

Cross-border liquidity flows – the role of the banking system in the German balance of payments

Germany is a large open economy in which a great many economic transactions are conducted with non-resident counterparties every day. These transactions are recorded in the balance of payments (b.o.p.). The bulk of them involve cross-border payment flows that are settled through the banking system and see liquidity being transferred from one country to another. Within the banking system, commercial banks and the central bank perform different, mutually supportive tasks. Viewed individually, transactions recorded in the b.o.p. can be traced back to specific decisions by the counterparties involved and come about for all kinds of reasons. Analysed as an aggregate, it is possible to identify domestic and external factors and conduct a systematic investigation into the main determinants of the direction and composition of net liquidity flows.

One major source of impetus for payment flows into and out of Germany since the turn of the millennium has been domestic and external economic activity. Another key factor was confidence or uncertainty in financial markets. And monetary policy, too, has left a lasting impression on the German banking system's cross-border liquidity flows that varied largely according to whether monetary policy in the euro area was generally tighter or looser than in other major currency areas.

The past two decades have also seen a change in how commercial and central banks settle cross-border capital flows and in the way they interact within the banking system. Those changes were reflected by the extent to which cross-border payments on aggregate were transacted primarily in the form of commercial banks' book money or as central bank money. The monetary policy measures in particular not only left their mark on the German banking system's other investment as a whole, but brought about a structural change as well in the resulting liquidity flows of the commercial banking system and the Bundesbank.

That holds true for the current phase of monetary policy tightening as well. It would be welcome if this phase also saw structural excess liquidity being scaled back to a point where the private interbank market can regain importance in the field of European payment transactions, thus enabling commercial banks to focus more strongly on their traditional task once again.

■ Introduction

Germany's high degree of interconnectedness with the global economy is reflected in a large number of cross-border transactions. These transactions come about whenever goods are imported or exported, with every trip abroad, or when non-resident securities are purchased. Being interconnected internationally has become second nature for people living, working and doing business in Germany and many other countries. How accustomed to this situation people have become is thrown into particularly sharp relief when disruptions hit cross-border production and trade relations, worldwide supply chains or global capital markets. The coronavirus pandemic and Russia's war of aggression against Ukraine are prime examples of this phenomenon. The global financial crisis and the sovereign debt crisis that followed in some euro area countries affected cross-border relationships between many countries worldwide in a different way altogether, yet with a similarly strong impact.

How have domestic and external developments affected Germany's cross-border transactions over the past two decades?

Crises like those mentioned above impact particularly strongly and visibly on cross-border economic activity. Yet even in the absence of extreme crisis-like episodes, there are a great many determinants and decisions by agents that drive activity. The b.o.p. systematically records all transactions between residents and non-residents over a specific period of time based on the double-entry accounting system.

How has the banking system ensured the necessary payments and the associated inflows and outflows of liquidity?

The banking system – in other words, domestic monetary financial institutions (MFIs) including the central bank – provides the necessary payment services for all cross-border transactions.¹ That is, it enables the corresponding inflows and outflows of liquidity associated with the cross-border transactions. A liquidity inflow into Germany comes about when transactions posted as counterpart entries under other investment cause an increase in the euro-denominated deposits of residents with the German banking system or in the euro currency held by residents. In a liquidity outflow, these

deposits decline or the euro currency holdings of residents decrease.²

This raises two questions. First, how have different domestic and external developments influenced Germany's cross-border transactions and thus the corresponding inflow and outflow of liquidity? And second, how has the banking system ensured the payments needed for this over the past two decades?

■ The role of MFIs in a balance sheet context

A glance at the individual accounts within the b.o.p. can give an impression of the sheer magnitude and variety of Germany's cross-border relationships.

Put simply, the current account shows transactions in the real economy, the financial account financial ones.³ Germany's current account last recorded a deficit in 2001 and has been generating surpluses – often very large ones by international standards – ever since. The current account surplus expressed relative to gross domestic product (GDP) reached its highest level to date in 2016, at 8.6%. The year 2022 saw the German current account surplus contract significantly, dropping to €162.3 billion, or 4.2% of nominal GDP, mainly on the back of rising prices for imported commodities and the associated deterioration in the terms of trade.

Germany's current account posted large surpluses ...

¹ In principle, residents can also hold an account with a non-resident bank, in which case it is possible for the payments associated with transactions to be settled outside the German banking system.

² The term "liquidity" is therefore used here not in the sense of the different monetary aggregates, such as M0, M1, M2 or M3, but with regard to the structure of the b.o.p.

³ The current account and the financial account are the two most important accounts within the b.o.p. in terms of magnitude. Another account is the capital account, the balance of which has varied between a surplus of €6 billion and a deficit of €19 billion over the past 20 years. And then there is the errors and omissions item, which is derived residually as the balance of transactions not included elsewhere.

The current account shows cross-border transactions in goods and services, amongst other items. It is also where cross-border primary and secondary income is recorded. Primary income includes compensation of employees or investment income, for example, and secondary income transfers between resident and non-resident households. Trade in goods and investment income stood out in recent years on account of their substantial contribution to the large surpluses recorded in the German current account.

... and the financial account high net capital exports

While there were surpluses in the current account, there were correspondingly high net capital exports in the financial account. This means that claims on non-residents rose more strongly than liabilities to non-residents. The surplus in the German financial account came to €227.7 billion in 2022. The financial account is divided into five subaccounts for each type of external claim or liability: direct investment, portfolio investment, financial derivatives, reserve assets, and other investment. The other investment account shows, in particular, changes in loans and trade credits (other than those included under direct investment) as well as in holdings of currency and deposits with banks. Hence, this account records the banking sector's cross-border payment services mentioned at the beginning of this article. In the b.o.p., all MFIs established in Germany belong to the banking sector, including the Bundesbank.⁴

Balance of payments shows all transactions with non-residents using the double-entry accounting system

MFIs play a special role on account of the payment services they provide. This role is visible in the b.o.p. because all transactions with non-residents are systematically recorded according to the double-entry accounting system. Each transaction is booked twice, no matter whether it is a transaction in the current account or a financial transaction in portfolio investment, say. An entry is made first for the original transaction (an export of goods by an enterprise, for example); then, a second entry – the counterpart entry to the export of the goods – documents the payment received for the delivered

Major items of the balance of payments – balances

€ billion

Item	2020	2021	2022
I. Current account	+ 240.2	+ 278.7	+ 162.3
1. Goods	+ 191.0	+ 194.4	+ 111.9
2. Services	+ 7.4	+ 4.8	- 30.8
of which:			
Travel	- 14.7	- 24.3	- 55.0
3. Primary income	+ 96.0	+ 138.5	+ 150.0
of which:			
Investment income	+ 94.2	+ 137.9	+ 152.9
4. Secondary income	- 54.2	- 59.0	- 68.8
II. Capital account	- 9.1	- 1.2	- 18.6
III. Financial account ¹	+ 191.5	+ 248.6	+ 227.7
1. Direct investment	- 4.9	+ 100.4	+ 125.3
2. Portfolio investment	+ 16.4	+ 203.5	+ 24.3
3. Financial derivatives ²	+ 94.6	+ 60.2	+ 42.7
4. Other investment ³	+ 85.4	- 147.4	+ 31.0
of which:			
Monetary financial institutions ⁴	+ 19.4	- 151.8	+ 11.4
5. Reserve assets	- 0.1	+ 31.9	+ 4.4
IV. Errors and omissions ⁵	- 39.6	- 29.0	+ 84.1

¹ Increase in net external position: + / decrease in net external position: -. ² Balance of transactions arising from options and financial futures contracts as well as employee stock options. ³ Includes, in particular, loans and trade credits as well as currency and deposits. ⁴ Including the Bundesbank. ⁵ Statistical errors and omissions resulting from the difference between the balance on the financial account and the balances on the current account and the capital account.

Deutsche Bundesbank

goods via the enterprise's account with a bank in Germany (see the box on pp. 36 f.). The banking system performs the payment services in this regard for all the remaining sectors, which include enterprises, households and government. Unlike private commercial banks, the Bundesbank – being a central bank with a statutory mandate – cannot normally be used directly by households and enterprises as a provider of cashless transaction services. Even so, their payment orders can also flow through the Bundesbank's accounts and end up producing balances there (see the box on pp. 48 ff.). Furthermore, the banking system engages in portfolio investment with non-resident counterparties for its own account or in direct investment in proprietary business, for which it performs the necessary payment services.

