe and the United States. This has led to a debate on the effectiveness of existing climate finance tools and the need for new financial instruments, including sovereign debt instruments, that could both accelerate the climate transition and protect sovereigns and investors against climate and transition-related risks, and the question of whether debt relief should be linked to climate action.

The chapter expands on these channels, focusing on the first three (with the fourth having recently been covered in the 2022 Geneva Report on the World Economy).[111] First, it takes stock of debt sustainability after pandemic and war, focusing on advanced economies and emerging market economies (EMEs). Second, it describes the ongoing debate on the reform of the EU fiscal governance framework and makes some suggestions on how this debate might move forward in ways that would lead to an improvement over the status quo ante and also might find political support from EU member states. Third, it describes the state of the international architecture for restructuring sovereign debt after the pandemic and the war, focusing on how changes in the creditor structure of sovereign debt have challenged the existing architecture and how it is likely to be challenged further by the geoeconomics shifts of the last few years. The final section discusses some possible solutions.

4.1 DEBT SUSTAINABILITY AFTER THE PANDEMIC AND THE WAR

As described in Chapter 2, the pandemic and the war have led to a large increase in sovereign debt, deficits and (more recently) borrowing costs. Will sovereigns be able to repay?

The answer depends, on the one hand, on where borrowing costs will end up over the medium and long term, and on the other, on the ability of sovereigns to stabilise debt and deficits through both fiscal adjustment and economic growth. To gauge the former, the chapter will use market-based interest rate expectations, with a discussion of uncertainty around these expectations. To gauge the latter, it will rely on a combination of medium-term forecasts from the IMF's World Economic Outlook and rules of thumb on feasible fiscal adjustment.[112]

111 Zettelmeyer et al. (2022).
112 Eichengreen and Panizza (2016); Zettelmeyer et al (2017).

The remainder of this section proceeds in two steps. The first is to look at many countries and focus on a comparison of the fiscal outlook at two points in time – just before the pandemic and today – based only on baseline projections. The second step is to focus on Europe today and dig a bit deeper, by looking at the robustness of the baseline projections and by attempting to quantify uncertainty around two key variables: long-term interest rates and long-term growth rates.

Because the emphasis of this chapter is on how the pandemic and the war have changed the fiscal outlook, the chapter does not focus on long-term fiscal risks related to population ageing and climate change. In some countries, such as the United States and many European countries, these would further complicate the outlook.[113]

4.1.1 A first pass based on World Economic Outlook projections

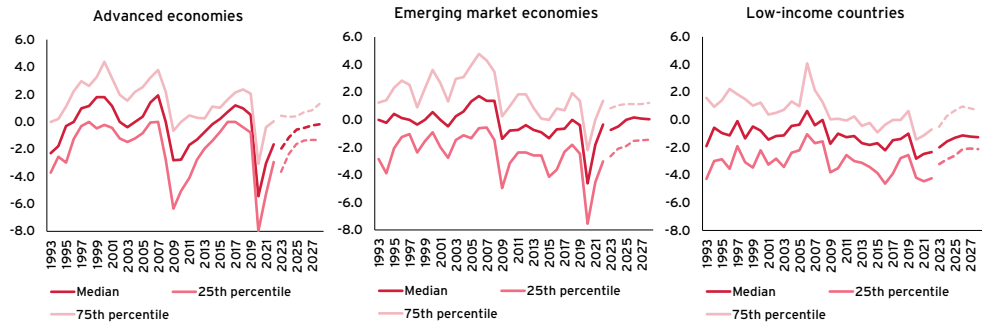
Figure 18a shows the evolution of deficits and debts, respectively, since the beginning of the millennium, in advanced economies, EMEs and low-income countries (LICs). The fiscal impact of the global financial crisis and the pandemic is clearly visible in panel (a). Panel (b) indicates that in advanced and emerging market countries, public debt ratios are higher today than at any time in the last 30 years. This statement is true not only at the median of the distribution but also at the 75th and 25th percentiles, and data from the IMF's global debt database show that it is true also for the last 70 years or so (i.e. the period since World War II). Importantly, however, it is not true for low-income countries, where debt is still much lower today than it was around 2000, reflecting a sharp decline of the debt ratio in the 2000–2010 period as a result of debt relief – the Highly Indebted Poor Countries (HIPC) Initiative and the Multilateral Debt Relief Initiative (MDRI) – and economic growth.

Figure 18 also includes five years of World Economic Outlook projections for deficit and debt ratios, from 2023 to 2028, reflecting not only assumptions about the evolution of real growth, inflation and interest rates, but also the IMF's view on likely fiscal adjustment. At first glance, these projections provide some reassurance that debt might be sustainable. Fiscal balances have already bounced back significantly from their pandemic lows, reflecting both a vigorous economic recovery since 2021 and the unwinding of pandemic support programmes. Some deficit reduction is projected to continue. Similarly, debt has already declined below the pre-pandemic peak, again reflecting a combination of economic recovery and the 2023 inflation shock. Panel (b) suggests that debt will stabilise over the medium term, albeit at a high level.

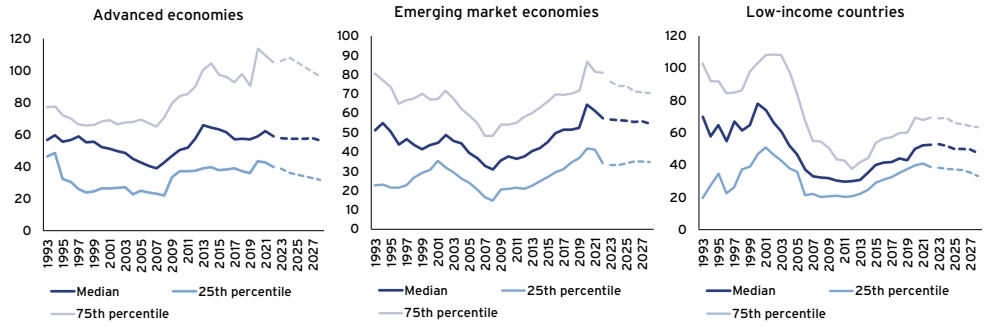
113 European Commission (2023).

FIGURE 18 **GENERAL GOVERNMENT DEFICITS AND DEBT, 2020-2028**

a) General government primary fiscal balance



b) General government gross debt



Note: dotted lines represent projections.
Source: IMF World Economic Outlook database, April 2023.

On closer inspection, however, the figure is less reassuring. First, at least for advanced and emerging markets, the projected medium-term stabilisation of debt ratios benefits from the fact that it takes a while for higher interest rates to creep into the average cost of borrowing, as debt matures and is refinanced at higher market rates. Hence, the stabilisation may partly reflect favourable conditions of a temporary nature: economic recovery, unanticipated inflation, and still very low average interest payments per unit of debt outstanding. All these may have worn off by 2028, so it is not clear whether a flattening of the debt profile implies that debt will stay flat or whether (in the absence of further fiscal adjustment) it will start to rise again. Second, the figure is insufficiently granular to show less-favourable debt trajectories for individual countries, some of which may have systemic importance. This concern is best illustrated by the 25th percentile trajectory of primary balances in advanced economies, which shows that for one quarter of countries in this group, the IMF expects the *primary* fiscal balance to remain at around -2% of GDP or even lower, even after the post-Covid and post-war-shock adjustment has run its course. Unless these countries have strong potential growth or can continue to borrow at very favourable rates, this is probably not consistent with debt sustainability.

Examining these concerns requires country-level analysis. To undertake this for many countries at the same time, we use a simple approach organised around two main country-level indicators.

The first indicator is the steady-state debt-stabilising primary balance projected for 2028, after economic recovery, unanticipated inflation and post-pandemic fiscal adjustment have all run their course. This is the primary balance (tax revenue minus non-interest expenditure, as a share of GDP) that a country would need to run *indefinitely* to stabilise the debt ratio at its 2028 level, assuming the economy is in a steady state in which the primary balance, gross financing needs, real interest rates and real growth rates remain unchanged (in actual fact, of course, the economy is not in steady state, which means that the actual debt-stabilising primary balance, taking into account the amortisation structure of debt, can be higher or lower; we will return to this when we examine EU countries in greater detail below). The steady state debt-stabilising primary balance is given by a simple formula:

$$pb^{*}_{t+5} = \frac{r - g}{1 + g} d_{t+5},$$

where pb^{*}_{t+5} represents the steady-state debt-stabilising primary balance as a share of GDP at the end of the World Economic Outlook's five-year forecast horizon (end-2028, from the perspective of the April 2023 World Economic Outlook), $r - g$ represents the difference between 'long-run' expected real interest and real growth rates, and d_{t+5} the World Economic Outlook's debt ratio projection at the end of the forecast horizon.[114] r is computed using a weighted average of medium- and long-term government bond forward rates corresponding to the original maturity structure of market debt for each country, deflated using five-in-five inflation expectations (i.e. five-year inflation expectations expected for 2028). As an estimate of g, we use g_{t+5}, which is the IMF's expectation of growth at the end of the forecast horizon. This represents the IMF staff's estimate of the potential growth rate, as cyclical movements are assumed to dissipate within five years.

The second measure is the difference between the debt-stabilising primary balance and the projected primary balance at the end of the World Economic Outlook forecast period ($pb^{*}_{t+5} - pb_{t+5}$). This measures how much additional adjustment a country would need to undertake, beyond what is already projected in the World Economic Outlook, to get to a primary balance level that will stabilise its debt.

114 The formula can be derived from the debt accumulation identity $D_{t+1} = (1 + r_t)D_t - PB_{t+1}$, where D_t and PB_t represent real (constant dollar) values of debt and the primary balance, respectively. Dividing both sides by GDP, using lower case letters to denote shares of GDP and rearranging gives

$d_{t+1} = \frac{1+r_t}{1+g_t} d_t - pb_t$.

Imposing the debt-stabilisation condition ($d_{t+1} = d_t$) and rearranging leads to the formula used in the text.

The two indicators capture two different aspects of fiscal efforts. The first relates to the ability to *sustain* a primary surplus over time. The higher the required primary surplus, the less plausible this is. Long spells of fiscal surpluses in the order of 1–2% of GDP are relatively common in countries that are seeking to reduce their debt levels, as are short spells involving high primary surpluses (3–5%). Long spells involving average surpluses above 3%, however, are very rare.[115] The second indicator captures the effort required to *raise* the fiscal surplus to the level that will stabilise the debt, over and above the adjustment that is already projected by the IMF.

To understand how these two measures have changed as a result of the pandemic and the war, we start with the three variables entering the definition of the debt-stabilising primary balance, namely, d_{t+5}, g, and r. We focus on countries for which forward interest rates and market-based inflation expectations are available; unfortunately, this means we lose all low-income countries and some advanced and emerging market economies. The resulting sample consists of 26 advanced economies, 22 European (EU+UK) economies, and 18 EMEs.[116] Figure 19 plots the distributions of the three variables at two points in time, namely, as forecast in October 2019 and April 2023.

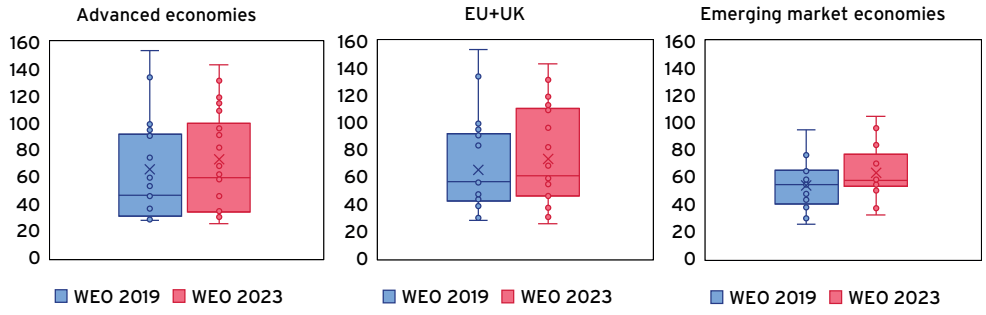
Panel (a) shows that for countries with median debt levels, five-year-expected debt (d_{t+5}) increased by about 12 percentage points between October 2019 and April 2023 in advanced economies, and by about 4 percentage points in EMEs. The EU+UK median increase is closer to that of the EMEs; however, at the 75th percentile, the increase is much higher than in advanced economies on average, reflecting a widening of the gap between countries with debt ratios above 90% and those with debt ratios around or below 60%.

Panel (b) indicates that the pandemic and war period made no difference to the distribution of five-year expected growth rates in advanced economies but that expected growth declined in the top half of the distribution of EMEs, particularly the top 25%. This reflects an expected slowdown in medium-term growth in China and, to a lesser extent, India and some of the other fast-growing EMEs. In contrast, at the bottom of the EME growth distribution, medium-term expected growth in 2023 was higher than in 2019, reflecting mostly emerging European countries. Partly due to the same countries, but also reflecting higher expected growth in Italy, Portugal and Sweden, medium-term growth in the EU+UK group is expected to be moderately *higher* today than it was in 2019.

115 Eichengreen and Panizza (2016) and Zettelmeyer et al. (2017). Based on a historical sample of advanced and emerging market economies with starting values of debt in excess of 60%, Zettelmeyer et al. (2017) show that the probability of maintaining an average positive primary balance for 30 years or longer is about 50%, while the probability maintaining an average primary surplus above 2.5% for such a long period is only about 20%. Above 2.5%, the probability drops sharply (for example, the probability of maintaining a 3.5% average primary surplus for 20 years or more is near zero).

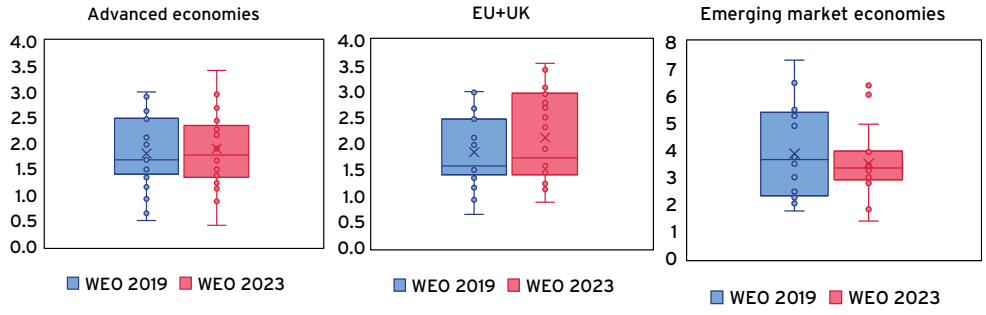
116 Eighteen European countries (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Netherlands, Portugal, Slovak Republic, Slovenia, Spain, Sweden, and the United Kingdom) are members of both the advanced country and the EU+UK group. Croatia, Poland, Hungary and Romania are members of both the EU+UK and the EME group. Other EMEs shown in the plots include Brazil, China, Colombia, Costa Rica, India, Indonesia, Malaysia, Mexico, Panama, Peru, Philippines, South Africa, Thailand and Turkey.

FIGURE 19a **FIVE-YEAR AHEAD DEBT-TO-GDP RATIO PROJECTED OCT. 2019 AND APRIL 2023**



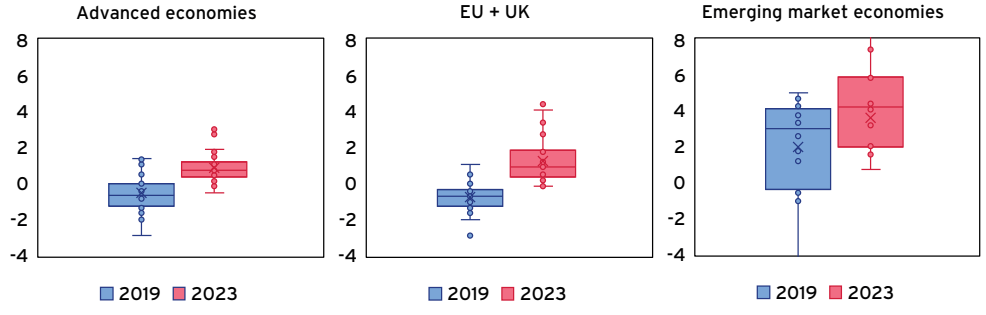
	2019	2023	*Diff.*		2019	2023	*Diff.*		2019	2023	*Diff.*
75th pc.	91.7	99.7	*8.0*	75th pc.	91.7	110.3	*18.6*	75th pc.	65.0	76.8	*11.7*
Median	46.6	59.3	*12.7*	Median	56.2	60.7	*4.5*	Median	54.3	57.9	*3.6*
25th pc.	31.0	34.0	*3.0*	25th pc	42.3	46.1	*3.8*	25th pc	40.1	53.4	*13.3*

FIGURE 19b **FIVE-YEAR AHEAD REAL GROWTH RATE PROJECTED OCT. 2019 AND APRIL 2023**



	2019	2023	*Diff.*		2019	2023	*Diff.*		2019	2023	*Diff.*
75th pc.	2.5	2.4	*-0.1*	75th pc.	2.5	3.0	*0.5*	75th pc.	5.4	4.0	*-1.4*
Median	1.7	1.8	*0.1*	Median	1.6	1.7	*0.2*	Median	3.6	3.3	*-0.3*
25th pc.	1.4	1.4	*-0.1*	25th pc	1.4	1.4	*0.0*	25th pc	2.3	2.9	*0.6*

FIGURE 19c **FIVE-YEAR AHEAD REAL INTEREST RATES PROJECTED OCT. 2019 AND EARLY 2023**



	2019	2023	*Diff.*		2019	2023	*Diff.*		2019	2023	*Diff.*
75th pc.	-0.1	1.2	*1.3*	75th pc.	-0.3	1.9	*2.2*	75th pc.	4.1	5.9	*1.8*
Median	-0.7	0.8	*1.4*	Median	-0.8	1.0	*1.8*	Median	3.0	4.3	*1.2*
25th pc.	-1.2	0.4	*1.6*	25th pc	-1.3	0.4	*1.7*	25th pc	-0.4	2.0	*2.4*

Note: WEO = World Economic Outlook. The boxes show the interquartile range (25th to 75th percentile of the distribution), the lines inside the boxes the median, and the whiskers the top and bottom of the distribution, except for outliers (observations more than one and a half times of the length of the box away from either end of the box).

Source: IMF for Figures panels a and b (October 2019 and April 2023 databases of the World Economic Outlook); Bloomberg for panel c.

Finally, panel (c) shows that the distribution of long-term real interest rates shifted up substantially between October 2019 and today, in the order of 1.5% to 2%. This is true for all country groups. As a result, the expected real interest–real growth differential has increased for most countries, though it remains negative in many.

Figure 20 shows the resulting impact on the two measures of fiscal effort defined previously: the steady state debt-stabilising primary balance, using the formula

$$pb^*_{t+5} = \frac{r-g}{1+g} d_{t+5} ,$$

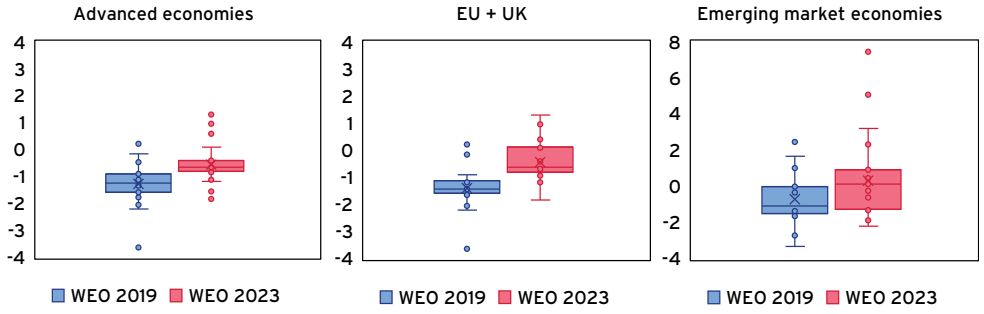
both from the perspective of 2019 and the perspective of 2023; and the residual adjustment need, over and above the adjustment that the World Economic Outlook is already expecting in the next five years.

Panel (a) shows that pb^*_{t+5} has increased moderately, by about 0.6% of GDP for the median advanced economy and 0.8% for the median EU country. For most of these countries, this shift occurred from a very low (negative) base. As a result, the steady-state debt-stabilising primary balance remains negative for 22 out of 26 advanced countries, reflecting the fact that even after higher real interest rates, $r - g$ remains negative. In the EU+UK group, about a quarter of countries now have a positive $r - g$ and consequently a positive pb^*_{t+5}.

The picture looks less sanguine for the EME group (note that the y-axis scale is different). Here, the median increase in pb^*_{t+5} is about 1.3% of GDP, and 10 out of 18 countries in the sample end up with a positive pb^*_{2008}. The median pb^*_{2008} is still very low (0.2% of GDP), but this partly reflects sample selection: EMEs whose debt is in distress or viewed as very risky (Argentina, Lebanon, Pakistan, Egypt, Sri Lanka or Venezuela) are not in the sample because they do not have liquid forward interest markets. Furthermore, four countries in the sample – Brazil, Colombia, Mexico, and South Africa – have pb^*_{t+5} in excess of 2%.

Finally, panel (b) shows the gap between the projected debt-stabilising primary balance and the projected actual primary balance. The results now look much more concerning than those of panel (a). For advanced economies, the median difference $pb^*_{t+5} - pb_{t+5}$ is projected to be about 1% of GDP, and about one quarter of the economies in all three samples are projected to have residual adjustment gaps of 1.2% of GDP or higher. For EMEs, the residual adjustment gap is over 2%. The EU+UK are somewhere in between.

FIGURE 20a **FIVE-YEAR AHEAD PROJECTED STEADY-STATE DEBT-STABILISING PRIMARY BALANCE**

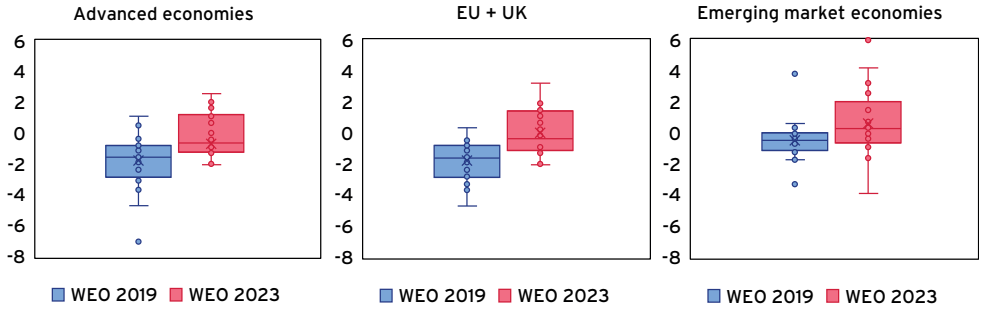


	2019	2023	*Diff.*
75th pc.	-0.9	-0.4	*0.5*
Median	-1.3	-0.7	*0.6*
25th pc.	-1.6	-0.8	*0.7*

	2019	2023	*Diff.*
75th pc.	-1.1	0.1	*1.2*
Median	-1.4	-0.6	*0.8*
25th pc	-1.6	-0.8	*0.8*

	2019	2023	*Diff.*
75th pc.	0.0	1.3	*1.3*
Median	-1.1	0.2	*1.3*
25th pc	-1.5	-1.3	*0.3*

FIGURE 20b **DIFFERENCE BETWEEN PRIMARY BALANCE PROJECTED BY THE IMF AND THE PROJECTED STEADY-STATE DEBT-STABILISING PRIMARY BALANCE**



	2019	2023	*Diff.*
75th pc.	-0.8	1.2	*2.0*
Median	-1.6	-0.6	*1.0*
25th pc.	2.8	-1.2	*1.6*

	2019	2023	*Diff.*
75th pc.	-0.8	1.5	*2.2*
Median	-1.6	-0.3	*1.2*
25th pc	-2.9	-1.1	*1.8*

	2019	2023	*Diff.*
75th pc.	0.0	2.3	*2.3*
Median	-0.6	0.3	*0.9*
25th pc	-1.2	-0.6	*0.6*

Note: WEO = World Economic Outlook. The boxes show the interquartile range (25th to 75th percentile of the distribution), the lines inside the boxes the median, and the whiskers the top and bottom of the distribution, except for outliers (observations more than one and a half times of the length of the box away from either end of the box).

Source: Author's calculations based on IMF and Bloomberg data.

To summarise, there is good news and bad news about debt sustainability after the pandemic and the war. The good news is that for most advanced countries and almost half of EMEs in our sample, $r - g$, and hence expected debt-stabilising primary balances, remain negative. The bad news is that several EMEs face high debt-stabilising primary balances. Furthermore, actual primary balances in most countries are projected to remain substantially below their debt-stabilising primary balances even in five years, with large adjustment gaps – in the order of 2% of GDP or higher – in more than a quarter

of the EME sample. For countries with large adjustment gaps that also have positive debt-stabilising primary balances, there may be reason to worry. Unless those countries undertake large adjustment efforts beyond what is currently projected by the IMF, their debt ratios will explode.

4.1.2 A closer look at Europe

The remainder of this section focuses on the European Union. It builds on the analysis of the previous section but goes beyond it in three ways. First, it computes the *actual* (rather than steady-state) debt-stabilising primary balance after 2028, based on a debt stock projection that assumes the same long-run growth rate as in the previous section (i.e., the World Economic Outlook projection for 2028) but also reflects the creditor and maturity structure of the existing debt stock. For example, this takes account of the fact that Greece, Ireland and Portugal still owe approximately 53%, 9% and 7%, respectively, of their total debt stocks to EU official creditors – mainly the European Stability Mechanism (ESM) and European Financial Stability Facility (EFSF) – which charge lower interest rates than bondholders.

