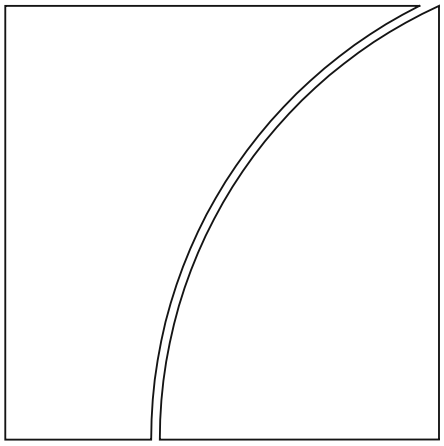

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by Swapan-Kumar Pradhan, Eswar Prasad, Előd Takáts and Judit Temesvary

Monetary and Economic Department

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Keywords: international debt securities, currency denomination, nationality and residence basis, reserve currencies, banks, non-bank financial institutions, nonfinancial corporations

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Dollarisation waves: new evidence from a comprehensive international bond database

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Abstract

We investigate how the US dollar's prominence in the denomination of international debt securities has evolved in recent decades, using a comprehensive global data set with far more extensive coverage than data sets used in prior literature. We find no monotonic dollarisation or de-dollarisation trend; instead, the dollar's share exhibits a wavelike pattern. We document three dollarisation waves since the 1960s. The last wave, following the global financial crisis, lifted the dollar's share nearly back to its level at the euro's launch in 2000. Our findings are robust to composition and currency valuation effects as well as alternative data definitions.

Keywords: international debt securities, currency denomination, nationality and residence basis, reserve currencies, banks, non-bank financial institutions, non-financial corporations

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1. Introduction

The roles of different currencies in the post-Bretton Woods international monetary system have been the subject of extensive research, with particular emphasis on the supremacy of the US dollar. The creation of the euro in 1999 and the internationalisation of the Chinese renminbi, starting in 2010, were seen as posing threats to the dollar's dominance. These threats appear to have faded, and a consensus has emerged that, while the dollar's eminence rests on vulnerable foundations, the absence of viable alternatives has left the dollar's primacy unchallenged. To examine this proposition, in this paper we provide new evidence on

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the role of the dollar in a key aspect of international finance: the currency denomination of international debt securities (IDS).

We examine the role of the dollar in IDS issuance using a comprehensive database compiled by the Bank for International Settlements (BIS).[2] IDS are defined as bonds listed in, registered in or following the legal covenants of financial markets outside the country in which the issuer resides. The stock of outstanding IDS rose from $2 billion in 1970 to $30 trillion at the end of 2024, which is about $6 trillion more than the outstanding cross-border loans of banks in BIS reporting countries. This highlights the importance of IDS in global finance.[3] The currency denomination of these securities is a marker of the relative importance of different currencies in global financial markets and how this importance has evolved over time. The IDS data set that we use in this paper has many advantages compared with those used in prior literature, in terms of not only its comprehensive coverage but also its longer time span. Furthermore, the data set allows us to examine currency denomination trends in new issuances in addition to outstanding stocks.

We find that the dollar's dominance waxed and waned in a wavelike pattern since 2000 rather than increasing or decreasing monotonically. The share of the dollar in outstanding stocks of IDS fell from about 60% in the early 2000s to about 43% in 2008, before surging back to about 60% in the latter half of the 2010s, excluding euro-denominated IDS issuance within the -euro area .[4] This pattern is preserved when we examine the dollar's share in gross issuance of IDS over time. Strikingly, the share of the dollar in 2024 is close to its share in 2000. Plus ça change, plus c'est la même chose!

In a seminal paper that is most closely related to our work, Maggiori et al (2020) use data on institutional investors' portfolios to document key stylised facts. They find that the dollar's share of global cross-border holdings of corporate debt was relatively stable from 2005 to 2008 but then increased sharply over the subsequent decade. This period of apparent dollarisation leads the authors to conclude: *"The US dollar appears today to be the world's only international currency. As recently as 10 years ago, however, this was not the case."* Our findings are consistent with these results over the period they analyse (2005–17). However, our longer sample provides a wider context: the "trend" of dollarisation appears to be particular to that period and does not seem to reflect broader patterns beyond their sample.

Furthermore, we observe a "euro moment" as the share of the euro rose considerably after its creation in 2000. Strikingly, the issuance of euro-denominated

[2] The BIS publishes two different sets of IDS data: (1) data reported by central banks; and (2) data compiled by the BIS from commercial data providers. The IDS data reported by central banks provide aggregate-level information, whereas the BIS-compiled IDS data that we use in this paper are more granular (security-level) and include additional details. The BIS-compiled data also offer global coverage and adhere to the methodology agreed upon by international organisations, as outlined in the *Handbook on securities statistics* (BIS (2015)).

[3] The outstanding $30 trillion IDS for end-2024 includes €6 trillion in outstanding stocks of euro-denominated IDS issued in other euro area countries by entities with euro area nationality. We discuss later how we deal with this issuance.

[4] The figures shown are calculated excluding domestic currency issuances within the euro area by euro area nationalities, regardless of the bondholders. In this paper, we refer to such issuances as intra-euro area euro-denominated IDS issuance.

IDS came close to dollar-denominated new issuance in the few years preceding the Great Financial Crisis (GFC). The share of the euro has fallen off since the GFC; yet the share of the euro was markedly higher in 2024 than the share observed at the introduction of the euro in 2000. Therefore, assertions about the decline of the euro seem to overstate a relatively short-term trend.

When we extend our investigation back to the pre-Bretton Woods era (1966 onwards), we find two more dollarisation waves. The share of the dollar increased similarly in the early 1980s and late 1990s before falling back. In fact, the share of the dollar today, at the peak of the current dollarisation wave, is not very different from the share observed at the two previous peaks in 1984 and 2000. After half of a century and three dollar waves, the share of the dollar today is very similar to what it was in 1973, at the end of the Bretton Woods system.

The dollarisation waves we identify are robust to various data specification choices. First, while we demonstrate that periods of dollar appreciation coincided with the waxing of the dollar's share – thereby reinforcing the dollar waves – the waves remain even after controlling for exchange rate valuation. Second, the wavelike patterns are similarly detectable when we include intra-euro area euro-denominated issuances, such as a Greek corporation issuing a debt security in Germany, and when we exclude own-currency issues, such as the US dollar-denominated IDS issued by US corporations (following the Bénétrix and Demirölmez (2025) setup). Third, our findings also hold up when we account for various compositional effects, such as shifts over time in the shares of various country groups and sectors in outstanding IDS stocks and new issuances.

We find that there is considerable stickiness in IDS currency denomination choice by the country where the debt is issued, with issuers in some groups of countries such as emerging market economies having a strong and consistent preference for the dollar. We extend our analysis to investigate variation across issuers' economic sectors. We show that the dollar wave in the 2000s was driven to a large extent by a growth spurt and a subsequent slowdown in euro-denominated IDS issuance in the financial sector – by banks and non-bank financial institutions (NBFIs) alike. Following the GFC, euro-dominated IDS issuance by the financial sector slowed sharply, driving down the share of the euro in IDS.

Lastly, we briefly review the evolving role of other major currencies. The data reveal that measures to promote the international use of the Chinese renminbi have had little effect on its use in IDS issuance. Having said that, the renminbi appears to have gained some momentum, rising from its near-zero levels since 2000. By 2024, its share in outstanding IDS, while still modest, surpassed that of the Swiss franc and rivalled that of the Japanese yen. In turn, the Japanese yen and the Swiss franc saw their shares in IDS issuance decline considerably over the past quarter of a century. The British pound sterling's share in 2024 remained comparable to what it was in 2000.

1.1 Literature review

An extensive literature documents the dollar's role as an invoicing currency, a payment currency and a reserve currency (Bertaut et al (2025)). Gopinath et al (2020) develop the dominant currency paradigm, highlighting the US dollar's role as an invoicing currency in international trade and the implications for exchange rate pass-through. The dollar remains the world's most widely used currency for payments, and this could be further reinforced by new financial technologies. For instance, most stablecoins today are still pegged to the US dollar (Board of Governors of the Federal Reserve System (2022)).

The dollar's share of global foreign exchange reserves has been the subject of considerable attention. Goldberg and Hannaoui (2024) find that the dollar's declining share in foreign official reserves is attributable to a small set of countries responding to interest rate differentials and geopolitical tensions. Prasad (2019) argues that the dollar's relative dominance as a reserve currency remains unchallenged; meanwhile, the relative importance of various second-tier reserve currencies is reshuffling. Chahrour and Valchev (2023) contend that targeted policies promoting the use of the renminbi and sanctions on large US dollar assets held abroad have the potential to erode the dollar's dominance.

A large literature highlights the feedback effects between the dollar's multiple roles. Gopinath and Stein (2021) argue that there is a strong relationship between trade-invoicing patterns and the pricing of safe assets denominated in various currencies. Clayton et al (2024) model competition across governments to provide safe assets, with this competition causing most countries to remain stuck at low reputation levels, preventing them from challenging the incumbent safe asset provider. The authors also investigate the strategies adopted by the United States to remain the dominant safe asset provider and by China to internationalise its bond market and build credibility as a safe asset issuer. Coppola et al (2023) provide a liquidity-based theory to explain the rise and fall of dominant currencies over time and rationalise the dollar-dominant global financial architecture. Eren and Malamud (2022) show that a "debt view" of the US dollar explains its dominant reserve currency status, as well as fluctuations in its investment shares, in recent decades.

Another key element of the dollar's prominence is its role as a financing currency in international capital markets. One strand of literature has examined the pricing aspects, including the convenience yield embedded in Treasury securities and other dollar-denominated assets (eg Krishnamurthy and Vissing-Jorgensen (2012); Faia et al (2022); Du et al (2018); Jiang et al (2018)). Liao (2020) examines the drivers of debt securities issuance and shows that hedging cost differentials across currencies play an important role.

A related strand studies the evolution of quantities of assets denominated in different currencies, with changes in the relative shares of different currencies interpreted as reflecting shifts in the dominance of those currencies. Among other theoretical contributions on the optimal portfolio choices of currencies, Jeanne (2000) examines foreign currency debt in a portfolio model that treats currency composition as endogenous. Campbell et al (2010) examine optimal risk-minimising currency strategies and document that the dollar, the euro and the Swiss franc should be attractive options for such strategies. Our paper builds on and contributes to this

literature by focusing on a class of assets – international debt securities – whose evolution supports this interpretation.

In this strand, most papers use the Morningstar database to examine the currency composition of portfolio holdings from the perspective of investors in debt securities. In addition to their finding of rising IDS dollarisation referred to earlier, Maggiori et al (2020) show that, while investors hold most of the foreign currency debt issued in their own currency, the US dollar is special in that investors hold this denomination irrespective of their nationality. Similarly, Maggiori et al (2024) document that investors prefer to hold securities in their own currency; however, US firms enjoy an exorbitant privilege as they can borrow in US dollars from international investors as well. Our work contributes to this strand of literature also by employing a far more comprehensive data set, in terms of both countries and periods covered, than those employed in the existing literature.

Maggiori et al (2019) argue that a dollarisation trend is present not just for debt securities but across a broad range of investment classes (bank claims, foreign exchange markets, Treasury markets). Lilley et al (2022) document the trend of dollarisation over the period 2007–12 even when accounting for the roles of exchange rates and risk factors. Florez-Orrego et al (2024) provide a review of the literature on the role of currency in investment choices, also documenting a longer-term trend of moving towards portfolio investments.

A line of papers uses the same Morningstar data set to examine the roles of tax havens and financial centres in the global map of international debt securities. Coppola et al (2021) examine securities issuance in tax havens to remap bilateral portfolio investments. The authors show that official statistics considerably understate developed world investments in emerging market economies (EMEs) as well as these EME firms' share in foreign currency debt, as many firms in these countries issue foreign currency debt via affiliates in tax havens. Clayton et al (2023) document Chinese firms' substantial reliance on such tax havens. Beck et al (2024) revisit currency trends in portfolio investments and the role of financial centres and tax havens, with a focus on Europe. Motivated by this strand, we also investigate in our paper the role of offshore financial centres.

Using other data sources (not based on Morningstar), Gerding and Hartley (2024) show that the share of the US dollar has not declined since Covid-19 across a range of investment types. Instead, the influence of the euro and the renminbi have declined. Ito and McCauley (2019) divide the world into currency zones based on the alignment of a country's currency with various reserve currencies and show that dollar-zone countries contribute over half of the world's economic output. The authors also document the rise of a well-defined and stable (albeit small compared with the dollar) euro zone and find a grouping of Asian currencies around the renminbi.

2. Data

In this section, we describe the BIS-compiled data set we use, compare its coverage and its advantages with those used in the prior literature and present a set of summary statistics.

2.1 Definition and structure

The IDS data set is compiled and maintained by the BIS, following the methodological principles as described by the BIS.[5] The IDS statistics are compiled from a security-by-security database built by the BIS using information from multiple commercial data providers (Dealogic, Euroclear, LSEG, Xtrakter Ltd) that track debt security issuance by all categories of issuers worldwide.

The coverage of the data set is comprehensive to our knowledge.[6] Available in the database are the name and identity of every issuer, whether they are private or official (including government issuers), as well as the characteristics of each issue, including the amounts of net issuance, maturity, currency denomination, the sector of the immediate borrower (issuer), the sector of the ultimate borrower (parent company of the borrower or guarantor), country of residence and nationality of the issuer, the type of instrument, interest rate structure and market of issue, governing law, listing place, and ISIN keys.[7] The data set allows us to examine both new issues and existing stocks of IDS. The evolution of stock measures is particularly useful to characterise long-term trends in currency composition and to compare these with the previous literature, which for the most part has been limited to analysing outstanding stocks.

A debt issue in the BIS database is considered to be international if it meets at least one of the following three criteria: the debt security is (i) governed by the laws of a country different from the issuer's domicile; (ii) listed on an exchange in a foreign country; and/or (iii) registered in a country different from the issuer's domicile. The majority of securities classified as IDS satisfy criterion (iii) – listing outside the issuer's country. By design, the BIS-compiled IDS data set excludes domestic debt securities. As a result, the share of foreign currency-denominated debt securities is lower when considering the full universe of all debt securities, including purely domestic bonds issued in the home currency.

In addition to the above three criteria, commercial data providers can also designate a debt security as international based on their professional judgment. The classification in these cases is based on these issues being underwritten by international underwriting syndicates and sold to international investors. Aldasoro et al (2021) provide examples of how the BIS classification works in practice. For instance, if an issuer resident in the United Kingdom issued a security governed by British law and listed on the London Stock Exchange *but* registered in the United States, then the security would constitute an IDS. The debt security would also be

[5] See Gruić and Wooldridge (2012) for details. Also, the *Handbook on securities statistics* provides some additional information about securities statistics in general.

[6] Dealogic, one of the commercial sources contributing to the BIS-compiled IDS, primarily focuses on corporate bonds, with more limited coverage of private placements and government bonds. The BIS IDS captures little of the government bond universe, since most government bonds are issued by domestic debt offices.

[7] Given the granularity of the information in the database and on account of contractual restrictions from commercial data providers, only authorised BIS staff members have access to the full database containing the security-by-security information. BIS-affiliated users have access to some of the aggregates that the BIS calculates. A narrower selection of these aggregates is publicly available at the BIS Data Portal.

considered as international if the UK resident issued it under New York law or listed it on the New York Stock Exchange. Table 1, which draws on Aldasoro et al (2021), lists different combinations of characteristics and their impact on a security's classification as domestic or international.[8]

Classification criteria for international debt securities — Table 1

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IDS criteria								
Immediate issuer residence	GB	**GB**	**GB**	**GB**	US	BR	**BR**	**BR**
Securities registration	GB	**US**	GB	GB	US	BR	US	**US**
Governing law	GB	GB	**US**	GB	US	BR	**US**	BR
Listing location	GB	GB	GB	**US**	US	BR	US	BR
Parent nationality	GB	GB	GB	GB	**BR**	BR	**US**	BR
Currency of issue	GBP	GBP	GBP	GBP	USD	**USD**	USD	**USD**
Classification	**DDS**	**IDS**	**IDS**	**IDS**	**DDS**	**DDS**	**IDS**	**IDS**

Notes: This table shows the criteria used by the BIS to classify a security as a domestic debt security (DDS) or international debt security (IDS). Two-letter acronyms refer to ISO country codes (GB is United Kingdom and BR is Brazil). The currencies are represented by GBP for the pound sterling and USD for the US dollar. Entries in red indicate characteristics that underpin an IDS classification; entries in blue indicate characteristics that do not lead to an IDS classification on their own.