⁴ The net claims of the Bundesbank and of the other MFIs usually represent the largest items in the other investment account, though certain transactions by government or by enterprises and households are shown there as well.

How individual entries are recorded in the balance of payments and how balances come about in the banking system's other investment account

The balance of payments records all of a country's cross-border transactions in a specific period and is subdivided into the current account, the capital account, the financial account and a net errors and omissions item. Put simply, the current account records transactions that take place in the real economy. These include, for example, purchases of goods and services, but also investment income and wage payments. If someone living in Germany sells a product to someone resident abroad (export) or performs a service for a non-resident (income, e.g. for advisory services), this leads to an increase in the current account balance, all other things being equal. Conversely, the purchase of a good in another country (import) or the use of a service abroad (expenditure, say for accommodation abroad) would reduce the current account balance, all else being equal. For more than 20 years, Germany has consistently posted current account surpluses, mainly because of its export surplus in the goods trade.

The capital account shows free transfers of capital as well as trade in non-produced, non-financial assets, which include, amongst other things, carbon emissions allowances. In the past, the balances on the German capital account have mostly been comparatively low.

Financial transactions are recorded in the financial account. These include direct investment, which tends to have a more long-term focus and involves the investor acquiring a significant influence over management. Direct investment is distinct from portfolio investment. With portfolio investment, investors purchase foreign securities such as shares or debt securities, which they can usually sell again relatively quickly.¹

The third item in the financial account is other investment. The term may suggest otherwise,

but this balance of payments sub-account is actually very important. Amongst other things, it records all cross-border liquidity flows. This includes all bank transfers that economic agents make in order to pay for an imported product or to purchase a foreign security, for example.

The balance of payments captures transactions and consequently flows.² Financial account transactions always result in a resident acquiring or parting with a foreign asset, or a non-resident (e.g. a person or an enterprise domiciled outside Germany) acquiring or parting with a German asset. Each individual transaction increases or reduces Germany's international investment position. Germany's international investment position shows holdings; changes to them are, put simply, the result of balance of payments transactions.³ If the international investment position increases, there is a net capital export, which has a positive sign in the financial account. By

¹ If an investor purchases a block of foreign shares, it is not necessarily clear whether they are pursuing a long-term interest and wish to exert influence over the company's management or whether they merely wish to generate an appropriate return in line with their risk appetite. In the balance of payments statistics, any equity investment where a stake of 10% or more is acquired is recorded in full as direct investment. Smaller equity holdings are considered portfolio investment.

² The balance of payments statistics for Germany are compiled and published by the Bundesbank. For information on balance of payments statistics, see <https://www.bundesbank.de/en/statistics/external-sector/balance-of-payments/balance-of-payments-776588>

³ Moreover, the international investment position may vary due to valuation effects such as exchange rate or price movements. Data on German external assets are available in the international investment position, a statistic that is compiled and published by the Bundesbank. Information on the international investment position is available at <https://www.bundesbank.de/en/statistics/external-sector/international-investment-position-and-external-debt/international-investment-position-and-external-debt-865106>

contrast, a net capital import reduces the international investment position, all other things being equal, and is entered into the financial account with a negative sign.

Finally, the residual is a purely mathematical item that ensures that the balance of payments is always balanced. It captures the difference between the balance on the financial account and the balances on the current account and the capital account. It is also referred to as “net errors and omissions” and results from the fact that the balance of payments sub-accounts are compiled using different primary statistics, some of which employ different recording principles, and that some data are based on estimates (such as certain tourism services and cash transactions).

Direct barter transactions have virtually disappeared from the modern economy; instead money is used as the means of payment. As a consequence, almost every transaction with non-residents is reflected not only in the goods account, services account or in portfolio transactions, it is likewise recorded in the banking system’s other investment account.⁴ At the end of a given month or year, the balance of the banking system’s other investment account represents the difference between all incoming and outgoing cross-border payments during the period in question.

This can be illustrated using a simple example involving two stylised transactions. On 5 January of a given year, Ms Simon, who lives in Germany, buys a drill for €200 from an online retailer, which she immediately pays for by transferring the money to the French seller’s bank account. She thereupon receives the product. Ten days later – on 15 January – Mr Bäcker, who also lives in Germany, sells his Federal bonds at their market value of €1,000 to pay for a holiday on the Baltic Sea. A student living in Switzerland purchases the bonds as part of her old-age provision; the transaction is settled that same day. She transfers the money from her Swiss account to Mr Bäcker’s German account. If these two transactions were the only ones conducted with non-

Stylised balance of payments in January

€	
Balance of payments item	Entry
Current account	
Goods trade	
Import of a drill (5 January)	– 200
Current account balance	– 200
Financial account	
Portfolio investment	
Sale of Federal bonds (15 January)	– 1,000
Other investment	
Outgoing payment (5 January)	– 200
Incoming payment (15 January)	+ 1,000
Total January	+ 800
Financial account balance	– 200
Deutsche Bundesbank	

residents in January, Germany’s balance of payments for January would be as shown in the stylised account above.

In the example, the current account for January has a deficit of €200. The financial account has a deficit in the same amount. Within the financial account, there was also a shift between portfolio investment and other investment: in portfolio investment, external liabilities increased by €1,000 (as a Swiss student purchased German Federal bonds from a resident of Germany). However, in other investment, incoming payments exceeded outgoing payments and resulted in a liquidity inflow of €800, i.e. a net capital export. As a result, banks’ net external position in other investment increased. Payments are generally made via accounts held with commercial banks.

⁴ In the balance of payments, the banking system is referred to as monetary financial institutions, one of which is the Bundesbank.

MFIs enable cross-border payments with corresponding liquidity inflows and outflows

MFIs including the Bundesbank, then, settle the payments associated with cross-border transactions and record the corresponding inflows and outflows of liquidity. If, for example, goods or services are exported (imported), there is a cross-border inflow (outflow) of liquidity via the banking system's accounts. A liquidity inflow is also generated when capital is imported, which happens when domestic shares or bonds are sold to non-residents, for example. The opposite, an outflow of liquidity, happens when resident investors purchase securities from abroad, say. Inflows and outflows of liquidity drive changes in the net external position of MFIs including the Bundesbank in the other investment account. Viewed from a German perspective, these changes reflect all the cross-border transactions that are paid for using commercial banks' book money or central bank money.

Developments in b.o.p. transactions and cross-border liquidity flows

Cross-border liquidity flows can be investigated in greater detail by presenting the b.o.p. differently.⁵ Viewing the b.o.p. from a different perspective can contribute to better understanding the transmission of external and internal events to the German economy as well as the role played by the banking system in cross-border payments. That includes the transmission channels of European monetary policy as well.

b.o.p. balances can be presented in a way that shows direction of liquidity flows

The b.o.p. balances are presented in a way that visualises the direction of the liquidity flow associated with them (see the chart on p. 39).⁶ Current account surpluses⁷ and net capital imports (other than the banking sector's other investment) are shown as areas stacked upwards. All other things being equal, these are associated with flows of liquidity into the German banking system – for example, resulting from an export surplus in goods trading, the net sale of German debt securities to non-residents (in-

crease in external liabilities) or the cross-border sale of previously acquired non-resident securities (decline in external claims). By contrast, net capital exports (other than the banking system's other investment) resulting, for example, from a net acquisition of non-resident mutual fund shares (increase in external claims) or a repurchase of non-resident-owned Federal bonds (decline in external liabilities) lead to flows of liquidity out of the German banking system. These are therefore presented as areas stacked downwards.⁸ The balance of all these transactions is plotted as a line and corresponds – depending on the sign – to the banking system's net capital exports or imports in the other investment account.⁹

The past two decades have seen the b.o.p. balances go through different phases. Some spells were characterised by stronger liquidity inflows, others by increased liquidity outflows via the accounts of MFIs including the Bundesbank.

Phases of liquidity inflows and outflows via the banking system

Portfolio investment, which responds particularly quickly to changes in the financial environment, played a particularly important role in each of these swings. The balances of other accounts, such as the German current account or direct investment, were less volatile.

