

Balance of Payments Report

2023



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This publication offers an analysis of the main items of the balance of payments of the Czech Republic over the past year and is supplemented with short analytical articles focused on the balance of payments and international trade. As we must rely on preliminary balance of payments data, which are subject to revision, data from previous years may differ in different editions of this publication. An electronic version, including previous editions, is available for download from the CNB website <https://www.cnb.cz/en/monetary-policy/>.

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I. EXTERNAL BALANCE OF THE CZECH ECONOMY

After the turbulent previous years, in 2023 the Czech economy returned to a slight external surplus that characterised it before the COVID-19 pandemic. The current and capital account balance, expressing residents' net income from trade and other transactions with non-residents, climbed in a single year from a deep deficit in 2022 (-4.2% of GDP) to a surplus of 1.6% of GDP in 2023, corresponding roughly to the average for the seven years before the pandemic.¹ The external surplus and the weakening of the koruna² in 2023 led to a sharp fall in the negative net international investment position of Czech companies, banks, public institutions and households, from almost 19% of GDP at the end of 2022 to 13.2% at the end of 2023.

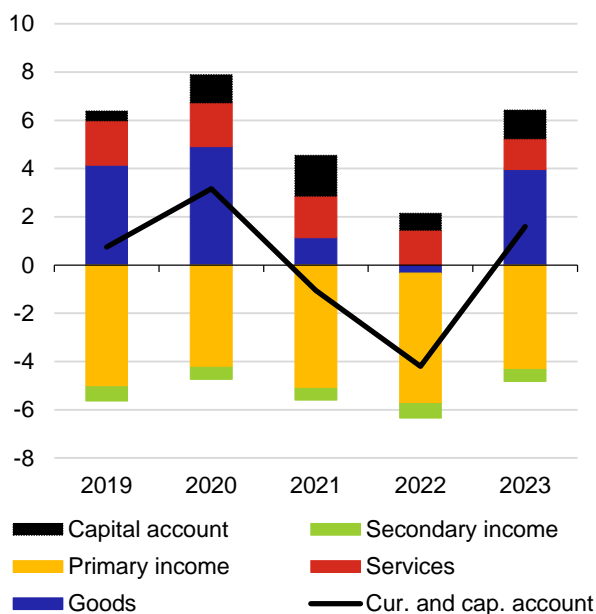
The external balance of the Czech economy is the sum of the goods and services balance with income balances (current account) and the capital account balance. These accounts cover all transactions between residents and non-residents related to international trade in goods and services, payments for capital and labour (primary income), unilateral transfers (secondary income) and transactions of a different nature, such as emission allowances trading and capital transfers (capital account).

I.1 BALANCE OF PAYMENTS

The current account ended 2023 with a small surplus of 0.4% of GDP (Chart 1). The return to balance after a deficit of 4.9% of GDP in 2022 was mainly due to the fading of adverse shocks in the form of expensive fuel imports and disruptions in global supply chains. The recovery of key export sectors, in particular the automotive industry, helped return the balance of international trade in goods (to GDP) to within sight of its pre-pandemic levels (Chart 2). To a lesser extent, the year-on-year increase in the CNB's income on international reserves also contributed to the higher current account balance.

Chart 1: The Czech Republic returned to a slight external surplus in 2023

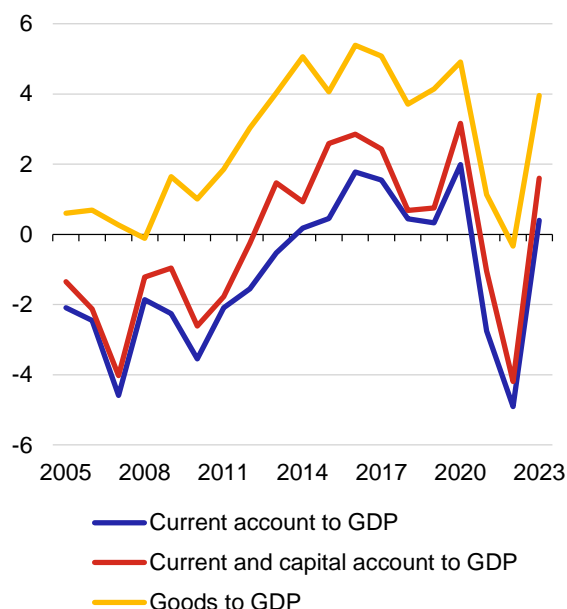
(individual external balances of the Czech economy as % of GDP)



Source: CNB, CZSO, CNB calculation

Chart 2: The recovery was mainly due to the balance of trade in goods

(individual external balances of the Czech economy as % of GDP)



Source: CNB, CZSO, CNB calculation

¹ Of this, net revenues from the EU budget (the net position of the Czech Republic in relation to the EU budget) accounted for 1.2% of GDP.