Second, to illustrate the additional fiscal effort that might be required by future (reformed) EU fiscal rules, it computes the post-2028 constant primary balance consistent with gradual declines in the debt stock for countries with debts above 60% of GDP.[117] Third, it attempts to incorporate uncertainty over r and g.

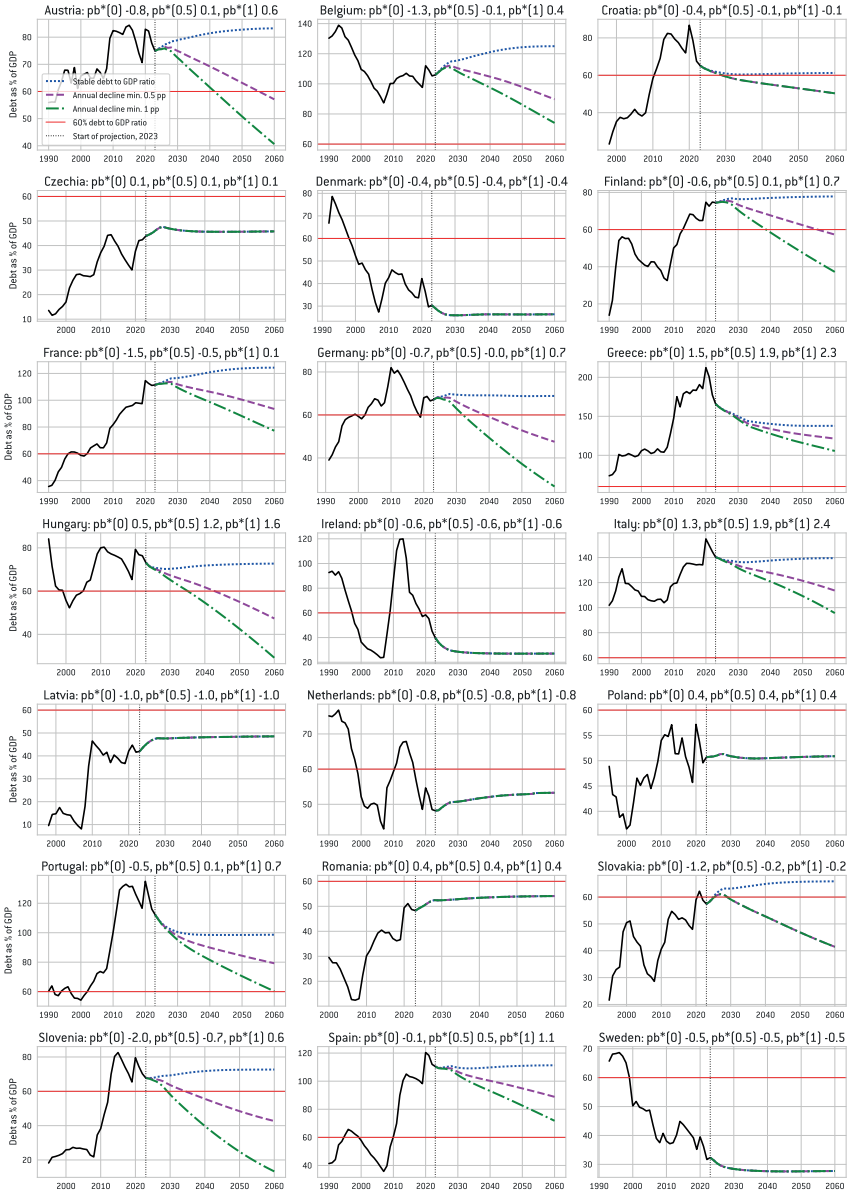
Figure 21 shows the results of three simulation exercises based on the current debt structure of each country, which is assumed to remain unchanged with respect to the original maturity of new debt issuance; forward interest rates corresponding to the maturity of new debt issuance; World Economic Outlook expected real growth rates for 2028, which are assumed to prevail indefinitely; and a constant primary balance for 2029 and beyond.[118] The latter is set such that the debt ratio either:

1. stabilises (i.e., flattens out) in the long term, referred to below as $pb^*(0)$;
2. falls by at least 0.5% of GDP per year between 2029 and 2060 for countries with debt above 60% of GDP in 2029 and shows no long-term increase for the others ($pb^*(0.5)$); or
3. falls by at least 1.0% of GDP per year between 2029 and 2060 for countries with debt above 60% of GDP in 2029 and shows no long-term increase for the others ($pb^*(1)$).

117 While the reform is not yet final, it will include a debt-reduction requirement for countries with debts above 60% of GDP (the Treaty-based debt reference value); see the next section.

118 Between 2024 and 2029, the primary balance is assumed to gradually adjust to the constant primary balance corresponding to each scenario.

FIGURE 21 **DEBT PATHS ASSOCIATED WITH DEBT STABILISATION/REDUCTION SCENARIOS IN EU COUNTRIES**



Note: Figure plots debt-to-GDP ratio projections for three debt-stabilisation/reduction scenarios. Each scenario is based on (1) World Economic Outlook data up to and including 2023 for the primary balance and debt, as well as up to and including 2028 for nominal GDP; and (2) the assumption that the primary balance will converge linearly from the WEO projection for 2023 to a constant primary balance from 2029 onwards. Scenario 1 (pb^*_0 in title, blue) sets the 2029 constant primary balance to stabilise the debt ratio by 2060. Scenario 2 ($pb^*_{0.5}$ in title, purple) prescribes a minimum annual decline in the ratio by 0.5 percentage points for countries starting at debt levels above 60% of GDP. Scenario 3 (pb^*_1 in title, green) prescribes a 1 percentage point annual decline for these countries. Debt ratios of countries with 2029 ratios at or below 60% are required not to increase in the long-term in scenarios 2 and 3. Projections are based on sovereign bond data, ESM and EFSF debt data and interest projections, ECB data on short term borrowing, IMF growth forecasts for 2028, and market expectations for inflation and interest rates. Amortisation and interest rate burdens from old debt are financed by primary surpluses and new debt issuance. We model issuance and refinancing costs by approximating and reproducing each countries' original maturity profile and adding interest based on expected market rates for respective maturities and projection years.

Source: Bruegel.

The figure shows that scenarios 2 and 3 both imply faster debt falls in the early years than the assumed minimum of 0.5% and 1.0%, respectively. That said, by 2060, debt remains above 60% for Belgium, France, Italy, Greece and Spain even in scenario 3. Note, however, that in the cases of Greece, Italy and, to a lesser extent, Spain, this reflects relatively high real expected market borrowing rates (close to 2% for Greece and Italy, and 1.2% for Spain), which would likely fall if debt were to decline in these countries, accelerating the debt declines in scenarios 2 and 3.

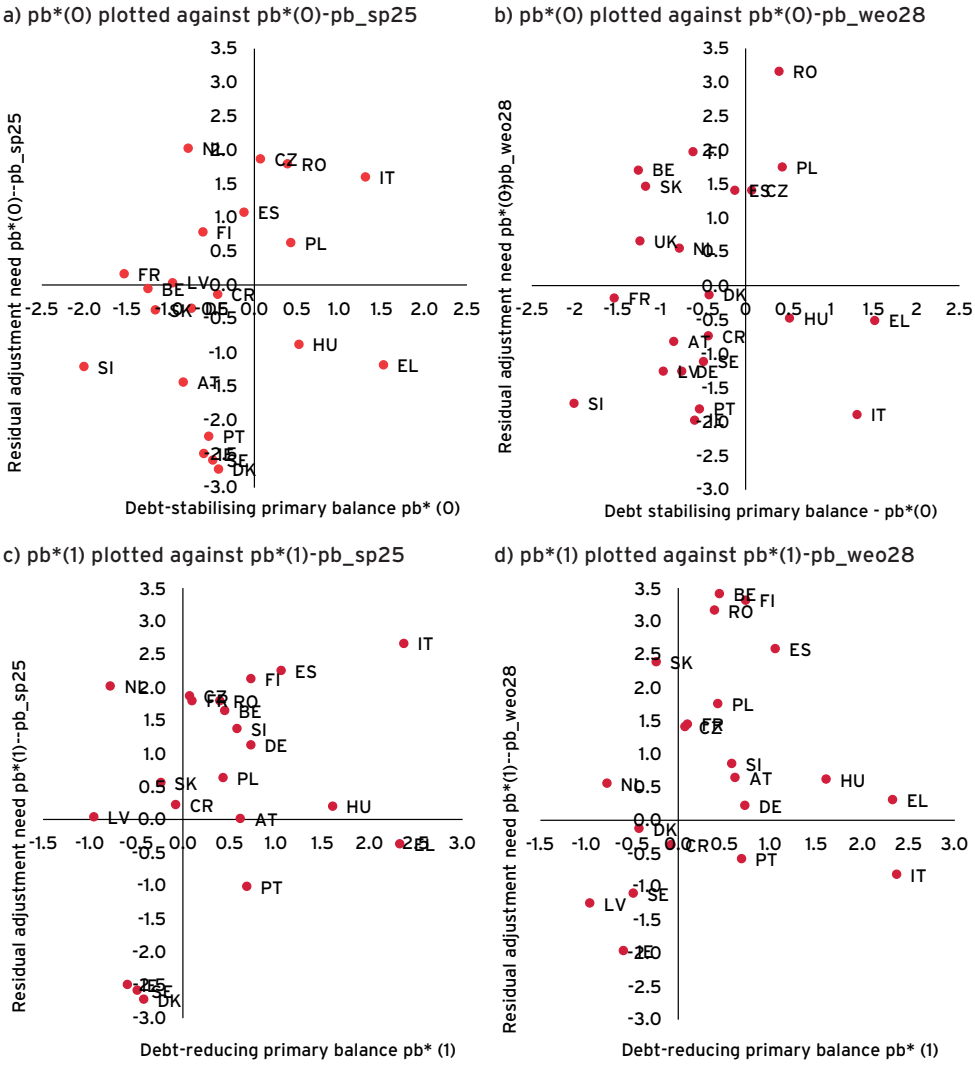
Armed with these scenarios, we revisit the questions of the previous section. First, how realistic is it to assume that EU member states could sustain (or exceed) the debt-stabilising/reducing primary balances associated with each scenario for several decades? Second, could countries realistically reach these primary balances by 2029, given where they stand today? To help with the last question, we use two reference values. The first is where the World Economic Outlook expects primary balances to be by 2028. The second is where EU governments themselves want to be in a few years, according to the final year of their recent 'stability programmes' (or 'convergence programmes' for non-euro area countries) – a three-year plan that EU members are required to submit in April/May of each year.

Figure 22 organises the results for the EU countries into four scatter plots. In the top plots, the debt-stabilising primary balance $pb^*(0)$ is shown on the x-axes; in the bottom ones, the debt-reducing balance $pb^*(1)$. The left-hand scatter plots show the difference between $pb^*(0)$ and pb*(1), respectively, and the 2025 structural (cyclically adjustment) primary balance target from the May 2022 stability/convergence programmes (y-axes), while the right-hand plots show the difference between $pb^*(0)$ and $pb^*(1)$, respectively, and the World Economic Outlook primary balance projection for 2028. Hence, the y-axes show the additional fiscal adjustment that countries need to undertake, beyond the adjustment that is either already targeted for 2025 or projected by the IMF for 2028, in other to reach either $pb^*(0)$ or $pb^*(1)$.

There are two main results, consistent with those highlighted in the previous section.

First, with only two exceptions (Greece and Italy), the levels of debt-stabilising primary balances remain modest. According to the simulations underlying Figures 21 and 22, both countries would need to run permanent primary surpluses in the order of 1.3–1.5% of GDP to stabilise their debt, and primary surpluses of 2.3–2.4% of GDP to reduce it at a minimum of 1% per year. These values are within historically plausible ranges. Setting aside the possibility that real interest rates might be higher or growth lower than assumed in the projections (see below), this is good news.

FIGURE 22 **DEBT-STABILISING/REDUCING PRIMARY BALANCES AND RESIDUAL ADJUSTMENT NEEDS (PERCENT OF GDP)**



Note: pb*(0) is the constant primary balance, starting in 2029, which stabilises the debt ratio in the long term. pb*(1) is the constant primary balance, starting in 2029, that leads to a debt reduction of at least 1% of GDP per year in countries with debts above 60% of GDP, and stabilises the debt in countries with less than 60% of GDP. pb_sp25 is the 2025 structural primary balances target according to the 2022 stability/convergence programmes of EU member states; while pb_weo28 is the 2028 primary balance projected by the April 2023 World Economic Outlook (the same as pb^{*}_{t+5} in Figure 3). See also note to Figure 4.

Source: Bruegel.

Second, there are a handful of countries that, conditional on current adjustment baselines, are not on track to reach even the debt-stabilising primary balances (let alone the debt-reducing ones). Which countries belong in this group is a little unclear, however, and depends in part on how seriously one takes the IMF's five-year out primary balance projections.

- Based on the 2022 stability programmes, seven EU countries will fail to reach their 2029 minimum debt-stabilising primary balance by 2025. This is not necessarily concerning, as they will have several years to make the additional required adjustment. But is the latter plausible? For one of the seven countries, the IMF's answer is an emphatic yes: the IMF projects Italy exceeding a 3% primary surplus by 2028. For the remaining six countries – Czechia, Finland, the Netherlands, Poland, Romania and Spain – the IMF thinks not (although the Netherlands is projected to come close). In addition, the IMF believes that Belgium and Slovakia will also fail to reach their debt-stabilising primary balances by 2028, notwithstanding the intentions of these countries to reach them as early as 2025.
- Not surprisingly, most EU countries do not plan to reach the debt-reducing surplus pb*(1) by 2025. According to the IMF, most will also miss it by 2028, although narrowly in some cases. Based on the IMF projections, seven countries would miss $pb^*(1)$ by a wide margin (of about 1.5% to over 3% of GDP) in 2028 – the six countries mentioned in the previous bullet (that would fail to even stabilise their debt ratios by 2028) plus France.

The final step is to quantify the effect of uncertainty around r and g. We do this by estimating the joint probability density functions of forecast errors of our estimates for r and g – long-term forward interest rates, and the IMF's growth forecast at the end of the World Economic Outlook's five-year forecast horizon (g_{t+5}) – and using the results to run a Monte Carlo simulation that generates estimated probability density functions for $pb^*(0)$ and $pb^*(1)$.[119] Table 2 shows the results.

119 Because we are interested in the accuracy of these forecasts as predictors of long-term future average growth and average interest rates, respectively, we define these forecasts errors not with respect to their realisation in the time period to which the forecast refers but with respect to the ten year ahead five-year moving average of g_{t+5}, i.e.,

$$\varepsilon_{g_{t+5},t} = g_{t+5,t} - \frac{1}{5}\sum_{\tau=t+5}^{\tau+10} g_{t+5,\tau}$$

Analogously, we compute the error of market interest rate expectations as the difference between 5Y10Y forward rates and their five year ahead one-month moving average. Our sample includes biyearly World Economic Outlook g_{t+5} forecasts between 1990 and 2023 and monthly market rates since 2000. We subsequently fit a bivariate Gaussian kernel density estimation (KDE) (Silverman, 1986) to the two distributions. We subsequently estimate the probability density function of $pb^*(0)$ and $pb^*(1)$ via a Monte Carlo simulation. Taking 500 draws from the bivariate KDE, we update the real growth and interest rate assumptions in our model projections. The latter assumes that the interest rate error is the same for all rates, i.e., that the spread between rates of different maturities and forward years is constant. We then solve for values of $pb^*(0)$ and $pb^*(1)$, respectively, by finding the minimum primary balance that results in a debt-to-GDP ratio path with a slope of zero in 2060 ($pb^*(0)$), or a slope with a minimum annual decline of one between 2029 and 2060 for countries with debt ratios exceeding 60% of GDP in 2029 ($pb^*(1)$). The resulting distributions represent the historical probability that our estimates undershoot the actual pb^*.

TABLE 2 **PROBABILITIES THAT THE 2028 DEBT-STABILISING PRIMARY BALANCE AND ADJUSTMENT GAP EXCEED A THRESHOLD**

	Estimated debt stabilising/ reducing primary balances (% of GDP)		Structural primary balance targets (% of GDP)	Prob {pb*(0)...		Prob {pb*(1)...		Prob {pb*(0) - pb_sp25...		Prob {pb*(1) - pb_sp25...	
	pb*(0)	pb*(1)	pb_sp25	>2}	>3}	>2}	>3}	>2}	>3}	>2}	>3}
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Austria	-0.84	0.62	0.6	1	0	19	1	0	0	4	0
Belgium	-1.26	0.45	-1.2	17	5	36	15	40	23	55	39
Croatia	-0.44	-0.08	-0.3	5	0	10	0	7	0	19	1
Czech Rep.	0.07	0.07	-1.8	0	0	1	0	51	14	53	16
Denmark	-0.42	-0.42	2.3	0	0	0	0	0	0	0	0
Finland	-0.61	0.73	-1.4	1	0	10	0	24	3	79	23
France	-1.53	0.10	-1.7	5	0	22	3	41	17	69	43
Germany	-0.75	0.72	-0.4	0	0	8	1	4	0	16	3
Greece	1.51	2.33	2.7	36	26	40	29	10	5	12	6
Hungary	0.52	1.60	1.4	23	13	37	23	8	1	19	8
Ireland	-0.60	-0.60	1.9	0	0	0	0	0	0	0	0
Italy	1.30	2.37	-0.3	44	33	57	41	50	37	60	47
Latvia	-0.96	-0.96	-1.0	10	1	12	1	32	10	33	12
Netherlands	-0.78	-0.78	-2.8	0	0	0	0	74	25	78	23
Poland	0.43	0.43	-0.2	1	0	2	0	3	0	4	0
Portugal	-0.54	0.68	1.7	23	6	29	19	1	0	7	1
Romania	0.39	0.39	-1.4	16	2	14	2	52	25	49	26
Slovak Rep.	-1.17	-0.24	-0.8	0	0	0	0	0	0	15	0
Slovenia	-2.01	0.58	-0.8	6	0	15	1	16	5	22	15
Spain	-0.12	1.05	-1.2	27	20	35	24	41	28	52	39
Sweden	-0.49	-0.49	2.1	0	0	0	0	0	0	0	0
UK	-1.24	0.23	n/a	0	0	3	0	-	-	-	-

Note: See note to Figures 21 and 22. The units of the table are probabilities in percent, except for columns (1) to (3), which refer to percent of GDP.

Source: Authors' calculations.

Columns 1 to 3 show the estimated values for pb*(0) and pb*(1) along with the structural balance target for 2025 from the 2022 stability programmes. The remainder of the table shows the estimated probability, based only on uncertainty about r and g, that $pb^*(0)$, $pb^*(1)$ or the differences between $pb^*(0)$, $pb^*(1)$ and the primary balance target shown in column 3 exceeds either 2% or 3% of GDP. Exceeding these thresholds would indicate that stabilising or reducing the debt according to the scenarios underlying $pb^*(0)$ and

*pb**(1) involves a fiscal effort that may be hard or very hard to achieve, either because of the size of the primary surplus that would have to be maintained over a long period (columns 4 to 7) or the magnitude of additional adjustment relative to what countries are planning to do by 2025 (columns 8 to 11). The highlights are as follows.

The danger that the debt-stabilising primary balance exceeds 3% of GDP is well below 50% (33% for Italy, 26% for Greece, 20% for Spain). Not surprisingly, the probability that the debt-reducing primary balance *pb**(1) exceeds 3% of GDP is higher, but even that is below 50% for all countries.

The probability that the country will need to adjust by 2% of GDP or more over and above their 2025 target to reach their 2029 debt-stabilising primary balance is over 70% for the Netherlands (whose 2022 stability programme was exceptionally unambitious), around 40–50% for Italy, Romania and the Czech Republic, and over one-third for Belgium, France and Spain. However, the chances that the extra adjustment may need to be higher than 3% of GDP (making it implausible over the 2025–2029 horizon) is more contained, at less than one-third for all countries except Italy. The chances that getting to *pb**(1) requires more than 3% adjustment over and above the 2025 target is higher, but even this does not exceed 50% for any country.

These results need to be viewed with caution. One important caveat is that the probabilities are based only on past forecast uncertainty, and do not consider any forward-looking information on whether real interest rates might fall again or stay high.[120]

The main conclusion is that the takeaways from the deterministic analysis are preserved if one attempts to quantify uncertainty around *r* and *g*. On the one hand, debt appears to be sustainable in every EU country, in the sense that debt-stabilising primary balances are unlikely to be outside the range that can plausibly be reached and maintained over time. On the other hand, in countries such as Belgium, Czech Republic, Finland, France, Italy, Netherlands, Romania and Spain, reaching primary balances that will reduce debt at satisfactory speed may require much higher adjustment than what is currently planned. Whether this is plausible will depend on country-specific factors, but also on the quality of EU fiscal rules.

120 See Blanchard (2023a) and Zettelmeyer et al. (2023).

4.2 EU FISCAL RULES AFTER THE PANDEMIC AND THE WAR

Fiscal rules are legal constraints on fiscal policy intended to maintain deficits and debt at prudent levels. At the national level, such rules are normally introduced to offset policy failures related to political economy: policymakers place bigger weight on the benefits of higher spending and/or lower taxes in the present than on the potential risks of high debt in the future. Fiscal rules are supposed to serve as commitment devices that prevent overspending. And indeed, there is evidence that fiscal rules have been at least somewhat effective in providing such commitment.[121]

The European Union has had such rules at the European level since 1997 (the Stability and Growth Pact), based on the 1992 Treaty on the Functioning of the European Union (TFEU), also known as the Maastricht Treaty.[122] With the responsibility for fiscal policy remaining at the national level, European-level rules are justified by the potential negative externalities of discretionary fiscal policy in one member state on another. One such externality could be the cross-border spillovers of a debt crisis. Another could be pressure on the ECB to stray from its price stability mandate to forestall such a crisis.

But imposing fiscal rules on members of the euro area poses a dilemma: while the negative spillovers of high debts and deficits are particularly relevant inside a currency union, so is the need for fiscal stabilisation policy (as the main remaining national-level stabilisation instrument). The European fiscal rules were designed to address this dilemma by (1) seeking to ensure that debt was sufficiently low to give all members fiscal space for stabilisation policy (with 60% of GDP being selected as a – somewhat arbitrary – benchmark); (2) constraining but not prohibiting deficits (within 3% of GDP); (3) allowing member states to exceed the 60% debt and 3% deficit ceilings if these deviations are temporary and the debt ratio is projected to return to less than 60% "at a satisfactory pace";[123] (4) prescribing minimum fiscal adjustment in cyclically adjusted ('structural') rather than nominal terms, to protect automatic stabilisers; and (5) incorporating an escape clause that allows the application of the rules to be suspended in the face of very large common shocks. The first three of these elements are in the TFEU, the latter two in secondary legislation. The escape clause was in fact activated in March 2020, and is supposed to be 'de-activated' at the end of 2023.

121 Debrun et al (2008), Bergman et al (2016), Caselli et al. (2020) and Davoodi et al. (2022).

122 See European Commission (2019). For brief overviews, see Blanchard et al. (2021) and https://economy-finance.ec.europa.eu/economic-and-fiscal-governance/stability-and-growth-pact/history-stability-and-growth-pact_en.

123 Article 126(2) of the TFEU stipulates that the deficit benchmark can be exceeded if it has "declined substantially and continuously and reached a level that comes close to the reference value, or, alternatively, the excess over the reference value is only exceptional and temporary and the ratio remains close to the reference value". The debt benchmark can be exceeded if "the ratio of government debt to gross domestic product … is sufficiently diminishing and approaching the reference value at a satisfactory pace".

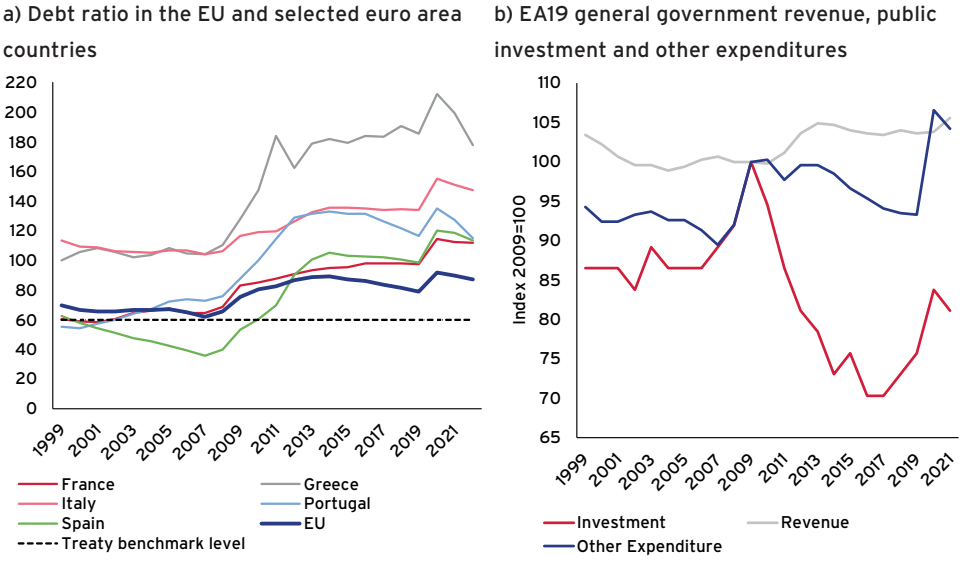
There is a good argument for returning to the normal application of EU-level fiscal rules sooner rather than later. As documented in the last section, there is a need to undertake more credible adjustment efforts in at least a half a dozen EU countries. By reassuring investors that debt will remain sustainable, fiscal rules could increase fiscal space in the form of lower interest rates.