Portfolio investment responds to changes relatively quickly

The global financial crisis and the sovereign debt crisis in some euro area countries impacted significantly on the German banking system's other investment, with each triggering swings in liquidity flows.

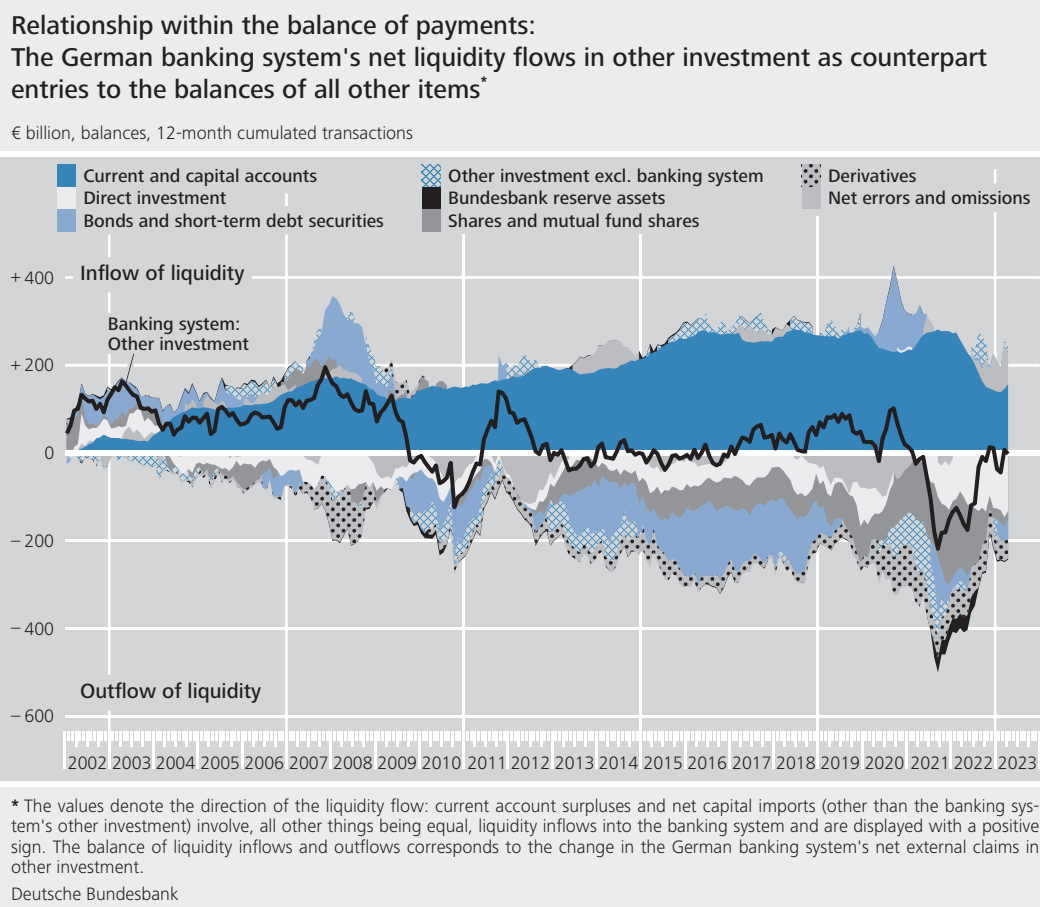
⁵ See Picón Aguilar et al. (2020) and Duc et al. (2008).

⁶ The balance of payments data are displayed as 12-month cumulated transactions, which makes it possible to smooth the otherwise very volatile capital flows for the reader and illustrate developments with greater clarity. This approach is quite common when presenting capital flows. See, for example, Deutsche Bundesbank (2020). The European Central Bank (ECB) also uses this presentation method for its press releases on the euro area balance of payments.

⁷ Balances in the capital account are included here.

⁸ A current account deficit, too, would be presented as an area stacked downwards because it represents an outflow of liquidity.

⁹ Transaction-related changes in reserve assets and the residual net errors and omissions item likewise belong to the counterpart entries of the banking system's transactions in the other investment account.



Global financial crisis and sovereign debt crisis led to swings in liquidity flows in some euro area countries

With the onset of the financial crisis, liquidity inflows shrank noticeably to begin with, before giving way to strong liquidity outflows, leaving the banking system's other investment account recording net capital imports. This mainly came about due to significant changes in portfolio investment – up until the onset of the global financial crisis, German securities had been highly sought after by non-residents. The global financial crisis then saw Germany's cross-border portfolio investment flows go into reverse. Above all, non-resident investors invested less in Germany or scaled back their exposure to it, resulting in net capital exports in portfolio investment.

In some euro area countries, the economic crisis sparked by the financial crisis gave way to a sovereign debt crisis, which saw capital flows change direction yet again. From the beginning of 2011, the German banking system once again registered net inflows of liquidity because German securities, especially public bonds,

were in demand as safe haven assets. In the second half of 2012, financial markets regained confidence that the worst of the crisis was over. The German banking system's liquidity inflows and outflows began to balance out again in the subsequent period.

The ECB Governing Council decided in January 2015 to implement the expanded asset purchase programme (APP) as a way of supporting inflation dynamics and responding to heightened risks of a too prolonged period of low inflation. The chief component was the programme dedicated to purchases of bonds issued by euro area central governments, agencies and European institutions (public sector purchase programme (PSPP)).¹⁰ Being part of the Eurosystem, the Bundesbank began pur-

Impact of Eurosystem purchase programmes evident as of 2015

¹⁰ See European Central Bank (2015). Under the APP, the Eurosystem continued to implement the covered bond purchase programme (CBPP3) and the asset-backed securities purchase programme (ABSPP) adopted in September 2014, subject to the same conditions.

chasing bonds issued by eligible German issuers, such as Federal bonds, in the secondary market as of March 2015. A very large proportion of these assets were in non-resident ownership. As a result of the repurchase of German securities from non-residents (net capital exports in portfolio investment), liquidity flowed out of Germany, all other things being equal, and the banking system recorded the corresponding net capital imports in the other investment account. These liquidity outflows subsided for a time in 2019 after net asset purchases under the APP were discontinued for a few months at the end of 2018.

Significant outflows between autumn 2020 and summer 2022

Marked outflows of liquidity then took place through the banking system's accounts between autumn 2020 and summer 2022. Unlike at the onset of the financial crisis, the liquidity outflows this time were not associated primarily with net capital exports related to bonds, but also to shares and mutual fund shares in particular. Liquidity inflows via the banking system then began to pick up again from the summer of 2022 against the backdrop of the ECB Governing Council's decision to tighten monetary policy.

The impact of economic activity, uncertainty and monetary policy on German transactions with non-residents

Three key factors driving cross-border transactions examined in greater detail:

The net liquidity inflows into and net liquidity outflows out of Germany via the banking system, as described above, are the net outcome of the many and varied cross-border transactions recorded in the b.o.p. as a whole. Because the types of transactions vary widely, they also end up being influenced by a great many factors, though certain systematic determinants can nonetheless be identified. Three key determinants and their impact on cross-border transactions are investigated in greater detail in the following (see the box on pp. 43 ff.).

One important driver of cross-border economic activity is economic developments – specifically, how those abroad compare with those in Germany. If, for example, the economy is running better abroad than it is in Germany, demand for German products is likely to rise. Goods exports abroad would increase at a brisker pace than goods imports, making it more likely that current account surpluses will be recorded. All other things being equal, these would involve liquidity inflows via the German banking system.

Economic activity: impact of economic developments abroad compared with those in Germany

Another factor that has a bearing on cross-border investment decisions is sentiment in financial markets. Cross-border investors consider not just the prospect of generating returns, but also the risk inherent in their investments in their decision-making processes. When markets are calm, investors are generally more willing to tolerate higher risks because it means they stand to achieve a higher return. In times of heightened uncertainty, however, investors often seek out safe havens in order to hedge against abrupt asset losses.¹¹ At the global level, the sheer size of the US economy and the special role the US dollar plays as a key global reserve currency make the United States the most important safe haven for capital in times of crisis.¹² At the regional level, Germany, being the euro area's largest Member State, has a similar status, especially within the monetary union. Depending on where and with what magnitude potential disruptions play out, crisis episodes are therefore likely to be characterised by safe haven flows into the United States or into Germany as well. If a global crisis sees demand focus mainly on US securities, liquidity will flow out of the German banking

Uncertainty: impact of sentiment in financial markets

¹¹ Such episodes will impact on the b.o.p. over the span of several months. The capital flows recorded here respond over a longer horizon. In capital markets, by contrast, safe haven events are often identified on the basis of short-term price movements, which can build up and decline again within the space of days.