² The vast majority of the foreign assets of Czech residents are in foreign currencies, while a significant part of foreign liabilities is in korunas.

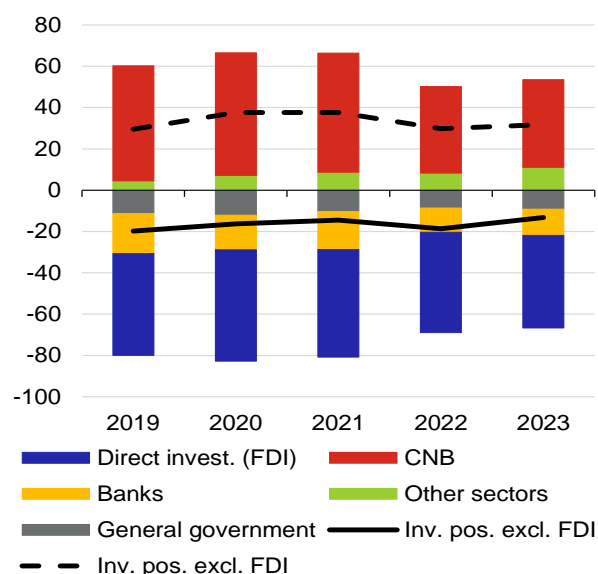
As usual, the Czech Republic's overall external surplus was supported by net income from the EU. Besides the traditional cohesion income and subsidies from the pandemic-related recovery plan for Europe (NGEU), the drawing of decarbonisation subsidies from the EU Modernisation Fund also started in 2023 (after a gradual ramp-up in 2021 and 2022). However, these are funded by the sale of emission allowances, which domestic energy and industrial companies must also buy under the EU Emissions Trading System. The total impact of transactions related to emission allowances on the external balance was thus broadly neutral. The capital account, which covers most of the income from the EU as well as allowance-related transactions, ended 2023 in a surplus of 1.2% of GDP, roughly in line with the average of the last ten years.

I.2 DEVELOPMENTS IN THE INTERNATIONAL INVESTMENT POSITION

The Czech Republic's net international investment position stood at -13.2% of GDP at the end of 2023 (Chart 3).³ After deepening to -22% of GDP in mid-2022, the net negative (i.e. debtor) position started to moderate, and in late 2023 had returned to its level before the start of the energy crisis in 2021. The negative investment position still reflects the large ownership interests of foreign investors in the Czech economy, which in terms of macroeconomic vulnerability are considered much less risky than debt-based liabilities. Adjusted for direct investment, the Czech Republic has a significant net creditor position.

Chart 3: The Czech Republic's net "debtor" position has fallen to pre-energy-crisis levels

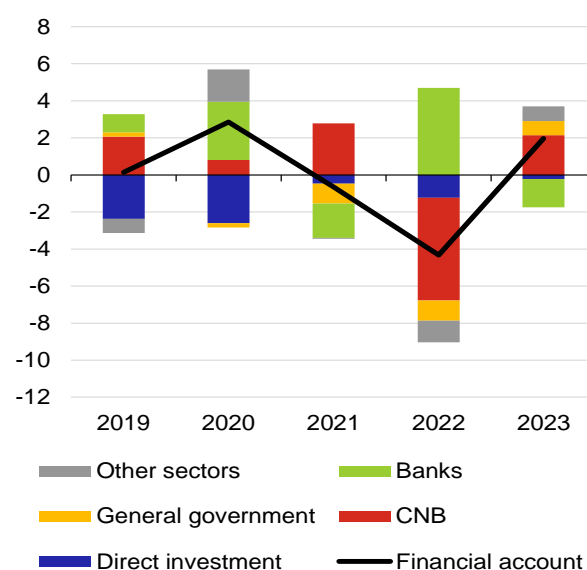
(investment position of the Czech Republic by debtor as % of GDP; end-of-period balance)



Source: CNB, CZSO

Chart 4: The external surplus was manifested in an increase in the CNB's net external assets

(financial account as % of GDP)



Note: A positive (negative) value means a net rise (decline) in external assets or a decline (rise) in liabilities, i.e. a capital outflow (inflow).