The question is whether the present framework is the right one to return to. The answer is no.

4.2.1 The need for reform

Fiscal performance in the European Union has not been what the fathers of the SGP had hoped for. The SGP did not lead to the desired accumulation of fiscal buffers in good times (e.g., 2000–2007), did not prevent a catastrophic debt crisis in the euro area (2010-12), and did not protect public investment from being disproportionately squeezed in economic downturns (Figure 23). Fiscal policy has generally remained procyclical.[124]

FIGURE 23 **DEBT AND PUBLIC INVESTMENT UNDER THE SGP (PERCENT OF GDP)**



Source: World Economic Outlook database, April 2023 (panel a); Eurostat (panel b).

124 European Fiscal Board (2019), Larch et al. (2021).

The question is whether this disappointing performance has occurred *because* of the rules or *in spite of* them. There is evidence that the rules have had some dampening effect on debt by creating incentives to keeping deficits below 3% of GDP, so having had no rules might have been worse.[125] Furthermore, the rules have been frequently disregarded.[126] Larch et al. (2021) find (not surprisingly) that the rules *would* have been conducive to countercyclical behaviour *if* they had been followed, by creating fiscal buffers in good times. For example, during the first decade of the euro, Greece and Portugal continuously exceeded the 3% deficit benchmark. Whether complying with this and other rules of the SGP would have avoided the ensuing debt crises in these countries is not clear,[127] but it would have given them much greater fiscal space to face the global financial crisis.

Arguments of this type have led some, such as Germany's former Minister of Finance Wolfgang Schäuble, to conclude that "[t]he problem in Europe is not the rules but the implementation".[128] This conclusion oversimplifies, for two reasons.

First, the rules use information about debt sustainability very inefficiently because they ignore essential debt drivers such as interest rates and economic growth, because they are based only on past realisations rather than expectations of future debt drivers, and because they ignore uncertainty. This is true not just for the SGP as it currently stands, but for any rules based on country- and time-invariant debt and deficit benchmarks.[129] Better implementation of the current rules may have led to better outcomes, but still far from the ideal outcomes.

Second, and relatedly, low compliance might be partly a consequence of the design of the rules. Compliance with the rules is largely voluntary, as the SGP lacks a credible enforcement mechanism. The TFEU explicitly exempts violators from the standard Treaty enforcement procedure via EU courts, and fines, although possible, were never imposed even on countries that serially violated the rules. Rules that are viewed as inefficient are more likely to trigger resistance than rules that are better designed. Furthermore, some technical aspects of the rules – in particular, the need to estimate the cyclical component of the fiscal deficit in real time – make them error-prone, which further reduces their attractiveness.[130]

125 Caselli and Wingender (2021)
126 Eyraud and Wu (2015), Eyraud et al. (2017) and European Fiscal Board (2019). In addition, the European Fiscal Board maintains a "compliance tracker" (https://commission.europa.eu/business-economy-euro/economic-and-fiscal-policy-coordination/european-fiscal-board-efb/compliance-tracker_en).
127 Ireland and Spain were both in continuous compliance with the deficit rule during the 2000s and still suffered crises, triggered by their banking sectors.
128 *Financial Times*, 29 June 2014.
129 Blanchard et al. (2021).
130 Claeys et al. (2016).

Furthermore, even if one were to take a benign view of the current rules, they would be difficult to implement after the pandemic and war, because debt levels are so far above the 60% benchmark. Under the 2011 '1/20th rule', member states are supposed to reduce their debt levels by an average of one-twentieth of the difference of their debt level and the 60% – an unrealistic pace for countries with high debt levels. While the 1/20th rule was not strictly enforced even prior to the pandemic, returning to a set of rules with the intention of not enforcing it for a group of high-debt countries is not ideal.

For a combination of these reasons, by mid-2021, there was a wide consensus among economists working on European fiscal issues that the rules needed to be rethought, with some consensus on the direction of the reform (see below).[131] By 2023, several member states from both the European North and South appeared to agree, converging on four main reform aims: (1) greater effectiveness in ensuring debt sustainability; (2) greater efficiency in managing the potential trade-off between avoiding excessive deficits and allowing adequate room for fiscal stabilisation and public investment; (3) equal treatment of all EU member states (which, in the view of at least some member states, had been undermined by bilateral 'deals' between member states and the European Commission); and (4) better incentives for implementation.[132]

4.2.2 Reform directions

The question is whether it is possible to find a new framework that meets these four requirements at the same time. The answer can be organised around three questions: (1) how to best reconcile rules and discretion; (2) how discretion should be exercised (prior the exercise of adjudication authority, which the Treaty gives to the Council of the EU); and (3) how compliance can be improved.

With respect to the trade-off between rules and discretion, there is broad agreement that the optimal framework should retain a 'hard' operational rule to deal with the commitment problem – specifically, an expenditure rule.[133] The latter would place a binding, multi-year ceiling on non-interest government expenditures, adjusted for the revenue impact of changes in tax policy and cyclical expenditure (unemployment benefits). Setting this ceiling requires a medium-term debt or deficit 'anchor' – an adjustment objective that the expenditure path is supposed to achieve – as well as assumptions about potential growth and interest rates; but it does not require a year-by-year estimate of the output gap (a problem that bedevilled the implementation of the current fiscal run). A commitment to an expenditure ceiling implies that fluctuations in tax revenues do not need to be offset

131 In a June 2021 survey of experts on the European economy, 41 of 42 respondents took the view that the rules required reform (Ilzetzki, 2021).

132 See the 2023 'non-papers' by the Dutch and Spanish governments (jointly) and the German government and Zettelmeyer (2022) for a discussion.

133 The main exception was Blanchard et al. (2021), who argued for replacing rules entirely by "fiscal standards" – qualitative prescriptions backed by common methods – with the commitment problem solved through independent surveillance and enforcement institutions. A similar argument had previously been made by Wyplosz (2005).

by changes in expenditures, allowing automatic stabilisers (i.e., higher deficits in bad times and surpluses in good time) to work. As a result, an expenditure rule should have better stabilisation properties than fiscal rules that focus on the deficit (even the cyclically adjusted deficit, given the difficulties of getting that adjustment right).[134]

There is also agreement, at least among economists, that the adjustment objective that guides the net primary expenditure ceiling should be based on an assessment of debt risks that depends not only on current debt and deficit levels but also on the expected level and volatility of real growth rates, real interest rates and the characteristics of the investor base (rollover risk).[135] Finally, there is agreement that financial sanctions have been difficult to enforce, and that better compliance with the rules requires greater national ownership. More sensible (efficient) rules surely help in this regard. In addition, several authors argue for greater involvement of national fiscal institutions as a way of delegating fiscal surveillance from the EU to the national level, where it might be resisted less.[136]

4.2.3 The 2023 reform

In November 2022, the European Commission published a Communication on reforming the fiscal framework that is broadly in line with this consensus.[137] It envisages a four-stage process.

1. The Commission would undertake a debt-sustainabilty analysis (DSA) classifying countries as low, medium and high risk (diplomatically referred to as "substantial challenges").

2. For countries facing high and medium debt challenges, the Commission would propose a "reference multiannual adjustment path" in terms of net primary expenditure. This would be set to ensure that after an initial adjustment period, the debt ratio would be on a "plausibly and continuously declining path" for at least ten years, assuming unchanged policies after the adjustment period. For high-debt challenge countries, the maximum adjustment period would consist of four years; for medium-debt challenge countries, seven years.

134 See Andrle et al. (2015), Claeys et al. (2016), Bénassy-Quéré et al. (2018), European Fiscal Board (2019), Eyraud et al. (2018), Darvas et al. (2018) and Weymuller et al. (2022), among others.
135 Blanchard et al. (2021), Martin et al. (2021), Arnold et al. (2022). This is equivalent to saying that the medium-term debt anchor should be time-and country-specific. However, to avoid a change in the Treaty, most proposals propose maintaining the 60% benchmark as a long-term anchor and/or as a way of identifying countries with lower debt risks.
136 Darvas et al. (2018), Debrun and Reuter (2022), Thygesen et al. (2022), Arnold et al. (2022).
137 European Commission (2022).

3. Following a discussion with the Commission, the member state would submit a "medium-term fiscal structural plan" outlining fiscal adjustment, reform and public investment commitments. If the Commission thinks that the reform/investment measures in this plan are likely to benefit debt sustainability in the medium and long term, it could extend the length of the adjustment period for high-risk countries to a maximum of seven years.

4. The final step would be the adoption or rejection of the member state's plan by the Council of the European Union, based on a Commission assessment. If the Commission and the Council cannot agree, the Council could adopt the original reference path "for the purpose of fiscal surveillance and enforcement."

Failure to comply with the expenditure path adopted by the Council would trigger the (debt-based) Excessive Deficit Procedure (EPD), which might lead to an amended expenditure path if the Commission takes the view that "objective circumstances" justify an amendment. Failure to comply with either the amended or the original path could lead to suspension of EU financing and reputational sanctions, including symbolic fines. The threat of heavy fines would be abandoned, given its lack of credibility.

The Commission's November 2022 proposal represented a huge leap from the present rules. But it was also criticised by both economists and member states as giving too much power and discretion to the Commission.[138] The language used to describe how the DSA would translate into a debt reduction prescription – namely, that debt must be "plausibly and continuously declining" after four years (for high-risk countries) or seven years (for medium-risk countries) – is imprecise. What "continuously" means is clear; what "plausibly" means less so.[139] Furthermore, the Commission can significantly influence the outcomes of the DSA through its role in setting growth and interest rate projections. Some member states – Germany in particular – fear that under political pressure, this discretion could be abused, leading to unequal treatment, with overly gradual debt reduction paths in some countries.

In principle, there could be two approaches to address these concerns. First, the scope for abuse of discretion in the DSA could be reduced, if not eliminated, by being precise on the probability with which debt would be required to stabilise, publishing the method and data that would be used to estimate the distribution around the projected debt ratio, and asking an independent third party to provide (or validate) key projections. Second,

138 Blanchard et al. (2022).
139 The Commission has subsequently clarified that by "plausibly declining" it means declining in a manner that is robust to plausible shocks, but what this means concretely is not yet clear.

'safeguards' against abuse could be created, in the form of rules prescribing minimal adjustment or debt reduction regardless of the outcome of the DSA. At meeting in March 2023, the Economic and Financial Council of the European Union concluded that both routes should be explored.[140]

Since then, however, the focus of the debate has been almost entirely on the second approach, namely, 'safeguards' that would override DSA-based fiscal adjustment prescriptions when they become binding. In early April, Germany circulated a "technical non-paper"[141] proposing multiple safeguards and additional common quantitative benchmarks that would in effect turn the proposed framework back into a system of multiple overlapping (and sometimes conflicting) rules. The Commission's formal legislative reform proposal,[142] presented in late April, took a similar approach. In addition to the DSA-based debt reduction path, this presents three additional requirements for countries with moderate or substantial debt challenges: (1) all countries with deficits of more than 3% must reduce it by at least 0.5% of GDP per year; (2) debt at the end of the 4–7 year adjustment period must be lower than at the beginning of the adjustment period; and (3) a 'no-backloading' requirement stating that countries benefiting from an extended (seven- year) adjustment period need to deliver most adjustment in the first four years.

While these safeguards would certainly prevent abuse through inappropriately gradual adjustment, they come at a cost. They could impose faster debt reduction on countries that both deserve and need more time, thereby reducing the willingness of such countries to implement the new framework. They would also undermine the simplicity and consistency of the original design. Rather than having a DSA-based system with a single operational rule (the expenditure ceiling), there will now likely be a hybrid, with multiple overlapping rules, although the DSA at its core and the use of expenditure ceilings would still represent a significant improvement, particularly after the initial adjustment phase from high post-Covid deficits.[143]

A better approach would have been to address potential abuse of discretion at its root, by eliminating the need to use discretion in the methodology except through the projections, by ensuring that all members states (and the public) know how to apply the methodology and can reproduce its results, and by subjecting the Commission's forecasts to independent scrutiny.[144] It is to be hoped that in the coming months, the discussion of the Commission's legislative proposal will focus on this point, rather than adding more rules that would render the DSA element of the proposal increasingly irrelevant.

140 "The Commission trajectory should be based on a common methodology to be agreed that is replicable, predictable and transparent. … informed by regular technical discussions on projections and forecasts and should be discussed in a multilateral context in the relevant Committees." … "Common safeguard provisions to ensure sufficient debt reduction and prevent back-loading of fiscal efforts should be explored" ("Economic governance framework: Council agrees its orientations for a reform", press release, 14 March 2023).
141 See www.bruegel.org/sites/default/files/2023-04/German%20technical%20non%20paper.pdf
142 See https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2393
143 Darvas (2023).
144 Blanchard and Zettelmeyer (2023).

4.3 DEALING WITH SOVEREIGN INSOLVENCY AFTER THE PANDEMIC AND THE WAR

In the absence of a statutory (treaty-based) sovereign debt restructuring regime, an informal process for restructuring sovereign debt issued under foreign law has been in place since the mid-1990s, in the wake of the Latin American debt crisis.[145] This involves the following steps:

1. A country has difficulties repaying its debts and loses access to capital markets. After exhausting bilateral official borrowing from its friends, it turns to the IMF for an emergency loan.

2. The IMF conducts a debt sustainability analysis. If it finds debt to be unsustainable, it can lend only if (1) it has specific and credible assurances from bilateral official creditors (confusingly referred to as "financing assurances") that they will undertake a sufficiently deep debt restructuring to restore debt sustainability (conditional on the parameters of the programme agreed with the IMF); and (2) a credible restructuring process with private creditors is under way. Cases where either official bilateral debt or privately held debt is small require only one of the two conditions.

3. The coordination of official bilateral creditors occurs through the Paris Club, an informal forum dating back to 1956 and currently comprising 20 advanced countries, Brazil and Russia. Until the late 2000s, these countries held the bulk of official bilateral debt to low-income countries and emerging markets (Figure 7). Debt relief needs are established in close coordination with the IMF, as Paris Club creditors generally have an interest in providing the "financing assurances" required for an IMF programme.[146] Paris Club debt relief is conditional on "comparable treatment" of private creditors and bilateral official creditors outside the club.

4. The coordination of private creditors – mainly bondholders – occurs through either a 'take it or leave it' exchange offer (an offer to exchange old bonds for new bonds of lower face vale and/or interest payments, sometimes combined with a cash incentive) or by triggering collective action clauses in bond contracts, which allow the payment terms of bonds to be changed if a qualified majority of bondholders agree. Both are generally preceded by informal negotiations between the debtor and one or several bondholders. The restructuring tends to occur after the IMF has agreed to a programme and published its debt sustainability analysis.

145 There is a large literature on sovereign debt restructuring (e.g., Eichengreen and Portes, 1995; Rogoff and Zettelmeyer, 2002; Sturzenegger and Zettelmeyer, 2007; Panizza et al., 2009; Buchheit et al., 2013; Buchheit et al., 2019; IMF, 2020; Meyer et al., 2022).

146 The IMF's policies for lending in unsustainable debt cases are describe in Annex I of IMF (2022c).

5. The debt of multilateral official lending institutions, including multilateral development banks and the IMF, is normally not restructured.

Many debt restructurings have followed this template or a variation of it. The exceptions included some debt restructurings undertaken outside IMF programmes (such as Argentina's 2005 restructuring), some 'post-default' restructurings that took place after a country had defaulted and fallen into arrears to private creditors,[147] and the 1997-2006 HIPC and MDRI, which delivered debt relief, including from multilateral institutions, to a pre-determined group of 36 low-income countries following a *sui-generis* process agreed by the bilateral official creditors, the IMF and the World Bank.[148]

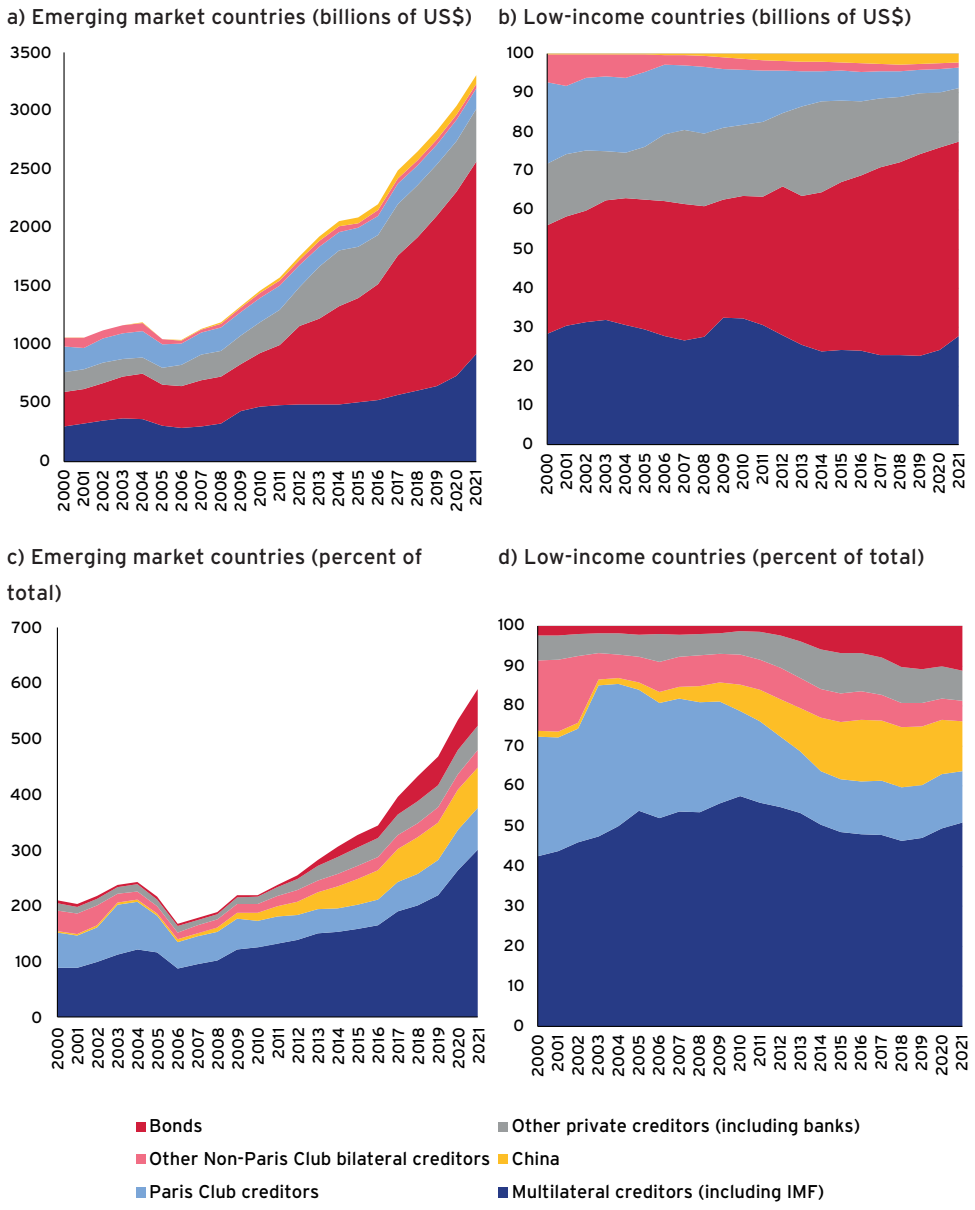
Until recently, the template described above was reasonably successful in dealing with sovereign debt crises, in the sense of generally achieving debt restructurings that restored debt sustainability in a matter of months rather than years.[149] The exceptions, as in Argentina (2001–2005), Mozambique (2016–2019), Venezuela (in default since 2017) and Lebanon (in default since 2020), were attributable to dysfunctional domestic politics rather than a failure of the system. The latter succeeds in part because it evolved to take into account changes in the structure of creditors and debt instruments. Major milestones in the evolution of bond contracts included the introduction of collective action clauses in sovereign bond contracts issued under New York law (from 2003 onwards) and the introduction of 'enhanced' collective action clauses that allow restructuring if a supermajority of creditors across bonds agrees, even is such a supermajority is not available at the level of each individuation bond.[150] Milestones in official policy included the creation of a lending into official arrears (LIOA) policy by the IMF, in response to Russia's refusal to agree to restructuring of a sovereign bond issued by Ukraine following the invasion of Crimea in 2014. The new policy allowed the IMF to lend to a country in the presence of arrears to official creditors under certain conditions, even without the consent of that official creditor.[151]

4.3.1 Changes in creditor structure and its implications for the architecture

Figure 24 shows the changes in the structure of creditors to EMEs (panels a and c) and LICs (panels b and d) since 2000. Three main developments are noteworthy.

147 These 'post-default' cases generally tend to take longer to restructure and involve higher output costs than 'pre-default' restructurings (Asonuma and Trebesch, 2016).
148 IMF and World Bank (1999) and IMF (2019). For an overview, see https://www.imf.org/en/About/Factsheets/Sheets/2023/Debt-relief-under-the-heavily-indebted-poor-countries-initiative-HIPC
149 IMF (2020).
150 See Gelpern (2014), IMF (2014) and IMF (2020)
151 Namely, when there is either a restructuring agreement with the Paris Club that is adequately representative (encompassing a majority of official claims) or the following criteria are satisfied: (1) prompt financial support from the IMF is considered essential; (2) the debtor is making good faith efforts to reach agreement with the creditor on a contribution consistent with the parameters of the Fund-supported program; and (3) the decision to provide financing despite the arrears would not have an undue negative effect on the Fund's ability to mobilise official financing packages in future cases (IMF, 2022c).

FIGURE 24 **EXTERNAL DEBT STRUCTURE OF DEVELOPING COUNTRIES, 2000-2021**



Source: World Bank, International Debt Statistics

First, bonds have increased from about 28% of external debt in EMEs and just 2% in LICs to over 50% and 11%, respectively. From the perspective of the debt restructuring architecture, this is not a problem – except, in some cases, through interactions with other changes in the creditor landscape (see below).

The second development is the rise in the share of multilateral debt in low-income countries by about 8.5 percentage points, from 42.6% in 2000 to 51% 2021, mainly at the expense of bilateral official creditors. This does not yet constitute a regime change. If the trend continues, however, it will be a potential problem for the architecture, as multilaterals do not normally participate in debt restructurings. Even today, about 20 LICs have shares of multilateral debt of upwards of 65%, making the resolution of debt crises in these countries very difficult.

Third, and perhaps most consequentially, is the decline of the Paris Club as a creditor from about 2004 onwards and the – almost symmetric – rise of China as a major official creditor outside of the Paris Club. According to World Bank data, China's share in the external debt of LICs rose from about 1.5% in the mid 2000s to over 15% by 2016, larger than the combined share of all Paris Club creditors (about 13%). Some of this increase was connected to the Belt and Road Initiative, an overseas lending programme by China announced in 2013.[152] Since then, China's share has declined to about 12.5%, roughly in line with that of the Paris Club. In EMEs, China's share has also risen substantially, but from a much lower base – from about a quarter of a percent in the mid-2000s to 2.8% in 2018. It has since declined to about 2.3%, a bit less than half of the Paris Club's share (5.2%). Because of incomplete recording of Chinese loans, these shares may underestimate China's true exposure.[153]

Until the onset of the pandemic, China conducted debt restructuring negotiations separately from those with other creditors.[154] Bon and Cheng (2021) document 140 restructuring cases between 2000-2019 involving the Chinese government and its two main policy banks – the Export–Import Bank of China and the China Development Bank – as creditors, slightly higher than the number of Paris Club restructurings in the same period (124).[155] Almost all of these restructurings were with LICs, with only about half in the context of IMF-supported programmes, and only one third within a four-year window of Paris Club restructurings with the same country. The total debt relief offered was generally lower than that offered by the Paris Club to the same country within that window.

Bon and Cheng's data suggest that that Chinese restructuring can be classified into two phases. Between 2000 and 2011, there were many restructurings (around 90) involving interest-free loans administered by the Ministry of Commerce. The amounts of debt treated were relatively small (reflecting China's relatively small exposures) and the restructurings typically took the form of principal haircuts and arrears cancellations and

152 See Hurley et al. (2018) and Bandiera and Tsiropoulos (2020).
153 Horn et al. (2021).
154 Acker et al. (2020), Bon and Cheng (2021; 2020) and Horn et al. (2022).
155 Cheng et al. (2018). The lower number of Paris Club restructurings is slightly misleading, as several Chinese restructurings in the early- to mid-2000s were directed at HIPC countries whose Paris Club debt was restructured prior to 2000 (Bon and Cheng, 2021). Furthermore, the treated volumes were obviously smaller, reflecting China's minor role as an official creditor during the pre-Belt and Road Initiative period. For details of more recent Chinese restructurings, see Bon and Cheng (2020).

often followed HIPC debt relief operations with the same creditor countries. From 2012 to 2019, there were somewhat fewer documented operations (37), most of which involved debt reschedulings of loans granted by the Export–Import Bank of China, sometimes in larger volumes (the record being a US$ 21 billion rescheduling with Angola in 2015).