¹² In a situation when uncertainty surges, like it did during the global financial crisis, responses in the opposite direction are possible as well: investors are forced to offload their comparatively safe investments despite the increased uncertainty because they need to generate liquidity.

system. Where investors wishing to hold euro-denominated instruments are aiming first and foremost to shield their assets from critical developments elsewhere in the euro area, they focus their interest primarily on German government debt securities denominated in euro – which means that liquidity flows into the German banking system. If the situation eases again later, those movements will begin to go into reverse.¹³

Monetary policy: impact on demand for securities and other channels

Monetary policy is another determinant of cross-border transactions. If, for instance, monetary policy is tighter in the euro area than in other parts of the world, this will generally lead to changes in interest rates that give euro-denominated paper an edge over securities denominated in different currencies.¹⁴ The likely outcome of this is brisker demand for debt securities from Germany and other euro area countries. In that kind of situation, the German banking system would generally see inflows of liquidity from (non-euro) non-residents, and hence, all other things being equal, an increase in its net external claims. Monetary policy can impact on cross-border transactions through other channels as well, like via their effects on the exchange rate, asset prices or cross-border lending.¹⁵

Systematic analysis of different developments within and outside Germany

The three factors mentioned above – economic activity, uncertainty and monetary policy – set important framework conditions for agents operating internationally. In terms of their effect on cross-border transactions, it is always important to look at how these factors develop within Germany compared with outside Germany. But what systematic impact have changes in these determinants had on transactions in the German b.o.p. over the past two decades? And how did they ultimately affect the cross-border liquidity flows of the German banking system? These questions are systematically explored using Bundesbank estimations based on a Bayesian vector autoregressive (BVAR) model.

The analysis examines how exogenous changes in the aforementioned factors – economic activity, uncertainty and monetary policy – affected the cross-border net liquidity flows of the German banking system. The BVAR model allows us to quantify what shares of the fluctuations in liquidity flows can be attributed to these three stimuli.

Economic activity, uncertainty and monetary policy provide different stimuli

The BVAR model estimations underscore how important the impact of economic activity in Germany relative to other countries is for Germany's cross-border transactions. The historical decomposition indicates that foreign demand for German goods and services still tended to support German banks' net claims and send liquidity flows their way at the start of the global financial crisis. During the sovereign debt crisis in some euro area countries, however, economic activity went into steep decline, especially in the key European partner countries. During this period, economic activity thus also contributed to the considerable liquidity outflows from the German banking system.

Historical decomposition shows effect on cross-border net liquidity flows of German banking system ...

... of economic developments ...

Starting in February 2022, Russia's war of aggression against Ukraine placed a considerable strain on economic activity in Germany. At the same time, Germany's terms of trade deteriorated significantly owing to surging commodity prices. Together, these two factors led to a drastic reduction in Germany's current account surplus and thus – taken in isolation – to corresponding lower liquidity inflows.

Changes in uncertainty likewise explain a large share of the variation in liquidity flows. In the model, the "safety" motive for investment is characterised by international investors' willingness to accept yield discounts when buying assets. In the early 2000s, German bonds, es-

... of uncertainty and safe haven flows ...

¹³ See Deutsche Bundesbank (2020).

¹⁴ While it is true that an unexpected tightening of monetary policy will also involve price losses, these will only impact directly on existing stocks of securities. Later transactions will be traded at the then-prevailing level of interest rates.

¹⁵ See also Deutsche Bundesbank (2022a) and European Central Bank (2021a).

pecially, benefited from their status as comparatively safe assets. This changed during the course of 2008, when the financial crisis which had originally been confined to the United States spread to other countries and hit the advanced economies in particular. The global nature of these distortions increasingly steered global capital flows into the United States, which was still regarded as a particularly safe haven, even though the crisis had originated there. The German banking system's net claims in the other investment account subsequently declined and, ultimately, liquidity outflows in fact predominated.

At the height of the sovereign debt crisis in some euro area countries (2011 to mid-2012), another influx of safe haven flows into the German banking system was observed, mainly from other euro area countries. These receded as confidence in the cohesion of European monetary union grew again in the second half of 2012.

The outbreak of the coronavirus pandemic in early 2020 posed a new global challenge for the world economy. The pandemic not only led to a historic slump in economic activity, but also sent uncertainty about future economic developments skyrocketing. Once again, the United States emerged as the key haven for international capital flows in times of crisis. In Germany, this was initially accompanied by stress-induced liquidity outflows. As financial market tensions subsequently eased, this effect was reversed and Germany saw net capital imports in portfolio investment. Conversely, these led to higher net capital exports in other investment in the German banking sector.¹⁶

The Russian war of aggression launched against Ukraine in February 2022 marks a particular turning point in Germany's external relations and likewise sparked a rapid rise in uncertainty. This led to increased demand for US securities around the world. These safe haven flows can be identified in the model, as was the case during the global financial crisis and at the start of

the coronavirus pandemic, by risk-induced outflows of liquidity from the German banking system.

Monetary policy in the euro area and other parts of the world had strongly varying effects on transactions in the German b.o.p. over the period under analysis. At the beginning of monetary union and also during the global financial crisis up until the sovereign debt crisis in some euro area countries in 2010, the model classifies the monetary policy of the Eurosystem as fairly restrictive compared with monetary policy in other countries. From the start of 2010 to early 2011, the model then identifies a significantly expansionary impulse in the Eurosystem's monetary policy compared with that of other countries, combined with large net outflows of liquidity from Germany.

After that, up to the end of 2020, European monetary policy had sometimes contractionary and sometimes expansionary effects on the cross-border liquidity flows of the German banking system. The Eurosystem's asset purchase programmes played an important role in euro area monetary policy from the end of 2014 to mid-2022. However, given that the major world economies had similar monetary policy measures in place during this period, in the model they displayed no pronounced monetary policy impact on the net capital exports of the German banking system in other investment overall in many years.¹⁷ That said, they most likely had a significant impact within the banking system, which can be seen in the cross-border transactions of commercial banks on the one hand and of the Bundesbank on the other (see the box on pp. 48 ff.).

In 2020, too, during the coronavirus pandemic, the Eurosystem's expansionary monetary policy

... and of monetary policy in the euro area and other parts of the world

¹⁶ The outbreak of the coronavirus pandemic in March and April 2020 sent stock markets around the world into a brief slump, but sentiment in financial markets quickly recovered, and at the end of 2020 global stock market prices were already higher than in the previous year in some cases.

¹⁷ See also Deutsche Bundesbank (2017a).

The determinants of cross-border liquidity flows through the banking system

This box takes a closer look at the cross-border transactions of the monetary financial institutions established in Germany, including the Bundesbank, recorded as other investment in the balance of payments (b.o.p.). The changes in their net external claims in the other investment account reflect all cross-border transactions that are paid for using commercial banks' book money or central bank money. They correspond to the cross-border liquidity flows of the banking system. Within the b.o.p., the German banking system's liquidity flows in the other investment account are counterpart entries to the transactions made by enterprises, households and government, but also to the transactions made by the banking system for its own account in portfolio investment and direct investment.¹ The banking system is responsible for the associated payments and records the corresponding inflows and outflows of liquidity when, for example, goods and services are exported or imported or capital is imported or exported. These relationships are registered in the b.o.p. using the double-entry accounting system. In net terms, changes in the banking system's net claims in the other investment account constitute the balance sheet counterpart entries to all other transactions.² Net capital exports (net capital imports) in the banking system's other investment account are accompanied by liquidity inflows (liquidity outflows).