Source: CNB, CZSO

About half of the moderation of the Czech Republic's negative investment position in 2023 was due to the economy's external surplus, while the rest was related to exchange rate movements and the revaluation of external assets and liabilities. The surplus on the current and capital accounts was reflected in the financial account mainly in growth in the CNB's net external assets (Chart 4). The investment position was also improved by the depreciation of the koruna, mainly through an increase in the koruna value of the CNB's reserve assets and direct investment abroad.⁴

³ From the view point of the MIP (Macroeconomic Imbalance Procedure) evaluation, a value of up to -35% of GDP is regarded as safe.

⁴ Growth in the value of foreign shares held by domestic corporations, households and the CNB also contributed to a lesser extent. Growth in the prices of bonds issued by the domestic government, however, acted in the opposite direction.

The balance of payments must always be **balanced**. The current and capital account balance always equals the financial account balance. However, as they are based on different statistical sources, the values may differ. So, the identity must be adjusted for errors and omissions: $CA + KA + E\&O = FA$.

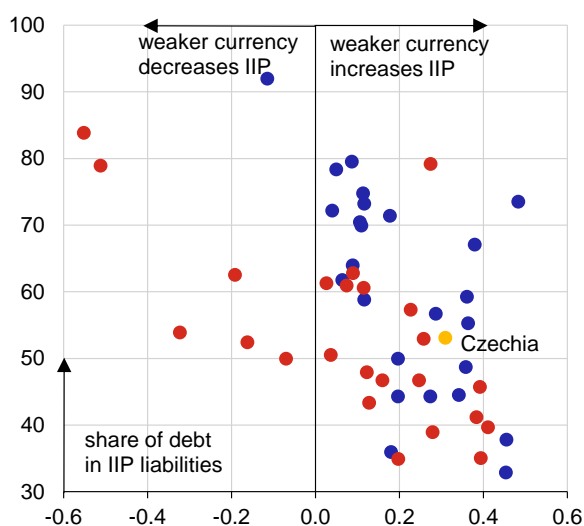
The CNB’s international reserves grew markedly in 2023 and, for many years, have far exceeded the prudential level required for preventing and resolving balance of payment crises. In addition to market revaluation, which can affect the size of the reserves in both directions, its long-term evolution is affected mainly by the Czech Republic’s net income from EU institutions, which the CNB purchases into reserves under an earlier agreement with the Ministry of Finance of the Czech Republic. Reinvestment of income on the reserves is the second factor behind the upward trend. However, since August 2023, the CNB has been selling most of its international reserves income on the market to slow down the growth of its balance sheet.⁵

The Czech economy’s external balance (the FA balance or the sum of CA and KA balance, net of measurement error) is reflected in the **change in external assets and liabilities**. The international investment position is also affected the exchange rate and the repricing of assets and liabilities.

The investment position structure eases concerns about the Czech Republic’s external vulnerability. Almost half of the liabilities is equity, putting the Czech Republic above the average of advanced economies (Chart 5). The currency structure of assets (89% foreign-currency) and liabilities (70% koruna) strengthens the absorption role of the exchange rate, whose weakening improves the investment position and vice versa. But this “insurance” against external shocks comes at a cost. The long-term appreciation of the koruna, accompanying convergence to the EU, reduces the net international investment position, which is thus less favourable in the long run than the accumulation of external surpluses and deficits (Chart 6).

Chart 5: The investment position structure strengthens international risk sharing and exchange rate absorption

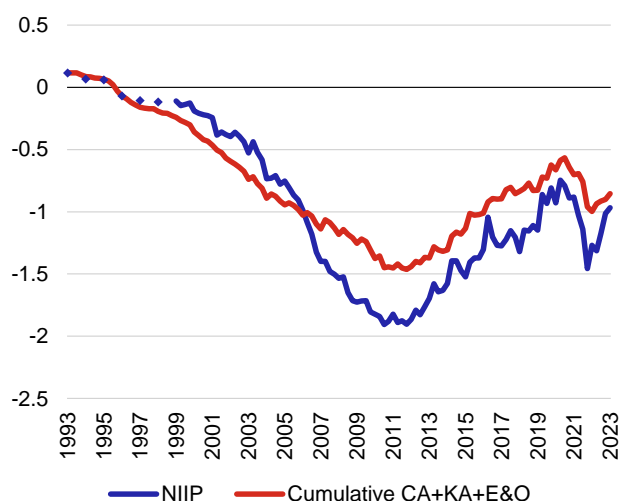
(horizontal axis— exchange rate exposure of the IIP; vertical axis— debt/liabilities; 2020, advanced (emerging) states in blue (red))