The Chinese approach was not an issue for the functioning of the restructuring framework organised around the IMF and the Paris Club as long as China represented only a small share of outstanding claims in unsustainable debt cases. This began to change in the late 2010s. In the case of Mongolia (2017), high outstanding debt to China took the form of a swap line between Mongolia's central bank and the People's Bank of China, which agreed to roll over a maturing swap line after the completion of a debt exchange involving bondholders, clearing the way for IMF support. In the case of Republic of Congo, which experienced debt distress in 2017, the lack of financing assurances from the main Chinese creditor, the Export–Import Bank of China, held up the programme for about a year, until the bank restructured in April of 2019.

In April 2020, in response to calls from the heads of the World Bank and the IMF, the G20 and Paris Club members agreed to a Debt Service Suspension Initiative (DSSI),[156] benefitting 73 LICs that became eligible for an net present value (NPV)-neutral suspension of debt relief followed by full repayment after four years (extended to six years in November 2020).[157] This marked the first time Paris Club and non-Paris Club G20 official bilateral creditors, including China, had coordinated debt relief, albeit limited to liquidity support. Notwithstanding some tensions – particularly after China argued that China Development Bank should be regarded as a commercial creditor and hence was outside the scope of the DSI – the DSSI provided official debt service relief to 48 countries between May 2020 and December 2021, suspending almost US$13 billion in total, more than half of which was provided by China.[158]

Building on the DSSI, the G20 launched the Common Framework for Debt Treatments beyond the DSSI ('Common Framework') in November 2020.[159] The Common Framework is open to the same group of low-income countries but, unlike the DSSI, (1) it is open-ended, (2) it operates on a case-by-case basis, and (3) it can lead to deep debt relief in NPV terms if this is what is needed to restore debt sustainability. Its modalities represent a compromise between the Paris Club and Chinese approaches to debt restructuring. The Paris Club secretariat (a unit of the French Treasury) functions as the secretariat of the Common Framework. As with Paris Club restructuring, the debtor is required to seek comparable treatment from private and non-participating official bilateral creditors. Like Paris Club restructurings involving LIC creditors, Common Framework debt treatments are supposed to be informed by an IMF–World Bank debt sustainability

156 Paris Club (2020a).
157 Paris Club (2020b).
158 See www.worldbank.org/en/topic/debt/brief/covid-19-debt-service-suspension-initiative. Paris Club creditors provided US$4.6 billion (https://clubdeparis.org/en/file/3970/download?token=7KIYVaGM).
159 Paris Club (2020c); see also Beaumont and Hakura (2021).

analysis and "the parameters of an IMF-supported program" (determining the debtor's fiscal adjustment efforts and financing needs). At the same time, however, the Common Framework memorandum also refers to "the participating official creditors' collective assessment" of the debt restructuring envelope, giving China and other creditors the possibility to reject the debt relief proposed by the IMF. Finally, the Common Framework memorandum accommodates the preference of Chinese official lenders (in particular, Export–Import Bank of China) by stating that debt write-offs and cancellations will be conducted only as a last resort.

The Common Framework has so far not been the game changer that its creators had hoped for.[160] Only four countries have applied for debt relief under the framework (Chad, Ghana, Ethiopia and Zambia) and only one (Chad) has obtained it. The time between the negotiation of an IMF-supported programme and the "financing assurances" from official creditors that the IMF requires before releasing its first tranche has only been marginally shorter with the Common Framework than without it.[161] Finally, the Common Framework only covers LICs, whereas coordination problems between China and Paris Club creditors can also arise in some EMEs. These problems delayed financial support for Suriname (in 2021) and Sri Lanka (in 2022). In both cases, it is still unclear when and in what form China will participate in the restructuring of the debts of these countries.

4.3.2 Dealing with high and unsustainable debt after the pandemic and the war

The changes described above have two main consequences for high-debt developing countries. First, debt crises have become more difficult to resolve, particularly when China is a large creditor. Second, in countries where multilaterals already account for a high share of external borrowing, additional borrowing from multilaterals would make debt resolution intractable, as it would imply inordinately high losses for the non-multilateral creditors that cannot claim preferred creditor status. But at the same time, many of these countries face continued high financing needs, particularly in areas (such as climate finance) where multilaterals have a comparative advantage.

How could these problems be addressed, short of a new multilateral debt relief initiative, which would be both very difficult to engineer and at this point does not yet seem to be justified by debtor fundamentals?[162] Five options would merit exploration.

160 Georgieva and Pazarbasioglu (2021); Ahmed and Brown (2022).

161 Outside the Common Framework, lack of financing assurances from Chinese lenders delayed IMF disbursements by about a year in Republic of Congo, nine months in the case of Suriname, and seven months in the case of Sri Lanka. Inside the Common Framework, the equivalent delay was five months in the case of Chad and seven months in the case of Zambia. However, 17 months passed between financing assurances and agreement on the terms of debt relief in the case of Chad, and as of end-April 2023 these continued to be no agreement on the terms of debt relief for Zambia, nine months after financing assurances were given in July 2022. Ghana requested a debt restructuring under the Common Framework in January 2023; at the time of this writing (end-April 2023), the creditor committee had yet to be constituted.

162 Chuku et al. (2023).

First, the set of multilateral institutions that claim preferred creditor status must be defined conservatively. The IMF has taken the related step of defining the perimeter of institutions that are privileged by its lending-into-arrears framework (in the sense that the IMF will not lend to countries that are in arrears to such institutions) more narrowly.[163]

Second, there is a need for a greater non-debt-creating financial role of multilateral development banks (MDBs). Apart from grants, this could include 'blended finance', based on risk sharing between MDBs and private creditors.[164]

Third, the official creditor community may need to become more creative in finding ways to make MDBs 'participate' in restructurings without threatening their solvency or preferred creditor status. One way to do this could be through commitments to grant financing that are linked to debt-restructuring commitments by the remaining creditors. Another way could be donor-funded facilities that finance MDB debt relief for very poor countries, analogous to the IMF's Catastrophe Containment and Relief Trust.[165]

Fourth, coordination under the Common Framework needs to be improved. In view of tensions within the G20 and China's reluctance to commit to deadlines or delegate the debt relief envelope to the IMF, this is easier said than done. However, G7-backed proposals that clarify and create expectations on how MDBs will 'participate' in restructurings may help extract concessions from China.

Finally, for countries with high climate-related solvency risks, debt instruments and debt relief must better reflect these risks. How this is achieved precisely depends on whether or not the debtor has control over the economic impact of climate disasters (via adaptation policies/investments). If it does not, there is a straightforward argument for climate-resilient debt clauses[166] – debt contracts that automatically suspend or extend debt service when a pre-defined natural catastrophe hits. If it does, debt instruments and debt restructurings should be linked to climate adaptation policies. One way to do this would be to swap conventional debt for sustainability-linked bonds, where financing conditions depend on adaptation actions.[167]

4.4 CONCLUSION

This chapter has attempted to give a broad overview of the sovereign debt landscape and architecture after the pandemic and war, and how they differ from previously. The main findings are as follows.

163 IMF (2022c).
164 Lankes (2021).
165 See www.imf.org/en/About/Factsheets/Sheets/2023/Catastrophe-containment-relief-trust-CCRT.
166 ICMA (2022).
167 Kulenkampff et al. (2023).

Debt and real interest rates have risen, but debt remains sustainable in most market access countries. The main reason is that $r - g$ remains small for most countries. Caveats related to demographics apply, but these also existed before the pandemic.

To put debt on a downward trajectory, a subset of EU countries will need to undertake significantly more adjustment, over the medium term, than they are currently planning. Countries in this group include Belgium, Czech Republic, Finland, France, Italy, the Netherlands, Romania and Spain.

The planned reform of the EU fiscal framework could be a big step forwards in reconciling debt sustainability with room for stabilisation policy and creating incentives for investment and reform. The main challenge is how to manage/reduce discretion under the proposed DSA-based approach. Rather than going back to multiple, overlapping rules that provide safeguards against the abuse of discretion, it would be better to reduce the potential for such abuse, by publishing the underlying method and data and asking an independent third party to provide (or validate) key projections.

The rise of China as a creditor and the increase in the share of external debt owed to multilateral official creditors is making crisis resolution in emerging market and developing economies much harder. Addressing this problem requires (1) more creative use of MDB balance sheets and financial instruments, (2) bond contracts linked to climate risks and climate actions, and (3) better coordination among official creditors, including China.

CHAPTER 5

Discussions

5.1 DISCUSSION OF CHAPTER 2, "MACRO TIMES ARE A-CHANGING: STABILISATION POLICIES AFTER COVID-19 AND THE WAR IN UKRAINE", BY RICARDO REIS

This thoughtful chapter provides a discussion of the many shocks that have hit Western advanced economies in the last three years, the many challenges facing policymakers, and the many new emphases needed for models to make sense of them and help policymakers. Chapter 2 covers a lot of ground, which I cannot do justice to or fully comment on here. Instead, I will focus on four questions, how the chapter answers them, and what I would add: How and why did inflation rise so much? Will it be coming down soon? What changes does the monetary policy model need? What changes does the fiscal policy model need?

How and why did inflation rise so much?

I agree with much of what Chapter 2 writes, and I venture that it is becoming a dominant view among many academics. Inflation rose in 2021–22 because a remarkable string of unfavourable shocks was met with a few monetary policy mistakes.

The bad shocks were a combination of a sharp contraction in aggregate supply and a sharp expansion in aggregate demand. The fall in the productive capacity of the economy was due to problems in supply chains, a rise in energy prices that was exacerbated by an appreciation of the US dollar, and costly readjustments of production across sectors following the pandemic and requiring relative-price changes. The fast recovery in aggregate demand following the Covid lockdown was partly due to intertemporal substitution by households, and partly to expansionary fiscal policy.

The policy mistake was to detect and respond to this excess aggregate demand six to twelve months too late. By keeping interest rates too low for too long, central banks allowed expectations to drift. This made a violent, but otherwise short-lived, burst of inflation persist for at least two years.

In terms of academic debates, I would further hammer down the nail on two zombie intellectual ideas of the past two years. The first was the insistence in 2021 that inflation would be transitory, in the sense that it would come down by itself in 2022–23 without requiring any monetary policy tightening. After the fastest tightening of policy in decades throughout 2022, some measures of inflation were still above 10% in the United States

and the euro area at the start of 2023. Reality has not been kind to this 2021 idea, and yet it re-emerges sporadically as a belief that inflation is about to plummet, and that if the Fed and the ECB do not start cutting rates urgently and quickly, deflation will be upon us in 2024.

The other, more recent zombie idea came to the fore in the first half of 2022. It insisted that almost all of the increase in inflation during that year was due to the spike in energy prices following Russia's invasion of the Ukraine. Therefore, again monetary policy should have kept steady, for inflation would come down naturally once energy prices fell. At the same time, raising policy interest rates would cause a deep recession. Again, reality has spoken loud and clear against this idea. At the start of 2023, energy prices are back at what they were before the invasion but inflation is still high, while the unemployment rate is at record low levels despite a record fast hike in interest rates.

What lies ahead for inflation in the near future?

The chapter emphasises three challenges in the process of bringing inflation down. The first is that relative prices across sectors must readjust. Still today, in March of 2023, the interquartile range of the sectoral inflation rates of the components of the HICP in the euro area is almost three times larger than in the decade before the pandemic (and roughly twice as large among the personal consumption expenditure components in the United States). Relatedly, but not the same, nominal wages and prices must adjust, and different sectors and different regions are doing so at different speeds.

I would add to this observation that data on expectations show a clear improvement in the US outlook over the past six months. The distributions from the surveys of households run by the University of Michigan and by the Federal Reserve Bank of New York show a thinning of the right tail, the emergence of a significant left tail, and a steady and sure shift to the left of the median. Looking instead at the distribution of outcomes from swaptions, the probability of a US inflation disaster at the five-year, five-year horizon has fallen in the past six months, while the distribution of expected inflation over the next five years has flattened and has a considerable probability of inflation being below 2%. Unfortunately, this progress is limited to the United States; the euro area data show no change.

Second, fiscal policy has been expansionary, not just during the pandemic but also during the recovery in 2021 (especially in the United States) and during the energy crisis in 2022 (especially in the euro area). Sooner or later, it must reverse course, as the chapter emphasises. Otherwise, fiscal and monetary policy will be working against each other when it comes to bringing inflation down. This is a particular concern in the euro area, which will have to remove price caps and relative-price controls that are politically popular. The IMF's forecast for cyclically adjusted deficits for the euro area are large for the coming years.

On a more optimistic side with regards to fiscal policy, I would add that the impulse responses of inflation to government spending shocks in identified vector autoregressions tend to be relatively short-lived. The fiscal news shocks in the United States happened in 2021. If the estimates from the empirical time-series literature are to be trusted, then the fiscal impulse to inflation should be dying rapidly during 2023.

Third, the chapter rightly notes that a financial crisis would test central banks' resolve to keep monetary policy tight. A crisis in public debt markets could lead to fiscal dominance, with the central bank over-using its balance sheet to sustain the debt revenue of the fiscal authority. A crisis in some financial markets could test the limits of liquidity and macroprudential policies, especially as it triggers large losses for some influential groups. Financial dominance may be lurking around the corner.

The events of March 2023 in the US banking sector provided a first taste of these concerns, as deposits fled small and medium-sized banks. At the same time, the funds that left from deposits went to money market funds. These in turn were deposited at the Fed's reverse repo facility or were used to fund purchases of bonds issued by the federal home loan associations, which lent them to banks. Therefore, banks retained their funding and there was no funding crisis. Instead, there were losses for some (mostly bank managers and shareholders) and solvency concerns for a few along the way. These need not get in the way of controlling inflation.

What revisions are more urgent for the monetary policy model?

The model of monetary policy that relied on independent central banks with an inflation mandate using a short-term interest rate as their main policy tool delivered a remarkable period of low and steady inflation across the world in the two decades before the pandemic. The chapter notes several cracks in that framework today. These include an imperfect interaction between fiscal and monetary policies, the role of central banks in public debt markets, the gains from cooperation between central banks across borders, and the innovations introduced to raise inflation from below target (namely, quantitative easing).

Focusing on the recent rise in inflation, I would emphasise the latter point in this list. Central bankers did not just adopt a "monetary strategy addressing 'inflation below target'" as the chapter puts it. Judging by the mission reviews at the Fed and the ECB, they embraced this challenge as the new norm, and high inflation as a distant threat. I have referred to this in the past as the 'low r-star view' of the world. If real interest rates in the long-term were expected to be low forever, then policymakers had to be creative to allow for monetary stimulus beyond setting their policy rates at the effective lower bound. Deflation was the main fear, and the insufficient demand at the effective lower bound the recurrent problem. Managing aggregate demand, as opposed to worrying about aggregate supply and capital allocation, was the priority.

Arguably, the last year-and-a-half of inflation has shown that this view of the world was too narrow, and perhaps dangerous. Beyond creativity in loosening, policy had to be steadfast and determined in tightening. Inflation was the fear and excess demand was the problem. Different policies are required when worrying about aggregate supply. Returns on government bonds have fallen but returns on private capital stayed high, as the wedge between the two increased. All together, these changes do not require a change in the paradigm but demand a greater focus on inflation than had been the norm.

What revisions are more urgent in the model for fiscal policy?

While the chapter's focus is more on monetary policy, the rough paradigm for fiscal policy that came out of the Washington Consensus looks dated today. In ongoing work with Andrés Velasco, I have been exploring some of these changes.

One significant change is in both the extent of and the rationale for fiscal activism. On the policy front, during the financial, pandemic and energy crises, fiscal policy has been very active. Its focus has been less on aggregate demand and more on lowering the burden of the shocks on the households and firms that are more affected by them. In practice, policy has provided transfers to households after the fact where insurance markets were missing before the shock. Bailouts have become the norm for firms when there is an aggregate shock that threatens to spread. There are good academic arguments for this shift, as well as counters to it, but there seems to be a new form of fiscal activism in practice.

Another, complementary, change is that the size of the public debt has grown. Taking advantage of the growing discount in the rates at which the governments of many countries can borrow relative to private sector agents, debt could – and should – grow. This is especially true for the public debt that is perceived to be safer and more liquid, underscoring the importance of having solid fiscal institutions that preserve fiscal space during crises. Even advanced countries are at risk of having a sovereign debt crisis, and the careful management of higher public debt has become even more important. The design and plumbing of financial markets where public debt is traded, and communication of fiscal frameworks, are new priorities for fiscal policy.

Conclusion

Chapter 2 is ambitious in its aims, so that even though it offers many insights and is sharp and succinct, much more can still be said about the topic. The macroeconomy is always changing, but the ups and downs of the last three years have been particularly extreme. Economic theory has proved invaluable to make sense of these changes, and as the chapter's analysis shows, it can provide guidance on how policy can deal with the

current inflation challenge and more persistent change in strategy and focus. In this discussion, I have added a few more points that strike me as pressing. As the authors write, some golden repair is needed as part of the natural evolution of macroeconomic stabilisation policies.

5.2 DISCUSSION OF CHAPTER 2, "MACRO TIMES ARE A-CHANGING: STABILISATION POLICIES AFTER COVID-19 AND THE WAR IN UKRAINE", BY FRANCESCA MONTI

The first part of the chapter takes stock, in a simple but insightful way, of the changes to the macroeconomic outlook since the onset of the economic crisis. It discusses the causes of the resurgence of inflation and speculates on the possible challenges faced by policymakers aiming to bring inflation down to target. The chapter mainly focuses its analysis of the causes of inflation on the evolution and relative balance of demand and supply shocks. While these have certainly been important drivers of the dynamics of inflation, I will argue that inflation expectations have played an equally central part in this process and still represent a potential risk to the outlook for inflation.

The second part of the chapter presents an appraisal of the model of economic policy that has dominated in the last three to four decades, which postulates the independence between fiscal, monetary and prudential policy. The chapter, while recognising that the recent unconventional balance sheet policies have blurred the lines between fiscal and monetary policy, does not argue for closer cooperation. To the contrary, it reaffirms the importance of not watering down such independence. It nonetheless argues for pragmatism and not being blind to the interactions of these different policies. I agree with the chapter's assessment that coordination among policies is counterproductive for their credibility, particularly in light of the fact that inflation expectations, which are among the gauges of a central bank's credibility, still display signs of heightened uncertainty. Taking as an example the recent events involving Silicon Valley Bank (SVB) and Credit Suisse, which have highlighted how the interactions between financial and monetary policy are also consequential, I discuss some of the potential problems that need to be faced when navigating such policy interactions.

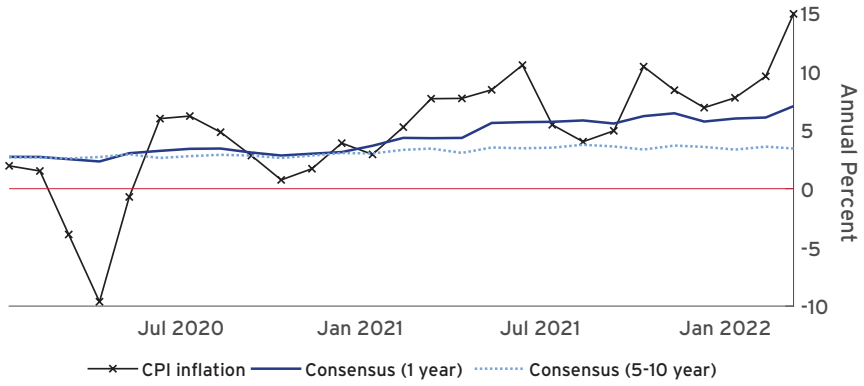
The role of inflation expectations

Inflation expectations account for more of the dynamics of inflation than the chapter suggests. As shown in the top panel of Figure 1, in the period from January 2020 to March 2022, the consensus measure of 5- to 10-year ahead inflation expectations from the Michigan Survey of Consumers, obtained by collapsing the individual survey data to the cross-sectional average, seems to have hardly moved (dotted line). However, the focus on the 'consensus' measure, regularly used in policy circles to assess whether

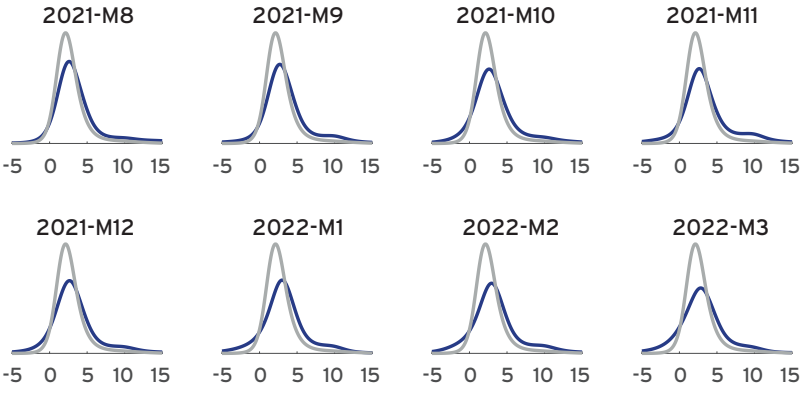
expectations are well-anchored, veiled the striking movements in the distribution of long-run inflation expectations (in blue) that happened in the same period (bottom panel of Figure 1). These distributions became progressively more fat-tailed and more skewed towards high inflation outcomes relative to January 2020 (in grey).

FIGURE 1 **MICHIGAN SURVEY OF CONSUMERS**

a) Inflation and consensus expectations



b) Distributions of long-run expectations during the pandemic recovery



Note. Top: month-on-month US CPI inflation (annual rate), along with mean Michigan Survey inflation expectations 1 year and 5-10 years ahead. Bottom: distribution of Michigan Survey inflation expectations at 5- to 10-year ahead (blue) and the same distribution as of January, 2020 (grey).

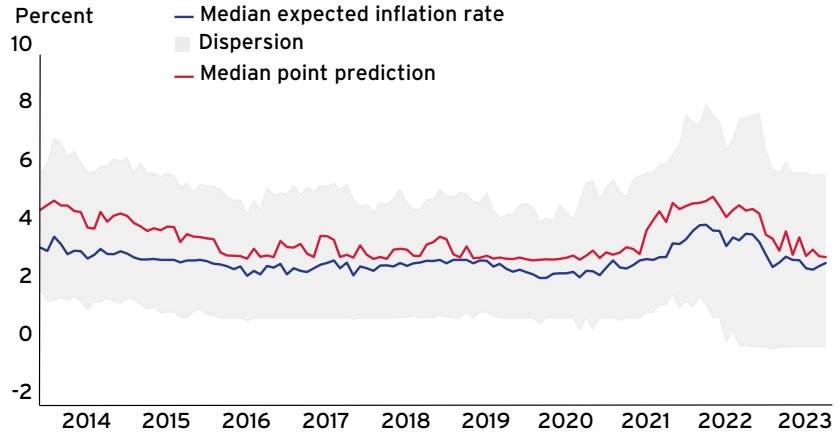
This considerable amount of cross-sectional heterogeneity in beliefs present in the survey data varies in time with economic conditions and is informative about the evolution of inflation, but poses problems both in terms of measurement and of potential inconsistency between theoretical and empirical work. In Meeks and Monti (2019), my co-author and I propose a novel way of estimating models of inflation that can account for the role of heterogeneous beliefs and find that they do indeed play a statistically and economically important part in explaining the dynamics of inflation, especially in times of economic dislocation. Our calculations suggest that, when accounting for the whole distribution of beliefs, inflation expectations can explain almost half of the run-up in inflation over the period between January 2020 and March 2022.

The risks to the inflation outlook

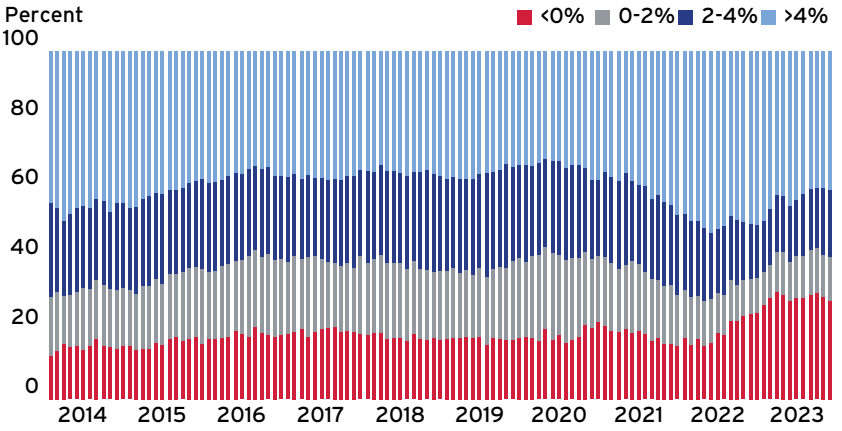
Time variation in the cross-sectional distribution of inflation expectations is important for understanding the dynamics of inflation, and it also matters for the transmission of monetary policy, which relies on people's assessment of how policy actions will affect inflation outcomes in the future. Falck et al. (2021) show that, in times of low disagreement, a contractionary shock to monetary policy leads to a statistically significant decline in inflation, as predicted by textbook theory, whereas it leads to an increase in inflation in times of high disagreement. That is because, when uncertainty about the state of the economy is high, policy actions provide public information about the central bank's view on current inflation and the output gap, and this signalling effect dominates.