Source: Aldasoro et al (2021).

The IDS statistics encompass debt instruments designed to be traded in financial markets, such as government and corporate bonds, commercial paper, negotiable certificates of deposit, debentures and asset-backed securities. They include instruments traditionally referred to by market participants as foreign bonds and Eurobonds but exclude negotiable loans. Foreign bonds are issued by non-residents under the registration rules of the local market – for example, US dollar bonds issued in the US market by borrowers residing outside of the United States. Eurobonds, also known as offshore bonds, are issued outside the local market of the currency in which it is denominated – for example, US dollar bonds issued in Europe. Of note, based on the classification criteria, a bond issued through an "offshore" affiliate – an entity based outside the issuer's home country – may not be classified as IDS (Aldasoro et al (2021); examples 5 and 6 in Table 1). However, such cases are limited, as the vast majority falls under examples 7 and 8.

The IDS statistics also include information on the issuer's nationality and residence. The residence of the issuer is the country where the issuer is incorporated, whereas the nationality of the issuer is the country where the issuer's parent company

[8] The BIS also compiles total debt securities and domestic debt securities alongside international debt securities. These data sets differ in scope and methodology (Chan et al (2025)).

is headquartered. For instance, if a Brazilian subsidiary of a Chinese parent company were to issue a debt security in international markets, that security would be recorded as originating from Brazil on a residence basis and from China on a nationality basis. For our baseline analysis, we use the residency of issuers. This is consistent, for instance, with the treatment of debt flows in balance of payments data. For other purposes, the nationality of issuers may be more relevant – in such cases, we examine both residence- and nationality-based classifications of issuers. This BIS-compiled data set also allows us to delineate issuers according to their immediate business activity (ie type of business activity that the issuer engages in within the country of residence of the issuer) and ultimate business activity (ie the type of business activity of the parent company).

The data set covers issuers from both the private and public sectors. Among private sector issuers, the data cover financial corporations (banks and NBFIs) and non-financial corporations. The covered public sector entities include general governments and central banks (official monetary authorities). The "all sectors" category also incorporates international organisations (lumped into one category irrespective of their country of residence), which account for approximately 10% of the overall IDS outstanding in 2024.

2.2 Comparison with other data sources

This BIS-compiled IDS data set is uniquely well suited for examining the currency denomination of IDS, relative to alternatives such as the International Monetary Fund's Coordinated Portfolio Investment Survey (CPIS) and Morningstar.[9]

The CPIS (renamed as Portfolio Investment Positions or PIP) contains data on cross-border holdings of debt securities as well as equities, as reported by national authorities to the International Monetary Fund. However, it does not include information on currency breakdowns, as currency denominations are not available for bilateral data and are not disclosed even at the aggregate level by a number of reporting countries (such as Australia, China, Ireland, Luxembourg, Norway, Singapore and the United Kingdom). The CPIS does not include securities-level data. Furthermore, the CPIS does not contain a clear distinction between domestic and international debt securities that is consistent with the definitions we have discussed above. For example, US domestic securities (such as Treasury bills) held by residents of China and Japan are included in the CPIS, but these are not part of IDS since they do not satisfy any of the relevant criteria. Thus, the CPIS would overstate IDS since in principle it includes holdings of foreign exchange reserves, which are almost entirely government securities.

[9] Another highly relevant data set, the US Treasury International Capital (TIC) data, tracks all securities-based foreign portfolio investments by US residents, providing data that the Bureau of Economic Analysis utilises in computing US external accounts. Bertaut et al (2019) provide a comprehensive analysis comparing US TIC data classified by residency versus nationality, examining the implications of these different classification methods for understanding investment home bias patterns and evaluating the sustainability of the US current account deficit. Maggiori et al (2020) demonstrate that the country and currency shares of US outward positions in their data broadly match with the TIC data.

The Morningstar database, which has been used in some influential recent papers including Maggiori et al (2020), is highly granular, with information on individual security holdings of institutional investors. This database has excellent coverage of institutional investors in advanced economies, but the coverage becomes less comprehensive in EMEs, which have become increasingly important in the global financial system in recent years. The BIS-compiled data set is more comprehensive than Morningstar because it is constructed from the perspective of issuers rather than holders of securities. This means, for instance, that the Morningstar data set does not include securities directly held by large foreign entities investing in US securities, such as government institutions in China and Japan or large European insurance companies. Moreover, the data set has broader geographic (country) and time coverage – features that are crucial for uncovering our key results.

A major advantage of the BIS-compiled IDS data compared with both the CPIS and the Morningstar data sets is that we can track new issuances rather than just outstanding stocks. This allows us to analyse yearly changes and correct for exchange rate valuation effects.

Table 2 compares the three databases' coverage across key countries in the Morningstar database in 2017 (as used by Maggiori et al (2020)). This comparison is not straightforward, as the data in Morningstar are collected from institutional investors and the domiciles of those investors are used by various authors to report summary features of the data set. As already noted, Morningstar's coverage is most comprehensive for advanced economies, which also have more institutional investors

Comparison of country coverage in various data sets, 2017

Amounts outstanding, in USD billion — Table 2

	Country name	Code	MNS (AUMs)[1]	MNS (%)[1]	IDS	IDS (%)	CPIS	CPIS (%)
1	United States	USA	**21,077**	**65.2**	**2,409**	**14.5**	**8,330**	**35.6**
2	European Union	EMU	7,004	21.7	8,622	52.0	9,915	42.4
3	Canada	CAN	1,437	4.4	869	5.2	1,034	4.4
4	United Kingdom	GBR	1,408	4.4	3,116	18.8	2,235	9.6
5	Switzerland	CHE	431	1.3	74	0.4	152	0.7
6	Sweden	SWE	355	1.1	492	3.0	473	2.0
7	Australia	AUS	313	1.0	605	3.6	720	3.1
8	Norway	NOR	133	0.4	243	1.5	241	1.0
9	Denmark	DNK	127	0.4	130	0.8	227	1.0
10	New Zealand	NZL	43	0.1	20	0.1	49	0.2
	Total		**32,328**	100.0	**16,581**	100.0	**23,376**	100.0
	World		NA		**23,436**		**30,255**	

[1] Maggiori et al (2020).

Notes: This table compares the country coverage of the outstanding amounts in the BIS-compiled IDS data set with that of the Morningstar database used by Maggiori et al (2020) and the IMF's Coordinated Portfolio Investment Survey (CPIS). We show this comparison for 2017, as that is the last year of the sample used by Maggiori et al. The assets under management (AUMs) figures reported for the MNS data include various types of funds (equity, fixed income, allocation and money markets). The EMU (as defined in the MNS data set) comprises Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, Netherlands, Portugal, Slovenia and Spain. The CPIS provides data on cross-border holdings of debt securities, although not all of these are international according to any of the criteria noted in Table 1. For example, holdings of US Treasury securities by China or Japan are included in the CPIS, but these do not constitute IDS.

Sources: Maggiori et al (2020); International Monetary Fund; Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

with cross-border holdings. Indeed, the United States dominates the Morningstar data set, representing 65% of securities. However, focusing on the domicile of *issuers* – a more relevant dimension for the questions we attempt to address – the BIS-compiled IDS data set has much broader coverage. In fact, US domiciled issuers make up only 15% of the IDS data set, compared with nearly two thirds of the Morningstar data. Conversely, issues by European Union-domiciled borrowers make up around half (52%) of the IDS data and a significant portion of the CPIS data (42%), but only about one fifth of the Morningstar data.

The broader coverage of the IDS data set is clear when looking at non-US and non-euro area issuances as well. Indeed, the other eight countries that Maggiori et al (2020)examine (including the United Kingdom, Canada, Switzerland and Australia) collectively represent just 13% of the Morningstar data set; however, key countries in this group, such as the United Kingdom, see non-trivial coverage in the IDS data set (19% compared with less than 10% in the CPIS). In summary, the data set we use covers IDS issued by borrowers domiciled in a much broader set of countries.

2.3 Benchmark sample

Using the IDS data set to characterise patterns in the choice of currency denomination raises some conceptual questions, in addition to those already discussed (such as the nationality versus residence of an issuer). In setting up the sample for our benchmark analysis, we make two material decisions. First, we focus on the 2000–24 period. Second, we exclude intra-euro area euro-denominated IDS (securities issued within the euro area by issuers of euro area nationality).

We start our benchmark sample in 2000, the year following the creation of the euro, to ensure continuity in our analysis of currency denomination. The creation of the euro in 1999 constitutes a break in data series, because it is difficult to accurately gauge the euro's importance relative to the collective importance of its predecessor currencies. By starting the sample in 2000, we avoid the potentially confounding effects of this data break. In extensions to our baseline analysis, we consider a longer time series going back to 1966 and show that our focus on the past 25 years does not affect our main dollarisation wave results.

We also exclude intra-euro area euro-denominated claims from our benchmark sample. We do so because it would be natural for issuers from within the euro zone to denominate their debt securities in euros even if issued in any other national jurisdiction within the zone. Such securities are considered international and constitute part of BIS IDS data according to the definition discussed above. However, including intra-euro area IDS issuance in euros could artificially inflate the share of euro-denominated issuances, as these securities would in effect be in the home currency of the issuer, even if technically they are counted as "international". Hence, in our baseline analysis, we remove euro-denominated IDS issued in any country in the euro zone by borrowers based in any other country within the zone (for example, German borrowers residing in Spain issuing euro-denominated bonds). This approach is similar to earlier analyses (McGuire et al (2024); ECB (2025)). It is worth emphasising that we do not remove intra-euro area issuance denominated in currencies other than the euro. To ensure robustness, in our extended analysis, we include intra-euro area euro-denominated IDS (Graph 6; Tables A4 and A5). As we show later, this choice does not affect our key conclusions.

2.4 Summary statistics

Table 3A presents summary statistics for our benchmark sample of outstanding stocks of IDS for selected quarters (the data frequency used in our analysis). The table shows that the IDS market has expanded markedly from 2000 to 2024 across multiple dimensions. Geographic coverage has broadened considerably, with the number of countries represented increasing from 97 to 136 on a residence basis (and from 100 to 134 on a nationality basis).

The market's scale has grown dramatically, with the number of issuers rising from 6,468 to 16,814. Similarly, the number of individual securities has had an over fourfold increase. Notably, the total outstanding value of IDS has expanded from under $5 trillion to nearly $24 trillion, representing a fivefold increase over the past 25 years. These figures show how important the IDS market has become in global finance, both as a financing mechanism and as a component of cross-border capital flows. The mean value of individual issues has fluctuated over our sample period, starting at $186 million in 2000 and then hitting $301 million in 2016 before settling at $254 million by 2024. Meanwhile, the median value has declined from $97 million to $75 million, suggesting an increasing number of smaller issues alongside very large ones. Maximum issue size has nearly doubled, to $20.8 billion compared with $10.7 billion in 2000. The number of issuers and individual securities, as well as the values of the total stocks, have increased for outstanding IDS denominated in both dollars and euros. It is clear, though, that in all of these dimensions, dollar-denominated IDS are far above those denominated in euros. It is also worth noting that these two currencies have come to dominate the IDS market. In 2000, the dollar and the euro together accounted for 44% of the number of securities and 56% of the value of the stock of IDS. By 2024, these two currencies accounted for 61% of the volume and 82% of the value of the stock of IDS.

The bottom panel of Table 3.A shows that the maximum size of outstanding IDS is roughly the same, at around $20 billion for both dollar- and euro-denominated debt securities, with the median values of IDS denominated in both currencies falling markedly from 2016 to 2024. The mean value of outstanding IDS in euros is higher than the mean of those denominated in dollars, while the opposite is true of the respective medians. This implies that there are a number of large-value euro-denominated IDS.

The BIS-compiled data set can track new issuances rather than just outstanding stocks. This is particularly useful in capturing shifts in currency denomination that might become apparent in stock data only with a substantial lag. Data on issuances are also more helpful for understanding the influence of macro-financial developments, such as changes in funding costs in different currencies, on issuers' choice of currency denomination. These effects will naturally look muted in stock data. Our ability to analyse stock and gross issuance data separately is valuable in capturing both long-term swings in currency preferences of issuers as well as changes at the margin, thus providing a more comprehensive picture than the existing literature.

Summary statistics for outstanding international debt securities

Table 3A

	Q1 2000	Q1 2008	Q1 2016	Q4 2024
Number of countries (residence)	97	113	130	136
Number of countries (nationality)	100	111	131	134
Number of issuers	6,468	9,956	11,814	16,814
Number of individual securities	22,541	51,685	52,943	89,420
Total outstanding ($ billion)	4,429	13,628	16,476	23,811
Summary statistics by currency				
USD: Number of issuers	2,110	5,390	9,062	13,568
Number of securities	8,331	19,059	26,600	51,185
Total outstanding ($ billion)	2,177	5,698	9,304	14,197
EUR: Number of issuers	617	2,678	2,316	3,223
Number of securities	1,526	13,759	9,114	17,296
Total outstanding ($ billion)	309	3,841	3,447	5,435
Value of each issue (USD million)				
Mean	186	249	301	254
Median	97	88	107	75
Max	10,716	20,310	20,310	20,778
Value of each issue by currency (USD million)				
USD : Mean	253	283	341	265
Median	125	100	125	77
Max	10,716	20,310	20,310	20,310
EUR : Mean	190	269	370	304
Median	89	79	114	57
Max	4,299	9,573	9,108	20,778

Notes: This table presents summary statistics for our main analysis sample, which excludes euro-denominated securities by euro area nationality issuers within the euro area. The columns provide snapshots at eight-year intervals, starting with the first quarter in our sample (Q1 2000) and ending with the last quarter (Q4 2024). The count of issuers and individual securities as well as mean, median and maximum exclude securities that have a face value of less than $25 million (securities below this threshold value account for about 2 to 6% of the "Total outstanding" amounts shown in this table). We exclude these low-value securities which, in most cases, represent small residual amounts that are carried through for extended periods in the original data set but have little material value or consequence. Face values of securities issued in currencies other than the US dollar are converted to US dollar equivalents using end-of-period (quarterly) market exchange rates.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Table 3B presents summary statistics for gross issuances or new issuances for selected years.[10] We show annual rather than quarterly data in this table since gross issuances fluctuate from quarter to quarter (unlike outstanding stocks, which are relatively stable). Issuing countries are fewer than those represented in the stock data,

[10] In contrast, net issuance is defined as gross issuance minus redemptions.

Summary statistics for gross issuances of international debt securities Table 3B

	2000	2008	2016	2024
Number of countries (residence)	78	73	99	106
Number of countries (nationality)	76	77	96	104
Number of issuers	2,409	2,163	2,832	4,570
Number of individual securities	24,212	41,368	31,412	50,938
Total gross issuances ($ billion)	2,017	5,472	4,651	6,520
Summary statistics by currency				
USD: Number of issuers	1,399	1,257	1,892	3,075
Number of securities	9,994	15,096	14,883	25,903
Total gross issuance ($ billion)	1,044	1,929	2,796	3,518
EUR: Number of issuers	727	723	694	971
Number of securities	4,636	11,554	6,320	10,717
Total gross issuance ($ billion)	380	1,581	892	1,583
Values of new issuances ($ million)				
Mean	79	129	145	121
Median	30	45	50	41
Max	18,317	26,604	6,521	20,123
Values of new issuances by currency ($ million)				
USD : Mean	100	123	184	127
Median	35	40	50	40
Max	18,317	16,602	6,500	20,123
EUR : Mean	79	135	140	145
Median	35	52	45	43
Max	4,521	7,051	5,646	16,984
Maturity structure of new issuances (in years)				
Mean	8.4	8.5	10.3	13.2
Median	5.0	5.0	6.1	10.0
USD: Mean	7.0	9.2	11.6	14.8
Median	5.0	5.1	8.0	11.0
EUR: Mean	6.9	8.2	10.8	11.0
Median	5.0	5.0	8.3	10.3

Notes: This table presents summary statistics for the gross issuances data sample, which excludes euro-denominated securities by euro area nationality issuers within euro area. The count of issuers and individual securities as well as mean, median and maximum values exclude incremental additions of zero-coupon securities and those with face values below $10 million (securities below this low threshold value account for less than 5% of the "Total gross issuances" shown in this table). Face values of securities issued in currencies other than the US dollar are converted to US dollar equivalents using period average (quarterly) market exchange rates. Mean and median maturity statistics relate to bonds and medium-term notes. Securities with maturities exceeding 99 years are treated as having a maturity of 99 years.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

but this is mainly because some countries' issuers may not have new issuances in every year. The number of issuers dipped in 2008 relative to 2000, but overall, even in the year of the GFC, there was a substantial increase in the number of individual securities and the value of gross issuances. An analysis of quarterly issuance data (not shown here) shows that this was mainly because of strong issuance in the first half of

that year, with all of these numbers falling sharply in the fourth quarter. By 2024, the numbers of issuers and individual securities were about double their 2000 levels, while the value of gross annual issuances had more than tripled.