Source: data and methodology – Allen et al. (2023), “Currencies of External Balance Sheets”, IMF WP 2023/237, CNB calculation

Chart 6: The negative investment position is deeper than the accumulation of the economy’s external balances

(net investment position and CA+KA accumulation, adjusted for errors and omissions, in CZK trillions)



Source: CNB

⁵ The CNB publishes the sales volumes at <https://www.cnb.cz/en/financial-markets/foreign-exchange-market/cnb-foreign-exchange-trading/>.

II. INTERNATIONAL TRADE

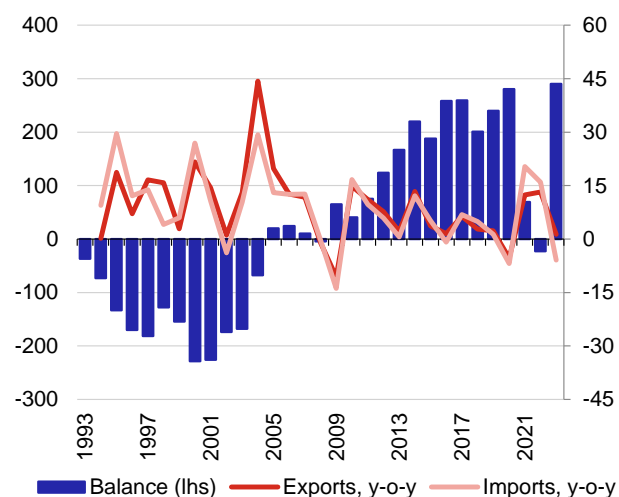
The surplus on international trade in goods and services recovered sharply, with exports (both real and nominal) slightly increasing and imports falling significantly. This is not the first time that net exports have increased amid declining international trade turnover – a similar situation occurred during the financial and economic crisis of 2008–2009. The largest year-on-year change in 2023 occurred mainly in goods, while the balance of services changed little due to opposing changes in individual items. The overall surplus on trade in goods and services reached 5.2% of GDP in 2023 (with the goods balance accounting for 4.0%). The share in GDP increased by 4.1 percentage points year on year. Such a big change is a record, but despite this, the share of the goods and services balance in GDP is still slightly below the values of the last pre-COVID years of 2018 and 2019.

II.1 GOODS

After two years of negative balance, trade in goods again made a significant contribution to the positive external balance of the Czech Republic. The balance of goods reached a record CZK 290 billion in 2023, mainly due to a decline in prices and volumes of imported fuels and the fading of manufacturing difficulties in the automotive industry.⁶ The previous peak was reached in the pandemic year of 2020, when, amid an overall deterioration in economic performance, a more dramatic decline in import volumes and prices compared to the decline in exports contributed to the high surplus. Similar turnover dynamics also increased net exports in 2023 (Chart 7), with imports again declining markedly more than exports, whose year-on-year change remained negative for most of the year, yet total exports increased slightly (by 1.3%) year on year in 2023. By contrast, imports dropped by almost 6% (Chart 8).

Chart 7: The goods balance broke records...

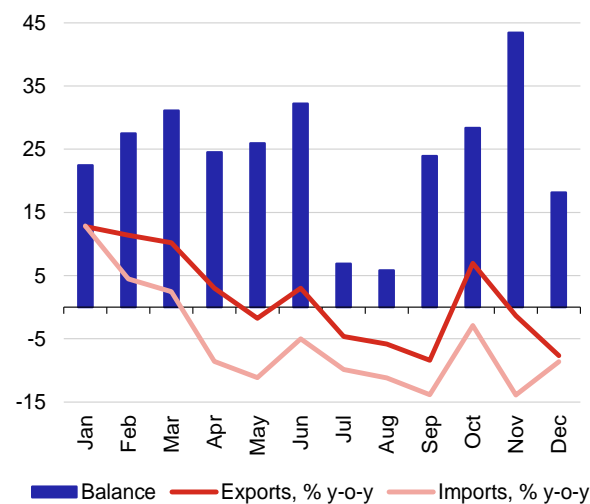
(international trade in goods in 1993–2023, in CZK billions and %)