FIGURE 2 **THREE-YEAR AHEAD INFLATION EXPECTATIONS**

a) Inflation expectations



b) Probability of different inflation outcomes



Note: Top: median expected inflation rate (blue), median point prediction (red), dispersion (grey). Bottom: average of the individual probabilities of different inflation outcomes.

Source: Data from the New York Fed Survey of Consumer Expectations

The latest read on medium-term consumer expectations from the New York Fed Survey of Consumer Expectations, which collects individual probabilistic forecasts in addition to point forecasts, highlights two important facts. First, as shown in the top panel of Figure 2, even if the median of 3-year ahead inflation expectations (blue line) has been falling since mid-2023, the survey's measure of disagreement across respondents (the difference between the 75th and 25th percentile of inflation expectations, shown by the grey shaded area) has been increasing throughout the same period. Second, individual consumers have become more uncertain about the medium-term outlook for inflation. Data on individual respondents' probability distributions about 3-year ahead inflation expectations from the New York Fed's Survey of Consumer Expectations evidences an increase in the probability mass assigned to tail outcomes (bottom panel of Figure 2). Overall, this increased uncertainty about inflation outcomes, manifesting both in an increase in inter-personal dispersion as well as in increase in individual uncertainty, can pose risks to policymakers' credibility, and therefore the effectiveness of their policies.

Policy interactions

The second part of the chapter discusses whether the economic policy model of the last decades – built around the independence between monetary, fiscal and regulatory policy – is still fit for purpose. The pre-Covid 'secular stagnation' period had ushered in a rethink of the boundaries between these types of policies and pushed some to call for closer coordination. For example, the chapter cites work by Bianchi and Melosi (2019) suggesting that, when the central bank is constrained by the zero lower bound, a coordinated commitment to inflate away the portion of debt resulting from a large recession can lead to welfare improvements and lower uncertainty. This prescription, which crucially relies on credibly temporary deviations from active monetary policy, is quite natural when both policies are aiming to reduce the amplitude of a recession and bring inflation back up towards target. In the current inflationary environment, the policy actions necessary to achieve the objectives of stabilisation of economic fluctuations and bringing inflation back down to target present more obvious trade-offs, and lend themselves less naturally to that sort of coordination. Moreover, there is a substantial risk to credibility, stemming from the fact that these violations of 'good behaviour' rules are indeed very hard to manage in practice.

The chapter advocates for independence to be maintained and not be watered down, while recognising that some of the policies put in place after the great financial crisis of 2008/09 blur the boundaries between different policy domains and will need to be managed carefully. The evidence I presented on inflation expectations, which are among the proxies for central credibility, further confirms the importance of maintaining clear and independent mandates as a way to secure credibility. Obviously this does not mean that each policy should be blind to the interactions with the other policies. The recent events involving SVB and Credit Suisse, for example, have put a spotlight on the interactions between financial and monetary policies, showing how these too can be quite

consequential. But rather than heeding the calls for monetary policy to loosen in order to avoid possible contagion, monetary policymakers should respond only to the extent to which this financial turmoil affects the macroeconomy and thus inflation. This can be challenging, though, especially when it is not clear which channels dominate, as in the case of a tightening in financial conditions – a plausible consequence of the downfall of SVB and Credit Suisse. On one hand, the subsequent credit contraction could affect the economy by reducing households' ability to borrow and consume, and therefore would operate mainly through demand. On the other hand, a credit contraction would reduce firms' ability to borrow and grow, thus affecting the economy's productive capacity. The policy response would need to be quite different depending on whether the supply-side channel or the demand channel dominated. This sort of uncertainty can make policy less effective and confirms the need for very clear mandates that can strengthen policymakers' credibility.

5.3 DISCUSSION OF CHAPTER 3, "THE INTERNATIONAL MONETARY LANDSCAPE: IMPLICATIONS OF THE RUSSIA-UKRAINE WAR, THE RISE OF CHINA AND NEW DIGITAL TECHNOLOGIES", BY ROBERT McCAULEY

Chapter 3 makes the case that the multilateral blockage of Russia's official foreign exchange (FX) reserves is unlikely to change the dollar's predominance in global FX reserves. Consideration of neither the alternative of the renminbi nor the disruption of a European or Chinese first move with a central bank digital currency alters this assessment.

The case is convincingly argued. On its face, the claim that a so-far limited European war, China's rise and new digital public money together will not take down the dollar is plausible. After all, it took some combination of the founding of the Federal Reserve, World War I and World War II to see off sterling.[168]

This discussion seeks to reinforce the case, to file an *amicus curiae* brief offering other reasons to draw the same conclusion.

Let's start with the dollar's utterly pivotal role in the largest financial market in the world. This dominance helps explain why the Russian authorities stuck with the dollar in their FX reserves in the face of rounds of sanctions. If US foes have a hard time doing without the dollar, then the US allies and friends that hold most dollar reserves can be expected to stick with the dollar.[169]

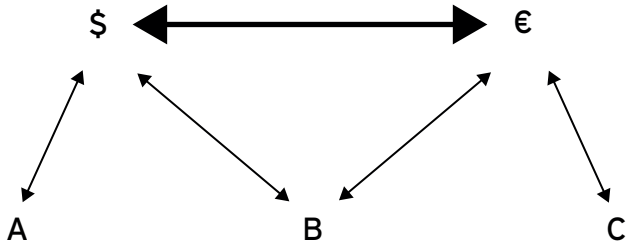
168 Eichengreen and Flandreau (2009).
169 Eichengreen et al. (2019) show that countries held more reserves in the currency of allies before WWI.

The dollar as pivot in FX swaps, the world's biggest financial market

In the world's largest financial market, FX swaps, the dollar is on one side of over 90% of all trades.[170] Thus almost all of the $4 trillion turnover per day in this private market features contracts to borrow and to lend dollars for a time against other currencies – a degree of dollar dominance far beyond that in other currency uses. The euro is on one side of about a third of all FX swaps, so one might imagine that the structure of the market is bipolar, with both the dollar and euro both serving as hubs for transactions between third currencies.

To visualise such a market, Figure 1 adapts Paul Krugman's abstract diagram of a bipolar FX trading structure to identify the dollar and euro as the two poles.[171] Currency A trades only with the dollar; currency C trades with only the euro; and currency B trades with both. A-to-B transactions require the use of the dollar as vehicle. C-to-B transactions require the use of the euro as vehicle. A-to-C transactions require both as vehicles. Does this model apply to the FX swap market?

FIGURE 1 **THE FX SWAP MARKET AS SYMMETRICALLY BIPOLAR**

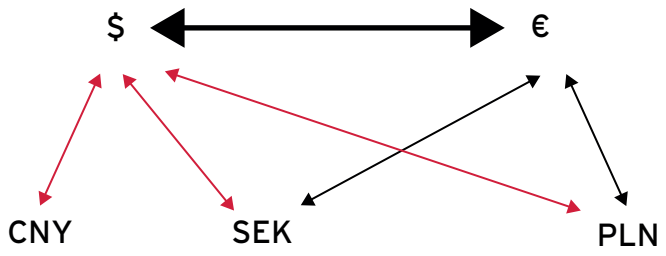


Source: Adapted from Krugman (1984), Figure 8.2.

The answer is no. In the FX swap market, only the dollar serves as vehicle, as shown in Figure 2. No major currency trades only against the euro. And even currencies that trade mostly against the euro in the spot FX market, like the Swedish krona (SEK) or Polish zloty (PLN), trade mostly against the dollar in the FX swap market, as shown by the thicker arrows between these currencies and the dollar.[172] Swedish banks can swap euros directly for krona to fund their domestic mortgages. But for trades between the krona and the zloty, for example, liquidity drives trades through the dollar, not the euro, as shown by the gold arrows. And for the many currencies like the Chinese yuan renminbi (CNY) that swap only against the dollar, the dollar is necessarily the vehicle currency.

170 BIS (2022c) and Borio et al. (2022). The ECB (2022) misleads by showing the dollar share of FX trading at almost 50% in Chart 2 on page 4, as a result of imposing a sum of 100% rather than 200% referred to in footnote 1 on page 5 of ECB (2022).
171 Krugman (1984).
172 BIS (2022c).

FIGURE 2 **THE FX SWAP MARKET AS ASYMMETRICALLY BIPOLAR**



Note: Red arrows indicate vehicle currency transactions.
Source: Figure 1 and author's elaboration, based on BIS (2022c).

The upshot is that the dollar plays a unique role in the FX swap market. If you start with any currency other than the dollar or the euro and you want to swap for any other third currency, you need to go through the dollar. This utterly pivotal position of the dollar, moreover, has not diminished over successive triennial surveys. Very strong network effects make the dollar very sticky in the world's largest financial market.

Sanctioned, but sticking with the dollar: The Bank of Russia, 2014–2021

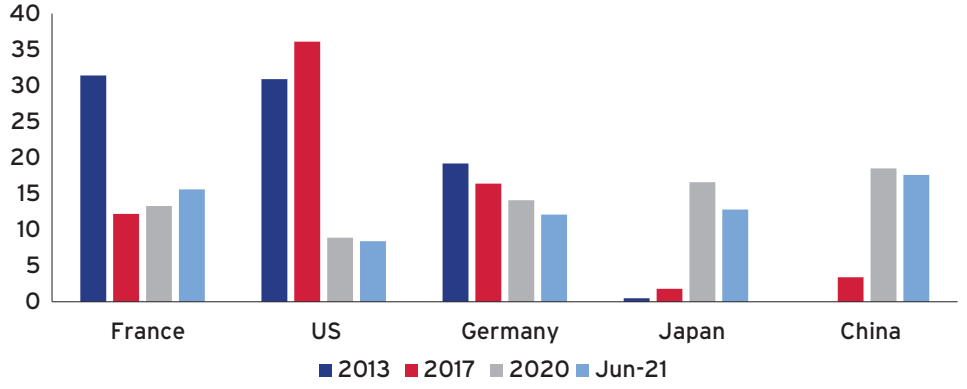
Such dollar dominance in private transactions helps to explain the dollar's striking stickiness in Russian official FX reserves as the authorities responded to two waves of sanctions between 2013 and 2021. The Central Bank of the Russian Federation (henceforward, the Bank of Russia) sought to build a fortress balance sheet against further sanctions, although the 2022 multilateral blockage of Russia's FX reserves by major reserve currency countries was to some extent surprising.

Recall that the US and European authorities imposed sanctions in 2014 in response to the Russian annexation of Ukrainian territory. There was a further round of sanctions in 2018 by the US and European authorities in response to election meddling, military operations in Ukraine and Syria and other acts.

The Bank of Russia responded by moving the *location* of its official reserves and by changing the *mix of currencies* in which it held them. At the margin, it increased its holdings of gold in its own vaults; these reserves did not give rise to any country risk. But as Chapter 3 notes, this came at the expense of the usability of the reserves. Regarding the FX holdings, the Bank of Russia looks to have changed their location, and thus the immediate exposure to legal risks, more than their currency.

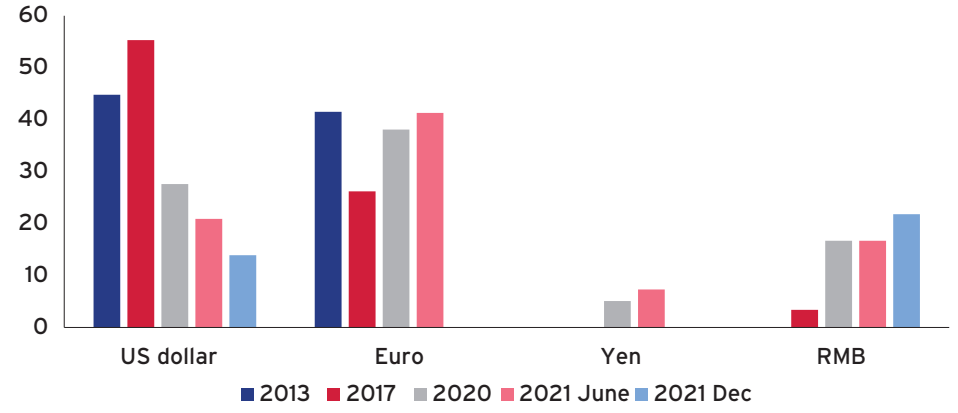
The Bank of Russia diversified its country risk away from France, the United States and Germany towards China and Japan, as shown in Figure 3. The share in the first three fell by more than half from 80% in 2013 to 36% in 2020. The shift from the United States was particularly marked after the 2018 sanctions.[173]

FIGURE 3 **RUSSIA DIVERSIFIED THE LOCATION OF ITS FX RESERVES (%)**



Source: Central Bank of the Russian Federation.

FIGURE 4 **RUSSIA DE-DOLLARISED ITS CASH FX RESERVES (%)**



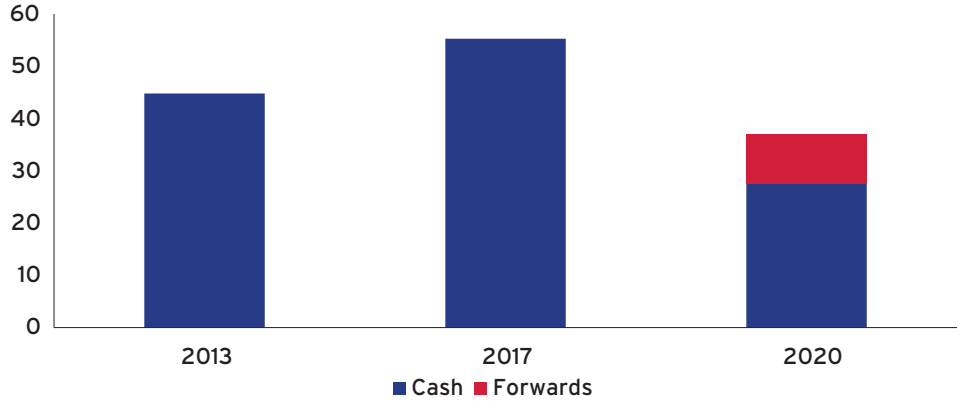
Source: Central Bank of the Russian Federation.

However, the cash holdings do not tell the whole story. The Bank of Russia disclosed a substantial position in FX forwards not involving the rouble at the end of 2000 amounting to about 10% of its FX reserves. These were likely forward purchases of dollars against yen or renminbi. On this view, the Bank of Russia synthetically held dollars by holding yen or renminbi on its balance sheet along with an off-balance sheet forward sale of these

173 See McDowell (2020, Figure 4) for the sharp drop in Russian holdings of US government securities reported by the US Treasury in early 2018 of about $100 billion. A former head of the central bank termed the sale a 'hedge' against the possibility of confiscation; see Andrianova et al. (2018).

currencies against the dollar.[174] If so, the Bank of Russia's holding of dollars both on- and off-balance sheet amounted to 38% of its FX reserves at end-2020 (the last date for which forwards are footnoted). This would represent a decline, but not a large decline, from 45% in 2013, as depicted in Figure 5.

FIGURE 5 **RUSSIA STUCK WITH DOLLAR EXPOSURE IN ITS FX RESERVES (%)**



Source: Central Bank of the Russian Federation; author.

Why would a central bank in a country subject to rounds of sanctions led by the United States see fit to stick with most of its holdings of dollars, moving them offshore and off-balance sheet? Such stickiness could reflect the dollar's private use: 90% of rouble forwards were traded against the dollar in Moscow and about 20% of the deposits in the Russian banking system were in dollars. With 20-20 hindsight, the Bank of Russia would have done better holding fewer dollars and more renminbi, but private use of the dollar led it to weigh the risks and stick with the dollar to a remarkable extent.

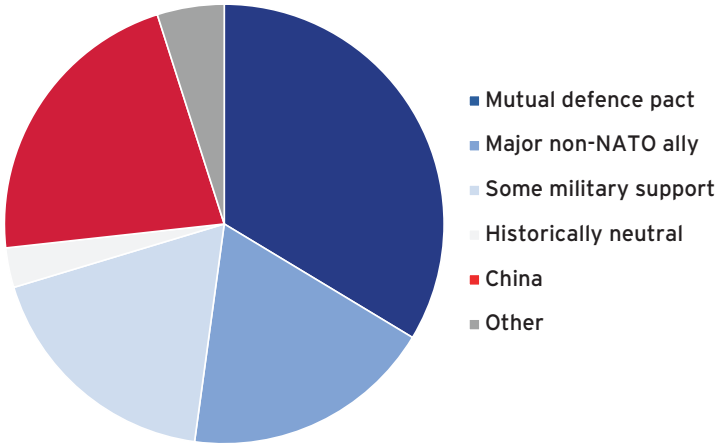
Allies as sticky holders of US dollar FX reserves

Chapter 3 notes that FX reserve managers who worry about US sanctions cannot find alternatives in the currencies and banking systems of countries that join the United States in imposing sanctions. China therefore has a hard time diversifying away from sanctions risk since all the reserve currencies other than the renminbi are issued by countries that have sanctioned Russia. It is also true that those countries that join the United States in sanctions have limited reason to worry about US sanctions. US allies and countries that are strategically aligned with the United States are likely to prove sticky holders of dollar reserves.

174 See www.cbr.ru/Collection/Collection/File/39294/ar_2020.pdf (page 289). For background, see Debelle (2017).

Colin Weiss has argued that US allies dominate the holdings of US dollar reserves.[175] That is, countries in mutual defence pacts or major non-NATO allies held most dollar reserves at the end of 2021, as shown in Figure 6, although one can question Weiss's lumping together NATO and the Rio Pact as mutual defence pacts. In addition, countries categorised as receiving "some military support" accounted for another 18% of dollar reserves, but some of these have strained relations with the United States.[176] That said, two of the three "historically neutral" countries, Finland and Sweden, have applied to join NATO and a third, Switzerland, has applied sanctions on Russian private parties.

FIGURE 6 **DOLLAR RESERVE HOLDING IN THE UNITED STATES BY GEOPOLITICAL RELATIONSHIP**



Source: Weiss (2022).

All in all, it is fair to say that most dollar reserves are held by US allies with limited cause to worry about sanctions. Data kindly provided by Weiss show that 40% of dollar reserves in the United States are held by countries that have sanctioned Russia.[177] If Weiss' procedure underestimates Japanese and Swiss dollar FX reserves, this share could exceed 50%. As political scientists have long argued, geopolitics as well as economics sustains the dollar's predominance.[178]

In sum, further evidence of the dollar's sticky role supports the conclusion of Chapter 3. Sustained by strong network effects, the dollar serves as an unrivalled pivot in the largest financial market in the world. Such private use helps to explain how sticky the dollar proved in Russian reserves even in the face of the 2014-18 sanctions. And geopolitics keeps most dollar FX reserve holders on side, giving them more reason to join in imposing sanctions than to fear US sanctions.

175 Weiss (2022) uses estimates of US reserve holdings by country generated from the product of country totals and average official shares by advanced and emerging economies.
176 This group includes India, Saudi Arabia, Hong Kong SAR (!), Mexico, Indonesia, United Arab Emirates and South Africa, none of which has joined in sanctions against Russia.
177 Using Brown (2023) for sanctions.
178 Cohen (2019).

5.4 DISCUSSION OF CHAPTER 3, "THE INTERNATIONAL MONETARY LANDSCAPE: IMPLICATIONS OF THE RUSSIA-UKRAINE WAR, THE RISE OF CHINA AND NEW DIGITAL TECHNOLOGIES", BY LINDA GOLDBERG[179]

Key arguments of the chapter

The international monetary system (IMS) is dollar-based, as demonstrated by standard evidence. This thoughtful chapter argues that three recent developments weigh against the dollar's status, on different timelines: (1) recourse to financial sanctions by the United States serving as a global 'wake-up call', but with slower and less far-reaching effects for the dollar status than some pundits argue; (2) China-related developments, including investments in alternatives to dollar payments (e.g. the Cross-Border Interbank Payments System), which could influence current trends if countries want to hedge bets against possible future sanctions; and (3) digital innovations through wholesale central bank digital currencies (CBDCs), which could have the most potential for changing the current international monetary system as long as they are set up to be acceptable to nonresidents. The emphasis of the chapter is on the role of the dollar within the portfolio of assets in central bank official foreign exchange reserves. As an overall assessment of where I have broad areas of more or less agreement, I agree with the assessment that overall there are no current challenges to the overall international roles of the dollar, and to the composition of official foreign exchange reserves specifically.

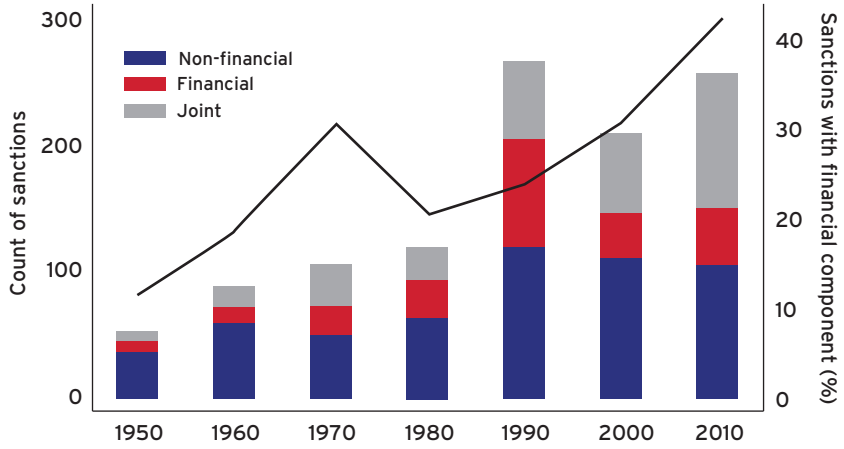
For the international monetary landscape more broadly, I would take a broader perspective and suggest more of a focus on the broader context in which the three emphasised drivers occur. In particular, this context includes a troubling and rising risk of global fragmentation that preceded the Russia invasion of Ukraine and the recent application of sanctions. In this context, the use of sanctions as a tool has increased in frequency since the 1990s. Moreover, the broader environment is one of greater uncertainty and threat of fragmentation now. This context is important, as the consequences of siloed country blocs are more important for the international monetary system than some of the narrower measures of international roles of currencies, including the composition of official portfolios that is the main focus of the chapter. It is important to have an expanded focus with a more far-reaching discussion of the potential implications. For example, if cross-border payments systems and CBDCs are transformative, for what part of the international monetary system? And more work is needed to understand which system or CBDC would be selected, and why, before fully considering the consequences.

179 The views in this comment should not be interpreted as reflecting the views of the Federal Reserve Bank of New York or the Federal Reserve System.

Financial sanctions are important, but are they new?

The chapter brings to the fore the recent sanctions against Russia following its invasion of Ukraine. However, the tool of financial sanctions has been used actively over recent decades. Figure 1, reproduced from Cipriani et al. (2023), shows the prevalence of financial sanctions by decade since the 1950s. Sanctions are divided into non-financial – for example, restrictions on individuals and goods and services transactions – and financial. As discussed in Cipriani et al. (2023), financial sanctions involve flows of funds that occur through networks of banks and financial institutions. These sanctions typically restrict the ability of sanctioned entities – countries, businesses, or even individuals – to purchase or sell some financial assets. Sanctions can also be imposed on 'custodial services', influencing the ability of entities to store or manage the financial assets of the sanctioned entity. Other financial services, such as financial guidance or wealth management, can also be included. Figure 1 shows the sharp increase in the use of sanctions in the 1990s, whether non-financial, exclusively financial or jointly applied. In this context, the new content of recent sanctions applications per se, from the vantage point of the international roles of the dollar, is not extensive.

FIGURE 1 **PREVALENCE OF SANCTIONS, BY TYPE**



Note: Sanctions within each decade only counted in the first decade of implementation. Joint sanctions have both economic and financial elements. Black line percentage of sanctions with a financial component over time (right axis).

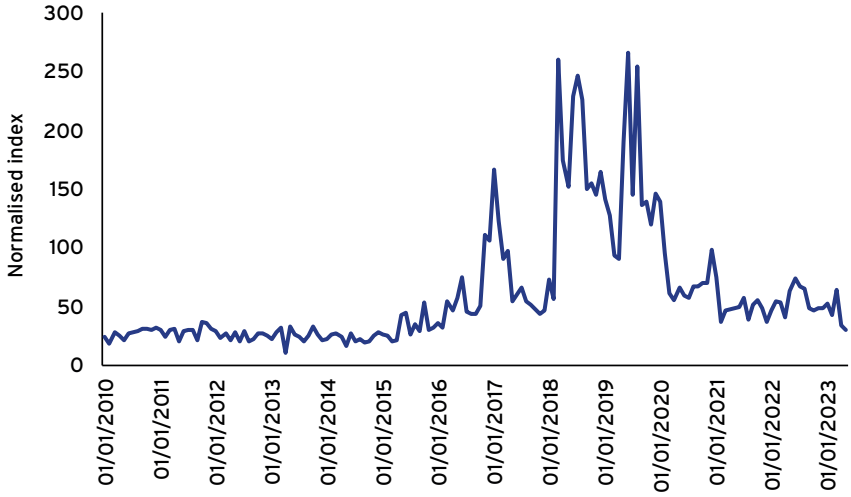
Source: Cipriani et al. (2023).