The transactions of all economic agents – and thus also those of the banking system – are influenced by factors such as economic activity, uncertainty in financial markets, and monetary policy. In terms of cross-border transactions, it is always important to look at how these factors develop within Germany compared with abroad. A model is used to estimate the impact of domestic

and external economic developments, uncertainty in global financial markets, and monetary policy in major currency areas on German cross-border payments over the past two decades.

Model specification, data and identifying shocks³

The impact of the above-mentioned determinants on changes in the banking system's net claims in the other investment account is estimated using a Bayesian vector autoregressive (BVAR) model. All data are incorporated as month-on-month changes for $n=4$ variables:

1. The net claims of the banking system in the other investment account, as they appear in the b.o.p. statistics (*bank_oth*, in € billion).
2. The yield spread between international and German government bonds (*yield_spread_wd*, in percentage points).⁴
3. The non-dimensional index of business confidence provided by the OECD as a measure of cyclical factors.⁵ The variable

¹ Transaction-related changes in reserve assets and the residual net errors and omissions item likewise belong to these counterpart entries.

² At the euro area level, these relationships are reflected in the monetary presentation of the b.o.p. See Picón Aguilar et al. (2020) and Duc et al. (2008).

³ Econometricians generally refer to shocks rather than impulses. In contrast to the main article, the technical specifications presented in this box therefore use the term "shock".

⁴ Yields are derived from the corresponding Bloomberg indices for global and German government bonds across all maturities (Bloomberg Global Aggregate – Government EUR and Bloomberg Euro Aggregate: Germany – Government EUR). Since the index values reflect the price developments of the underlying securities, the BVAR model uses logarithms of the original values with the sign reversed.

⁵ OECD business confidence index.

Sign restrictions for the assumed impact of shocks on the variables observed^o

Variable	Shock		
	Economic activity (better abroad)	Uncertainty (stronger increase abroad)	Monetary policy (more accommodative abroad)
Changes in the banking sector's net claims in other investment (<i>bank_oth</i>)	+	+	+
Change in the yield spread between international and German government bonds (<i>yield_spread_wd</i>)	+	+	-
Change in the OECD's business confidence index (difference between OECD countries as a whole and Germany) (<i>cycle_spread_wd</i>)	+	-	+
Change in a (hypothetical) nominal effective exchange rate for Germany vis-à-vis 60 countries (<i>newk</i>)	*	+	+

^o A +/- denotes a restriction that triggers a positive/negative response by the variables to the respective shock. An * indicates that no restriction was imposed on the variables' response to the respective shock.

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corresponds to the difference between the OECD-wide aggregate, supplemented by six non-OECD members, and the values for Germany; the index is entered in logarithms (*cycle_spread_wd*).

- The index of a hypothetical nominal effective exchange rate for Germany vis-à-vis 60 countries (*newk*), expressed in logarithms.⁶

All variables are adjusted for their long-term sample mean. The estimation period runs from January 2001 to April 2023, with the inclusion of time lags shortening the effective estimation period.⁷ In total, 12 lags and thus a whole year of back data are included.⁸ The estimated reduced form model is represented as:

$$y_t = \sum_{i=1}^{12} A_i y_{t-i} + \epsilon_t$$

Here, $y_t = (y_{1,t}, y_{2,t}, \dots, y_{n,t})$ denotes an $n \times 1$ vector of the observations described above at time t , A_i the $n \times n$ coefficient matrices of the observations (months) lagged by i units, and ϵ_t an $n \times 1$ vector of residuals that follows a multivariate normal distribution ($\epsilon_t \sim N(0, \Sigma)$).⁹

In the reduced form of a VAR model presented above, information about the structural relationships between the variables is lost. The aim of the analysis is to disclose how disturbances in the equilibrium, or shocks, affect individual variables in the system. To this end, shocks that can be interpreted economically need to be identified. In the model presented here, these shocks

⁶ Geometrically weighted hypothetical index of bilateral nominal external values, calculated from the monthly exchange rate averages vis-à-vis 60 countries. The euro area countries are also included in the weighting. The index thus takes account of the fact that there are no exchange rate movements vis-à-vis some of the partner countries that are important for Germany's b.o.p. transactions. The weighting scheme and country group correspond to those used for the corresponding indicator of price competitiveness based on consumer price indices. See Deutsche Bundesbank, Statistical Series – Exchange rate statistics, Explanatory notes (www.bundesbank.de).

⁷ The data used cover the period from December 2000 to April 2023.

⁸ The ECB's BEAR toolbox version 5.0 with a Minnesota prior is used for the estimation. The Minnesota prior makes assumptions for the statistical properties of the variables and in this way reduces the number of parameters to be estimated. The estimate is based on the recommended standard specification: autoregressive coefficient: 0.8; overall tightness: 0.1; cross-variable weighting: 0.5; lag decay: 1; total number of iterations: 2,000, burn-in iterations: 1,000. The time series of all variables are adjusted for the long-term sample mean, which is why estimations are made without a constant.

⁹ $\Sigma = E(\epsilon_t, \epsilon_t')$ denotes the positively defined variance-covariance matrix of the residuals.

are identified using sign restrictions. The sign restrictions correspond to prior ideas from economic theory. They specify the qualitative impact of certain shocks on the individual system variables without defining their quantitative significance. The sign restrictions are imposed here in such a way that they only have to be satisfied at the same time for the corresponding variables when the economically predefined shock occurs. Each shock has an individual prior pattern. Shocks can therefore be clearly distinguished from each other. They are identified. What all shocks have in common is that they lead to an increase in the banking system's net external claims. The respective restrictions for the individual economically interpretable shocks are shown in the table on p. 44. The assumed shocks are defined below.

A closer look at each of the shocks

Economic activity: If the economy is running better abroad than it is in Germany, this tends to increase the German current account surplus owing to demand. All other things being equal, the transactions result in higher net external claims for banks established in Germany. If the economy is running better abroad relative to Germany, yields abroad rise more strongly than those in Germany. The same is true of the business confidence measured by the OECD. No assumptions are made regarding the exchange rate.

Uncertainty: If there is a stronger increase in uncertainty abroad than in Germany, foreign investors' demand for Bunds grows.¹⁰ If these securities were previously held by residents, this results in liquidity inflows and thus net capital exports in banks' other investment. In particular, higher uncertainty regarding developments in other European countries can lead to higher demand for German government debt securities. According to theory, the assumed greater un-

certainty in markets outside Germany and the liquidity inflows to Germany lead to an increase in the yield spread between foreign and German bonds. In view of the heightened uncertainty felt abroad, theory predicts that business confidence should decline relative to Germany. From a German perspective, the nominal effective exchange rate should tend to rise as a result of an uncertainty shock. By contrast, in the event of global disruptions, international capital flows – including those out of Germany – go mainly into the United States. In this case, the other model variables are also likely to respond in the opposite way to what can be expected for safe haven flows that go primarily into Germany.

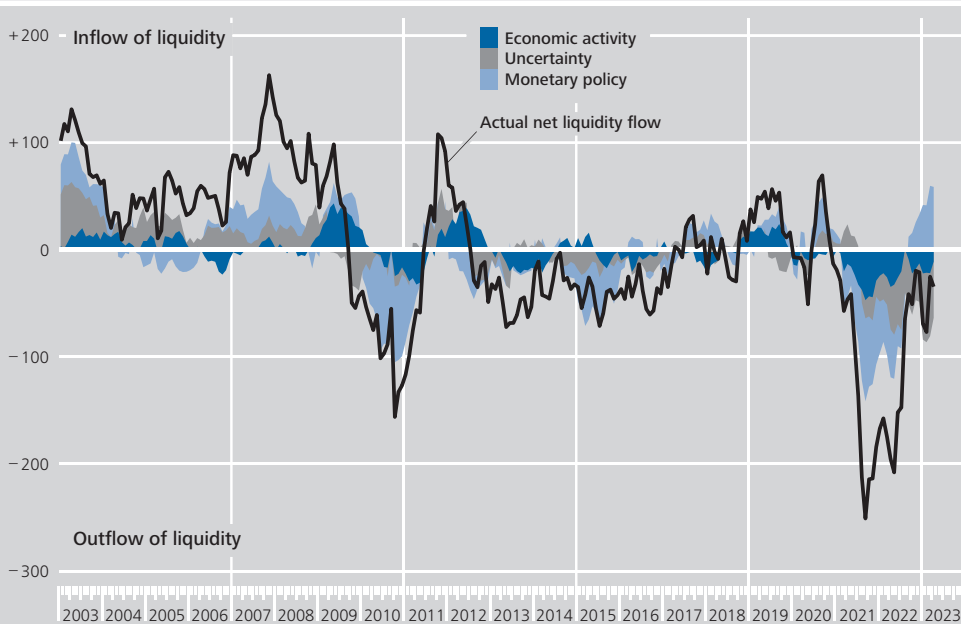
Monetary policy: A relatively contractionary monetary policy in the euro area, relative to monetary policy in countries outside the euro area, leads to above average interest rate hikes in the euro area and to stronger demand for debt securities from Germany and other euro area countries. The German banking system therefore sees liquidity inflows from abroad, which, all else being equal, increase its net external claims. Viewed in isolation, tighter monetary policy in the Eurosystem would probably tend to dampen the real economic outlook. By contrast, the euro would be more likely to appreciate.