The second panel of Table 3B shows that the number of securities issued and the value of total gross issuances rose sharply from 2000 to 2008 for euro-denominated IDS, while the corresponding increases (in percentage terms) were less impressive for dollar-denominated IDS. Neither of the two numbers budged for euro-denominated IDS from 2008 to 2024, while they rose substantially for dollar-denominated IDS.

The next two panels of Table 3B show the mean, median and maximum values of new issuances, for dollar- or euro-denominated IDS. Mean issuance size has increased, especially for euro-denominated IDS. The bottom panel of this table shows that the average maturities of both dollar- and euro-denominated IDS have lengthened over our sample period. The mean and median maturities of dollar-denominated IDS more than doubled from seven and five years, respectively, in 2000 to 14.8 and 11 years, respectively, in 2024. The average maturities of euro-denominated securities were shorter in 2024, although the mean differences in maturities between IDS denominated in the two currencies were much greater than the differences in median maturities. These patterns could reflect funding costs at different points of the yield curve. Graph A.1 in the Appendix, which shows median maturities in the aggregate and broken down by currency for each period, confirms the observation that IDS maturities have generally been rising, although not in a monotonic way.

Since our focus in this paper is on the evolution of the currency composition of IDS, we leave for future work a more detailed examination of the size, maturity structure and other characteristics of individual issues, as well as an analysis of the factors that could be driving the evolution of each of these characteristics.

3. Main findings

In this section, we first present our main results on the evolution of the currency composition of IDS and then discuss some extensions to those results.

3.1 Benchmark: dollar waves over the 2000–24 period

We begin with an exploration of the shares of the dominant reserve currencies in the denomination of outstanding IDS stocks. The US dollar and the euro account for a majority of IDS, although their relative prominence has fluctuated significantly over the last quarter century.

The dollar's share has a distinct wave-like pattern over the period 2000–24 (Graph 1). The dollar's share of the outstanding stock of IDS (solid red line) declined from around 60% in the early 2000s to less than 45% during the GFC in 2008–09 (shown in grey shade). This trough proved short-lived, however. The resurgence of the dollar's share commenced after the GFC, and by 2016 it had climbed back to 60% of the stock of IDS. The dollar's share then stabilised at this high level. In short, with a long wave

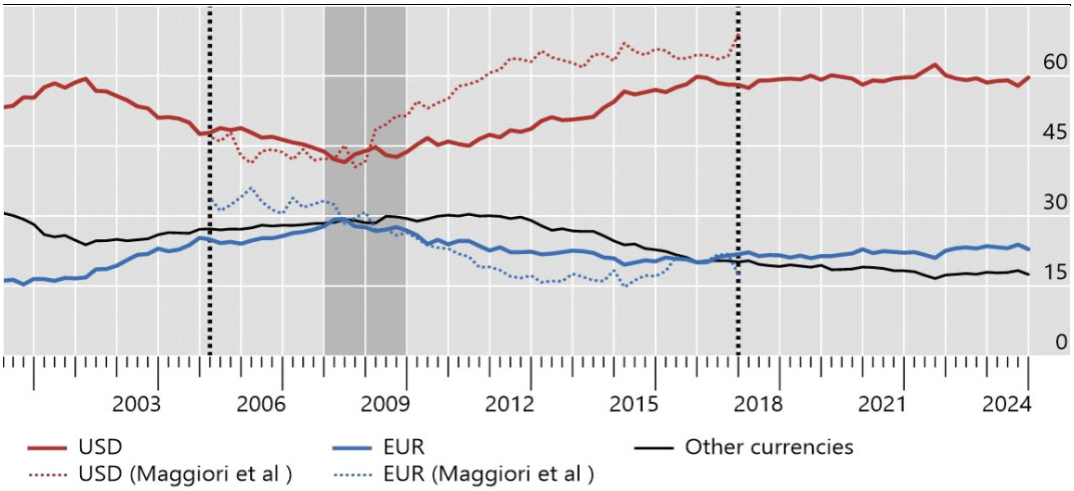
that had a trough around the GFC, the dollar's share in outstanding IDS has ended our sample roughly where it started.

We observe the opposite of the dollar wave for the euro (solid blue line): the share of the euro increased rapidly, from 16% in 2000 to around 30% in 2008–09. There was a clear "euro moment" in the first few years after the euro's creation. Thereafter, the euro's share declined steadily to around 22–23% in 2012–13 during the euro area sovereign debt crisis and subsequently stabilised at around that level. While the euro moment has passed, the euro remains highly relevant in IDS; the euro's share is about 8 percentage points higher than what it was in the early 2000s.

Our findings are consistent with the conclusions that Maggiori et al (2020)drew based on the dollar and euro shares in their sample (as shown by the dotted red and blue lines, respectively, in Graph 1). Maggiori et al's analysis focused on the 2005–17 period (shown by the vertical droplines). During these years, the shares shown by Maggiori et al are similar to those we see in the data set. Focusing on this segment of a dollarisation wave might indeed be seen as evidence of a dollarisation trend. Our ability to analyse a longer sample allows us to characterise the full dollarisation wave.

Outstanding stocks of IDS by currency of denomination, 2000–24

Shares in per cent of total in all currencies — Graph 1



Notes: This graph shows the shares of outstanding stocks of IDS denominated in different currencies. IDS issued within the euro area by euro area nationality issuers are excluded from the calculations. The dotted lines show the shares of the dollar and the euro in the Maggiori et al (2020) data set (the period of coverage of that data set is marked by dotted vertical lines). The black line is the composite share of all other currencies in which IDS are denominated.

Sources: Maggiori et al (2020) (the authors provided the data); Dealogic; Euroclear, LSEG. Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

One striking observation is that, for all the discussion of de-dollarisation and the ascendance of other currencies in global finance, the share of the dollar ends the first quarter of the 21st century slightly ahead of where it started. A second striking observation is that despite recurrent discussions related to the euro's demise, its share has also increased over this period.

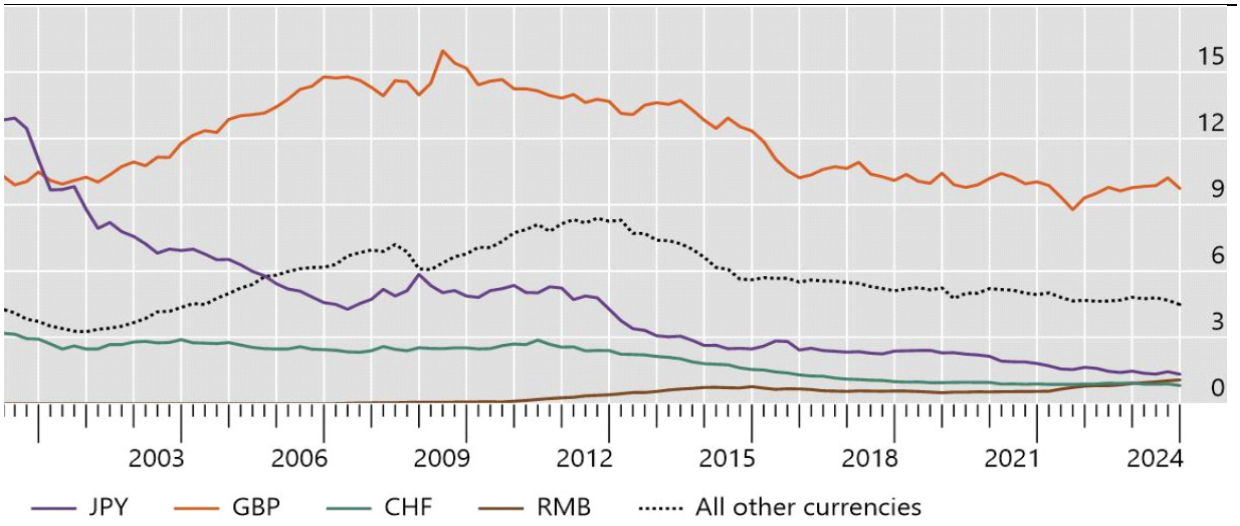
In summary, the BIS-compiled data do not support assertions of a long-term rise or decline of either the dollar or the euro in this crucial area of global finance. At the same time, it is clear that prospects of the euro rivalling the dollar have faded since

the GFC and after the euro zone debt crisis that soon followed. Interestingly, the pattern of a surge from 2000–09 followed by a decline in the euro's importance in IDS is very similar to the pattern observed in the euro's share of global foreign exchange reserves (ECB (2025)).

Next, we examine the shares of the other (non-dollar and non-euro) reserve currencies, whose aggregate share in total IDS is shown by the black line in Graph 1. This combined share remained stable up until 2012–13 and declined thereafter as the dollar's share kept growing. In Graph 2, we decompose the black line from Graph 1 and show the evolution of the four other (non-dollar and non-euro) major reserve currencies, with the remainder grouped into "all other currencies". In 2000, both the Japanese yen (purple line) and the British pound sterling (orange line) featured prominently in IDS denomination, each accounting for about 10% of the total IDS stock. The Swiss franc's share (green line) was 3%, and the Chinese renminbi had no presence in the early years of our sample.

Outstanding stocks of IDS by currency of denomination (other than the dollar and the euro), 2000–24

Shares in per cent of total in all currencies — Graph 2



Notes: This graph shows the shares of outstanding stocks of IDS denominated in Japanese yen (JPY), British pound sterling (GBP), Swiss franc (CHF), Chinese renminbi (RMB) and all other currencies. Euro-denominated IDS issued within the euro area by euro area nationality issuers are excluded from the calculations.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Over the course of our sample, the yen's share fell markedly, to barely 2% by 2024. The share of the Swiss franc declined as well, to just around 1%. The roles of both of these currencies, which are still considered among the major safe-haven currencies, have greatly diminished in IDS markets. The pound sterling had its own wave, similar in trajectory to that of the euro and peaking around the GFC, with its share falling back to 9% by 2024. The Chinese renminbi (brown line) appeared to gain some momentum, rising from its near-zero levels in 2000. By 2024, its share, while still modest, surpassed that of the Swiss franc and rivalled that of the Japanese yen. The data reveal that this rise was driven primarily by the IDS issuance patterns of

Chinese banks (not shown); we leave a more careful exploration of this feature for future work.

3.2 A longer-term perspective: dollar waves over the 1966–2024 period

One immediate question is whether the dollar wave is unique to the period 2000–24. To address this question, we examine whether such dollar waves were also present in earlier periods in the postwar era. While our main analysis focuses on the 2000–24 period due to the data break arising from the introduction of the euro, in this exercise we extend our sample back to the mid-1960s, more than doubling the time span.

Two additional dollar waves appear in the extended time sample (Graph 3). In the late 1960s, nearly the entire stock of outstanding IDS was denominated in dollars. The dollar's share (red line) then fell to about 50% following the breakdown of the Bretton Woods system. The dollar's share of IDS exhibits two additional waves that are similar to the one we observe in our main sample (2000–24). Specifically, the dollar's share increased in both the 1980–84 and 1994–2000 periods – then declined after both of these crests. Strikingly, the dollar's share of IDS today is not much different from its share observed in the mid-1970s. Since the euro did not exist before 1999, we cannot analyse its share over the full sample, although we note that preliminary analysis (not shown here) suggests that the Deutsche mark, British pound sterling and Japanese yen were on the other side of these dollar waves at different points in the historical sample.[11]

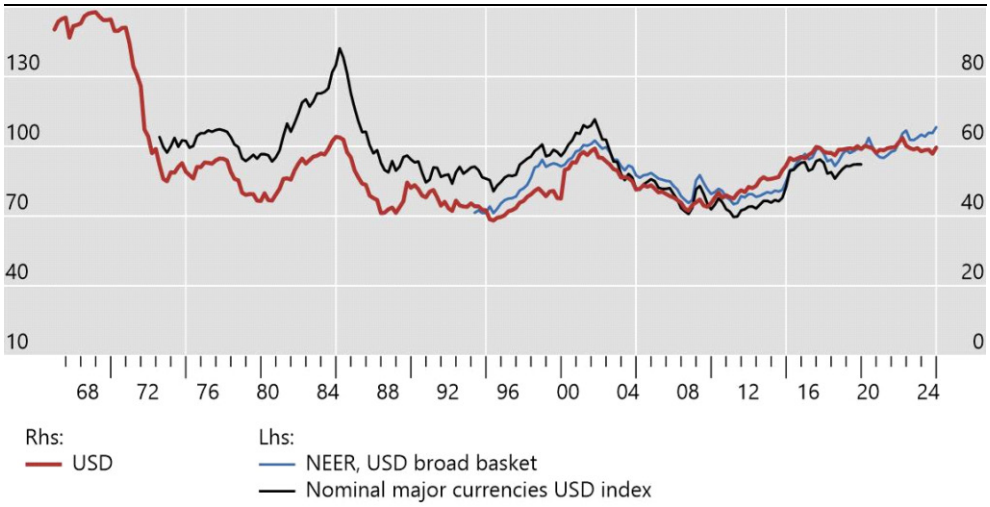
A couple of caveats are in order. Before 2000, IDS volumes were relatively small and data collection was less comprehensive. Moreover, the Bretton Woods system of fixed exchange rates among the major currencies in the 1960s and the breakdown of this system in the early 1970s may have distorted currency issuance patterns. These caveats also strengthen the case to focus the main analysis on the 2000–24 period.

[11] The BIS-compiled IDS includes pre-2000 proxies for euro aggregates that are calculated using the contribution of all the legacy currencies.

A historical perspective on outstanding stocks of dollar-denominated IDS,1966–2024

In per cent of total in all currencies

Graph 3



Notes: This graph shows the US dollar share of IDS stocks over a longer time span than in our baseline sample. Over the period 2000–24, the calculations exclude IDS issued within the euro area by euro area nationality issuers. The blue line is the dollar's nominal effective exchange rate (NEER) based on geometric trade-weighted averages of bilateral exchange rates of the US dollar against the currencies of 64 economies (quarterly averages of monthly data). The black line is a trade-weighted average of the dollar's value relative to a set of major currencies: those of the euro area, Canada, Japan, United Kingdom, Switzerland, Australia and Sweden (this series has been discontinued by the BIS).

Sources: Board of Governors of the Federal Reserve System; Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS effective exchange rates; BIS international debt securities statistics; authors' calculations.

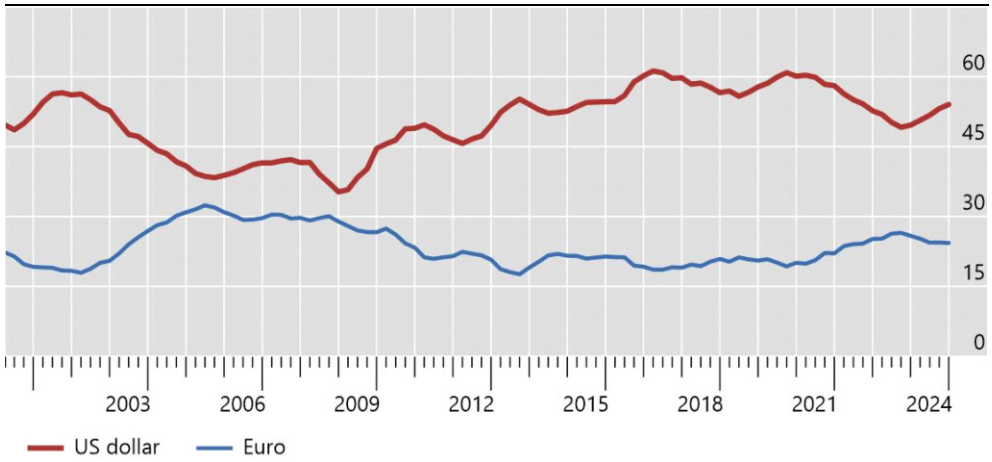
3.3 Dollar waves in new issuance

So far, we have focused mainly on currency shares in outstanding IDS stocks. The prior literature focused exclusively on stock data, due to data constraints the authors faced. By contrast, as discussed above, our rich data set enables us to examine new issuances as well. New issuances can shed light on changes at the margin, adding new perspectives beyond the analysis of stock data.