What is different now is the broader geopolitical context

The recent sanctions are applied in an era of high global uncertainty. Uncertainty has been a material concern since the global financial crisis. Some elements of uncertainty have also been associated with the Covid-19 pandemic, climate change, Brexit, and the Russian war on Ukraine, which are emphasised in the report. Additional uncertainty is coming from the international trade environment, around tendencies towards deglobalisation and fragmentation, supply chain disruptions and reshoring or friend-

shoring momentum. As shown in Figure 2, trade policy uncertainty, as measured by Caldara et al.'s (2020) index, rose in 2016, spiked in 2018 and then stayed high. This uncertainty changes investment, spending and the trade finance needs of importers and exporters. The effects are not limited to those firms directly impacted. Detailed data on lending by large US banks reveals that this type of uncertainty leads banks to contract credit supply across al firms, including by assessing borrowers as riskier.[180] Credit supply contractions and tighter financial conditions increase overall tendencies towards economic contraction, manifesting in lower capital expenditure and asset growth by firms

FIGURE 2 **TRADE POLICY UNCERTAINTY INDEX, 01/2010 TO 04/2023**



Note: A monthly value of 100 indicates that 1% of articles in select newspapers are TPU-related.
Data source: Caldara et al. (2020).

Beyond the trade policy uncertainty index, a range of measures show that the risks of geo-economic fragmentation are enhanced. Measures presented in Aiyar et al. (2023) show higher risk of military conflicts and higher geopolitical risk; an escalation in trade restrictions imposed on goods, investments and services; a sharp increase in national security mentions in IMF Annual Reports on Exchange Arrangements and Exchange Restrictions; and steep increases in mentions of 'reshoring', 'nearshoring' and 'onshoring' in corporate presentations.

180 Correa et al. (2022).

More than the official reserves portfolio, there are potential consequences for other international roles of the dollar

Much of the literature on the broader consequences of decisions related to the international monetary system hinges on pricing and invoicing choices in financial and real international transactions. Specific consequences relate to exchange rate pass-through into prices. This consequence is tied directly to the selection of a specific vehicle currency, such as the US dollar, in invoicing trade and likewise as the currency of pricing rigidities. Strong arguments have been made for producers coalescing around the use of specific currencies and for hedging movements in revenues relative to costs.[181] Arguments described in recent research emphasise capturing synergies or complementarities with the use of the dollar across domains and functions. The bigger questions in the current environment are perhaps around understanding how these synergies and complementarities change in relationship to siloed payments infrastructures, with the silos and fragmentation potentially reinforced by financial sanctions.[182] It would also be useful to understand how CBDCs might change the structure of economic risks and returns across countries in the international monetary system.

The forces reinforcing fragmentation also could have implications for global liquidity and international risk sharing

An extensive body of evidence documents that global demand for 'safe assets' continues to be high from public and private agents. Safe assets, or 'safe haven' currencies, typically are those that are most liquid. This liquidity generates a convenience yield and such assets pay lower interest rates than alternative investments. Associated features are reinforced by some 'safe asset' users having access to lender of last resort facilities and liquidity facilities, including those provided through the Federal Reserve and other central banks' swap networks.[183] This context opens up additional questions that are relevant for the future of the international monetary system. What are the risk-sharing, capital flow and backstop liquidity structures in a siloed or fragmented world? How effective are they? What new risks would accompany an evolution away from the current integration of capital markets, hedging arrangements and rules around global liquidity flows?

Final remarks

This chapter provides deeply insightful perspectives on the consequences for the international monetary system of developments in financial sanctions, US-Sino relations, investments in alternative payments infrastructures, and potential developments in CBDCs. The discussions concentrate around the questions of which changes will be most impactful for the official functions in the international monetary system, and especially

181 Goldberg and Tille (2008).
182 Cipriani et al. (2023).
183 Goldberg and Ravazzolo (2022).

on the official holdings of US dollars versus other currencies in official foreign exchange reserve portfolios. A research agenda and set of thought experiments for the research and policy communities could focus on understanding the real and financial implications of a potentially more geopolitically fragmented world order.

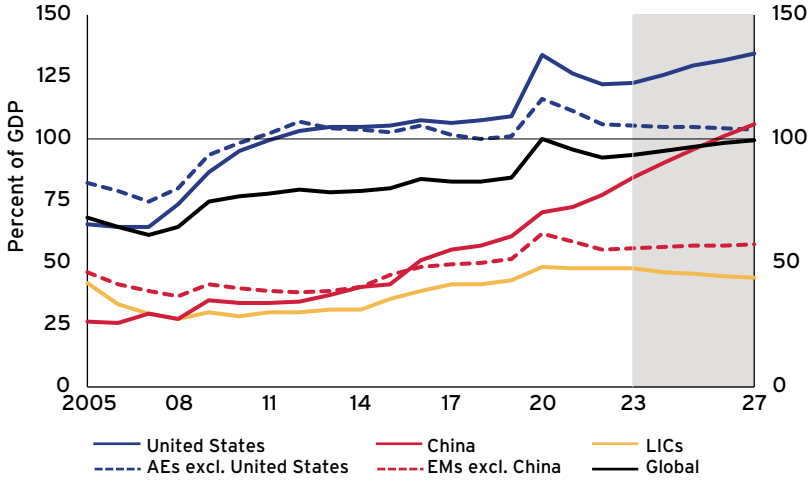
5.5 DISCUSSION OF CHAPTER 4, "SOVEREIGN DEBT AFTER THE PANDEMIC AND THE WAR", BY PIERRE-OLIVIER GOURINCHAS AND ADRIAN PERALTA

The aftermath of crisis: Exploring sovereign debt in a post-pandemic and post-war world

The Covid-19 pandemic significantly impacted public debt-to-GDP ratios ('debt ratios' henceforth), with the worldwide average approaching 100% in 2020. The implications of these high debt levels are concerning for policymakers, especially in the present environment of tightening financial conditions, weak economic growth prospects and a stronger US dollar.

The chapter provides a timely and comprehensive analysis of the post-pandemic and post-war sovereign debt landscape and architecture. The chapter identifies four issues: the macroeconomic impact, characterised by rising deficits and soaring public debts; the suspension of the EU's Stability and Growth Pact and the subsequent debate on its replacement; the complexities of restructuring sovereign debt in a global environment with pre-existing fissures magnified by the crisis; and the opportunities and challenges in linking climate finance, debt relief and the development of new financial instruments for decarbonisation.

FIGURE 1 **PUBLIC DEBT TRENDS (PERCENT OF GDP)**



Note: Averages weighted by nominal GDP. Shaded area denotes forecast period. Sample covers 28 advanced economies (AEs) from 1979 to 2021, 83 emerging market economies (EMs) from 1991 to 2021, and 55 low-income countries (LICs) from 1985 to 2021.

Source: IMF staff calculations.

This discussion will focus on the first two issues, emphasising the difficulties in stabilising and reducing public debt-to-GDP ratios, and the need for innovative solutions.

Examining public debt ratios across the globe: An analysis of advanced, emerging market and low-income countries

The chapter's analysis considers the IMF World Economic Outlook projections for deficit and debt ratios from 2022 to 2027. While initially reassuring, these projections reveal concerning trends upon closer examination. For advanced and emerging markets, the projected medium-term stabilisation of debt ratios may be temporary, as it partly relies on economic recovery, unanticipated inflation and low average interest payments per unit of outstanding debt.

The chapter employs two primary country-level indicators: (1) the debt-stabilising primary balance projected for 2027, and (2) the difference between the debt-stabilising primary balance and the projected primary balance at the end of the World Economic Outlook forecast period. These indicators capture the ability to sustain a primary surplus over time and the effort required to raise the fiscal surplus to stabilise debt.

The analysis finds that, for countries with the median debt levels, the expected value of debt-to-GDP five years ahead increased by about 12 percentage points in advanced countries and approximately 6 percentage points in emerging markets between October 2019 and October 2022. Long-term real interest rates also rose significantly, by around 1.5–2%. Consequently, the median debt-stabilising primary balance increased by 0.6% for the median advanced country and 0.8% for the median European country. Compounding these challenges, the recent World Economic Outlook[184] forecasts a decline in growth for advanced economies from 2.7% in 2022 to 1.3% in 2023. In an alternative scenario with increased financial sector stress, global growth could further decrease in 2023. These projections emphasise the difficulties countries face in managing debt levels and achieving fiscal stability.

For emerging markets, the median increase in the debt-stabilising primary balance is about 1.5% of GDP, with ten out of 18 countries in the sample ending up with a positive balance. Four countries – Brazil, Colombia, Mexico and South Africa – have predicted debt-stabilising primary balances exceeding 2%.

The gap between the projected debt-stabilising primary balance and the projected actual primary balance is even more concerning, with a median difference of 1.5% of GDP for advanced countries. Additionally, approximately one-quarter of the economies in all three income groups have adjustment gaps of 2.5% of GDP or higher.

184 IMF (2023a).

While three-quarters of advanced countries and about half of emerging markets have negative debt-stabilising primary balances, most countries are projected to remain below these levels in five years, with large gaps for roughly one-quarter of both advanced and emerging market samples.

The above results hinge on some assumptions that are worth further discussing. For example, the chapter presumes that the higher forward rates, which are substantially above pre-Covid levels, mean that relatively high interest rates on sovereign debt should be expected to prevail. In contrast, the World Economic Outlook[185] suggests that interest rates might return to lower levels in the long run. This is due to the persistence of structural factors that have historically suppressed interest rates, such as demographic shifts, subdued economic growth and income inequality. A return to lower interest rates would have implications for debt dynamics and fiscal stability, potentially easing some of the pressure on countries to maintain high primary balances.

Moreover, the chapter's simulations, which are based on independent shocks, might not fully capture the complexity of real-world interactions between interest rates and growth rates. In practice, these variables often exhibit interdependence, with periods of high interest rates coinciding with periods of low growth. Such a relationship can exacerbate debt dynamics by increasing debt burdens and simultaneously hampering a country's ability to generate sufficient income to service its debts. It is important to note that this relationship holds true along the economic cycle; however, on the trend, the real interest rate (r) and growth rate (g) may move together positively, as low total factor productivity (TFP) growth reduces the natural rate of interest (r*).

The analysis in Ando et al. (2023) takes into account both the possibility of a return to lower long-term interest rates and the interdependence between interest rates and growth rates. Utilising stochastic simulations with interdependent shocks, the findings indicate there is a set of countries for which debt may not be stabilising over the medium term, under the World Economic Outlook baseline assumptions and policies.

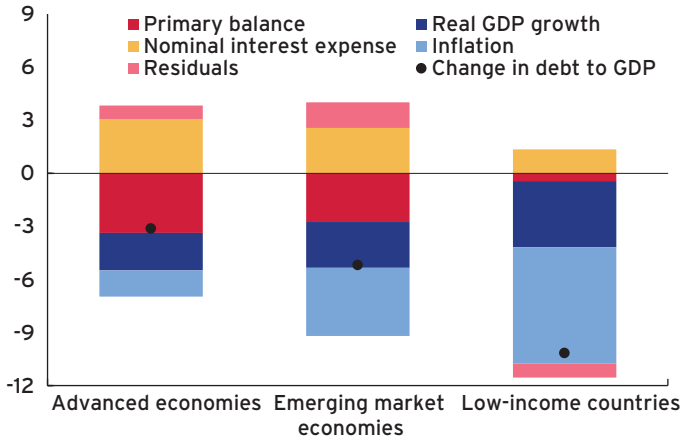
Debt reductions: Lessons from the past and challenges ahead

Examining past experiences of public debt-to-GDP ratio management can offer valuable insights for achieving the more demanding goal of durably and substantively reducing debt ratios. Chapter 3 of the IMF's April 2023 World Economic Outlook,[186] titled "Coming down to earth: how to tackle soaring public debt", examines this issue in detail.

185 IMF (2023b).
186 IMF (2023b).

Using standard debt decompositions, the report shows that debt reduction episodes last an average of five years. In advanced economies, the magnitude of the decline per year is about 3 percentage points; in emerging market economies, the decline is 5 percentage points per year; and in low-income countries, it is 10 percentage points. Hence, when debt ratio reductions happen, they are relatively substantial.

FIGURE 2 **CONTRIBUTION TO DEBT-TO-GDP CHANGE DURING REDUCTION EPISODES (PERCENT CHANGE)**



Note: Sample covers 28 advanced economies from 1979 to 2021, 83 emerging market economies from 1991 to 2021, and 55 low-income countries from 1985 to 2021.

Source: IMF, Global Debt Database; Mauro et al. (2013); IMF staff calculations.

And what are the factors that have contributed to reducing debt ratios in practice? In advanced economies, primary balance surpluses and real GDP growth have historically been the most significant drivers of debt ratio reductions, while in emerging market and low-income countries, real GDP growth and inflation have played a relatively larger role. However, it is worth noting that debt decompositions do not reveal causality, given that all the variables involved are endogenous and interdependent. Of special note is the role of inflation. Standard theory would say expected increases in inflation would simply backfire (in the form of increases on interest rates). Unexpected increases in inflation, on the other hand, may reduce debt but should not be exploited as they erode the credibility of institutions and are highly regressive.

The 2023 World Economic Outlook studied the impact of fiscal consolidation on debt ratios. Different methods to account for biases arising from factors such as the macroeconomic environment, which can influence both consolidations and debt are considered. For instance, 'narrative shocks' identify cases where governments enacted tax increases or spending cuts explicitly aimed at reducing public deficits and promoting fiscal sustainability, regardless of macroeconomic conditions. The augmented inverse probability weighted (AIPW) estimator, which also addresses the non-random nature of consolidations, is also employed. The basic result is robust to the method employed:

on average, fiscal consolidations do not reduce debt ratios, which poses a challenge for policymakers. Furthermore, unforeseen factors – such as transfers to state-owned enterprises and other contingent liabilities, or unexpected exchange rate depreciations that increase the domestic value of foreign exchange-denominated debt – have sometimes offset debt reduction efforts.

When consolidations reduce debt ratios, the average impact is relatively small, albeit durable: 0.7 percentage points in the first year and up to 2.1 percentage points after five years. The effectiveness of fiscal consolidation in reducing public debt ratios depends on a variety of factors. According to the analysis, the probability of success in reducing debt ratios improves from a baseline of around 50% to more than 75% during domestic or global expansions when global risk aversion and financial volatility are low.

In summary, the point of the chapter's analysis that stabilising debt can be challenging is strengthened by the analysis in the IMF's 2023 World Economic Outlook. Even countries that may manage to sustain primary balance surpluses may find it challenging to stabilise or reduce public debts.

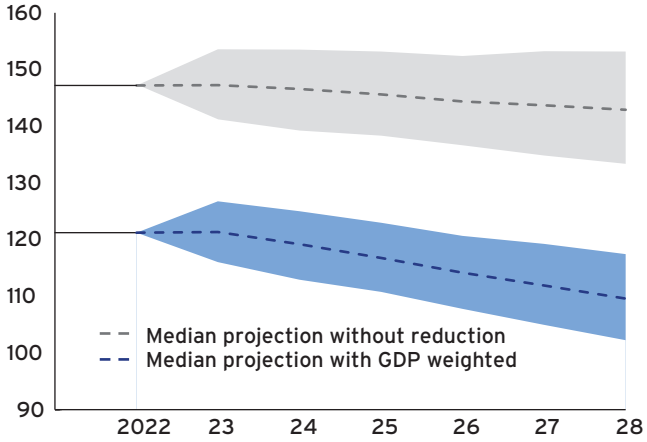
Debt mutualisation: A radical approach to sovereign debt reduction

The urgency for future debt reduction strategies in euro area countries with high pre-pandemic debt levels is growing. The February 2020 review of the European Union's economic governance framework prompted debates on its challenges, including high public debt ratios, complexity, and insufficient ownership and enforcement of fiscal rules. The chapter discusses a European fiscal framework that addresses four key requirements: reconciling rules and discretion, exercising discretion, and improving compliance. The consensus suggests implementing an expenditure rule and basing adjustment objectives on debt risk assessment.

The European Commission's 2022 proposal outlines a four-stage process for fiscal framework reform, but has faced criticism for its vagueness on minimum adjustment requirements and the Commission-centric nature. To address these concerns, the authors recommend disclosing and sharing the debt sustainability analysis methodology, reducing the Commission's role in exercising judgement, and implementing a deficit rule backstop to constrain the net primary expenditure ceiling design.

Despite the benefits of new fiscal rules, disparities in debt-to-GDP ratios among EU countries hinder common rule adoption. Ando et al. (2023) explore debt mutualisation, first proposed by the German Council of Economic Experts in 2011, to stabilise national debt without directly transferring fiscal resources. A European Debt Management Agency (EDMA) would issue risk-free common debt, reducing debt-to-GDP ratios through favourable interest-growth differentials.

FIGURE 3 **ITALY: PUBLIC DEBT TRENDS WITH AND WITHOUT MUTUALISATION**



Note: Shaded areas represent 5th-95th percentile projections.
Source: October 2022 World Economic Outlook and IMF staff calculations.

Stochastic simulations incorporating non-linearities between debt and interest rates from the literature reveal potential outcomes. The results suggest that the EDMA could issue up to 15% of euro area GDP without transferring national fiscal resources, and EDMA debt ratios would likely decrease. Without mutualisation, most euro area countries' debt ratios are expected to decrease with 95% probability, except for Belgium, Finland, France, Italy and Spain. For these countries, a debt mutualisation operation equivalent to 26% of GDP is considered. Italy would see a decreasing debt-to-GDP ratio after three years, while Belgium, Finland, France and Spain would need additional primary balance improvements for their 95th percentile debt-to-GDP ratio to decrease after three years.

Debt mutualisation may allow for a reduction in the overall cost of debt by transferring some of the debt of more highly indebted countries to a less-indebted (and hence safer) centralised entity. The key is that the reduction in service cost due to the reduced riskiness of the highly indebted country's debt must exceed the increase in the same cost for EDMA. This may, for instance, result from default costs not fully priced in or under multiple equilibria when mutualisation helps eliminate the high interest rate equilibrium and associated risk premia. In addition, the EDMA, by issuing a European safe asset, may offer a desirable asset to bond holders. The associated convenience yield implicitly constitutes a new common fiscal resource that could be usefully employed.

In conclusion, while not a panacea, debt mutualisation could be further considered as a complement to the set of reforms proposed and contemplated by the European Union to address the challenges arising from the varied debt levels and economic conditions within euro area countries.

Conclusion

The chapter delivers a thorough and well-timed exploration of the post-pandemic and post-war sovereign debt landscape and architecture. By showcasing the challenges that policymakers face in stabilising and reducing elevated public debt ratios amidst tightening global financial conditions, weak economic growth prospects, and a strengthening US dollar, the chapter emphasises the urgency for creative solutions to address these pressing issues.

Drawing on insights from the latest IMF World Economic Outlook, this discussion underscored how reducing debt ratios is a complex task. Innovative strategies to address high debt levels may be necessary. In the European context, this could involve debt mutualisation, which capitalises on a shared resource, namely, the value of risk-free, jointly issued assets.

Ultimately, comprehensive and well-structured approaches are required to achieve sustainable reductions in debt ratios. Policymakers must thoughtfully consider the timing and design of fiscal consolidations while taking into account a multitude of factors influencing their decisions.

Robust institutional frameworks also play an essential role in addressing these challenges. Proper incentives to prevent future fiscal profligacy that may bring back high debts and the accompanying risks need to be implemented in parallel. This may require a more risk-based approach design for fiscal rules, revamped medium-term fiscal frameworks, and a stronger role for independent national fiscal councils. The chapter also contributes valuable insights to that important discussion.

5.6 DISCUSSION OF CHAPTER 4, "SOVEREIGN DEBT AFTER THE PANDEMIC AND THE WAR", BY ISABEL VANSTEENKISTE[187]

The chapter provides a comprehensive and rich review of the global sovereign debt landscape and the challenges to its architecture following the pandemic and the war. With global sovereign debt now almost equal to the size of the global economy, the chapter touches upon two key topical policy questions: Are sovereign debt vulnerabilities increasing? And how should we address debt vulnerabilities in the current economic reality?

187 The views expressed here are those of the author and do not necessarily represent those of the ECB or the Eurosystem.

Global public debt ratios had already been consistently on the rise in the 50 years preceding the first Covid-19 lockdowns. As the pandemic hit, record fiscal support helped protect households and firms and put countries both economically and financially back on track. But the support was fiscally costly: it led in 2020 to the largest one-off debt surge since World War II. Russia's war in Ukraine has added to these unprecedented levels of global public borrowing.

The pandemic and the war also brought rapid and sudden changes to the inflation outlook. When pandemic concerns waned, inflation soared as supply could not keep up with the sudden and rapid surge in demand. Fuel and food shortages caused by the war exacerbated this post-pandemic inflation. As a result, inflation rates reached multi-decade highs in most of the world. While inflation surprises may lower debt ratios in the short-run, persistent inflation risks ultimately increase the cost of borrowing. This process can happen quickly in countries with short debt maturities.[188]

The chapter examines whether these recent developments have increased sovereign debt vulnerabilities. It does so by drawing on market-based interest expectations and on IMF debt, growth and primary balance projections. The chapter finds that, based on these metrics, debt vulnerabilities remain benign for the vast majority of countries. This is mainly because financial markets expect long-term real interest rates to remain below IMF projected real GDP growth rates. More worrisome, though, is that fiscal efforts in most countries fall short of what would be needed to stabilise their debt levels. They fall significantly short for about one-quarter of countries. These are coincidentally also the countries that tend to have positive debt-stabilising primary balances. This means that these countries will need to take significant additional fiscal efforts to avoid debt ratios going on an upward path. In the first section of this discussion, I will delve deeper into this assessment.

The chapter also considers how the pandemic and the war are challenging fiscal policy frameworks and the global sovereign debt architecture.

In Europe, already before the pandemic a number of flaws had been identified in the EU fiscal framework and the European Commission had initiated a review of its economic governance framework. With the 'General Escape Clause' period drawing to a close, the chapter stresses the importance of returning to a set of fiscal rules. Acknowledging that the old rules are no longer adequate, it argues that the European Union should adopt a new set of better-suited rules. In this regard, it praises the Commission's proposal and makes suggestions as to how to make the new rules work in practise. In the second section of this discussion, I will offer a complementary view.

188 Gaspar and Pazarbasioglu (2022).

Finally, the pandemic and the war have rendered challenges to the sovereign debt restructuring architecture more acute. The chapter proposes a rethink, inter alia by using multilateral development bank (MDB) capital more creatively and by finding ways to get MDBs to make a greater contribution to debt restructuring, in exchange for getting concessions from China to improve the Common Framework. In the final section of this discussion, I will put some caveats to these proposals and make some alternative suggestions.

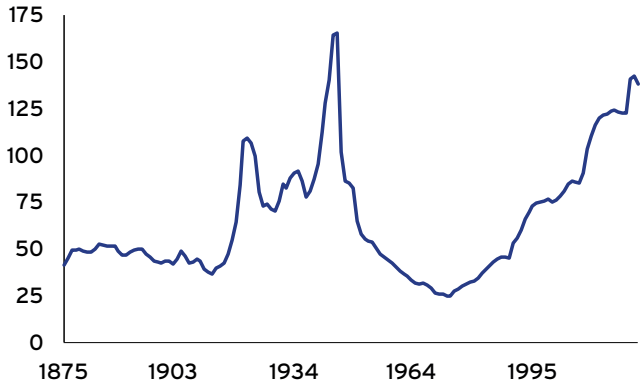
Throughout this discussion, there are two recurring themes: the climate transition and geopolitical fragmentation. Both can significantly affect the sovereign debt landscape and architecture going forward. While the baseline forecast is benign, the risks these challenges may bring should be taken into account.

The changing economic reality and the implications for the sovereign debt outlook

Debt dynamics are governed by three key variables: the legacy debt level, the difference between the expected interest rate to be paid on debt and growth, and the fiscal balance.[189] We can examine how the pandemic and the war have altered each.

The most obvious change has occurred in the legacy level of debt. The pandemic and, to a lesser extent, Russia's invasion of Ukraine led to a surge in already high debt levels. This is illustrated in Figures 1 and 2, which shows that for both emerging markets and advanced economies, debt ratios are now at or close to the highest levels we have observed since the recording of data.

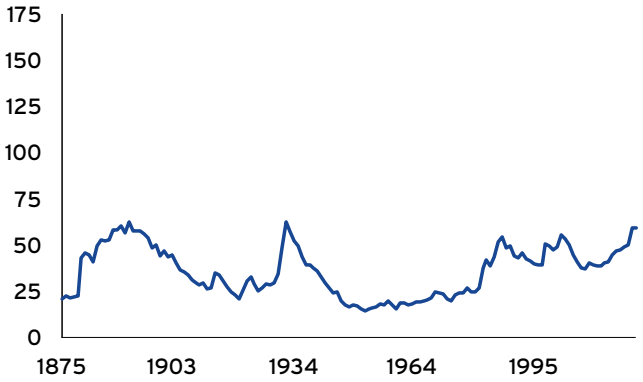
FIGURE 1 **G7 AVERAGE DEBT RATIO (%)**



Note: Last observation: 2022 (annual data)
Source: Global Financial Data and Haver.

189 Bouabdallah et al. (2017).

FIGURE 2 **EMERGING MARKET ECONOMIES AVERAGE DEBT RATIO (%)**



Note: The emerging market economies included in the sample are: Argentina, Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, Philippines, Poland, Saudi Arabia, South Africa, Thailand and Turkey. Last observation: 2022 (annual data).