Source: CNB

Chart 8: ...as imports lagged exports

(monthly dynamics in goods trade in 2023, in CZK billions and %)



Source: CNB

The change in the balance compared to 2022 was due mainly to a decline in prices of mineral fuels and, to a lesser extent, to real growth in exports of machinery and transport equipment.⁷ Price effects caused a decline in both exports and imports, while a decline in prices of mineral fuels (oil and natural gas) had the most significant effect, fostering a decline in the value of imports (Chart 9). Given

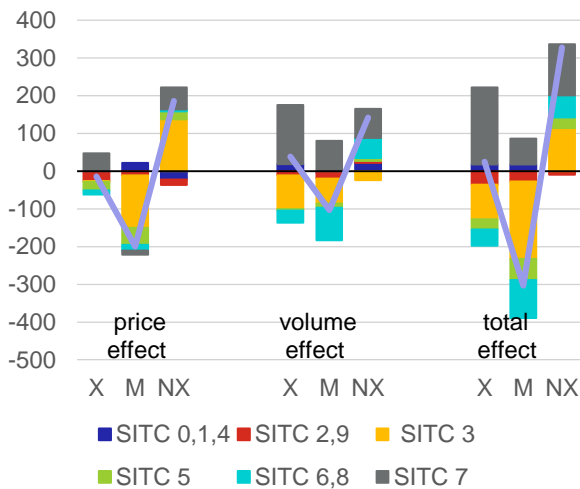
⁶ However, the best result relative to GDP was achieved in 2016, when the ratio was 5.4%.

⁷ BoP statistics are not split into prices and volumes, nor into more detailed categories of goods. The breakdown into individual categories of goods is therefore based on slightly different methodology for statistics for international trade in goods from the CZSO, while price indices are available for some categories.

that trade in this group is largely asymmetrical and the Czech Republic is a net importer, the result was a rise in net exports. Conversely, growth in prices of machinery and transport equipment increased exports and the balance. Compared to 2022, volume effects increased exports and decreased imports, with SITC categories 6, 7 and 8 (industrial goods) mainly contributing to the year-on-year increase in the balance. The positive contribution of the change in the volume of raw materials was due to a larger drop in imports of natural gas and coal,⁸ while their effect on the balance was fully offset by lower net revenues from electricity exports (Chart 10). The total volume impact on mineral fuels was slightly negative.

Chart 9: The decline in import prices affected net exports more strongly than real exports...

(volume and price effect on the change in the balance between 2023 and 2022, in CZK billions)

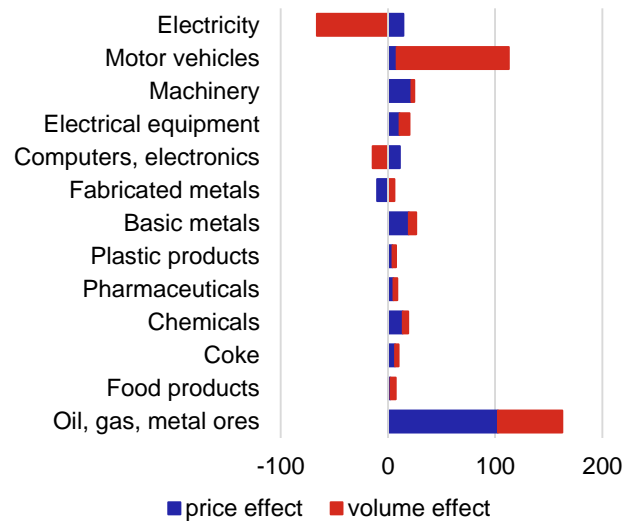


Source: CZSO, CNB calculation

Note: X denotes exports, M imports and NX net exports. The breakdown is carried out by means of the Bennet decomposition – see the thematic chapter VI-4 for a description.

Chart 10: ..., which were primarily driven by the volume dynamics of car exports

(breakdown of the change in the balance in selected goods items, in CZK billions)



Source: CZSO, CNB calculation

Note: The breakdown is carried out by means of the Bennet decomposition – see the thematic chapter VI-4 for a description. Goods groups broken down according to the CPA. Electricity, coke, crude oil and natural gas are included in SITC category 3 (Chart 9).