The patterns of new issuances further confirm our main findings of a dollar wave as well as a euro moment following the introduction of the new currency (Graph 4). The issuance data add some important texture to our baseline results. For instance, the euro's share in new issuances peaks in 2005, earlier than in the stock data. This suggests that the euro moment was even more short-lived than indicated by the stock data. Meanwhile, the dollar's share, which looks stable since 2016 in the stock data, in fact exhibits an additional small wave in the new issuance data in the last five years of the sample.

Gross issuance of international debt securities by currency

Four-quarter moving average, in per cent of total in all currencies — Graph 4



Notes: This graph shows the shares of gross issuances of IDS denominated in dollars (red line) and euros (blue line). Euro-denominated IDS issued within the euro area by euro area nationality issuers are excluded from the calculations. Since the issuance data tend to be volatile from quarter to quarter, this graph plots trailing four-quarter moving averages of the respective shares.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

In our subsequent analysis, we discuss both stock and issuance data where relevant. To avoid an excessive proliferation of results, we include graphs showing some of these results in the Appendix.

3.4 Evolution of dollar and euro shares by issuer country

We turn next to trends in currency shares over time at the level of individual countries, focusing on the US dollar and the euro. To facilitate visual inspection and interpretation, we build a set of heat maps in which larger shares of a currency are shown in darker colours (and smaller shares in lighter shades of the same colour), using shades of green for the dollar and shades of red for the euro. Tables 4 and 5 show end-of-period (final quarter) shares in country-level IDS stocks for the dollar and euro, respectively, for selected years in our main sample.

Currency composition of outstanding IDS stocks by country: shares of US dollar-denominated IDS

In per cent

Table 4

REGION	COUNTRY	2000	2004	2008	2012	2016	2020	2024
ADVANCED ECONOMIES (NON-EU)	Australia	58.4	44.3	43.3	49.3	53.1	52.3	56.4
	Canada	65.5	53.9	47.2	61.5	69.8	67.4	62.4
	Japan	44.0	19.8	17.8	43.1	72.4	72.8	75.6
	United Kingdom	32.3	23.0	21.9	26.1	33.4	31.3	33.3
	United States	74.4	71.7	60.4	65.9	70.8	59.6	64.9
EUROPE	Denmark	37.3	15.7	14.0	19.2	20.3	24.0	20.7
	Finland	41.1	43.1	33.9	30.1	51.3	44.0	52.4
	France	55.0	47.3	46.2	54.6	65.6	61.6	72.2
	Germany	52.2	43.7	50.4	51.7	67.6	60.6	56.7
	Ireland	51.1	28.3	26.8	26.4	35.7	29.4	26.6
	Italy	56.4	58.5	48.3	54.4	54.5	67.8	58.8
	Luxembourg	65.5	55.1	55.3	60.0	62.6	44.4	47.5
	Netherlands	52.9	41.3	44.3	47.2	59.8	55.0	53.0
	Norway	54.1	32.6	21.0	31.8	37.1	31.4	35.1
	Poland	85.4	23.7	10.4	22.1	24.9	18.0	32.1
	Spain	54.7	68.4	54.7	56.5	74.0	69.4	69.5
	Sweden	33.0	19.3	21.1	21.9	37.2	25.7	23.3
	Switzerland	18.2	26.1	26.8	24.2	43.8	66.5	78.7
EMERGING MARKET ECONOMIES	Brazil	84.7	81.7	80.7	87.2	89.9	93.5	98.5
	Chile	97.6	97.3	99.0	92.6	84.2	80.9	80.2
	China	74.6	70.2	63.9	33.7	69.1	77.7	64.0
	Hong Kong SAR	70.6	59.1	62.0	67.0	77.0	79.4	70.8
	Indonesia	99.4	96.6	100.0	95.7	84.4	82.0	88.4
	Korea	78.2	82.3	69.6	70.5	78.3	75.4	76.7
	Mexico	80.0	81.4	81.1	76.8	72.8	76.2	84.0
	Saudi Arabia	0.0	0.0	81.2	57.8	89.5	94.1	92.7
	Singapore	82.6	67.4	66.3	67.5	73.6	71.6	75.2
	Türkiye	40.0	62.6	73.6	83.7	86.4	87.5	90.7
	United Arab Emirates	100.0	100.0	67.9	77.9	85.7	87.7	89.6
	AVERAGE	**59.8**	**52.4**	**51.8**	**53.5**	**63.0**	**61.8**	**63.4**

Notes: This table shows, for selected years, shares of the outstanding stock of US dollar-denominated IDS by issuers (on a residence basis) from selected countries. The shares (as a percentage of total IDS) are calculated excluding euro-denominated securities issued within the euro area by euro area nationality issuers. For each country, end-of-year data are shown. The averages shown in the last row are unweighted cross-country averages for the countries shown in this table (which collectively account for the vast majority of outstanding IDS). Saudi Arabia started issuing IDS in 2004, with the first issuance of riyal-denominated IDS in Q4 2004 and IDS denominated in other currencies starting in 2006.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

The use of the US dollar seems to be concentrated in advanced economies outside Europe and emerging market economies (Table 4). The share of the dollar in IDS tends to be high in most non-European advanced economies (top of table), often reaching over 50%. In these economies, the shares of the dollar are roughly similar at the beginning and end of our sample. There are two striking exceptions, though. First, issuers in the United States tend to heavily favour the dollar, but the share of the dollar in their IDS stocks fell by about 10 percentage points (to 65%) over our sample. Second, issuers in Japan, by contrast, increased the share of the dollar in outstanding IDS from 44% to 76% by the end of the sample.

Among European countries, the share of the US dollar in IDS tends to be lower, below 50% (middle of table). Looking over time, consistent with the euro moment that we see in the aggregate data, in European countries the dollar's share fell

substantially by 2008. Then, we see an increasing share of the US dollar throughout the 2010s, reaching nearly 50% by 2024. Emerging market IDS issuers tend to overwhelmingly favour the US dollar (bottom of table). Even for issuers in China, the dollar accounted for two thirds of IDS stocks in 2024.

On average across the countries included in Table 4, the share of the dollar decreased somewhat by 2012, then rose back up, registering a modest increase from 2000 to 2024. Table 5 shows that, in general, the dynamics of the euro's share are the flipside of the dollar's share, suggesting a trade-off between the two currencies. The share of the euro in the emerging market economies remains low at around 10% (bottom of table). Similarly, the share of the euro outside of European advanced economies is small – but rose from around 10% in 2000 to around 20% by 2024. As expected, the euro's share in IDS in the European countries rose considerably over time (from around one sixth), but even in 2024 it remains relatively low (at around one third). However, we see exceptions in this group. The shares of the euro in Spain and France remain very low in IDS, below 5%, which is related to the fact that these figures exclude issuers of euro area nationality. By contrast, in other countries, such as Denmark and Poland, the share of the euro rose quickly in the early 2000s and remains around two thirds today. Emerging market economies (bottom of table) typically have lower shares of euro-denominated instruments in their IDS stocks relative to advanced economies.

We also analyse country-level patterns of gross issuance of IDS. The results are in the Appendix, Tables A.2 (dollar) and A.3 (euro). We describe some of those results here only briefly. The issuance data help us understand (at least on a mechanical level) some of the swings in the currency denomination of the IDS stock data. For instance, the share of the dollar in IDS issuances by issuers in Japan fell sharply in 2004 and 2008, before rebounding and exceeding previous levels after 2012. As a result, the stock data show a decline in the country's dollar-denominated IDS stocks in 2004 and 2008, followed by a more gradual rebound that exceeds prior levels by 2016. Chinese resident issuers' reliance on the dollar falls sharply towards the end of the sample – from over 70% in 2016 and 2020 to 42% in 2024. Their reliance on the euro also fell, from just over 10% in 2016 and 2020 to 1% in 2024. These phenomena are clearly worthy of further investigation in future work.

The heat maps using data on IDS stocks suggest that the shares of the dollar and the euro in IDS stocks are more stable across issuing countries than over time. This visual impression is supported by a simple variance decomposition exercise. Specifically, we regressed IDS dollar and euro shares in outstanding volumes on country, year-quarter and sector fixed effects. For dollar shares, we find that country fixed effects explain 67% of the variation. In other words, two thirds of the variation can be attributed to time-invariant differences (propensities) across countries. Adding time and sector fixed effects to the model raises the R-squared only marginally, to 69%. Similarly, for euro shares we find that country fixed effects explain 74% of the variation; time and sector fixed effects contribute minimal extra explanatory power.

Currency composition of outstanding IDS stocks by country: shares of euro-denominated IDS

In per cent

Table 5

REGION	COUNTRY	2000	2004	2008	2012	2016	2020	2024
ADVANCED ECONOMIES (NON-EU)	Australia	7.4	23.3	26.2	18.6	21.6	26.7	21.2
	Canada	8.9	11.5	15.1	4.8	15.0	17.8	22.9
	Japan	12.3	15.8	11.9	5.4	5.4	12.6	14.8
	United Kingdom	24.7	39.7	39.1	31.1	27.6	26.0	22.7
	United States	12.6	19.2	25.5	21.0	19.9	29.3	24.2
EUROPE	Denmark	30.1	60.5	64.6	58.5	57.6	62.8	64.6
	Finland	10.4	26.0	15.8	11.1	1.9	7.4	13.1
	France	3.5	4.9	6.0	6.2	5.5	6.3	3.8
	Germany	2.4	4.9	6.0	4.1	4.6	6.9	7.5
	Ireland	8.4	32.8	44.7	45.2	38.9	53.1	59.7
	Italy	3.9	1.5	2.4	2.5	16.0	20.3	31.3
	Luxembourg	7.3	16.4	24.6	21.6	22.0	36.9	36.9
	Netherlands	11.6	21.0	26.9	21.0	19.7	27.5	31.0
	Norway	19.0	30.3	45.5	36.1	44.5	52.5	47.1
	Poland	14.6	66.3	69.4	63.3	64.8	76.4	63.4
	Spain	0.0	0.0	4.6	1.5	4.1	5.6	3.1
	Sweden	29.7	53.2	53.6	42.7	38.7	48.1	54.8
	Switzerland	59.1	38.2	39.7	31.1	29.7	23.8	14.7
EMERGING MARKET ECONOMIES	Brazil	11.7	14.7	8.5	3.8	6.1	4.4	0.0
	Chile	2.4	2.7	0.0	0.0	7.0	12.6	11.8
	China	3.0	21.9	9.2	3.6	6.3	12.0	7.0
	Hong Kong SAR	1.9	3.8	3.3	2.3	4.1	4.2	3.5
	Indonesia	0.0	0.0	0.0	0.0	11.7	13.6	8.7
	Korea	3.7	4.8	12.5	5.2	5.4	9.2	9.6
	Mexico	12.7	14.2	12.5	9.0	16.5	15.0	9.8
	Saudi Arabia	0.0	0.0	8.9	0.0	0.0	3.4	2.5
	Singapore	5.8	12.1	11.4	1.9	2.8	10.7	8.5
	Türkiye	41.5	37.1	26.5	11.7	9.1	7.9	8.4
	United Arab Emirates	0.0	0.0	5.4	9.3	7.4	3.4	2.5
	AVERAGE	**12.0**	**19.9**	**21.4**	**16.3**	**17.7**	**21.9**	**21.0**

Notes: This table shows, for selected years, shares of the outstanding stock of euro-denominated IDS by issuers (on a residence basis) from selected countries. The shares (as a per cent of total IDS) are calculated excluding euro-denominated securities issued within the euro area by euro area nationality issuers. End-of-year data for each country. The averages shown in the last row are unweighted cross-country averages for the countries shown in this table (which collectively account for the vast majority of gross issuances of IDS). The zeros shown in this table indicate no recorded issuance in a particular quarter by issuers with nationality of the relevant country, rather than missing data.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

We also repeated this exercise for currency shares in new issuances. As expected, country-specific factors explain somewhat less of the variance. For dollar shares, country fixed effects account for 39% of the variation, while time and fixed effects contribute an extra 7% to the R-squared values. For euro shares, country fixed effects explain a higher share (60%), with time and sector fixed effects improving model fit only marginally (to 62%). The high explanatory power of country fixed effects that our variance decomposition points to is consistent with Maggiori et al (2020).

4. Robustness tests

In this section, we examine the robustness of our main findings on the presence of dollarisation waves rather than monotonic trends in patterns of IDS currency denomination.

4.1 Currency valuation effects

First, we examine the robustness of our key conclusions to accounting for valuation effects arising from exchange rate movements. In principle, persistent exchange rate changes could drive shifts in currency shares even absent changes in the underlying volumes of IDS stocks denominated in different currencies. This is because, for comparison purposes, all IDS issues are converted back to a common currency – the US dollar – at market exchange rates. For instance, an appreciation of the dollar relative to the euro would reduce the dollar value of euro-denominated IDS and, by extension, reduce the euro's share of outstanding IDS.

Indeed, an observation of the three dollarisation waves suggests that the waxing and waning phases of the dollar's share (Graph 3, black line) correspond to periods when the dollar was appreciating and depreciating relative to other major currencies (blue lines).

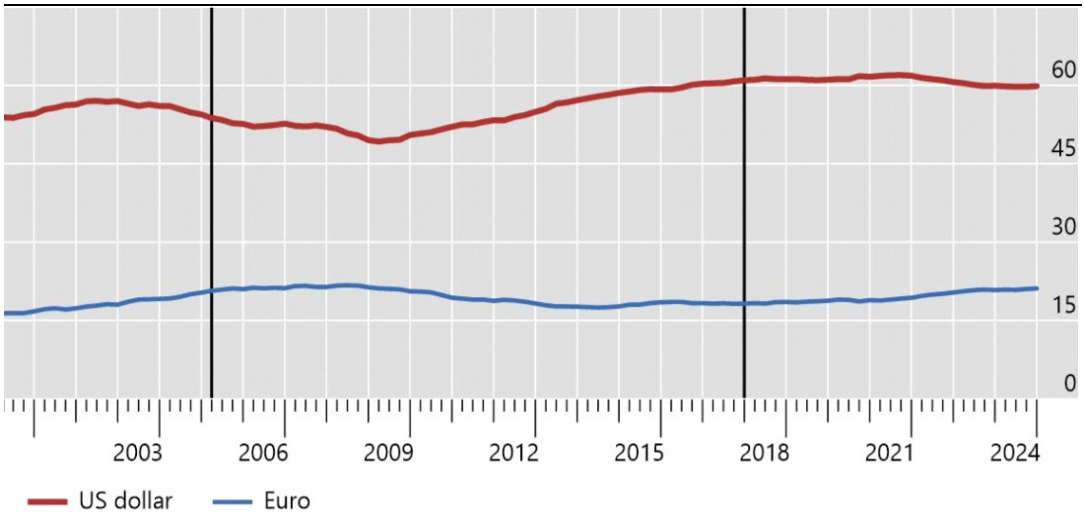
To evaluate the impact of exchange rate changes, we show what the value of outstanding IDS would have been over time if we kept the exchange rates of the dollar relative to other currencies fixed at their respective levels at the beginning of the sample. In other words, we convert the value of securities denominated in other currencies into US dollars using the bilateral exchange rate of each currency relative to the dollar at of the start of our sample (first quarter of 2000).

The dollar waves become smoother once we remove exchange rate valuation effects (Graph 5). The results suggest that the dollarisation wave (and also the dollarisation trend discussed in the Maggiori et al (2019, 2020 and 2024) and elsewhere) is reinforced by, but not solely determined by, exchange rate movements. However, most importantly for our analysis, the dollar wave itself remains qualitatively little changed: we can observe the waxing and waning of the dollar's share even when we hold the exchange rate unchanged. This analysis also underlines the relevance of correcting for exchange rate movements when discussing dollarisation trends or waves.[12]

[12] From a portfolio perspective, this exercise has less relevance, as institutional investors and other investors should incorporate exchange rate fluctuations into their portfolio allocation decisions. From the perspective of issuers choosing what currency to denominate their securities in, however, adjusting for exchange rate changes arguably provides a better basis for comparing the volumes of IDS stocks in different currencies. Of course, this adjustment is not relevant when analysing the currency denomination of new issuances, as those data are based on the nominal exchange rates in the period of issuance.