Source: Global Financial Data and Haver.

High debt levels are a cause for concern. Prior to the pandemic, these concerns were attenuated by the low and often even negative interest rate-growth differential in both advanced and emerging markets. As the chapter indicates, the IMF and financial markets expect this benign environment to last for most countries, despite the rise in inflation and short-term rates. As a baseline, this is a plausible scenario, especially since some of the key structural drivers remain in place.[190] There are three important caveats.

First, recent events have amplified the uncertainty surrounding the interest rate-growth outlook. Risks go in both directions. This is in part due to uncertainties related to the events themselves. However, Russia's war against Ukraine may also be the harbinger of more fundamental geopolitical shifts. If this results in a divide of the global economy into competition blocs, trade and financial flows between them may drop significantly.[191] Such a scenario would be a huge negative shock for the world economy, leading to lower growth, higher costs and more uncertain trade relations.[192]

Second, the weaponisation of energy is accelerating the climate transition. Delivering on climate goals and ensuring energy security will require massive investments. Estimated investment needs to address the climate challenge alone range from $3 to $6 trillion per year until 2050.[193] The private sector is expected to cover the bulk of these needs, but the public sector will surely play a large role. This poses a burden to public finances.

190 The protracted fall in the neutral rate of interest in advanced economies was driven by ageing, waning productivity growth, a rise in mark-ups, and a surge in risk aversion in the wake of the global financial crisis (Brand, 2018).
191 For concrete analysis and estimates of such a scenario, see International Relations Committee (2023).
192 Lagarde (2023).
193 Adrian and Georgieva (2022).

The third caveat is that the negative interest rate-growth differential should not be taken for granted; it may be subject to rapid change, especially when debt ratios are high. Both interest rates and growth rates are endogenous variables that respond to fiscal policy. While many countries can currently afford to run fiscal deficits for an extended period of time, deficits that grow too large and linger too long risk undermining creditor confidence.

To avoid negative dynamics and to ensure the green transition can be financed, governments will need to pursue sound and prudent fiscal and structural policies. This implies that once economic conditions improve, stimulus should be reversed swiftly. It is widely acknowledged that withdrawing stimulus is politically difficult. It may be even more difficult in the current environment. During the pandemic and the war, governments were called upon to roll out sizeable fiscal support to ensure macro stabilisation. This risks creating a sense among households and firms that fiscal authorities will counter any future negative shock. The expectation of such a 'government put' not only poses risks to the inflation outlook but also increases debt vulnerabilities, in particular where macro policy frameworks are weak.

Some reflections on the EU fiscal framework: Is the leap forward far enough?

To ensure that national fiscal flexibility would not endanger the long-term sustainability of public finances, EU member states agreed to lay down their fiscal frameworks in the Maastricht Treaty and the Stability and Growth Pact (SGP).[194]

The European fiscal framework has been the subject of an active debate for many years. Even before the pandemic, there was broad consensus that the framework needs reform. The recent rise in debt levels has further reinforced the need for an overhaul. Being recognisant of its weaknesses, the European Commission has recently proposed a new set of rules. Conceptually, this new proposal is a clear improvement over the old rules, as the chapter indicates.

At the same time, it falls short of the leap forward that would bring Economic and Monetary Union closer to completion. This would require a central fiscal capacity.

Proposals for a central fiscal capacity have been a recurring theme in the debates on completing EMU. Pre-pandemic, the focus was on schemes that would support macroeconomic stabilisation.[195] Recent developments have brought to the fore the need for an EU central fiscal capacity that could also fulfil the large investment needs for energy security and the green transition. Such a capacity would support the provision

194 The latter was subsequently strengthened through legislative measures introduced with the 'six-pack' and 'two-pack'.
195 See, for example, Bénassy-Quéré et al. (2018).

of EU public goods, help to address market failures, and allow the economies of scale and synergies that the size of a united continental economy can deliver to be reaped.[196] There are various ways to shape such a capacity. Importantly, however, the legal and institutional bases already exist.[197]

Through the provision of safe assets, a central fiscal capacity would also help complete other areas of the economic and monetary union – most importantly, the capital markets union. In addition, it would also strengthen the international role of the euro.

Challenging the sovereign debt restructuring architecture

Over the past decade, the external debt structure of low-income countries has changed markedly. As a result, the existing sovereign debt restructuring architecture may no longer be adequate. While vulnerabilities in the low-income countries have been building up over the past decade, they have been reinforced by the war and pandemic. This makes the risk associated with this disconnect more acute.

The international community is aware of these risks and has been debating the way forward. For a large number of low-income countries, it is not too late yet. Their debt burdens are still significantly below what they were in the mid-1990s.[198] Focusing on policy tools to lower these debt burdens, as the chapter suggests, can help avoid them facing a debt crisis.

However, the international community should also prepare for worst-case scenarios. This will require a rethink of the sovereign debt restructuring architecture. Given the current external debt structure of low-income countries, credit coordination has become more complex. Geopolitical fragmentation risks worsen the situation. The chapter suggests that ways may need to be found to get MDBs to make a greater contribution to debt restructuring, in exchange for getting concessions from China to improve the Common Framework coordination among stakeholders. Such an approach is risky. It may negatively affect the capacity of the international community to scale up concessional finance for all in need. Instead, new ways will need to be found to bring all creditors to the table together. The G20 Global Sovereign Debt Roundtable, co-chaired by the IMF, World Bank and India, has been a good starting point.

However, more is needed. Low-income countries, which typically have not contributed much to global warming, are expected to suffer from the largest damages. This puts a large fiscal burden on those countries that can afford it the least. The IMF has already expanded its lending toolkit with the Resilience and Sustainability Trust for this purpose,

196 Panetta (2022b; 2023).
197 Abraham et al. (2023).
198 Chuku et al. (2023).

and the MDBs have embarked on a capital adequacy framework review. Given the large needs, these measures may need to be flanked by additional donor financing, not only in the form of concessional loans but ideally in the shape of grants. As climate change is a global challenge, helping low-income countries is in the common global interest.

5.7 CONCLUDING OBSERVATIONS BY HAROLD JAMES

I am most grateful to have the opportunity to speak at the end of such an interesting and productive discussion of three important chapters. The chapters raise the question of the extent to which we are at a caesura or structural turning point in the global – and of course also the European – financial system. Chapter 2 examines the inflation shock and the likely policy shock, and concludes that "the high level of debt, the geopolitical and economic consequences of the war in Ukraine, the high uncertainty reflecting the vulnerability of our economy to global health shocks and climate change, however, will stay". Chapter 4 thinks about the effects of increased interest rates on debt sustainability and coherently outlines the need for remedies, including debt restructuring. Chapter 3 maps out good reasons to think that the dollar will continue to be at the centre of the world's monetary and financial system – with all the problems that that long-standing US hegemony brings. There is much uncertainty.

Let me use my comparative advantage as a historian and give a historical parallel. In August 1914, there was a widespread assumption that the European war would necessarily be short, in that countries couldn't pay for a long war or manage the costs of having their supply chains disrupted. As governments reordered their economies, and as the costs of war mounted, it was both ever clearer that the war would not be short and that it would not end without the collapse of one side. There is an almost identical evolution of thinking after 24 February 2022. When Putin's plan for a short strike that would change the Ukrainian government failed, he started to bet on a longer-term strategy that aimed at the dissolution of the Western security and economic framework, an end to NATO and to the EU. And the experience of dealing with Putin has made it clear – not only to the Ukrainians – that his promises cannot be relied on in any peace negotiation and hence that a conclusion to the conflict is only possible with a post-Putin Russia. We still don't know which side will collapse first, though the combination of incompetence and brutality in the Russian war machine makes it, in my view, more likely that the war will end when Russians change their own regime.

Making short- or medium-term forecasts – including predictions about inflation and interest rates – is extraordinarily difficult because we simply don't – and can't – know how long the war will last. With war there are major disruptions to energy and food supply, and increased fiscal strains. These will impact inflation. In that sense, the

interesting debate between Jeromin Zettelmeyer and Adrian Peralta on the assumptions about Italian interest rates built into a five-year picture of Italy's debt sustainability is inevitably incapable of resolution. One of the certain impacts at present is simply the increased level of uncertainty.

Over the past weeks, uncertainty has increased with new financial turmoil. The failure of Silicon Valley Bank and the massive contagion it sparked looks simply like a classical banking run. It is a pattern that was common in the 19th century and in the Great Depression, rare after 1933, and then once more a threat after 2007. The answer of the Treasury and the Fed also looks quite classical: the application of the 19th century British economist Walter Bagehot's principles on the need for a lender of last resort to stem panics.

In the case of SVB, the bondholders and the owners of stock lose their assets, but all depositors, whether insured or not, will be made whole. The threat of contagion to the whole financial system was too great: if any middle-sized bank can fail, there is an impeccable logic for all depositors to move their deposits quickly to large banks, and of course that action by itself would bring down the medium-sized bank. The United States has in effect guaranteed the whole US banking system, and made a nonsense of the principle of insurance and the FDIC operations – and perhaps also, as many critics of the action are suggesting, a nonsense of the principle of liability that is at the heart of the capitalist system.

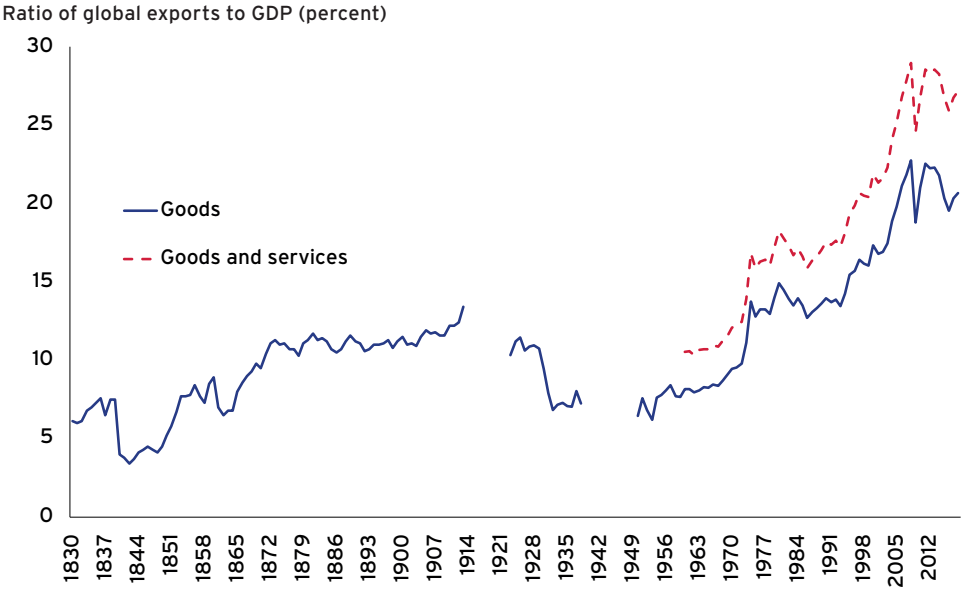
The fallout then reinforced a lesson of 2008 and the global financial crisis, that large countries (like the United States, or for that matter China) can afford to rescue their banking systems, but small countries, especially if they have very large and internationally exposed banking systems, cannot. Iceland and Ireland learnt that experience in the global financial crisis. Switzerland then had a very narrow and very lucky escape; now it has to manage of the failure of a bank whose total assets and liabilities were roughly equal to Swiss GDP and which was rescued by a takeover by another larger bank. Is that manageable? Banking rescues will add to the fiscal strain – and provide an instance where insurance is necessarily provided to complete markets, but where the longer-term costs are substantial.

If the near and medium term is very uncertain, I am more confident about the longer-term outlook. Giancarlo Corsetti rightly emphasised that it is hard to disentangle supply from demand shocks. Yet the basic observation that he relates, that prices and output move inversely against each other in supply shocks and simultaneously in demand shocks, holds a key to a longer historical observation about the long-term trajectory of globalisation.

To understand why our future is not necessarily that bleak, why globalisation may not be ending because of the pandemic or Ukraine, contemplate how the decisive turning points of the past were inflationary, and how they drove the world to more rather than less globalisation. Modern globalisation appears as two distinct episodes. What is usually

thought of as the first age of modern globalisation began in the middle of the 19th century. It was interrupted by World War I, after which there was a desperate attempt to revive it – with a more robust institutional framework – in a 'half episode' that quickly failed with the Great Depression. And then new-style globalisation took off in the 1970s. Both caesuras, in the 1840s and 50s and in the 1970s, started with dramatic shortages and inflationary surges.

FIGURE 1 **TRADE AND WORLD OUTPUT, 1830 TO 2014**



Source: Catao and Obstfeld (2019)

The antithesis of globalisation can be found in periods of conflict and war, when economic advantage appears as a zero-sum game and fiscally driven inflation drives up prices. Twentieth century world wars interrupted globalisation. We are now living through a 21st century conflict that may be thought of as a return to the era of world wars and cold wars.

Both the mid-19th century and the late-20th century globalisations were technologically driven, and some of the most important productivity gains involved the cost of transport. It was the steam engine that drove both the opening up of continents (with railroads) and oceans (with steamships). The container reduced the cost of transporting goods after the 1970s. But these innovations substantially pre-dated the moment at which they were economically transformative: Matthew Boulton and James Watt were creating operational steam engines in the 1770s, and *The Autocarrier*, usually thought to be the

first container ship, was launched in 1931. It required a specific set of circumstances to actually realise the transformative character of the innovations; and that was precisely the environment that the disruption of big price rises created. The new technologies would pay off because of the conditions of shortage.

The widespread adoption of innovation depended on policy choices: the removal of impediments to commerce, but also a consensus around a stable and internationally applicable monetary framework – whether the gold standard in the late-19th century or a modern inflation-targeting regime in the late-20th century.

There were at these moments, in the mid-19th century and from the end of the 1970s, revolutions in government, when public authorities took on many more tasks concerned with managing the economy, including guiding the course of trade liberalisation. In today's recasting of that old debate, Ricardo Reis importantly spoke of a new 'London consensus' in which there is both more fiscal activism, in the sense of providing insurance to complete markets and using fiscal policy aggressively, and also a much closer awareness of the importance of policy effectiveness, of assessing how money is spent (in order to assure that it is spent productively). The banking turbulence of the past weeks, and reflection on the fiscal cost of bank rescues, will only increase the demand for close monitoring of the effectiveness of public spending.

References

Abraham, L., M. O'Connell and I. Arruga Oleaga (2023), "The legal and institutional feasibility of an EU Climate and Energy Security Fund", ECB Occasional Paper 313.

Acker, K., D. Brautigam, and Y. Huang (2020), "Debt Relief with Chinese Characteristics", China Africa Research Initiative Working Paper 39, June (www.sais-cari.org/s/WP-39-Acker-Brautigam-Huang-Debt-Relief-V5.pdf).

Adrian, T. and K. Georgieva (2022), "Public Sector Must Play Major Role in Catalyzing Private Climate Finance", IMF blog, 18 August.

Aftalion, M. (2019), "INSTEX, a Game Changer?", unpublished manuscript, Vienna Center for Disarmament and Non-Proliferation (December).

Ahmed, M. and H. Brown (2022), "Fix the Common Framework for Debt Before It Is Too Late", CGD Blog, 18 January (www.cgdev.org/blog/fix-common-framework-debt-it-too-late).

AidData (2021), "Banking on the Belt and Road: Insights from a New Global Dataset of 13,427 Chinese Development Projects", College of William and Mary.

Aiyar, S., J. Chen, C.H. Ebeke et al. (2023), "Geoeconomic Fragmentation and the Future of Multilateralism", IMF Staff Discussion Note 2023/001.

Ando, S., G. Dell'Ariccia, P.-O. Gourinchas, G. Lorenzoni, A. Peralta-Alva, and F. Roch (2023), "Debt Mutualization in the Euro Area: A Quantitative Exploration", IMF Working Paper 2023/059.

Andrianova, A., E. Pismennaya, and O. Tanas (2018), "Putin hedges Trump bet by dumping Treasuries to safeguard assets", Bloomberg, 20 July.

Andrle, M., J. Bluedorn, L. Eyraud, T. Kinda, P. Koeva Brooks, G. Schwartz, and A. Weber (2015), "Reforming Fiscal Governance in the European Union", IMF Staff Discussion Note 15/09 (www.imf.org/external/pubs/ft/sdn/2015/sdn1509.pdf).

Aramonte, S., W. Huang and A. Schrimpf (2021), "DeFi Risks and the Decentralization Illusion", *BIS Quarterly Review*, December: 21-36.

Arnold, N., R. Balakrishnan, B. Barkbu et al. (2022), "Reforming the EU Fiscal Framework: Strengthening the Fiscal Rules and Institutions", IMF Departmental Paper 22/014 (www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2022/08/31/Reforming-the-EU-Fiscal-Framework-Strengthening-the-Fiscal-Rules-and-Institutions-The-EUs-518388).

Arslanalp, S., B. Eichengreen and C. Simpson-Bell (2022a), "The Stealth Erosion of Dollar Dominance and the Rise of Nontraditional Reserve Currencies", *Journal of International Economics* 138.

Arslanalp, S., B. Eichengreen and C. Simpson-Bell (2022b), "Dollar Dominance and the Rise of Nontraditional Reserve Currencies", IMF Blog, 1 June.

Arslanalp, S., B. Eichengreen and C. Simpson-Bell (2023), "The Return of Gold as International Reserves: Barbarous No More?", IMF Working Paper 2023/14.

Ascari, G., P. Bonomolo, M. Hoeberichts and R. Trezzi (2023), "The euro area great inflation surge", De Nederlandsche Bank Analysis, February.

Asonuma, T. and C. Trebesch (2016), "Sovereign Debt Restructurings: Preemptive or Post-Default", *Journal of the European Economic Association* 14(1): 175-214.

Baker, T. (2022), "Crypto is Money without a Purpose", Wall Street Journal, 20 December.

Bandiera, L. and V. Tsiropoulos (2020), "A Framework to Assess Debt Sustainability under the Belt and Road Initiative", *Journal of Development Economics* 146(C).

Bank of Russia (2022), B*ank of Russia Foreign Exchange and Gold Asset Management Report.*

Bartsch, E., A. Bénassy-Quéré, G. Corsetti, and X. Debrun (2020), *It's All in the Mix: How Monetary and Fiscal Policies Can Work or Fail Together*, Geneva Reports on the World Economy 23, ICMB and CEPR (https://cepr.org/publications/books-and-reports/geneva-23-its-all-mix-how-monetary-and-fiscal-policies-can-work-or).

Beaumont, C. and D. Hakura (2021), "The Common Framework: Utilizing its Flexibility to Support Developing Countries' Recovery", *IMF Strategy, Policy and Review, Special Series on Covid-19.*

Bénassy-Quéré, A., M. Brunnermeier, H. Enderlein et al. (2018), "Reconciling risk sharing with market discipline: A constructive approach to euro area reform", CEPR Policy Insight 91.

Benigno, P. and G. Eggertsson (2023), "It is Baaack. The Surge in Inflation in the 2020s and the Return of the Non-Linear Phillips Curve ," NBER Working Paper No. 31197.

Bergman, U.M., M.M. Hutchison and S.E. Hougaard Jensen (2016), "Promoting sustainable public finances in the European Union: The role of fiscal rules and government efficiency", *European Journal of Political Economy* 44(C): 1-19.

Bianchi, F. (2021), "The Monetary/Fiscal Policy Mix", prepared for the G20 Framework Working Group March 2021 meeting (https://drive.google.com/file/d/1S9QOf94BPwYk7xrwrkLopj5THqUFS2af/view).

Bianchi, F. and L. Melosi (2019), "The Dire Effects of the Lack of Monetary and Fiscal Coordination", *Journal of Monetary Economics* 104: 1-22.

Bianchi, F., L. Melosi and A. Rogantini-Picco (2022), "Who is Afraid of Eurobonds?", mimeo (https://drive.google.com/file/d/10C7bZ0SAw0TX3qRJGKOJz6R-ELTTgyfy/view?usp=sharing).

BIS – Bank for International Settlements (2022a), "Project mBridge: Connecting Economies Through CBDC", BIS Innovation Center.

BIS (2022b), "The Future Monetary System", Chapter 3 of the *BIS Annual Economic Report 2022*.

BIS (2022c), "Triennial Central Bank Survey of Foreign Exchange and Over-the-Counter (OTC) Derivatives Markets in 2022", October.

Bénassy-Quéré, A., M. Brunnermeier, H. Enderlein, E. Farhi, M. Fratzscher, C. Fuest, P.-O. Gourinchas, P. Martin, F. Pisani, H. Rey, N. Véron, B. Weder di Mauro and J. Zettelmeyer (2018), "Reconciling risk sharing with market discipline: A constructive approach to euro area reform", CEPR Policy Insight 91.

Blanchard, O. (2023a), *Fiscal Policy Under Low Interest Rates,* Peterson Institute for International Economics.

Blanchard, O. (2023b), "Secular stagnation is not over", Peterson Institute for International Economics, 24 January (www.piie.com/blogs/realtime-economics/secular-stagnation-not-over).

Blanchard, O. and J. Zettelmeyer (2023), "Fixing Germany's fixes of the European Commission's fiscal governance proposal", Bruegel Analysis, 18 April (www.bruegel.org/sites/default/files/2023-04/fixing-germany's-fixes-of-the-european-commission's-fiscal-governance-proposal-%288974%29.pdf).

Blanchard, O., A. Leandro and J. Zettelmeyer (2021), "Redesigning EU fiscal rules: from rules to standards", *Economic Policy* 36(106): 195–236.

Blanchard, O., A Sapir and J. Zettelmeyer (2022), "The European Commission's fiscal rules proposal: a bold plan with flaws that can be fixed", Bruegel Blog, 30 November (www.bruegel.org/blog-post/european-commissions-fiscal-rules-proposal-bold-plan-flaws-can-be-fixed).

Board of Governors of the Federal Reserve System (2020), "Review of Monetary Policy Strategy, Tools and Communication" (www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications.htm).

Bodenstein, M., G. Corsetti and L. Guerrieri (2020), "The elusive gains from inward-looking monetary policy," CEPR Discussion Paper 14359.

Bon, G. and G. Cheng (2020), "China's overseas Sovereign debt relief actions: What insights do recent cases provide?", Economix Working Paper (https://economix.fr/pdf/dt/2020/WP_EcoX_2020-22.pdf).

Bon, G. and G. Cheng (2021), "China's debt relief actions overseas and macroeconomic implications", Working Paper (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3746174).

Borio, C., R. McCauley and P. McGuire (2022), "Dollar debt in FX swaps: huge, missing and growing", *BIS Quarterly Review*, December: 67–73.

Bouabdallah, O., C. Checherita-Westphal, T. Warmedinger, R. deStefani, F. Drudi, R. Setzer, and A. Westphal (2017), "Debt sustainability analysis for euro area sovereigns: a methodological framework", ECB Occasional Paper 185.

Brand, C. (2018), "The natural rate of interest: estimates, drivers, and challenges to monetary policy", ECB Occasional Paper 217.

Brown, C. (2023), "Russia's war on Ukraine: A sanctions timeline", Real Time Economics, Peterson Institute of International Economics, 23 March.

Bucheit, L., A. Gelpern, M. Gulati, U. Panizza, B. Weder di Mauro, and J. Zettelmeyer (2013), "Revisiting Sovereign Bankruptcy", Report Committee on International Economic Policy and Reform Brookings (www.brookings.edu/wp-content/uploads/2016/06/CIEPR_2013_RevisitingSovereignBankruptcyReport.pdf).

Bucheit, L., G. Chabert, C. DeLong and J. Zettelmeyer (2019), "How to Restructure Sovereign Debt: Lessons from Four Decades", PIIE Working Paper (www.piie.com/publications/working-papers/how-restructure-sovereign-debt-lessons-four-decades).

Caldara, D., M. Iacoviello, P. Molligo, A. Prestipino, and A. Raffo (2020), "The Economic Effects of Trade Policy Uncertainty", *Journal of Monetary Economics* 109(1): 38–59.

Caldara, D., F. Ferrante, M. Iacoviello, A. Prestipino and A. Queralto (2023), "The International Spillovers of Synchronous Monetary Tightening", paper prepared for the Carnegie Rochester NYU Conference on Public Policy.

Calvo, G. A. (1988), "Servicing the Public Debt: The Role of Expectations," A*merican Economic Review,* 78: 647–661.

Caselli, F., D. Stoehlker and P. Wingender (2020), "Individual Treatment Effects of Budget Balance Rules", IMF Working Paper 20/274 (www.imf.org/en/Publications/WP/Issues/2020/12/11/Individual-Treatment-Effects-of-Budget-Balance-Rules-49919).

Caselli, F., and P. Wingender (2021), "Heterogeneous effects of fiscal rules: The Maastricht fiscal criterion and the counterfactual distribution of government deficits", *European Economic Review* 136(C).

Catão L. and M. Obstfeld (2019), "Introduction", in L Catão and M Obstfeld (eds), *Meeting globalization's challenges: policies to make trade work for all*, Princeton University Press.

Cerutti, M.E.M. and H. Zhou (2017), "The global banking network in the aftermath of the crisis: is there evidence of de-globalization?", IMF Working Paper No. 2017/232.

Cerutti, M.E.M. and H. Zhou (2018), "The global banking network: what is behind the increasing regionalization trend?", IMF Working Paper No. 2018/046.