The impulse-response functions of all variables capture the time response of the variables to the above-mentioned structural shocks identified by their sign. Empirical evidence shows that the variables quickly return to their starting point, meaning that the shocks only have a short-term impact. This is ultimately due to the fact that

¹⁰ In acute crisis situations, however, the opposite can actually occur, with investors having to liquidate comparatively safe investments.

Historical decomposition of the German banking system's net liquidity flows in other investment: estimated contribution of explanatory factors*

€ billion, deviations from the mean, balances, 12-month cumulated transactions



* The areas represent the contributions of individual shocks (historical decomposition) based on a BVAR model with sign restrictions. The estimation period starts in January 2001 and ends in April 2023. The effective estimation period is shortened by the inclusion of time lags.

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changes in all variables are incorporated into the model from month to month.¹¹

The BVAR estimation permits the time series of all the variables involved to be decomposed into the contributions made by each identified shock. The results of the historical decomposition for the change in the German banking system's net external claims in the other investment account are presented as 12-month cumulated transactions. The smoothing effect thus achieved allows for a clearer depiction of the otherwise very volatile cross-border capital flows. The chart above shows the significance of the different shocks for the changes in the German banking system's net claims in the other investment account, and thus for cross-border liquidity flows, over the past two decades. The difference between the explained contributions (areas marked in colour) and the actual net liquidity flows of the banking system (black line) is due to unexplained influences (residuals).

The results underscore how important the impact of economic activity in Germany and abroad is for Germany's cross-border transactions. They also demonstrate the importance of changing uncertainty in financial markets for German capital flows. The influence of monetary policy during the period under analysis was mixed and varied largely according to whether monetary policy in the euro area was generally tighter or looser than in other major currency areas. A more detailed interpretation of the results can be found on pp. 41-47.

¹¹ The significance of structural differences was additionally tested using an alternative model. To this end, yield spreads and differences in business confidence were factored into the model as levels (instead of changes). The alternative model produced very similar results to the original model.

measures did not cause any liquidity outflows from the German banking system. On the contrary, the global provision of central bank liquidity actually tended to support the German banking system's net capital exports in other investment, on balance, given that all major economies of the world had similar monetary policy responses.

However, the model suggests that the Eurosystem's comparatively loose monetary policy in 2021 was a driving factor behind the liquidity outflows from the German banking system to other countries observed at that time. This reflects the fact that the US Federal Reserve Bank (Fed) initiated monetary policy tightening earlier than the Eurosystem. In December 2021, the Governing Council of the ECB announced that it would reduce the pace of net asset purchases under the PEPP and the APP in the following year, thereby paving the way for tighter monetary policy in the euro area as well.¹⁸ Monetary policy-induced outflows of liquidity declined and, over the course of 2022, euro area monetary policy had an increasingly restrictive effect, also compared with monetary policy in other countries, given the interest rate hikes starting in the middle of the year. This effect continued at the beginning of 2023.

Different functions of commercial banks and the Bundesbank in cross-border payments

Different tasks of Bundesbank and commercial banks in cross-border payments ...

This article has so far considered the German banking system as a whole. This makes sense in view of its function as the payment service provider for the economy and allows an overall analysis of the factors influencing cross-border liquidity flows. However, a country's banking system is not a single unit, but consists – with the exception of a handful of countries with no currency of their own – at least of a central bank and the other monetary financial institutions, primarily commercial banks. National central banks have a public mandate and gen-

erally do not aim to generate a profit. The Bundesbank is part of the Eurosystem and has a statutory commitment to price stability in the euro area. In addition, the Bundesbank performs other key tasks at both the national and international level. Among these are, first and foremost, involvement in the national supervision of credit institutions, including a role in the EU's Single Supervisory Mechanism, as well as the areas of cash management, cashless payment systems and financial stability.¹⁹ Commercial banks, on the other hand, are commercial undertakings and serve the objectives of their shareholders.²⁰

The different tasks of the Bundesbank and commercial banks are also reflected in the way in which they perform their function as payment service providers. One way that these are evident is in their respective contributions to Germany's cross-border liquidity flows over the past two decades (see the box on pp. 48 ff.).

In a market economy, private transactions are generally conducted without the active involvement of the government. The role of payment service provider is thus ultimately assumed by commercial banks – using book money.²¹ At the beginning of the 2000s, up until 2008, the vast majority of cross-border net liquidity flows in other investment were therefore also attributable to other monetary financial institutions excluding the Bundesbank.

... reflected in cross-border liquidity flows over the past two decades

Until the financial crisis, transfers of book money dominated the German banking system's cross-border liquidity flows

¹⁸ See European Central Bank (2021b).

¹⁹ See Section 3 of the Bundesbank Act (*Gesetz über die Deutsche Bundesbank*).

²⁰ Maximising profits does not necessarily have to be the prime focus. Cooperative banks or savings banks can also pursue other objectives, for example. However, in Germany they are all subject to German and EU banking regulation and therefore cannot completely ignore profit objectives. Much the same applies to promotional banks such as the Kreditanstalt für Wiederaufbau. While these are not subject to the Banking Act (*Kreditwesengesetz*), they operate in accordance with banking principles and are subject to certain rules set by banking supervisors.

²¹ Nevertheless, the bulk of the individual transactions within the euro area were settled via the Eurosystem's payment system. On balance, however, the incoming and outgoing payments largely balanced out for the national central banks involved, since the commercial banks provided each other with sufficient funds.

The distribution of roles within the German banking system as reflected by cross-border liquidity flows

A country's banking system can be roughly divided into its national central bank and other monetary financial institutions (mainly commercial banks).¹

The assets side of the commercial banks' other investment account is affected by changes in the financial loans they grant to enterprises, households or the general government sector abroad, as well as changes in deposits they hold with financial institutions abroad. The changes in their liabilities in other investment mainly reflect the increase or decrease in deposits in the accounts that foreign investors, including other financial institutions, hold with them. For many years, the Bundesbank's net capital exports have been closely linked to developments in its TARGET balances with the ECB.² These form the largest item out of its external claims under other investment and shape how they develop. Changes in the Bundesbank's external liabilities in other investment are mainly due to the allocation of euro banknotes within the Eurosystem, and to deposits from non-euro area residents.³ The net positions of the commercial banks and the Bundesbank have often not developed independently of one another, especially since the outbreak of the financial crisis. A build-up of net claims by the Bundesbank was frequently accompanied by a corresponding reduction in the net claims of the German commercial banking system, and vice versa. The changes in these positions can therefore also provide an indication of the roles that the Bundesbank and the commercial banks each played in other investment.

Overall, developments in the banking system's cross-border transactions in other in-

vestment over the past two decades can be divided into five phases. They show the impact of the international financial crisis and the sovereign debt crisis in some euro area countries, as well as the impact of the Eurosystem's non-standard monetary policy measures – especially its asset purchase programmes.