Evolution of outstanding stocks of international debt securities: 2000–24, constant exchange rate

In per cent of total IDS stocks in all currencies — Graph 5



Notes: This graph shows the shares of outstanding stocks of IDS denominated in dollars and euros. Rather than using current period nominal exchange rates, the face values of IDS denominated in currencies other than the dollar are converted into US dollar values using bilateral nominal exchange rates fixed at their values at the beginning of the sample (Q1 2000). The SDR rate was used for currencies other than USD, EUR, JPY, GBP, CHF and RMB. Euro-denominated IDS issued within the euro area by euro area nationality issuers are excluded from the calculations.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

4.2 Intra-euro area IDS and own-currency issuance

Next, we examine the robustness of our main result to the choices we made in constructing our baseline sample. First, we include intra-euro area euro-denominated IDS, which we had excluded in the baseline. Second, we exclude all own-currency issues (that is, dollar issuance by borrowers in the United States, euro issuance by firms in euro area countries, etc).

First, including intra-euro area euro-denominated issuances substantially elevates the share of euro issuance in IDS (Graph 6.A). For instance, the euro's share (blue line) in 2000 is almost twice as high (at nearly 30%) compared with when we exclude such issues. Moreover, the euro's share surpasses the dollar's share during the euro moment, unlike in our baseline results in which the dollar's share is consistently higher than that of the euro. Notwithstanding these relative differences, the qualitative shape of the dollar wave and the surge followed by a fall in the euro's share are still evident. By 2014, the dollar's share rose back to above that of the euro and has remained dominant since then. At the end of the sample, the shares of the dollar and euro are 48% and 38%, respectively (compared with 60% and 23%, respectively, in our benchmark data, as in Graph 3).

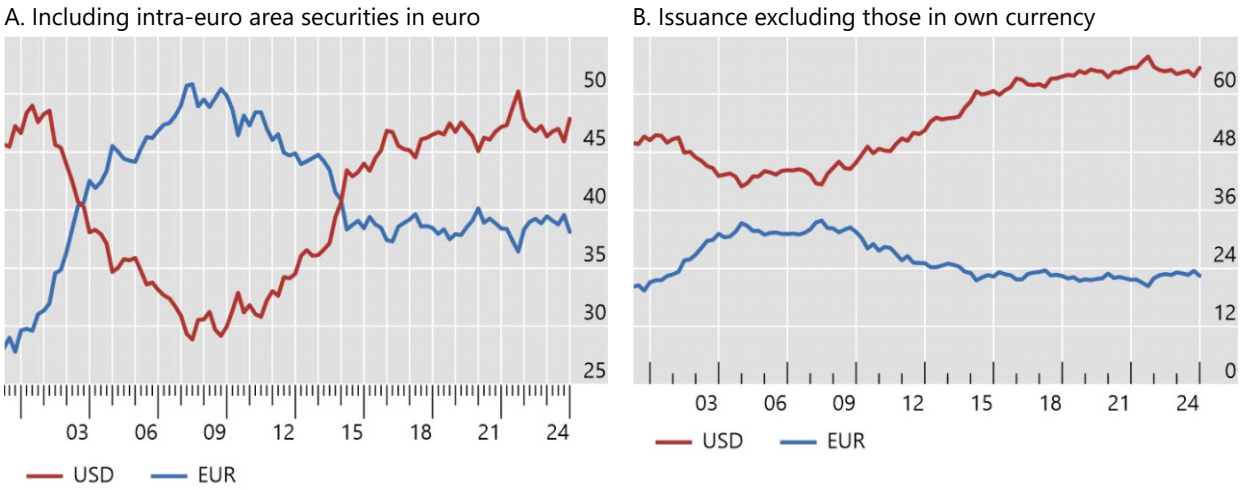
We treat the inclusion of intra-euro area euro-denominated issuances as a robustness exercise rather than an analysis suitable for drawing conclusions about international currency use. One could take the position that if euro zone IDS issuers

undertake a substantial majority of their issuances in other euro zone countries, then such an exclusion, while conceptually defensible, could understate the euro's importance. However, including intra-euro area IDS issuances denominated in euros is in many respects akin to including US domestic interstate dollar issuances, which would clearly not be appropriate. Indeed, much of the literature, including Maggiori et al (2020), analyses euro outstanding stocks without intra-euro area issues. Still, our robustness exercise is useful in demonstrating that our main results are not materially affected even when we give the euro a better shot at "shining".

Outstanding international debt securities by currency

In per cent of total in all currencies

Graph 6



Notes: This graph shows the shares of outstanding stocks of IDS denominated in the dollar and the euro. Unlike in previous graphs, IDS issued within the euro area by euro area nationality issuers are included in the calculations in panel A. Panel B shows the shares of the two currencies based on calculations that include only securities denominated in currencies other than the currency of issuers on a residence basis (eg dollar-denominated securities attributable to issuers resident in the United States are excluded from the calculations).

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Second, we extend our analysis by removing all own-currency issuance from our IDS sample. That is, we exclude dollar-denominated IDS issued by US borrowers and euro-denominated IDS issued by euro area nationality issuers. This enables us to compare our findings with those of a strand of the literature that defines "international" differently than the BIS IDS definition – explicitly excluding own-currency issuance (Bénétrix and Demirölmez (2025)). Graph 6.B shows that the dollar wave remains intact even under this definition (red line); in particular, the dollar's share increases sharply after the GFC. In contrast, the euro's share (blue line) increases before the GFC and declines afterwards – remaining elevated relative to the start of the sample. In short, excluding all own-currency issuance does not meaningfully affect our main results.

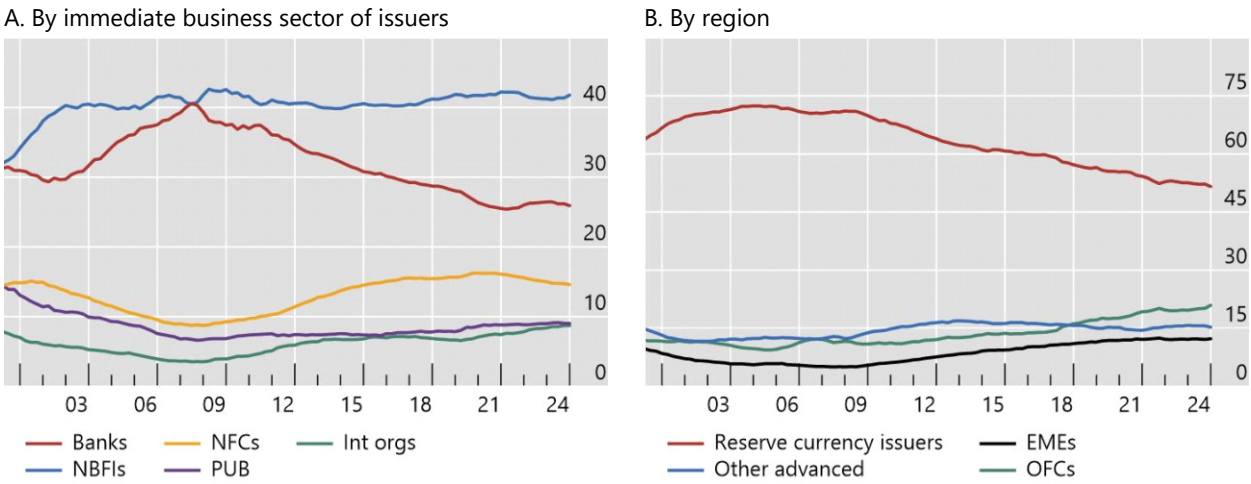
4.3 Composition effects

The shares of various currencies in IDS stocks could shift due to changes in the composition of issuers, even if each category of issuer continues to have the same relative preference for the two currencies. As an example, some countries (such as China and Brazil) issue IDS primarily in US dollars, while others (such as Germany and Poland) typically issue euro-denominated IDS (as shown in Tables 4 and 5). If the gross issuances of countries that favour dollar-denominated IDS grow faster than those that issue IDS primarily in euros, the share of the dollar could increase in aggregate volumes even if each country has a fixed proportion of each currency in its IDS issuance. Similarly, if one sector has a strong preference for issuing IDS in dollars and that sector accounts for a rising share of IDS, then the dollar share would rise for mechanical reasons rather than reflecting any shift in within-sector currency preferences. To examine such composition effects, we start by breaking down the shares of outstanding IDS by the immediate business sector of issuers (Graph 7.A) and by country group (Graph 7.B).

Focusing on our sectoral breakdown in Graph 7.A, we see significant changes over time in the relative shares of different sectors. For instance, the share of non-bank financial institutions jumps from 32% in 2000 to 40% in 2002 and then stays relatively stable at that level. The share of banks rose by about 10 percentage points from 2002 to 2008, a period when banks were rapidly expanding their balance sheets through leverage. After peaking at just over 40% in 2000, banks' share of IDS stocks declined steadily after the GFC, down to 26% by 2021.

Outstanding stocks of international debt securities: by sector and country group

In per cent of total in all currencies — Graph 7



Notes: This graph shows the shares of total outstanding IDS stocks broken down by the sector in (panel A) and country group (panel B) to which issuers belong. NFCs =: non-financial corporations; Int orgs = international organisations; NBFIs = non-bank financial institutions; PUB = public sector; EMEs = emerging market economies; OFCs =: offshore financial centres. The countries that comprise each group are listed in the Appendix, Table A.1. Euro-denominated IDS issued within the euro area by euro area nationality issuers are excluded from the calculations.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Next, in Graph 7.B we group countries into four broad non-overlapping categories – major reserve currency issuers (United States, euro area, Japan, United

Kingdom); other advanced economies; emerging market economies (EMEs); and offshore financial centres (OFCs). A list of countries in each group is shown in the Appendix, Table A.1. These groups collectively account for about 90% of outstanding IDS stocks in our sample. One striking feature is that the share of IDS stocks that issuers from the major reserve currency-issuing economies account for has fallen from about two thirds in the mid-2000s to about half by 2024. By contrast, the share of issuers in OFCs has risen by about 10 percentage points over this period.[13] The share of issuers based in EMEs dipped around the period of the GFC but was higher at the end of our sample period than at the beginning. We analyse these patterns in greater detail in the next section but for now just highlight that there are sizeable shifts in the composition of IDS stocks by sector and by country group.

Could one attribute the dollar wave that we have highlighted mainly to such composition effects rather than any fundamental shifts in currency preferences? To evaluate the role of compositional shifts in driving the evolution of aggregate currency shares in IDS stocks (or new issuances), we run panel regressions to uncover time-specific factors while correcting for country and sector-specific fixed effects:

$$(1) \quad share_{icst} = \gamma_0 + FE_i + FE_s + FE_t + \varepsilon_{isct}$$

where $share_{icst}$ denotes currency c's share in the outstanding stock (or new issuance) of IDS issued in sector s of country i in quarter t. FE_i, FE_s and FE_t denote country, sector and time fixed effects, respectively.

We first estimate this model and present trailing four-quarter averages of the estimated time fixed effects. Next, in place of the time fixed effects, we estimate a time trend by fitting a high-order (fifth degree) polynomial, while retaining the other fixed effects. This provides another form of smoothing and ensures that neighbouring time effect estimates are close to one another. In addition, fitting a polynomial requires fewer parameter estimates, while putting more structure on the data.

For the outstanding stock of IDS, the composition effect seems to contribute marginally to the dollar wave. However, it is not a key driver and the wave pattern is preserved, although in less accentuated form (Graph 8.A). Both the smoothed time fixed effect estimates (black line) and the polynomial estimates (blue line) trace the actual (averaged) dollar share from the full sample (red line) well. The smoothed time effects are close to the polynomial estimates.[14]

The composition effects seem to be weaker when we repeat the exercise using data on gross issuances (Graph 8.B). The smoothed time fixed effects estimates are even closer to the actual sample averages, while the fitted time polynomial (black line) follows the sample average (red line) closely. Since currency shares tend to

[13] In the BIS-compiled data set, no issuances can be attributed to the following OFC jurisdictions (on either a residence or nationality basis, unless indicated otherwise): Anguilla, Antigua and Barbuda, British Virgin Islands, Cook Islands, Dominica, Guernsey (residence), Isle of Man, Jersey (residence), Montserrat, Niue, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Samoa, Sint Maarten, Vanuatu and Virgin Islands of the United States. Cook Islands and Niue are reported under New Zealand, and US Virgin Islands under the United States.

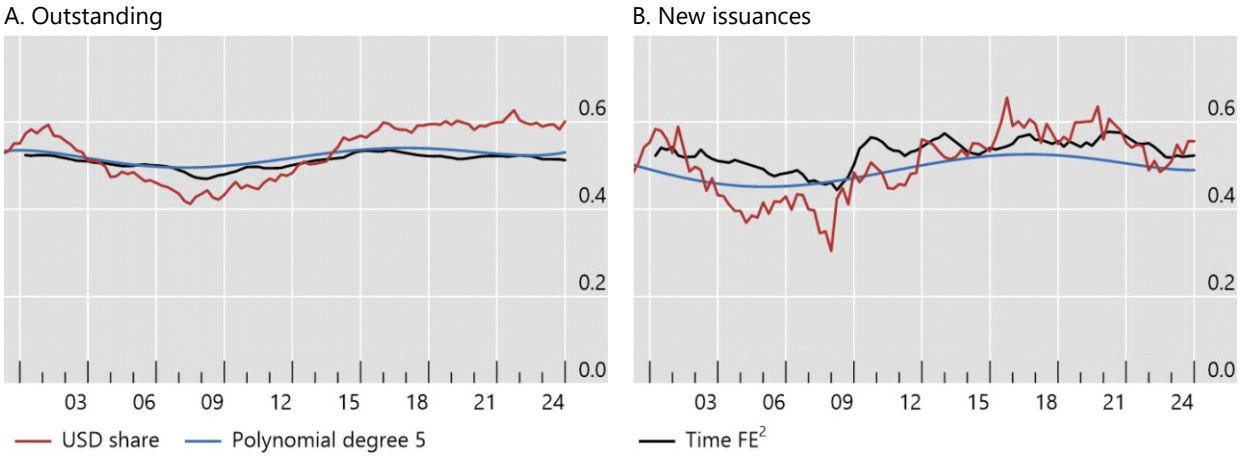
[14] We also estimated time series models with lower- and higher-order polynomials. The main conclusions are preserved, although lower-order polynomials of course do not adequately capture waves in the data. We find that higher-order polynomials are virtually identical to the fifth-order one.

fluctuate more in issuances than in IDS stocks, the actual data and the estimated time fixed effects look more volatile than their counterparts in Graph 8.A.

Overall, this simple empirical exercise suggests that changes over time in the dollar's share in IDS stocks and issuances are not driven simply by country- or sector-related composition effects.

US dollar share of international debt securities' stocks and gross issuances: average shares and fitted time effects

Graph 8



Notes: This graph shows the shares of dollar-denominated securities in total IDS stocks (panel A) and new issuances (panel B). The red lines show the actual dollar shares. The black lines show four-quarter trailing moving averages of estimated quarterly time fixed effects from a model that regresses country-level quarterly shares of IDS stocks (or new issuances) issued by different sectors in various currencies on country, sector and time fixed effects. The blue lines are from a similar model that replaces time fixed effects with a fifth-order time polynomial. All calculations are based on our baseline sample, which excludes euro-denominated securities issued by euro area nationals within the euro area.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

One final issue is whether changes in the country sample over time could contribute materially to the evolution of currency shares. Table 3A shows that the number of countries in our sample rose from 97 in 2000 to 136 in 2024. The 97 countries in the sample as of 2000 account for 98.3% of the $25.9 trillion of IDS stocks at the end of 2024, which suggests that the countries added to the sample over time are unlikely to alter the results substantially.[15] Still, it is possible that the increasing share of emerging market and developing economies, which appear to have a strong preference for issuing dollar-denominated IDS, could influence the results. We examined the evolution of currency shares keeping the sample restricted to the original 97 countries. The results, shown in Graph A.3 in the Appendix, confirm that our key finding is unaffected when we keep the country sample constant.

[15] The statistics on the BIS Data Portal show that total outstanding IDS as of Q4 2024 stood at $29.7 trillion including euro-denominated intra-euro area international securities by euro area nationality issuers. We excluded such intra-euro area euro-denominated securities from our analysis.