In 2023, Russia remained the largest exporter of oil to the Czech Republic, its share (according to cross-border statistics on goods trade published by the CZSO) rose to 50% year on year in nominal terms and even to 58% in terms of volume. The second-largest importer of oil was Azerbaijan, the source of more than a quarter of the oil imported by the Czech Republic. The Czech Republic’s current exemption from the EU oil embargo, applied due to insufficient alternative transport capacities to the Czech Republic, will be terminated in 2025. This will also open up the potential for greater diversification of oil suppliers to the Czech market, provided that the chemical properties of the imported raw material remain satisfactory. However, alternative oil imports from other states, including transport, could be more expensive.

While new oil suppliers are still being sought, significant changes have already taken place in the case of natural gas. The Czech Republic was most dependent on Russian gas in 2021, when its share was over 96%. After the escalation of the war in Ukraine, Russian gas imports fell to 78%, and fell to almost zero in the first nine months of 2023. However, there was a sharp turnaround in 2023 Q4, with

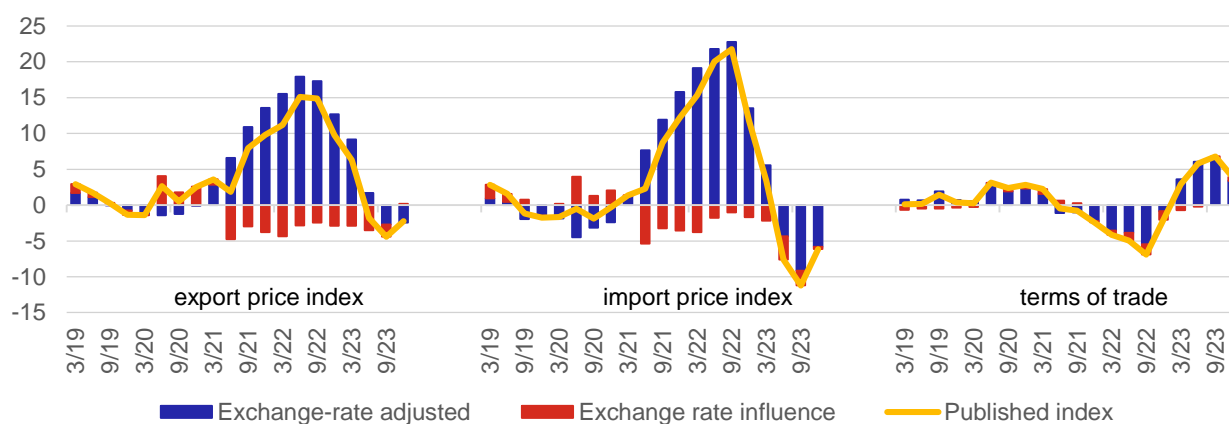
⁸ This was due to both the mild winter and the full natural gas storage facilities. This has a distinctly cyclical course, with a minimum at the beginning of spring and a maximum near the end of the year. While storage facilities were less than a quarter full in March 2022, in 2023 the minimum occurred in April and amounted to over 54%. The situation was also better year on year in the autumn. In 2022, the storage facilities were 97% full in November, while in 2023 they were already 100% full in September and remained almost 100% full for longer in the autumn. Since it was not necessary to address an acute shortage of gas, there was also an opportunity to look for more cost-effective purchases.

Russia's share rising to a third.⁹ The future situation with the diversification of gas suppliers is part of the pan-European intention to end dependence on Russian gas. Therefore, there are no plans to extend the agreement on the transit of Russian gas through Ukraine, which expires at the end of 2024, either. Moreover, finding alternative delivery methods, including LNG, is easier for natural gas than for oil.¹⁰

Exchange rate changes did not play a significant role in terms of terms of trade dynamics (Chart 11). The overall impact of exchange rate changes was also dampened by the fact that the Czech Republic has long invoiced export and import transactions mainly in euros. In 2022, around 81% of goods exports were invoiced (or contracts were settled) in euros. For imports, this share is naturally lower due to trading in some raw materials on commodity markets in dollars, yet it has remained high for a long time (66% in 2022). By comparison, with services exports, this share has been growing steadily for many years, up from 79.6% in 2021 to 83.3% in 2022. The share of euro transactions for services imports is 56.3%.¹¹

Chart 11: In 2023, the exchange rate had a neutral effect on the terms of trade

(year-on-year change in quarterly price indices and terms of trade, i.e. the ratio of export price inflation to import price inflation, %)



Source: CZSO, CNB calculation

Note: Quarterly aggregates calculated using monthly averages of export and import prices. The latest observation was December 2023.