In the first phase – the years leading up to the start of the international financial crisis – changes in the German banking system's net claims in other investment were mainly driven by the activities of commercial banks. There was no systematic build-up of positions by the Bundesbank during this period. The Bundesbank's other investment account balances were comparatively low. As the current account surpluses and frequent net capital imports in portfolio investment meant that incoming payments regularly outweighed outgoing payments, commercial banks' accounts registered net capital exports in most years. The counterparts to cross-border transactions were usually to be found in counterbalancing trans-

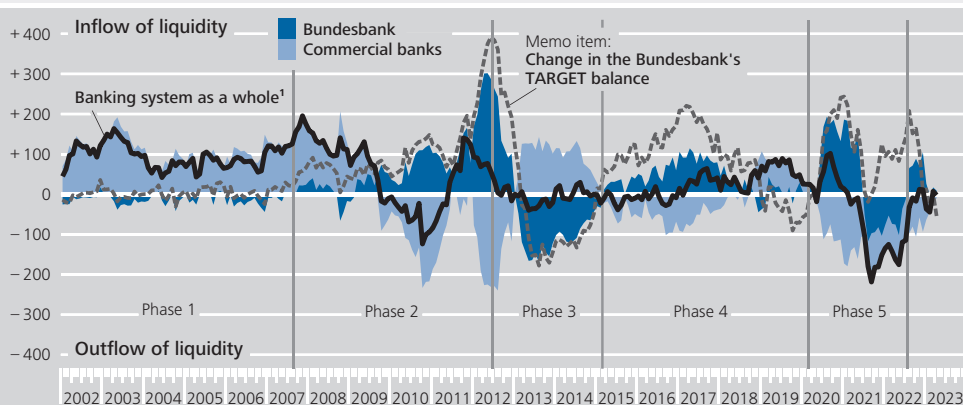
¹ For the sake of simplicity, all monetary financial institutions excluding the Bundesbank are referred to as "commercial banks" in this box. While promotional banks with public mandates are not (profit-driven) commercial banks, they are nevertheless also part of the banking system.

² TARGET balances are the aggregate balances from TARGET services (Trans-European Automated Real-time Gross Settlement Express Transfer), which form the Eurosystem's market infrastructure. This includes T2, in particular, which replaced the previous TARGET2 system on 20 March 2023. The use of TARGET services by commercial banks to settle cross-border transactions may result in claims on, or liabilities towards, the ECB. If the resulting claims and liabilities between central banks do not balance out over the course of a day, they are netted out at the end of the business day to form a single (net) claim on, or liability towards, the ECB. See Deutsche Bundesbank (2017b).

³ See Deutsche Bundesbank (2023).

The banking system's other investment

€ billion, balances, 12-month cumulated transactions



¹ The balance for the banking system as a whole is the sum total of the balances of the Bundesbank and the commercial banks.
 Deutsche Bundesbank

actions in the private interbank market.⁴ Commercial banks provided each other with sufficient liquidity in the form of book money in the interbank market, irrespective of the country in which they were based. As a result, the Bundesbank's TARGET transactions largely balanced each other out at this time.

The outbreak of the global financial crisis, which originated from the sub-prime mortgage crisis in the United States, marks the start of the second phase. The international financial crisis, starting in the summer of 2007 and spreading around the world from the autumn of 2008, impeded the functioning of the market for cross-border lending between commercial banks as they became increasingly mistrustful of one another given concerns that partner banks might face payment difficulties. Creditor banks called in maturing loans and several debtor banks were no longer able to obtain sufficient funding in the private market.

The Governing Council of the ECB responded by adopting a number of non-standard monetary policy measures,⁵ thus ensuring that commercial banks continued to receive sufficient liquidity. As consumer

prices came under pressure, the ECB Governing Council also made monetary policy more expansionary through interest rate cuts.

In the second half of 2007, the Bundesbank's TARGET claims rose significantly. However, its net external claims declined again the very next year. In connection with the fact that commercial banks continued to register net capital exports, this shows that German banks weathered the global financial crisis relatively well overall and continued to play a major role in international payments.

From the spring of 2010 onwards, the sovereign debt crisis in some euro area countries shaped events in the financial markets. It caused prices to fall sharply in the bond

⁴ Here, the interbank market also includes transactions between institutions within a group.

⁵ These included longer-term refinancing operations with a maturity of up to six months (see European Central Bank (2008a)), as well as the transition to the full allotment of central bank liquidity via fixed-rate tenders (see European Central Bank (2008b)). In addition, the Eurosystem expanded the collateral framework for monetary policy operations (see European Central Bank (2008c)), and also secured the supply of foreign currency through swap lines with major central banks outside the euro area (see European Central Bank (2008d)).

markets of highly indebted partner countries, which also put the banking systems in question under severe pressure owing to large price losses and liquidity outflows. As a result, the ECB Governing Council decided to adopt another set of non-standard measures to compensate for the limited functioning of the interbank market.⁶ The funds provided by the central banks were utilised asymmetrically by the commercial banks of the Member States. Some of the liquidity allocated was used to settle cross-border payment obligations. This was accompanied by a further rise in TARGET balances in the euro area, particularly that of the Bundesbank.⁷ All in all, the events therefore also had a visible impact on other investment.

The Bundesbank's net external claims in other investment rose significantly up to mid-2012. This was mainly due to TARGET claims, which had climbed to almost €730 billion by the end of June 2012. By contrast, the net external claims of commercial banks established in Germany fell perceptibly. For the first time, a clear pattern of the mirror-image developments in the positions of the Bundesbank and the commercial banks in the other investment account could now be observed. This mirror-image pattern is an expression of the changing roles of the Bundesbank and the commercial banks during the crisis.⁸ During this phase, the German banking system as a whole initially recorded marked net capital imports in other investment up to the autumn of 2010. After this, mainly owing to developments in the Bundesbank's position, there was a sharp rise in net capital exports, coupled with significant liquidity inflows.

On balance, both net liquidity inflows via the Bundesbank's accounts and net liquidity outflows via the German commercial banks' accounts continued until the summer of

2012. This development subsequently tailed off, and even reversed from 2013 onwards (phase 3). The reason for this was easing tensions in the financial markets, which helped encourage banks to lend to each other again.⁹ This was reflected in Germany's other investment in the form of declining net capital exports in the banking system. The Bundesbank's TARGET claims declined markedly during this phase. By contrast, commercial banks' net external claims rose again.

The asset purchase programme (APP) saw the Eurosystem central banks (including the ECB) enter the market starting in October 2014 as purchasers of securities issued in the euro area. From March 2015, euro area central banks purchased large volumes of public sector securities in the secondary market, mainly under the public sector purchase programme (PSPP), with each national central bank buying bonds from its own jurisdiction.¹⁰ This marks the start of the fourth phase, bringing with it a fresh increase in national TARGET balances. This time, however, the increase was not related to growing unease in the international financial markets. Instead, it was due to the APP and Europe's financial architecture,

⁶ These included purchases of Greek government bonds under the Securities Markets Programme (SMP) and a new set of longer-term refinancing operations. See European Central Bank (2010).

⁷ See Deutsche Bundesbank (2020).

⁸ Commercial banks based in Germany reduced their claims on commercial banks abroad. The foreign commercial banking systems obtained the liquidity required for cross-border credit transfers through tender operations with their respective national central banks. Within the euro area, these credit transfers were processed via TARGET.

⁹ This was connected to a speech by Mario Draghi, President of the ECB at the time, in which he stated that the ECB was ready to do "whatever it takes" to preserve the euro; see European Central Bank (2012a). In addition, the Eurosystem adopted a programme of outright monetary transactions (OMT); see European Central Bank (2012b, 2012c). To date, the OMT programme has not been used.

¹⁰ See European Central Bank (2015).

with Frankfurt as a major European financial hub.¹¹ This can be seen clearly in the German banking system's other investment. When the PSPP was launched in March 2015, the mirror-image balances of the commercial banks and the Bundesbank in the other investment account reversed again. The Bundesbank's accounts now recorded net liquidity inflows, while the accounts of the commercial banks registered liquidity outflows. In terms of the balance of the banking system as a whole, these positions largely offset each other in most years.

The Eurosystem central banks did not make any net purchases under the APP from the end of 2018 up to and including October 2019. There were no mirror-image developments in the balances of the Bundesbank and the commercial banks during this period, either. Net capital exports in portfolio investment were significantly lower owing to the lack of net purchases by the Bundesbank, and the banking system's net capital exports in other investment rose perceptibly during this period. These mainly took place via the commercial banks' accounts, while the Bundesbank's TARGET claims declined during this time.