5. Extensions

Having established the robustness of our main results in the aggregate sample, we now break down the results by country group and by sector to investigate those outcomes at a more granular level.

5.1 Evolution of currency shares by country group

Graph 7 revealed a decline in the share of IDS stocks accounted for by issuers in the major advanced economies and a corresponding increase in the share of issuers in OFCs. This shift is consistent with other evidence of the rising role of OFCs in global finance, although this most likely reflects tax and regulatory considerations, rather than any actual shift. Many corporations and financial institutions apparently find it advantageous to route their financial operations, including raising capital by issuance of IDS and other financial instruments, through OFCs rather than their home countries. The BIS-compiled data set has the advantage of bringing insights from data based on issuer nationality to this inquiry.

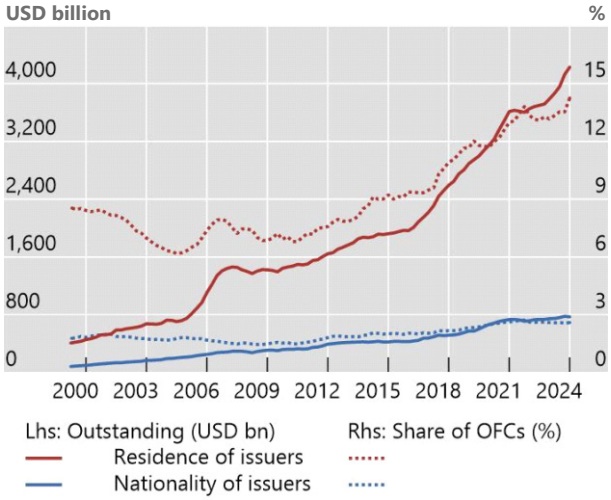
Graph 9.A shows that outstanding IDS issued through OFCs (solid red line) rose more than tenfold over our sample period, from $409 billion in 2000 to $4.2 trillion in 2024. By 2024, OFCs accounted for nearly 14% of total outstanding IDS worldwide (dashed red line). These figures, which are on a residency basis, clearly overstate the importance of IDS. As discussed earlier, the BIS-compiled data set allows us to measure issuance on a nationality basis as well. Indeed, the nationality-based data reveal a very different picture. The absolute amounts of IDS accounted for by OFC issuers and their share of the world total on this basis do go up over our sample period, but only to about $770 billion and 2.6%, respectively, by end-2024. Graph 9.B, which contains gross issuance data for OFCs on both residence and nationality bases, shows similar trends (although with more period-to-period volatility) and a similar large discrepancy between residence-based and nationality-based data.

Graphs 9.C and 9.D present absolute amounts and shares of the US dollar and the euro in OFC IDS stocks and gross issuances. In addition, these panels distinguish between residence- and nationality-based issuance. The stock data depict a dollar wave (and a mirroring wave in the euro's share) similar to that seen in the aggregate data. Interestingly, though, when we look at gross issuance data in OFCs, we see the share of the dollar falls and the euro's share rises towards the end of the sample. One possible reason is the divergence of US interest rates from euro area interest rates, implying lower funding costs in euros relative to dollars.

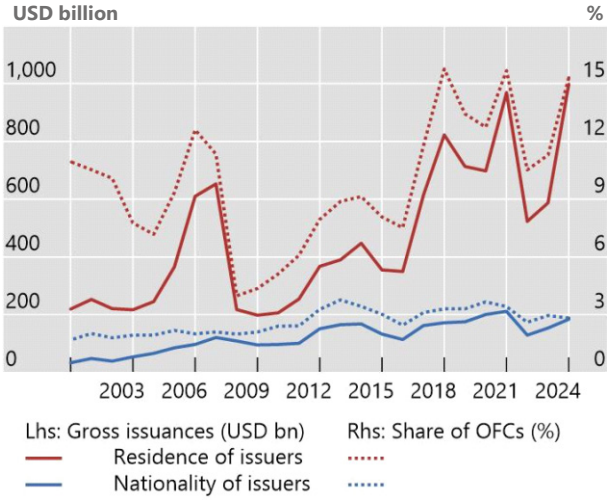
International debt securities – issuers in offshore financial centres

By residence and by nationality basis — Graph 9

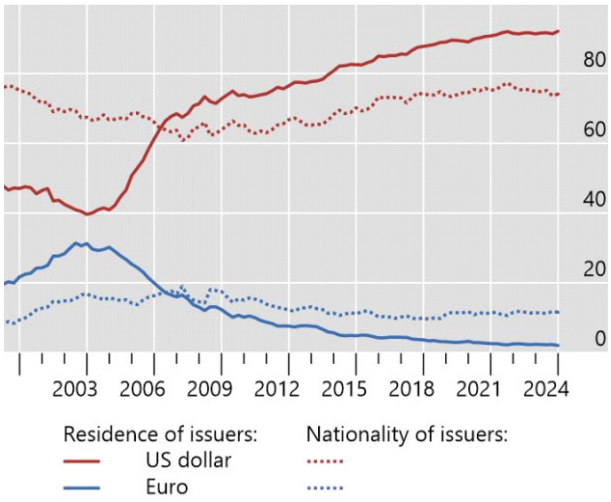
A. Outstanding: amount and share in global total



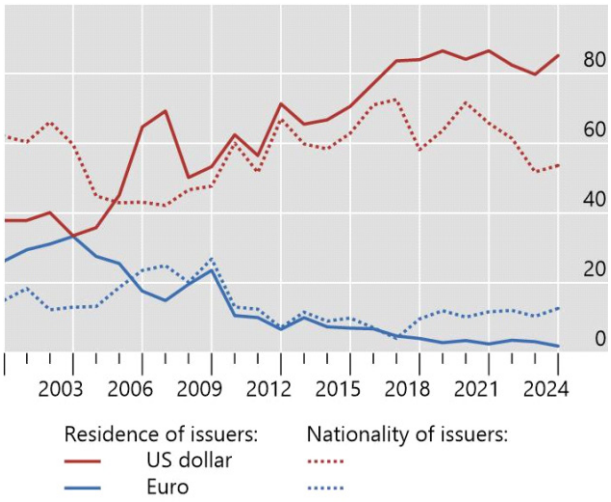
B. Gross issuances: amount and share in global total



C. Outstanding: share of USD and EUR in total



D. Gross issuances: share of USD and EUR in total



Notes: This graph shows the shares of IDS attributed to issuers in offshore financial centres (OFCs). Panels A and B show the absolute amounts and shares in global totals of IDS stocks and gross issuances, respectively, accounted for by OFC issuers on both residence and nationality bases. Panels C and D break down the data by currency denomination of IDS stocks and gross issuances, respectively. All calculations are based on our baseline sample, which excludes euro-denominated securities issued by euro area nationals within the euro area. A full list of offshore financial centres, based on the Eurostat definition, is in the Appendix, Table A.1.

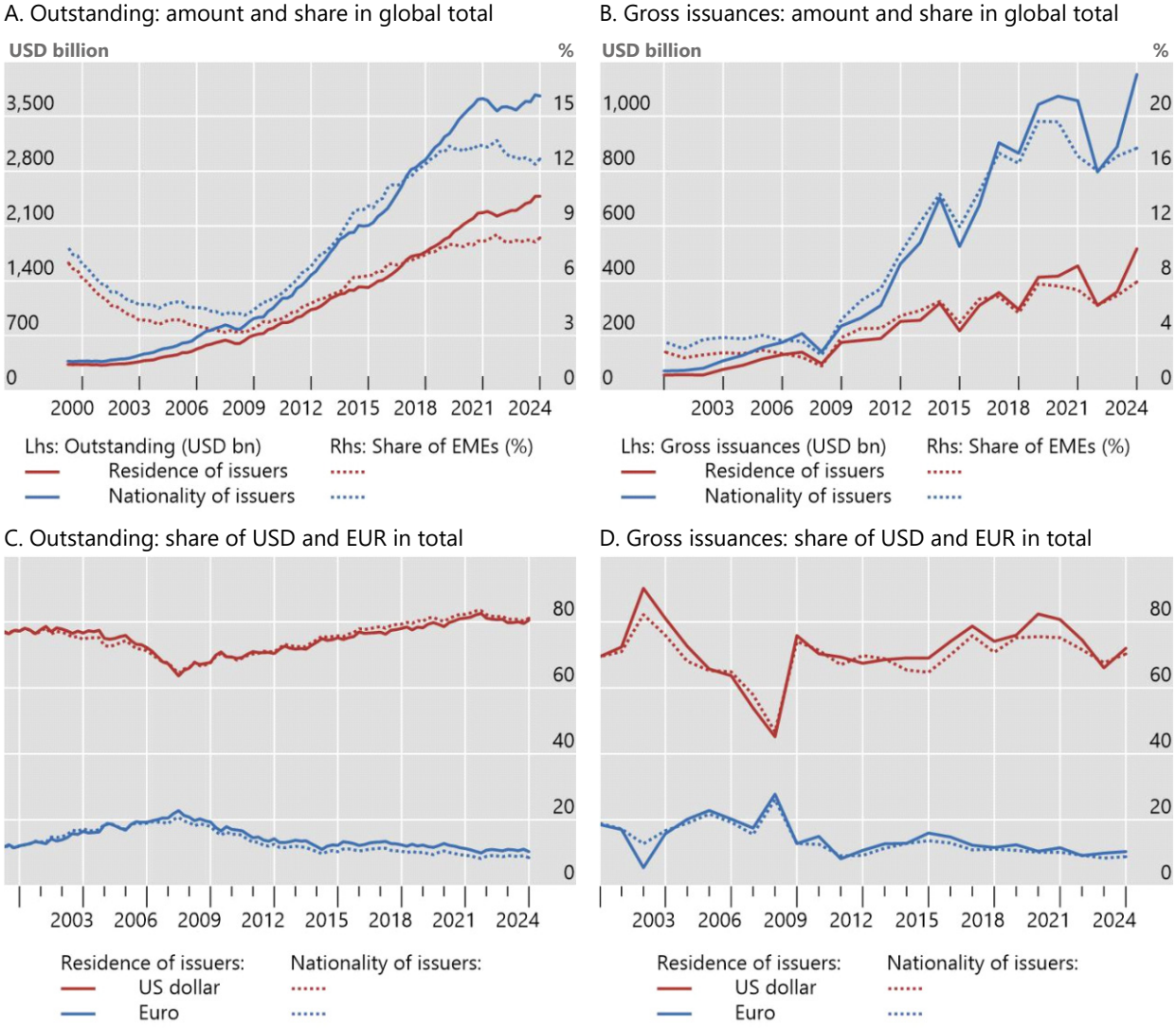
Sources: Dealogic; Euroclear; Eurostat; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Focusing on EME issuers, Graphs 10.A and 10.B show that IDS stocks and gross issuances have risen quite steadily and substantially from 2000 to 2024, both in absolute amounts and as shares of global totals. Interestingly, and in a reversal of the pattern observed in Graph 9 for OFCs, stocks and issuances based on the nationality of the issuer are much higher than those based on the residency of the issuer. This suggests that a number of EME issuers tend to raise debt financing in international markets through, for example, their subsidiaries operating in other countries. EME issuers overwhelmingly prefer to denominate their IDS in US dollars, with a slight dip

(which is more pronounced in the issuance data) in the dollar's share around the GFC and a recovery soon after. In 2024, the US dollar accounted for about 80% of outstanding IDS stocks of EME issuers and about 70% of their gross issuances.

International debt securities – issuers in major emerging market economies

By residence and by nationality basis — Graph 10



Notes: This graph shows the shares of IDS attributed to issuers in emerging market economies (EMEs). Panels A and B show the absolute amounts and shares in global totals of IDS stocks and gross issuances, respectively, accounted for by EME issuers on both residence and nationality bases. Panels C and D break down the data by currency denomination of IDS stocks and gross issuances, respectively. All calculations are based on our baseline sample, which excludes euro-denominated securities issued by euro area nationals within the euro area. The list of EMEs, based on the MSCI Emerging Markets Index, is shown in the Appendix, Table A.1. Greece and the Philippines are excluded as the former is a euro area country and the latter is included under the offshore financial centre (OFC) category.

Sources: Dealogic; Euroclear; LSEG; MSCI; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

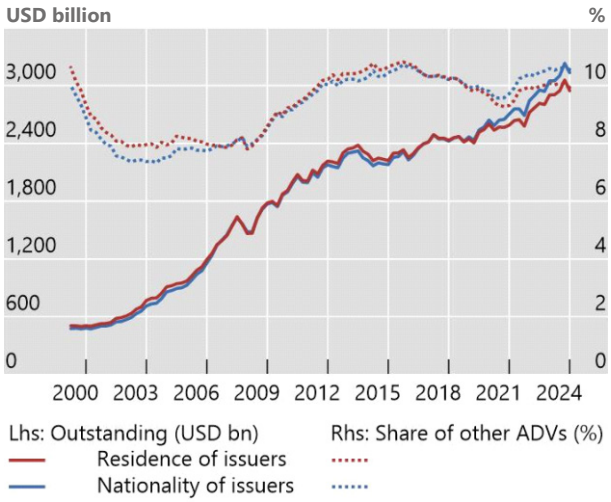
Finally, in Graph 11 we examine the group of other (non-reserve currency issuer) advanced economies. IDS stocks of this group rose from $500 billion in 2000 to $3 trillion in 2024, with their share in total IDS stocks remaining relatively stable in the

8–10% range over this period. Interestingly, there is little discrepancy between residence-based and nationality-based data for issuers from this group of countries.

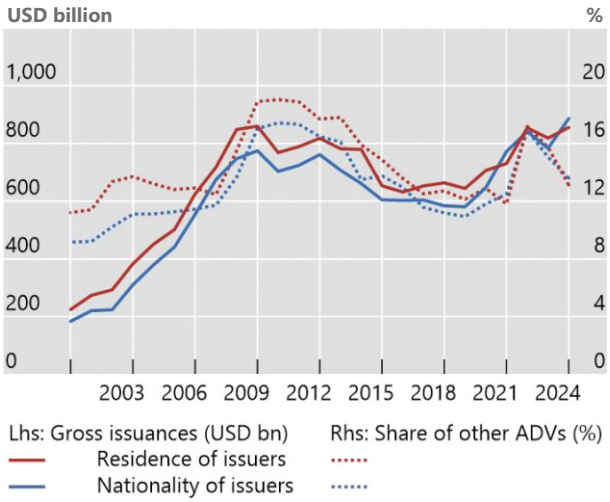
International debt securities – issuers in other advanced countries

By residence and by nationality basis — Graph 11

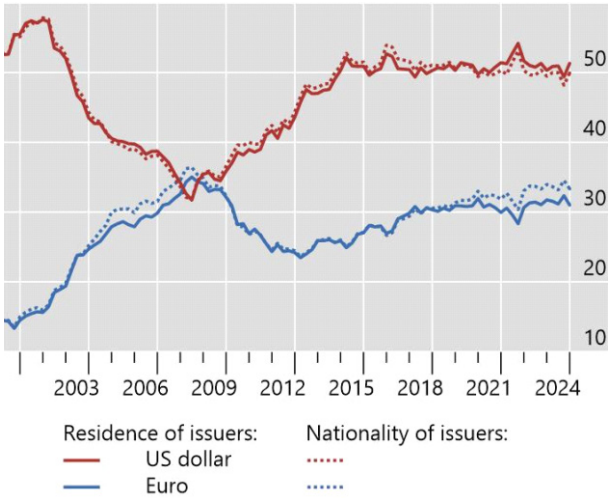
A. Outstanding: amount and share in global total



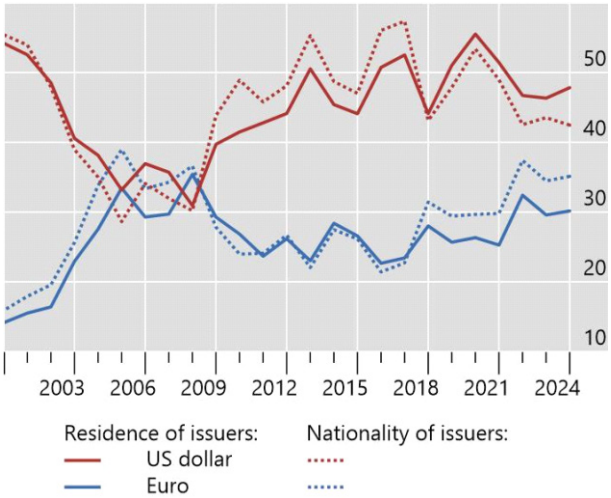
B. Gross issuances: amount and share in global total



C. Outstanding: share of USD and EUR in total



D. Gross issuances: share of USD and EUR in total



Notes: This graph shows the shares of IDS attributed to issuers to other advanced countries (a group that excludes the major reserve currency issuers). Panels A and B show the absolute amounts and shares in global totals of IDS stocks and gross issuances, respectively, accounted for by other advanced countries on both residence and nationality bases. Panels C and D break down the data by currency denomination of IDS stocks and gross issuances, respectively. All calculations are based on our baseline sample, which excludes euro-denominated securities issued by euro area nationals within the euro area. The list of countries included in the classification of other advanced economies is available in the Appendix, Table A.1.