Cheng, G., J. Díaz-Cassou and A. Erce (2018), "Official debt restructurings and development", *World Development* 111(C): 181-195.

Chon, G. (2022), "Russia's Gold Reserves Buy Putin a Few Options", Reuters, 28 March.

Chuku, C., P. Samal, J. Saito, D. Hakura, M. Chamon, M. Cerisola, G. Chabert, and J. Zettelmeyer (2023), "Are We Heading for Another Debt Crisis in Low-Income Countries? Debt Vulnerabilities: Today vs the pre-HIPC Era", IMF Working Paper 23/79.

Cipriani, M., L.S. Goldberg, and G. La Spada (2023), "Financial Sanctions, SWIFT, and the Architecture of the International Payments System", *Journal of Economic Perspectives* 37(1): 31–52.

Claessens, S. (2017), "Global Banking: Recent Developments and Insights from Research", *Review of Finance* 21(4): 1513-1555.

Claessens, S. and N. van Horen (2015), "The impact of the global financial crisis on banking globalization", *IMF Economic Review* 63(4): 868–918.

Claeys, G., Z. Darvas and A. Leandro (2016), "A Proposal to Revive the European Fiscal Framework", Bruegel Policy Contribution (www.bruegel.org/sites/default/files/wp_attachments/pc_2016_07.pdf).

Cochrane, J. H. (2023), *The Fiscal Theory of the Price Level,* Princeton University Press.

Cohen, B. (2019), *Currency statecraft,* University of Chicago Press.

Correa, R., J. di Giovanni, L.S. Goldberg, and C. Minoiu (2022), "Trade Uncertainty and U.S. Bank Lending", SSRN Working Paper.

Corsetti, G. and L. Dedola (2016), "The mystery of the printing press: Monetary policy and self-fulfilling debt crises", *Journal of the European Economic Association* 14(6): 1329-1371.

Corsetti, G. and B. Mackowiak (2022), "Gambling to preserve price (and fiscal) stability", CEPR Discussion Paper 17588, prepared for the *IMF Economic Review*.

Corsetti, G. and R. Trezzi (2023), "International policy coordination during disinflation", VoxEU.org, 16 February (https://cepr.org/voxeu/columns/international-policy-coordination-during-disinflation).

Corsetti, G., L. Dedola, M. Jarociński, B. Maćkowiak and S. Schmidt (2019), "Macroeconomic stabilization, monetary-fiscal interactions, and Europe's monetary union", *European Journal of Political Economy* 57: 22-33.

Darvas, Z., P. Martin and X. Ragot (2018), "European fiscal rules require a major overhaul", Bruegel Policy Contribution 18 (www.bruegel.org/sites/default/files/wp_attachments/PC-18_2018.pdf).

Darvas, Z. (2023), "Fiscal rule legislative proposal: what has changed, what has not, what is unclear?", Bruegel Analysis, 4 May (www.bruegel.org/analysis/fiscal-rule-legislative-proposal-what-has-changed-what-has-not-what-unclear).

Das, M., G. Gopinath, T. Kim and J. Stein (2022), "Central Banks as Dollar Lenders of Last Resort: Implications for Regulation and Reserve Holdings", NBER Working Paper 30787.

Davoodi, H. R., A. Fotiou, P. Elger, D. Garcia-Macia, X. Han, A. Lagerborg, W. R. Lam, and P. Medas (2022), "Fiscal Rules and Fiscal Councils. Recent Trends and Performance during the Covid- 19 Pandemic", IMF Working Paper WP/22/11.

Debelle, G. (2017), "How I learned to stop worrying and love the basis", address to the BIS Symposium "CIP: RIP?", Basel, 22 May.

Debrun, X. and W. H. Reuter (2022), "Fiscal is local: EU standards for national fiscal frameworks", VoxEU.org, 24 January (https://cepr.org/voxeu/columns/fiscal-local-eu-standards-national-fiscal-frameworks).

Debrun, X., L. Moulin, A. Turrini, J. Ayuso-i-Casals, M.S. Kumar, A. Drazen and C. Fuest (2008), "Tied to the Mast? National Fiscal Rules in the European Union", *Economic Policy* 23(54): 297-362.

Diamond, D. and P. Dybvig (1983), "Bank Runs, Deposit Insurance, and Liquidity", *Journal of Political Economy* 91: 401-419.

Duffie, D., T. Foucault, L. Veldkamp and X. Vives (2022), *Technology and Finance*, The Future of Banking 4, CEPR and IESE (https://cepr.org/publications/books-and-reports/barcelona-4-technology-and-finance).

Eichenbaum, M.S., S. Rebelo and M. Trabandt (2021), "The Macroeconomics of Epidemics", *The Review of Financial Studies* 34(11): 5149–5187.

Eichengreen, B. (2014), "International Policy Coordination: The Long View", in R. Feenstra and A. Taylor (eds), *Globalization in an Age of Crisis: Multilateral Economic Cooperation in the Twenty-First Century*, University of Chicago Press.

Eichengreen, B. (2021), "Central Bank Digital Currencies: A Solution in Search of a Problem", written evidence to UK Parliament, House of Lords (October).

Eichengreen, B. (2022), "Sanctions, SWIFT, and China's Cross-Border Interbank Payments System", CSIS Policy Brief, Center for Strategic and International Studies.

Eichengreen, B. and M. Flandreau (2009), "The rise and fall of the dollar, or when did the dollar overtake sterling as the leading reserve currency?", *European Review of Economic History* 13(3): 377–411.

Eichengreen, B. and D. Gros (2020), "Post-Covid-19 Global Currency Order: Risks and Opportunities for the Euro", Study for the Committee on Economic and Monetary Affairs, European Parliament.

Eichengreen, B. and U. Panizza (2016), "A surplus of ambition: can Europe rely on large primary surpluses to solve its debt problem?", *Economic Policy* 31(85): 5-49.

Eichengreen, B. and R. Portes (1995), *Crisis? What Crisis? Orderly Workouts for Sovereign Debtors*, Centre for Economic Policy Research.

Eichengreen, B. and G. Xia (2019), "China and the SDR: Financial Liberalization Through the Back Door", *Quarterly Journal of Finance* 9.

Eichengreen, B., A. Mehl and L. Chitu (2018), *How Global Currencies Work, Past, Present and Future*, Princeton University Press.

Eichengreen, B., A. Mehl, and L. Chitu (2019), "Mars or Mercury? The geopolitics of international currency choice", *Economic Policy* 34(98): 315-363.

Eichengreen, B., C. Macaire, A. Mehl, E. Monnet and A. Naef (2022), "Is Capital Account Convertiblity Required for the Renminbi to Acquire Reserve Currency Status?" CEPR Discussion Paper 17498.

ECB – European Central Bank (2021), "An overview of the ECB's monetary policy strategy", Overview Note (www.ecb.europa.eu/home/search/review/html/ecb.strategyreview_monpol_strategy_overview.en.html).

ECB (2022), *The international role of the euro*, June.

European Commission (2019), "Vade Mecum on the Stability and Growth Pact – 2019 Edition", Institutional Paper 101 (https://economy-finance.ec.europa.eu/publications/vade-mecum-stability-and-growth-pact-2019-edition_en).

European Commission (2022), "Communication from the Commission to the European Parliament, the Council, the European Central Bank, the European Economic And Social Committee and the Committee of the Regions", COM(2022) 583 final (https://economy-finance.ec.europa.eu/system/files/2022-11/com_2022_583_1_en.pdf).

European Commission (2023), "Debt Sustainability Monitor 2022", Institutional Paper 199 (https://economy-finance.ec.europa.eu/publications/debt-sustainability-monitor-2022_en).

European Fiscal Board (2019), "Assessment of EU fiscal rules with a focus on the six and two-pack legislation" (https://commission.europa.eu/publications/assessment-eu-fiscal-rules-focus-six-and-two-pack-legislation_en).

Eyraud, L., X. Debrun, A. Hodge, V. Lledó, and C. Pattillo (2018), "Second-Generation Fiscal Rules: Balancing Simplicity, Flexibility, and Enforceability", IMF Staff Discussion Note 18/04 (www.imf.org/external/datamapper/fiscalrules/sdn1804-on-second-generation-fiscal-rules.pdf).

Eyraud, L., V. Gaspar and T. Poghosyan (2017), "Fiscal Politics in the Euro Area", IMF Working Paper 17/018 (www.imf.org/en/Publications/WP/Issues/2017/01/30/Fiscal-Politics-in-the-Euro-Area-44601).

Eyraud, L. and T. Wu (2015), "Playing by the Rules: Reforming Fiscal Governance in Europe", IMF Working Paper 15/67 (www.imf.org/external/pubs/ft/wp/2015/wp1567.pdf).

Falck, E., M. Hoffmann, and P. Huertgen (2021), "Disagreement about inflation expectations and monetary policy transmission", *Journal of Monetary Economics* 118: 15–31

Farhi, E. and M. Maggiori (2018), "A Model of the International Monetary System", *Quarterly Journal of Economics* 133: 295-355.

Ferrando, A., P. McAdam, F. Petroulakis, and X Vives (forthcoming) "Monetary Policy, Market Power and SMEs", *AEA Papers and Proceedings*.

FSB – Financial Stability Board (2020), *Regulation, Supervision and Oversight of 'Global Stablecoin' Arrangements: Final Report and High-Level Recommendations*.

FSB (2021), *Regulation, Supervision and Oversight of 'Global Stablecoin' Arrangements: Progress Report on the Implementation of the FSB High Level Recommendations*.

Gaspar, V. and C. Pazarbasioglu (2022), "Dangerous Global Debt Burden Requires Decisive Cooperation", IMF blog, 11 April.

Gelpern, A. (2014), "A Sensible Step to Mitigate Sovereign Bond Dysfunction", PIIE Blog, 29 August (www.piie.com/blogs/realtime-economic-issues-watch/sensible-step-mitigate-sovereign-bond-dysfunction).

Georgieva, K. and C. Pazarbasioglu (2021), "The G20 Common Framework for Debt Treatments Must Be Stepped Up", IMF Blog, 2 December (www.imf.org/en/Blogs/Articles/2021/12/02/blog120221the-g20-common-framework-for-debt-treatments-must-be-stepped-up).

Goldberg, L.S. and F. Ravazzolo (2022), "The Fed's International Dollar Liquidity Facilities: New Evidence on Effects", NBER Working Paper 29982.

Goldberg, L. and C. Tille (2008), "Vehicle Currency Use in International Trade", *Journal of International Economics* 76(2): 177–192.

Gopinath, G. and J. Stein (2021), "Banking, Trade, and the Making of a Dominant Currency", *Quarterly Journal of Economics* 136: 783-830.

Guerrieri, V., G. Lorenzoni, L. Straub, and I Werning (2023), "Macroeconomic Implications of Covid-19: Can Negative Supply Shocks Cause Demand Shortages?" , *American Economic Review*, forthcoming.

Guerrieri, V., G. Lorenzoni, L. Straub and I. Werning (2021), "Monetary Policy in Times of Structural Reallocation", *Proceedings of the Jackson Hole Symposium*.

Horn, S., C.M. Reinhart and C. Trebesch (2022), "Hidden Defaults", *AEA Papers and Proceedings* 112: 531-35.

Hurley, J., S. Morris, and G. Portelance (2018), "Examining the Debt Implications of the Belt and Road Initiative from a Policy Perspective", CGD Policy Paper 121 (www.cgdev.org/publication/examining-debt-implications-belt-and-roadinitiative-policy-perspective).

ICMA – International Capital Market Association (2022), "ICMA publishes new climate resilient debt clauses to facilitate sovereign debt relief and financial stability", press release, 9 November (www.icmagroup.org/News/news-in-brief/icma-publishes-new-climate-resilient-debt-clauses-to-facilitate-sovereign-debt-relief-and-financial-stability/).

Ilzetzki, E. (2021), "Fiscal rules in the European Monetary Union", VoxEU.org, 10 June (https://cepr.org/voxeu/columns/fiscal-rules-european-monetary-union).

IMF – International Monetary Fund (2014), "Strengthening the Contractual Framework to Address Collective Action Problems in Sovereign Debt Restructuring", IMF Policy Paper (www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Strengthening-the-Contractual-Framework-to-Address-Collective-Action-Problems-in-Sovereign-PP4911).

IMF (2019), "Heavily Indebted Poor Countries (HIPC) Initiative and Multilateral Debt Relief Initiative (MDRI)—Statistical Update", Policy Paper 19/028 (www.imf.org/en/Publications/Policy-Papers/Issues/2019/08/06/Heavily-Indebted-Poor-Countries-HIPC-Initiative-and-Multilateral-Debt-Relief-Initiative-MDRI-48566).

IMF (2020), "The International Architecture for Resolving Sovereign Debt Involving Private-Sector Creditors—Recent Developments, Challenges, And Reform Options", Policy Paper 20/043 (www.imf.org/en/Publications/Policy-Papers/Issues/2020/09/30/The-International-Architecture-for-Resolving-Sovereign-Debt-Involving-Private-Sector-49796).

IMF (2022a), *Shockwaves from the War in Ukraine Test the Financial System's Resilience*, Global Financial Stability Report April 2022.

IMF (2022b), "Helping people bounce back", *Fiscal Monitor*, October.

IMF (2022c), "Review of the Fund's Sovereign Arrears Policies and Perimeter", IMF Policy Paper (www.imf.org/-/media/Files/Publications/PP/2022/English/PPEA2022023.ashx).

IMF (2023a), "Inflation peaking amid log growth", World Economic Outlook Update, January.

IMF (2023b), *World Economic Outlook: A Rocky Recovery*, April.

IMF and World Bank (1999), "Heavily Indebted Poor Countries (HIPC) Initiative—Perspectives on the Current Framework and Options for Change" (www.imf.org/external/np/hipc/options/options.pdf).

International Relations Committee (2023), "The EU's Open Strategic Autonomy from a central banking perspective. Challenges to the monetary policy landscape from a changing geopolitical environment", ECB Occasional Paper 311.

Jeanne, O. (2023), "How can we reconcile price stability with a monetary backstop for government debt?", in G. Corsetti, G. Hale and B. Weder di Mauro (eds), *The Making of the European Monetary Union: 30 Years Since the ERM Crisis*, CEPR Press.

Jin, E. (2022), "Under the Radar: Alternative Payment Systems and the National Security Impacts of Their Growth", testimony Before the House Financial Services Committee Subcommittee on National Security, International Development and Monetary Policy, 20 September.

Keating, J. (2022), "Russia's Bright, Shiny Anti-Sanctions Weapon", Grid, 15 July.

Krugman, P. (1980), "Vehicle Currencies and the Structure of International Exchange", *Journal of Money, Credit and Banking* 12: 513-526.

Krugman, P. (1984), "The international role of the dollar: theory and prospect", in J Bilson and R Marston (eds), *Exchange rate theory and practice*, University of Chicago Press.

Kulenkampff, A., J. McCarthy, J. Mundy, G. Pipan and S. Zadek (2023), *More for less: Scaling Sustainability-linked Sovereign Debt*, Sustainability-Linked Sovereign Debt Hub Report (www.naturefinance.net/resources-tools/more-for-less-scaling-sustainability-linked-sovereign-debt).

Lagarde, C. (2023), "Central Banks in a Fragmenting World", speech at the Council on Foreign Relations C. Peter McColough Series on International Economics.

Lankes, H.P. (2021), *Blended finance for scaling up climate and nature investments*, One Planet Lab Report (www.lse.ac.uk/granthaminstitute/wp-content/uploads/2021/11/Blended-Finance-for-Scaling-Up-Climate-and-Nature-Investments-1.pdf).

Larch, M., E. Orseau and W. van der Wielen (2021), "Do EU fiscal rules support or hinder counter-cyclical fiscal policy?", *Journal of International Money and Finance* 112.

Lawder, D. (2022), "Yellen: Not Legal for U.S. to Seize Russian Official Assets", Reuters, 18 May.

Laya, P. and B. Bartenstein (2020), "Iran is Hauling Gold Bars Out of Venezuela's Almost-Empty Vaults", Bloomberg, 30 April.

Ledger Insights (2022), "Digital Euro Legislation Planned for 2023. Lagarde Confirms Wholesale CBDC Considered", 27 September.

Leeper, E. (1991), "Equilibria Under 'Active' and 'Passive' Monetary and Fiscal Policies," *Journal of Monetary Economics* 27(1): 129-147.

Lorenzoni, G. and I. Werning (2023a), "Wage Price Spirals", mimeo.

Lorenzoni, G. and I Werning (2023b), "Inflation is conflict", NBER Working Paper 31099.

MacDonald, C. and L. Zhao (2022), "Stablecoins and Their Risks to Financial Stability", Bank of Canada Staff Discussion Paper 2022-20.

Mandruzzato, G. (2022), "Why is Swiss inflation so low?", SUERF Policy Brief 391.

Marin, E. (2022), "The Hegemon's Dilemma", mimeo.

Martin, P., J. Pisani-Ferry and X. Ragot (2021), *Reforming the European Fiscal Framework*, French Council of Economic Analysis (www.cae-eco.fr/en/pour-une-refonte-du-cadre-budgetaire-europeen).

Matsuyama, K., N. Kiyotaki, and A. Matsui (1993), "Toward a Theory of International Currency", *Review of Economic Studies* 60: 283-307.

McCauley, R. (2019), "Safe assets: made, not just born", BIS Working Paper 769.

McCauley, R. (2022), "What Russia's fortress balance sheet can tell us about the dollar's future", FTAlphaville, 23 June.

McCauley, R.N., P. McGuire and P. Wooldridge (2021), "Seven decades of international banking", *BIS Quarterly Review*, September.

McDowell, D. (2020), "Financial sanctions and political risk in the international currency system", *Review of International Political Economy* 28(3): 635-661.

McKinsey (2021), *The Great Divergence*, McKinsey Global Banking Annual Review 2021.

McKinsey (2022), *Banking on a sustainable pat*h, McKinsey Global Banking Annual Review 2022.

Meeks, R. and F. Monti, (2019), "Heterogeneous Beliefs and the Phillips Curve", Bank of England Staff Working Paper 807.

Meyer, J., C.M. Reinhart and C. Trebesch (2022), "Sovereign Bonds Since Waterloo", *The Quarterly Journal of Economics* 137(3): 1615-1680.

Milesi-Ferretti, G.M. and C. Tille (2011), "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy* 26(66): 285–342.

Miranda-Agrippino, S. and H. Rey (2020), "U.S. monetary policy and the Global Financial Cycle", *Review of Economic Studies* 87: 2254–2276.

Motevali, G. (2021), "Iran Rebukes EU on Trade Channel Set Up to Avoid U.S. Sanctions", Bloomberg, 17 January.

Niepelt, D. (2004), "The Fiscal Myth of the Price Level", *Quarterly Journal of Economics* 119(1): 277–300.

Obstfeld, M. and K. Rogoff (2002), "Global Implications of Self-Oriented National Monetary Rules", *Quarterly Journal of Economics* 117(2): 503–535.

Obstfeld, M. and H. Zhou (2022), "The Global Dollar Cycle", *Brookings Papers on Economic Activity* (conference draft).

Panetta, F. (2022a), "Demystifying Wholesale Central Bank Digital Currency", speech at the Symposium on "Payments and Securities Settlement in Europe – Today and Tomorrow," Frankfurt, 26 September.

Panetta, F. (2022b), "Investing in Europe's future: The case for a rethink", speech at Istituto per gli Studi di Politica Internazionale, Milan, 11 November.

Panetta, F. (2023), "United We Stand. European Integration as a Response to Global Fragmentation", speech at a Bruegel event on "Integration, multilateralism and sovereignty: building a Europe fit for new global dynamics", Brussels, 24 April.

Panizza, U., F. Sturzenegger, and J. Zettelmeyer (2009), "The Economics and Law of Sovereign Debt and Default", *Journal of Economic Literature* 47(3): 651-98.

Paris Club (2020a), "Debt service suspension initiative for the poorest countries: Term sheet".

Paris Club (2020b), "Debt service suspension initiative for the poorest countries: Addendum to the April 2020 Term sheet".

Paris Club (2020c), "Common Framework for Debt Treatments beyond the DSSI".

Rajan, R. (2023), "For central banks, less is more", IMF Finance and Development, 11 March.

Reis, R. (2022), "The Burst of High Inflation in 2021-22: How and Why Did We Get Here?", CEPR Discussion Paper 17514.

Reis, R. (2023), "Four mistakes in the use of measures of expected inflation", CEPR Discussion Paper 17850.

Rey, H. (2013), "Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence", in *Global Dimensions of Unconventional Monetary Policy*, Federal Reserve Bank of Kansas City.

Rogoff, K. (1985), "Can International Monetary Cooperation be Counterproductive", *Journal of International Economics* 18: 199-217.

Rogoff, K. and J. Zettelmeyer (2002), "Bankruptcy Procedures for Sovereigns: A History of Ideas, 1976–2001", *IMF Staff Papers* 49(3): 470–507.

Rosen, P. (2022), "China is Buying Russian Energy with its Own Currency, Marking the First Commodities Paid for in Yuan since Western Sanctions Hit Moscow", *Markets Insider*, 7 April.

Schoenmaker, D. (2017), "What happened to global banking after the crisis?", Bruegel Policy Contribution Issue No. 7.

Shin, H.S. (2023), "Global value chains under the shadow of Covid", speech at the Columbia University CFM-PER Alternative Data Initiative virtual seminar, 16 February.

Shirakawa M. (2023), "Time for Change", Finance and Development, International Monetary Fund, March.

Silverman, B (1986), *Density Estimation for Statistics and Data Analysis*, Chapman and Hall, London.

Sims, C.A. (2016), "Fiscal policy, monetary policy and central bank independence", Proceedings - Economic Policy Symposium - Jackson Hole, Federal Reserve Bank of Kansas City.

Stognei, A. (2023), "Russia Embraces China's Renminbi in Fact of Western Sanctions", *Financial Times*, 25 March.

Sturzenegger, F. and J. Zettelmeyer (2007), "Creditors' Losses versus Debt Relief: Results from a Decade of Sovereign Debt Crises", *Journal of the European Economic Association* 5(2): 343-351.

Thygesen, N., M. Szczurek, M. Bordignon, X. Debrun and R. Beetsma (2022), "Making the EU and national budgetary frameworks work together", VoxEU.org, 13 September (https://cepr.org/voxeu/columns/making-eu-and-national-budgetary-frameworks-work-together).

Tonelli, E. (2022), "Ukraine Spent $54M in Crypto on Drones and Other Military Expaneses", Decrypt, 18 August.

UK Parliament (2021), "The future of quantitative easing", Chapter 4 in *Quantitative easing: a dangerous addiction?*, Economic Affairs Committee.

UNCTAD – United Nations Conference on Trade and Development (2022), *World Investment Report 2022*.

Verma, P. (2022), "The U.N. is Sending Ukrainians Aid in Crypto. Should It?" Washington Post, 15 December.

Vives, X. (2022), "Crypto's Well-Worn Path to Crisis", Project Syndicate, 2 December.

Vives, X. (2023), "Is SVB the Canary in the Coal Mine?", Project Syndicate, 14 March.

Weiss, C. (2022), "Geopolitics and the U.S. dollar's future as a reserve currency", International Finance Discussion Paper 1359, Federal Reserve Board.

Weymuller, C.-H., G. Lorenzoni, F. Giavazzi, V. Guerrieri and L. D'Amico (2022), "Revising the European fiscal framework, part 1: Rules", VoxEU.org, 14 January (https://cepr.org/voxeu/columns/revising-european- fiscal-framework-part-1-rules).

Wyplosz, C. (2005), "Fiscal Policy: Institutions versus Rules", *National Institute Economic Review* 191(1).

Yeung, R. and K. Goh (2022), "Petroyuan Will Not Bring About a Regime Shift Soon", China Insight, ANZ Research, 6 April.

Zettelmeyer, J. (2022), "European Union fiscal rules: is a better system feasible?", Bruegel Blog, 27 October (www.bruegel.org/blog-post/european-union-fiscal-rules-better-system-feasible).

Zettelmeyer, J., U. Panizza and E. Kreplin (2017), "Does Greece Need More Official Debt Relief? If So, How Much?", Peterson Institute for International Economics Working Paper 17-6 (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2946378).

Zettelmeyer, J., B. Weder di Mauro, U. Panizza, M. Gulati, L. Buchheit and P. Bolton (2022), *Climate and Debt*, Geneva Reports on the World Economy 25, ICMB and CEPR Press.

Zettelmeyer, J., G. Claeys, Z. Darvas, L. Welslau and S. Zenios (2023), "The longer-term fiscal challenges facing the European Union", Bruegel Policy Brief No. 10/23.

CEPR PRESS

The fifth report in The Future of Banking series, part of the Banking Initiative from the IESE Business School, examines the implications of the Covid-19 pandemic and the war in Ukraine for the international economic and financial order. It centres around three major components: the macroeconomic outlook and the changes needed to the economic policy model (fiscal, monetary and regulatory) to preserve economic and financial stability; the consequences for the international monetary system and the position of the US dollar; and the financial architecture needed to ensure sovereign debt sustainability, with special attention to Europe.

ISBN: 978-1-912179-73-2

33 Great Sutton Street | LONDON EC1V ODX | UK
187 boulevard Saint-Germain | 75007 PARIS | FRANCE
TEL: +44 (0)20 7183 8801 | FAX: +44 (0)20 7183 8820
EMAIL: CEPR@CEPR.ORG
WWW.CEPR.ORG