Around the turn of 2019-20, the Eurosystem resumed net purchases under the APP. In March 2020, the pandemic emergency purchase programme (PEPP) was additionally adopted to address the risks to the monetary policy transmission mechanism posed by the rapid spread of the coronavirus (phase 5). The Bundesbank's TARGET balances subsequently rose again, as they had during net purchases under the APP, with the Bundesbank's TARGET claims reaching a temporary peak of €1,269 billion at the end of 2022.

Overall, however, the cross-border transactions of non-banks (including banks' proprietary business in direct investment and portfolio investment) led to significant liquidity outflows out of the German banking system from the autumn of 2020 to the summer of 2022. For example, foreign investors' deposits on accounts with commercial banks increased markedly. The Bundesbank's holdings of foreign deposits, mainly from non-euro area residents, also rose. Data cumulated over 12 months therefore also showed liquidity outflows via the Bundesbank's accounts, despite rising TARGET claims in some cases.¹²

The fifth phase ended in July 2022, when net asset purchases under the APP were discontinued, thus bringing net purchases as a whole to an end.¹³ In addition, the ECB Governing Council raised key interest rates by a total of 400 basis points in several steps up to June 2023.¹⁴ In the second half of 2022, transactions in the German balance of payments were again increasingly accompanied by liquidity inflows via the banking system's accounts. In the first six months of 2023, the Bundesbank's TARGET balance fell markedly.

¹¹ See Deutsche Bundesbank (2017a, 2017b).

¹² In addition, the Bundesbank recorded rising liabilities from the allocation of euro banknotes within the Eurosystem, and as a one-off effect, a larger counterpart entry for the new special drawing rights allocated by the IMF. See Deutsche Bundesbank (2022b).

¹³ See European Central Bank (2022a). Net purchases under the PEPP had already been discontinued at the end of March 2022. See European Central Bank (2021b).

¹⁴ See European Central Bank (2022b, 2022c, 2022d, 2022e; 2023a, 2023b, 2023c, 2023d).

Global financial crisis impaired private interbank market; importance of central bank liquidity in cross-border payments increased

This changed fundamentally with the onset of the global financial crisis, as commercial banks were no longer willing to lend money to one another – a key prerequisite for cross-border transactions in the interbank market – on account of the high level of uncertainty overall and, in particular, the perceived high level of counterparty credit risk.²² The Eurosystem intervened in the situation and provided commercial banks with central bank liquidity, mainly through longer-term refinancing operations. As a result, credit institutions increasingly borrowed the necessary funds from the domestic central bank. Cross-border provision of funds was now taking place within the Eurosystem through the transfer of central bank money. In addition, a newly established network of swap lines with the Fed and other central banks secured the provision of foreign currency and thus also ensured payments could be made with non-euro area partners.²³

Since 2015, distribution of roles between commercial banks and central bank in cross-border payments shaped by APP

Expansionary monetary policy can, however, also influence the distribution of roles within the banking system even when there is no serious disruption in the interbank market. This is evident in the cross-border liquidity effects of the Eurosystem's asset purchases. When the APP was launched, the Bundesbank's net external position in the other investment account started to grow in early 2015. This was because of an increase in its TARGET claims²⁴ on the ECB, which reflected persistent inflows of central bank liquidity via the Eurosystem. The reason for these payment flows lay in the financial architecture of the euro area.²⁵ If the original holders of the securities were resident outside the euro area, the purchases of the national central banks were largely settled through the subsidiaries of foreign commercial banks domiciled in Germany. This meant that central bank liquidity from abroad flowed into the German banking system, while book money flowed to other countries via Germany's commercial banking system. The two effects largely cancelled each other out with respect to the German banking system's payment transactions with non-residents overall. This mechanism ex-

plains why the APP mostly had no noticeable autonomous impact on other investment flows in the German banking system on aggregate between 2015 and 2018.

Cross-border payments were also very heavily affected by the coronavirus pandemic. From the end of February 2020, financial market developments were dominated by the assessment of the economic and financial implications of the pandemic. In March 2020, the Governing Council of the ECB announced that it would add a temporary envelope to the existing APP, which had already been resumed in November 2019.²⁶ It also decided to launch an additional purchase programme, the PEPP.²⁷ In conjunction with the increased global risks, the expansion of the purchase programmes led to massive liquidity outflows at commercial banks. Between autumn 2020 and summer 2022, the banking system as a whole also saw significant net capital imports in other investment.

Over the course of 2022, the Eurosystem distinctly tightened the monetary policy reins in view of the medium-term inflation outlook, which saw inflation remaining above the 2% target for an extended period of time. In mid-2022, net asset purchases under the APP were ended.²⁸ In the second half of 2022, the Governing Council of the ECB raised key interest

More restrictive monetary policy in Eurosystem since 2022 ...

²² Here, the interbank market also includes transactions between institutions within a group.

²³ The participants in the swap agreement – which is still in force – are the ECB, the Fed, the central banks of Canada, England and Japan, and the Swiss National Bank. See European Central Bank (2014).

²⁴ TARGET balances are the aggregate balances from the TARGET services (Trans-European Automated Real-time Gross Settlement Express Transfer), which form the Eurosystem's market infrastructure. This includes T2, in particular, which replaced the previous TARGET2 system on 20 March 2023. It is used, amongst other things, for the settlement of cross-border interbank payments in the euro area.

²⁵ See Deutsche Bundesbank (2017b).

²⁶ See European Central Bank (2020a).

²⁷ See European Central Bank (2020b).

²⁸ See European Central Bank (2022a). Net asset purchases under the PEPP had already been discontinued at the end of March 2022. See European Central Bank (2021b).

rates by a total of 250 basis points in multiple increments.²⁹

Four further interest rate rises totalling 150 basis points followed in the first half of 2023.³⁰ The Governing Council also gave detailed parameters for reducing APP holdings. From March 2023, these declined at a measured pace, as the Eurosystem no longer reinvested all of the principal payments from maturing securities. The decline amounted to €15 billion per month on average until the end of June.³¹ As of 1 July 2023, maturing securities in the APP portfolio are no longer being replaced.³² First steps towards normalising Eurosystem portfolios of securities held for monetary policy purposes have thus been taken.

... could also influence interplay between Bundesbank and commercial banks in other investment

The tightening of European monetary policy since the middle of last year and the reduction of the monetary policy portfolio this year had an impact on the level and composition of German liquidity flows with other countries. The monetary policy measures are not only leaving their mark on the aggregate banking system's other investment account, but bringing about a structural change as well in the liquidity flows of the commercial banking system and the Bundesbank. If Eurosystem central banks were to trim their balance sheets, this is likely to result in the Bundesbank's TARGET balances shrinking and its net asset position diminishing.

■ Conclusion and outlook

Liquidity flows into and out of Germany via the accounts of monetary financial institutions – including the Bundesbank. These payment flows stem from cross-border transactions in all sec-

tors. The net flows can be gauged from the banking system's other investment balances in the balance of payments. Over the past two decades, changes in macroeconomic conditions have left a significant mark on the cross-border liquidity flows of the German banking system. This is also true of the distribution of roles within the banking system – that is, between commercial banks and the Bundesbank – for cross-border transactions in other investment.

In the years leading up to the financial crisis, in a regime of structurally scarce liquidity provision by central banks, it was overwhelmingly commercial banks which performed the task of providing cross-border funds, in the form of book money. Since the financial crisis and the sovereign debt crisis in some euro area countries, transfers of central bank money, including across borders, have played a greater role with the transition to a regime of structurally ample liquidity provision by central banks. The private interbank market became less important.

As the Eurosystem scales back its monetary policy portfolios in the coming years and reduces existing excess liquidity, it would once again increasingly fall to commercial banks to lend funds at market conditions, and allocate scarce resources in this way. This has always been one of their core tasks. A step in this direction would be welcome, not least for this reason.

²⁹ See European Central Bank (2022b, 2022c, 2022d, 2022e).

³⁰ See European Central Bank (2023a, 2023b, 2023c, 2023d).

³¹ See European Central Bank (2022e).

³² See European Central Bank (2023c).

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