Sources: IMF country classification; Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities; authors' calculations.

As for currency denomination of their IDS, there is a pronounced wave in the share of the dollar, both in the stock and gross issuance data. In 2000, the US dollar accounted for more than half of outstanding stocks and the euro for barely 15%. By 2007, the gap between the two currencies had closed, with each accounting for about a one third share. Then the gap quickly widens again, with the dollar's share climbing

to just over 50% and the euro's share falling to 25% by 2014. The gap between the two currencies in the denomination of IDS stocks has stayed wide since then, although gross issuance data (Graph 11.B) show some narrowing of the gap since 2021.

In short, the dollar wave pattern is most pronounced for issuers in non-reserve currency-issuing advanced economies. However, it is also present when we look at those attributed to EMEs and, on a nationality basis, to OFCs.

5.2 Issuance by key sectors

In Section 4.3, we provided a broad characterisation of sectoral shifts in IDS stocks. We now investigate in more detail how currency denomination choices have developed across different categories of issuers and how these shifts in both their IDS stocks and gross issuances influence the evolution of aggregate currency shares.

First, we look at the evolution of outstanding IDS stocks (Graphs 12.A, 12.B and 12.C). The volume of US dollar-denominated IDS stocks grew steadily over our sample (Graph 12.A, all issuers (dotted line)). This growth looks similar across key sectors of issuers: banks (blue bars) and NBFIs (yellow bars) grew at similar rates as issuance by the public sector (purple bars), non-financial corporations (beige bars) and international organisations (grey bars).

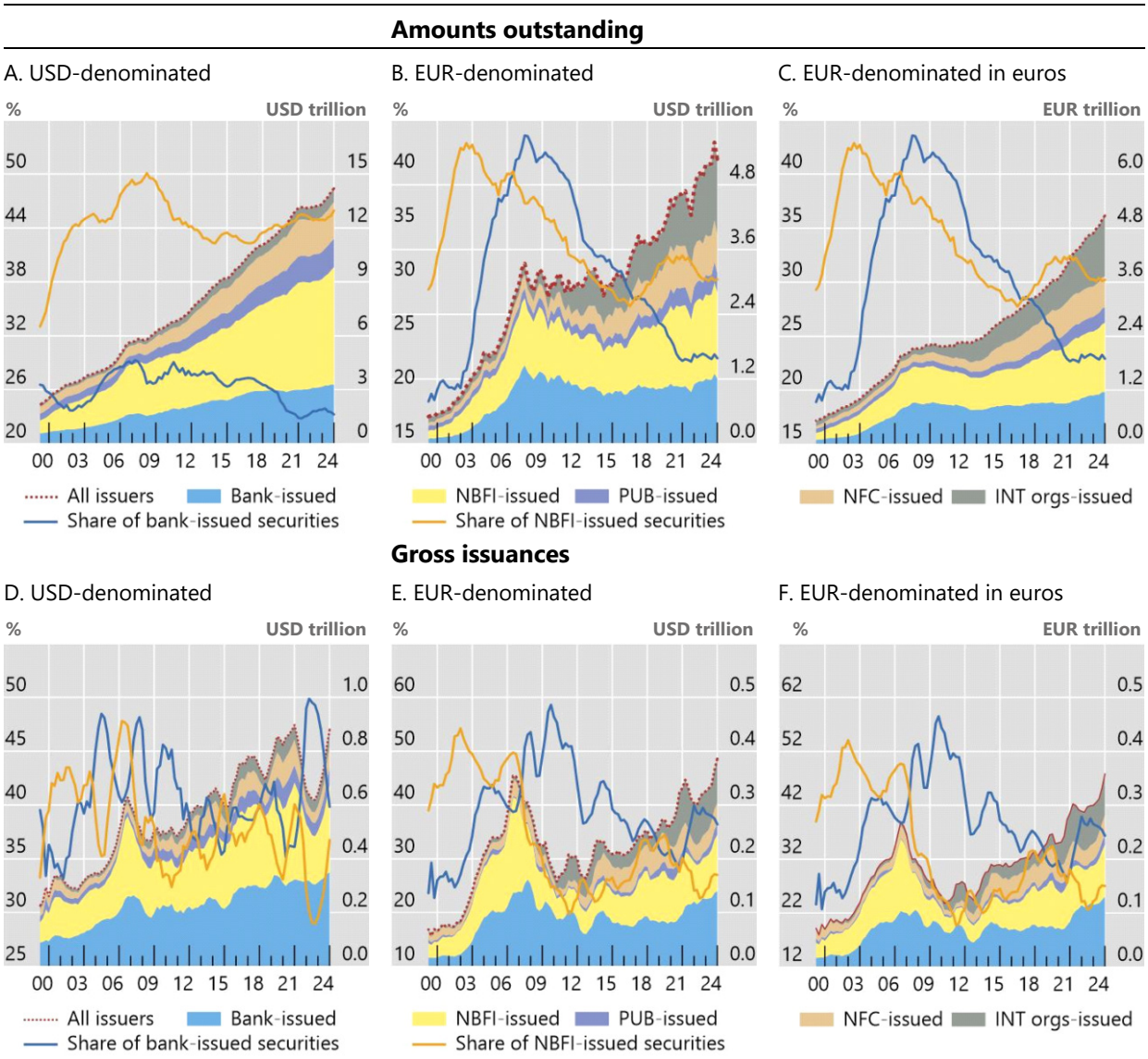
The euro moment was driven by the financial sector (Graph 12.B) – first a surge in euro-denominated IDS stocks accounted for by NBFIs (yellow bars) followed by a surge in IDS stocks accounted for by banks (blue bars). Together these surges sharply drove up the share of the euro in total IDS stocks in the period before the GFC. Issuance by the financial sector grew much faster than issuance by the public sector (purple bars), or by non-financial corporations (beige bars) and international organisations (grey bars). After the GFC, both NBFIs and banks pulled back sharply from IDS issuance denominated in euros, deflating the euro's rise. A closer look at currency shares matches these observations: the share of banks (blue line) and NBFIs (yellow line) increased quickly before the GFC and decreased thereafter.

As discussed in Section 4.1, exchange rate valuation effects could be important in explaining some of these dynamics. To account for such valuation effects, we convert the euro-issued volumes back into euros rather than expressing them in dollars (Graph 12.C). Removing the exchange rate effect makes the evolution of IDS stocks by different sectors look smoother over time. Indeed, after converting back to euros, the pre-GFC euro moment and the post-GFC declines appear smoother; however, the dollar wave pattern remains intact.

It is also noteworthy that international organisations' euro-denominated issues grew faster, and have become more prominent, than dollar-denominated IDS in the latter part of our sample (Graphs 12.B and 12.C, grey bars). Euro-denominated issuance by international organisations is highly concentrated, as it is dominated by four European issuers: the European Union, the European Financial Stability Facility, the European Investment Bank and the European Stability Mechanism. Dollar-denominated IDS issuance by international organisations is not only smaller in volume but also less concentrated.

US dollar- and euro-denominated international debt securities by sector

By immediate business sector of issuers — Graph 12



Notes: This graph shows the sectoral breakdowns of IDS denominated in dollars and euros. The sectors are banks, non-bank financial institutions (NBFI), sovereign governments and public sector institutions (PUB), non-financial corporations (NFC) and international organisations (INT orgs). The calculations exclude euro-denominated securities issued within the euro area by euro area nationality issuers. The panels in the first row are based on IDS stock data, while the panels in the second row are based on gross IDS issuances. The blue and red lines show the shares of banks and NBFIs, respectively, in the totals within each category. Since issuance data are volatile from quarter to quarter, the lower panels show four-quarter trailing moving averages of the underlying data.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities; authors' calculations.

The evolution of new issues by key sectors is shown in Graphs 12.D, 12.E and 12.F). As expected, new issuance is more volatile than changes in outstanding volumes. These new issuance graphs also confirm our main takeaways based on studying outstanding stocks. The dollar's growth is steadier, with fluctuating – but not trending – shares across sectors (Graph 12.D). In contrast, as already noted, issuance in euros shows the pre-GFC euro moment and the post-GFC euro deceleration, both

of which were led by the bank and NBFI sectors (Graph 12.E). Importantly, these features of euro-denominated IDS survive when we express euro-issued IDS in euros rather than converting them into US dollars (Graph 12.F).

The key takeaway is that IDS stocks denominated in US dollars have grown relatively steadily over our entire sample period. IDS stocks denominated in euros, by contrast, levelled off after the GFC and remained flat for nearly a decade before rising again. This pattern is accentuated when IDS stocks are measured in US dollars at current exchange rates and somewhat attenuated when we measure IDS stocks at constant exchange rates (fixed at levels at the beginning of sample). The evolution of euro-denominated IDS stocks, along with fluctuations in the US dollar-euro exchange rate, thus contributed to the observed dollar waves.

Changes in IDS issuances reveal a more nuanced picture, with both dollar- and euro-denominated IDS issuances rising in the lead-up to the GFC and then declining in its immediate aftermath. Although dollar-denominated IDS issuances fell briefly after the GFC, this decline was smaller and more short-lived in relative terms than was the case for euro-denominated issuances.

Both the stock and new issuances data show that the financial sector, comprising banks and NBFIs, drove the euro moment as well as the subsequent deceleration of euro issuance. Interestingly, the dynamics of issuance by NBFIs also accounts for the sharp but temporary fall in dollar-denominated IDS issuances during the Covid-related recession. Euro-denominated issuances, by contrast, were not as adversely affected during this period. However, the euro's depreciation relative to the dollar during this period results in a brief upward blip in the dollar's share of IDS stocks (and corresponding brief downward blip in the euro's share) when measured at market exchange rates.

6. Conclusion and implications

In this paper, we analyse a data set on international debt securities that has far more comprehensive coverage than data sets used in prior literature. This data set allows us to explore the role of the US dollar over longer time periods in debt security issuance and in a far more expansive manner than earlier papers.

We find no consistent dollarisation trend; instead, we document several dollarisation waves. The dollar's dominance has waxed and waned over time rather than rising or falling in a monotonic fashion, belying narratives about both rising dollar dominance and de-dollarisation, at least in this key aspect of global finance. The share of the dollar in international debt securities fell from close to 60% in the early 2000s to about 43% in 2008, before surging to 60% in the latter half of the 2010s and stabilising there until the end of 2024.

When we extend our investigation to a longer period dating back to 1966, we find similar dollarisation waves in the earlier data. The share of the dollar rose in the early 1980s and late 1990s as well – and declined thereafter. In short, while the US dollar has remained by far the single most important currency for the denomination of debt securities, the dollar's prominence has gone through significant waves.

The share of the euro rose considerably following the currency's creation in 2000. This euro moment lasted until about 2008, with volumes of euro-denominated new issuance in some of those intervening years nearly matching issuance volumes in US dollars. However, issuance in euros – and therefore the share of the euro in total IDS – declined after the GFC before recovering in the latter half of our sample period.

IDS stocks denominated in US dollars have marched upward over our entire sample period. New IDS issuances denominated in dollars fell briefly right after the GFC, although this decline was smaller in relative terms than that of euro-denominated issuances. We find that issuance by banks and non-bank financial institutions drove the euro moment as well as the subsequent deceleration of euro issuance.

Our work provides novel evidence in many dimensions and raises several new questions for future research. One key question is whether the euro moment was driven by the prospects of a new currency of a large economic block becoming a major alternative financing currency, perhaps even rivalling the dollar? Or did the substantial euro IDS issuance by banks and non-bank financial institutions at the time simply reflect excessive financial risk-taking? Similarly, what caused the subsequent deceleration of euro issues? Was it stricter post-GFC financial regulation that constrained (European) banks? Or was it the euro area sovereign debt crisis that deflated the rise of the euro? And, more broadly, what country-, sector- or issuer-specific factors drive the use of a dominant currency vis-à-vis its potential alternatives? Addressing such questions will considerably expand our understanding of the dynamics of dominant currencies and factors governing the evolution of the international monetary system.

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Appendix

Country groups

Table A.1

Reserve currency issuers (23)
Euro area (20 countries)
Japan
United Kingdom
United States

Other advanced countries (12)[2]
Australia
Canada
Denmark
Iceland
Israel
Macao SAR
New Zealand
Norway
Puerto Rico
San Marino
Sweden
Switzerland

EME countries (22)[3]
Brazil
Chile
China
Chinese Taipei
Colombia
Czechia
Egypt
Hungary
India
Indonesia
Korea
Kuwait
Malaysia
Mexico
Peru
Poland
Qatar
Saudi Arabia
South Africa
Thailand
Türkiye
United Arab Emirates

OFC jurisdictions (40)[4]
Andorra
Anguilla
Antigua and Barbuda
Aruba
Bahamas
Bahrain
Barbados
Belize
Bermuda
British Virgin Islands
Cayman Islands
Cook Islands
Curaçao
Dominica
Gibraltar
Grenada
Guernsey
Hong Kong SAR
Isle of Man
Jersey
Lebanon
Liberia
Liechtenstein
Marshall Islands
Mauritius
Montserrat
Nauru
Niue
Panama
Philippines
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Samoa
Seychelles
Singapore
Sint Maarten
Turks and Caicos Islands
Virgin Islands of the United States
Vanuatu

Notes: This table shows the non-overlapping groups that we use to classify the countries in our sample. There are 97 countries listed in this table while our full data set includes 138 jurisdictions, including one member, as international organisations (in the final year of the sample). On a residence basis, these 97 countries collectively account for 88% of the outstanding stocks and 89% of gross issuances of IDS in the fourth quarter of 2024. The list of emerging market economies (EMEs) is based on the MSCI Emerging Markets Index. Greece and the Philippines are excluded, as the former is a euro area country and the latter is included in the offshore financial centre (OFC) category. The list of OFCs is based on the Eurostat classification. The Cook Islands and Niue are reported under New Zealand; and the Virgin Islands of the United States under the United States. Jurisdictions marked in *italics* did not have any outstanding stocks or new issuances of IDS during our sample period.

Currency composition of gross issuances of IDS by country: shares of US dollar-denominated IDS

In per cent

Table A.2

REGION	COUNTRY	2000	2004	2008	2012	2016	2020	2024
ADVANCED ECONOMIES (NON-EU)	Australia	56.2	39.4	39.8	48.1	49.6	59.4	51.3
	Canada	70.9	41.6	33.7	81.3	63.7	70.2	55.4
	Japan	44.8	3.3	11.8	66.1	77.3	74.4	65.5
	United Kingdom	38.6	27.5	21.2	30.0	37.5	41.6	35.6
	United States	62.7	58.2	53.3	76.4	50.9	46.5	46.9
EUROPE	Denmark	49.2	28.4	18.2	30.3	27.1	36.0	25.2
	Finland	38.4	35.5	41.0	19.0	44.9	46.2	50.7
	France	46.8	52.0	53.0	57.9	67.2	66.8	67.9
	Germany	54.0	56.8	65.5	52.6	76.6	73.2	69.2
	Ireland	52.1	32.6	29.9	19.1	43.3	38.9	24.5
	Italy	58.0	57.7	75.7	16.2	26.7	61.3	41.4
	Luxembourg	54.7	58.2	57.2	56.5	56.2	42.2	45.2
	Netherlands	45.0	40.8	56.5	56.0	76.2	60.0	52.8
	Norway	45.1	30.6	18.2	24.8	28.8	53.2	20.4
	Poland	0.0	0.0	0.0	48.8	44.1	0.0	40.2
	Spain	91.7	87.8	47.5	61.0	72.0	60.0	67.4
	Sweden	31.4	23.4	19.9	20.5	41.4	33.0	38.0
	Switzerland	32.7	42.9	11.9	25.6	9.1	62.1	64.7
EMERGING MARKET ECONOMIES	Brazil	77.9	87.8	83.1	83.7	99.7	100.0	99.3
	Chile	0.0	100.0	0.0	97.2	50.9	71.9	58.3
	China	0.0	55.3	0.0	6.6	72.1	77.3	42.3
	Hong Kong SAR	40.3	27.2	45.7	63.3	69.9	79.7	61.3
	Indonesia	0.0	98.3	0.0	100.0	49.9	87.1	68.5
	Korea	65.3	79.2	42.7	54.5	79.3	74.7	71.4
	Mexico	71.1	74.9	72.9	59.1	57.8	60.3	58.4
	Saudi Arabia	0.0	0.0	0.0	0.0	0.0	99.0	98.3
	Singapore	66.3	57.0	33.1	53.7	69.1	73.6	74.6
	Türkiye	49.8	53.0	0.0	66.2	85.3	93.7	84.6
	United Arab Emirates	0.0	100.0	41.1	73.3	70.9	84.2	80.5
	AVERAGE	**42.9**	**50.0**	**33.6**	**49.9**	**55.1**	**63.0**	**57.2**

Notes: This table shows, for selected years, the end-of-year (fourth quarter) shares of the gross issuances of IDS by issuers (on a residence basis) from selected countries that are denominated in US dollars. The share in total of all currencies is calculated by excluding euro-denominated securities issued within the euro area by euro area nationality issuers. The averages shown in the last row are unweighted cross-country averages for the countries shown in this table (which collectively account for the vast majority of gross issuances of IDS). The zeros shown in this table are actual zeros (no recorded issuance in a particular quarter by issuers with nationality of the relevant country) rather than missing data. Annual data would have fewer zeros, but we show quarterly data because that is the data frequency used in much of our analysis. For example, on a residency basis, the data set records dollar-denominated new issuances by Chinese issuers in 2000 only in the second and third quarters and in 2008 only in the first three quarters.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Currency composition of gross issuances of IDS by country: shares of euro-denominated IDS

In per cent

Table A.3

REGION	COUNTRY	2000	2004	2008	2012	2016	2020	2024
ADVANCED ECONOMIES (NON-EU)	Australia	8.2	21.1	22.0	15.1	10.2	11.9	17.0
	Canada	11.3	9.5	24.8	0.3	17.2	15.4	28.2
	Japan	6.4	16.6	11.4	0.1	5.1	11.6	8.4
	United Kingdom	29.6	46.7	43.1	35.6	30.4	26.0	32.3
	United States	18.4	27.9	26.9	8.4	39.1	44.5	39.2
EUROPE	Denmark	29.6	42.3	60.8	47.0	52.0	58.4	68.0
	Finland	32.1	47.7	12.9	20.9	0.0	4.7	1.9
	France	2.8	4.7	4.2	0.1	1.7	1.9	2.5
	Germany	2.4	5.0	2.8	1.9	0.9	2.5	4.3
	Ireland	15.4	30.5	34.7	44.4	31.2	47.7	56.2
	Italy	7.4	1.0	0.1	0.0	48.7	28.7	48.5
	Luxembourg	4.4	8.0	14.0	17.0	26.2	34.3	32.0
	Netherlands	15.4	27.9	15.8	9.4	6.9	18.7	22.7
	Norway	24.5	28.6	49.5	45.9	47.3	33.0	54.3
	Poland	100.0	0.0	0.0	30.6	44.5	91.7	49.9
	Spain	0.0	0.0	0.0	0.0	12.7	7.6	5.0
	Sweden	29.2	51.3	54.3	44.3	36.1	41.4	44.3
	Switzerland	47.1	41.0	35.9	29.5	49.3	31.1	35.3
EMERGING MARKET ECONOMIES	Brazil	15.6	12.2	4.3	8.5	0.0	0.0	0.0
	Chile	0.0	0.0	0.0	0.0	38.1	17.9	34.8
	China	0.0	44.7	0.0	0.0	11.5	13.4	1.0
	Hong Kong SAR	4.4	1.0	0.1	4.8	2.5	2.4	3.3
	Indonesia	0.0	0.0	0.0	0.0	34.2	8.3	7.9
	Korea	10.3	6.8	26.1	3.1	2.9	11.9	3.7
	Mexico	16.1	0.2	0.0	15.7	33.3	6.5	16.7
	Saudi Arabia	0.0	0.0	0.0	0.0	0.0	1.0	0.2
	Singapore	11.0	9.7	6.0	1.7	4.6	5.0	3.9
	Türkiye	34.4	47.0	0.0	5.9	12.6	0.0	11.9
	United Arab Emirates			18.9	9.0	12.3	1.2	3.0
	AVERAGE	**17.0**	**19.0**	**16.2**	**13.8**	**21.1**	**20.0**	**21.9**

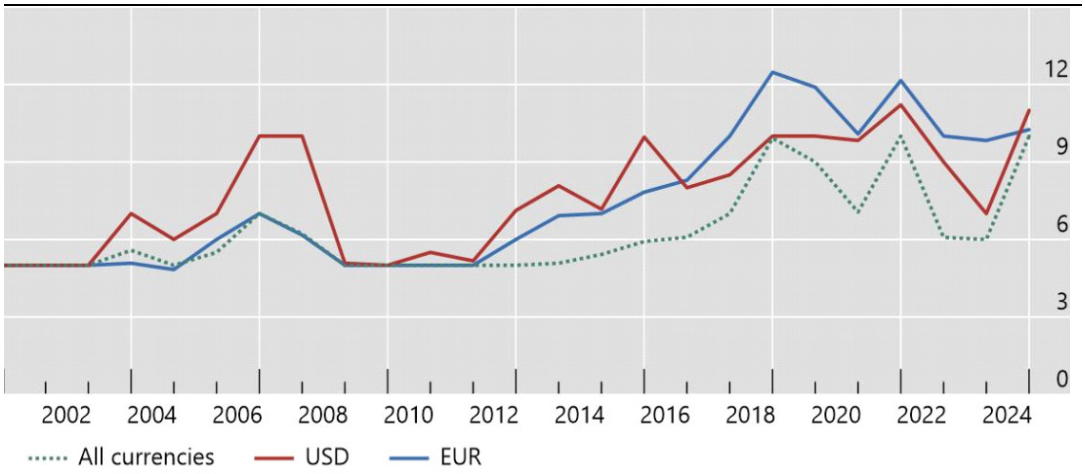
Notes: This table shows, for selected years, the end-of-year (fourth quarter) shares of the gross issuances of IDS by issuers (on a residence basis) from selected countries that are denominated in euros. The share in total of all currencies is calculated by excluding euro-denominated securities issued within the euro area by euro area nationality issuers. The averages shown in the last row are unweighted cross-country averages for the countries shown in this table (which collectively account for the vast majority of gross issuances of IDS). The zeros shown in this table are actual zeros (no recorded issuance in a particular quarter by issuers with nationality of the relevant country) rather than missing data. Annual data would have fewer zeros, but we show quarterly data because that is the data frequency used in much of our analysis.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Evolution of median maturities for gross issuances of IDS

In years

Graph A.1



Notes: This graph shows the median maturities of yearly new IDS issuances (bonds and medium-term notes). The green dotted line represents all new issuances, while the red and blue lines represent new issuances denominated in dollars and euros, respectively. These calculations exclude euro-denominated securities issued within the euro area by euro area nationality issuers.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

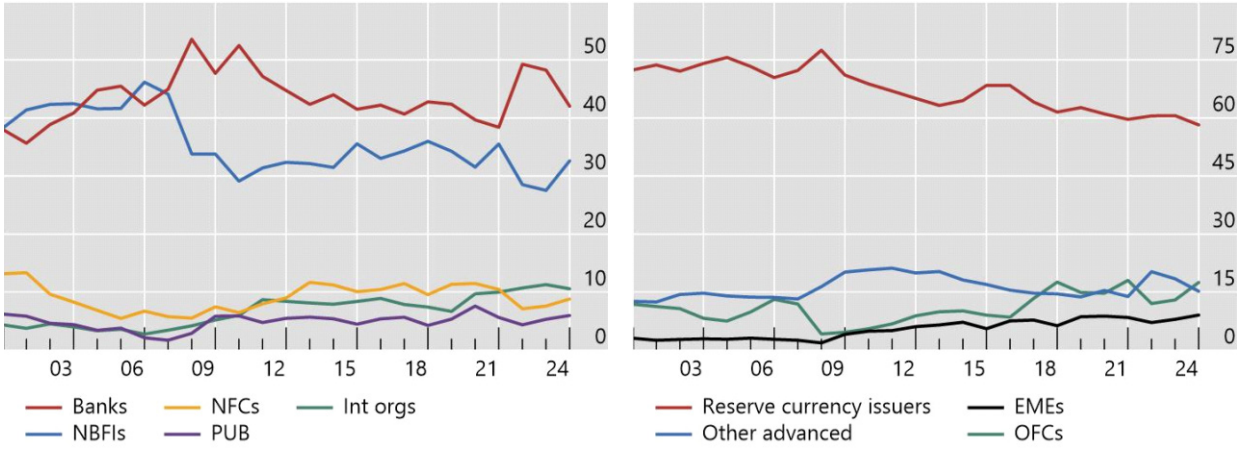
Gross issuances of IDS: by sector and country group[1]

In per cent of total

Graph A.2

A. By immediate business sector of issuers

B. By region



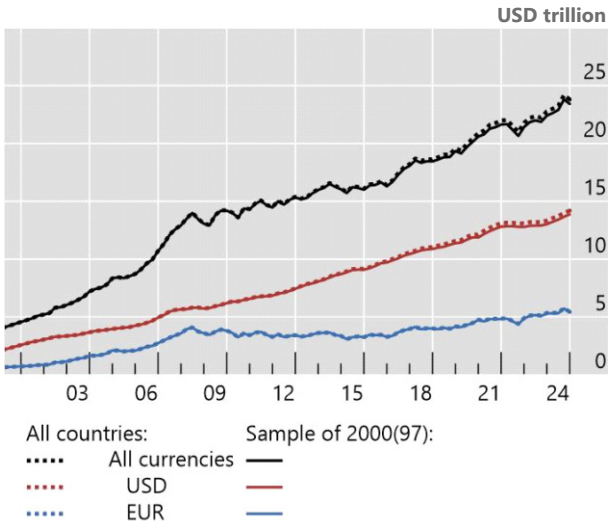
Notes: This graph shows the shares of gross issuances of IDS broken down by the sector (panel A) and country group (panel B) to which issuers belong. NFCs = non-financial corporations; Int orgs = international organisations; NBFIs = non-bank financial institutions; PUB = public sector; EMEs = emerging market economies; OFCs = offshore financial centres. The country groups are listed in the Appendix, Table A.1. IDS issued within the euro area by euro area nationality issuers are excluded from the calculations.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics, authors' calculations.

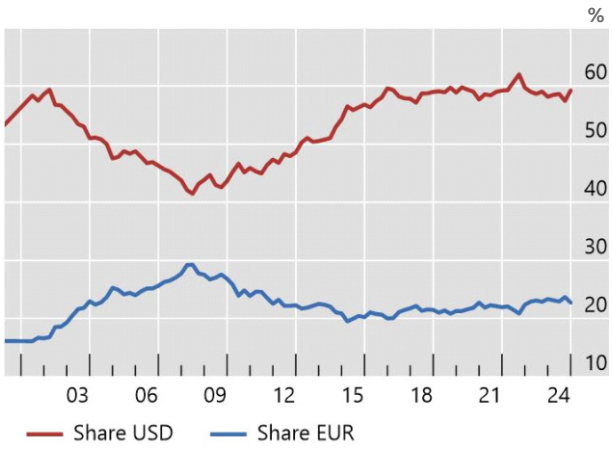
IDS stocks and gross issuances with fixed sample of countries

Graph A.3

A. Outstanding amount



B. Currency share



Notes: This graph shows the total amounts of IDS stocks outstanding and the shares of the US dollar and the euro in those stocks when we restrict the sample to the 97 countries that appear in our data set (with non-zero outstanding amounts) in 2000, the first year of our baseline sample. The dotted lines in panel A show the respective totals for all countries in each period (varying sample), while solid lines in both panels are for the fixed sample (restricted to the initial 97 countries). The data exclude intra-euro area euro issuances by euro area nationalities.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Summary statistics for outstanding stocks of international debt securities

(with intra euro area issuance included) Table A.4

	Q1 2000	Q1 2008	Q1 2016	Q4 2024
Number of countries (residence)	97	115	130	138
Number of countries (nationality)	101	115	131	137
Number of issuers	6,681	11,990	14,200	19,664
Number of individual securities	23,867	66,883	66,166	107,506
Total outstanding ($ billion)	4,775	19,416	21,447	29,667
Summary statistics by currency				
USD: Number of issuers	3,712	5,716	7,674	11,477
Number of securities	8,331	19,059	26,600	51,185
Total outstanding ($ billion)	2,177	5,698	9,304	14,197
Euro: Number of issuers	1,055	5,412	5,272	6,581
Number of securities	2,852	28,957	22,337	35,382
Total outstanding ($ billion)	655	9,629	8,419	11,290
Value of each issue (USD million)				
Mean	189	278	315	265
Median	97	90	112	76
Max	10,716	20,310	20,310	20,778
Value of each issue by currency (USD million)				
USD : Mean	253	283	341	265
Median	125	100	125	77
Max	10,716	20,310	20,310	20,310
EUR : Mean	218	324	370	311
Median	96	84	114	73
Max	7,588	12,365	17,761	20,778

Notes: This table presents summary statistics for our main analysis sample, including euro-denominated securities by euro area nationality issuers within euro area. The count of issuers and individual securities as well as mean, median and maximum exclude securities that have a face value of less than $25 million (securities below this threshold value normally account for less than 5% of the "Total outstanding" amounts shown in this table, which match those published on the BIS website). We exclude these low-value securities which, in most cases, represent small residual amounts that are carried through for extended periods in the original data set but have little material value or consequence. Face values of securities issued in currencies other than the US dollar are converted to US dollar equivalents using period end (quarterly) market exchange rates.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.

Summary statistics for gross issuances of international debt securities

(with intra euro area issuance included) Table A.5

	2000	2008	2016	2024
Number of countries (residence)	79	77	105	109
Number of countries (nationality)	77	80	101	107
Number of issuers	2,730	2,690	3,347	5,258
Number of individual securities	27,436	52,612	37,505	60,250
Total gross issuances ($ billion)	2,415	7,471	5,535	7,893
Summary statistics by currency				
USD: Number of issuers	1,399	1,257	1,892	3,075
Number of securities	9,994	15,096	14,883	25,903
Total gross issuance ($ billion)	1,044	1,929	2,796	3,518
Euro: Number of issuers	1,265	1,536	1,410	1,841
Number of securities	7,860	22,798	12,413	20,029
Total gross issuance ($ billion)	778	3,580	1,776	2,955
Values of new issuances ($ million)				
Mean	84	139	144	125
Median	30	45	50	42
Max	18,317	28,571	9,166	20,123
Values of new issuances by currency ($ million)				
USD : Mean	100	123	184	127
Median	35	40	50	40
Max	18,317	16,602	6,500	20,123
EUR : Mean	96	155	141	145
Median	37	52	45	43
Max	6,944	28,571	9,166	16,984
Maturity structure of new issuances (in years)				
Mean	8.4	9.0	10.3	14.3
Median	5.0	5.0	7.0	10.0
Maturity structure of new issuances by currency (in years)				
USD: Mean	7.0	9.2	11.6	14.8
Median	5.0	5.1	8.0	11.0
EUR: Mean	7.7	9.9	10.7	15.6
Median	5.0	5.1	8.0	10.0

Notes: This table presents summary statistics for gross issuances data, including euro-denominated securities by euro area nationality issuers within euro area. The count of issuers and individual securities as well as mean, median and maximum values exclude incremental additions of zero-coupon securities and those with face values below $10 million (securities below this low threshold value account for less than 5% of the "Total gross issuances" shown in this table, which match the numbers published on the BIS website). Face values of securities issued in currencies other than the US dollar are converted to US dollar equivalents using period average (quarterly) market exchange rates. Mean and median maturity statistics relate to bonds and medium-term notes. Securities with maturities exceeding 99 years are treated as having a maturity of 99 years.

Sources: Dealogic; Euroclear; LSEG; Xtrakter Ltd; BIS international debt securities statistics; authors' calculations.