Passenger car exports have approached historical records. In 2023, the number of exported passenger cars increased by 14.3%¹² year on year, bringing it close to the record years of 2018–2019 (Chart 12). As a result, the Czech Republic is likely to remain among the top 12 exporters in 2023 by the value of exported cars, and its global share will remain at least at the level of 2022 (3.2%).¹³ The share of the Czech Republic in total exports of passenger cars in EU27 also increased (by 0.3 percentage point to 7.0%). Among the EU states, the share of German car exports fell most, by 2.1 percentage points. Although nominal exports of passenger cars from Germany also grew, their growth rate in euros was far

⁹ This is a record of the movement of goods across borders. The state of origin may be the state of extraction or processing of the raw material, not necessarily the state of the importing entity. For this reason, all gas of Russian origin may be included in imports from Russia, including gas physically imported into the Czech Republic from other states.

¹⁰ See thematic article VI.1 for the import dependence of the Czech Republic on strategically important goods and raw materials.

¹¹ ECB. The international role of the euro, June 2023.

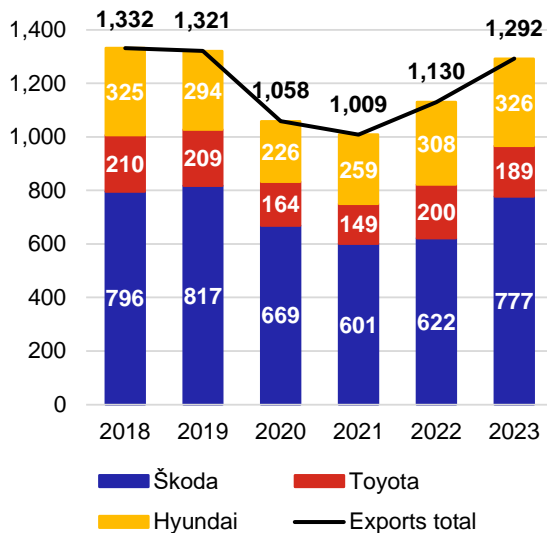
¹² Exports of electric vehicles increased by 34%. Their share in the total number of passenger cars reached just under 13%.

¹³ Preliminary data for 2023 (available as of mid-April 2024). In dollar terms, Germany accounted for a fifth of all global passenger car exports (HS Code 8703, Comtrade statistics) in 2022. Other major exporters were Japan, the USA, South Korea, China and Mexico. In terms of the number of cars sold abroad, the *China Association of Automobile Manufacturers* stated that China exported 4.91 million cars in 2023 (y-o-y growth 58%) to become exporter number 1, overtaking Japan with 4.42 million cars (16% growth) – data from *Japan Automobile Manufacturers Associations*. However, according to customs statistics, Japan still leads in the number of cars exported, with exports amounting to 5.22 million cars.

from the highest, leading to a decline Germany’s share in European exports.¹⁴ Even so, Germany remains by far the most important EU exporter of motor vehicles to the global market (Chart 13) and at the same time the Czech Republic’s most important trading partner.

Chart 12: Car exports from the Czech Republic significantly exceeded last year’s level

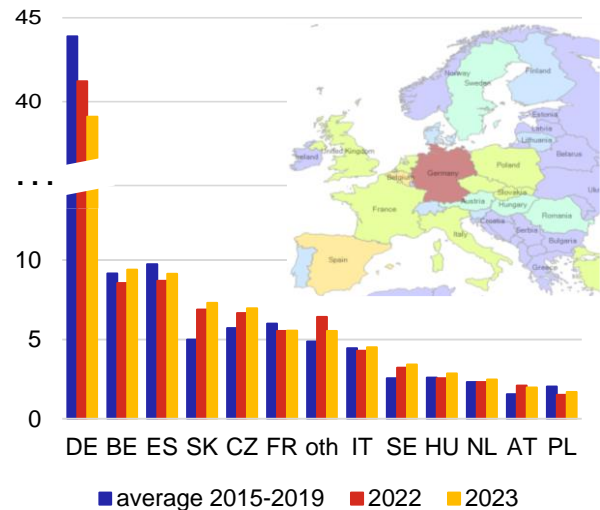
(exports of passenger cars manufactured in the Czech Republic, in thousands)



Source: Czech Automotive Industry Association

Chart 13: The Czech Republic also performed well compared to other EU states

(share of passenger car exports of the largest exporters of these goods in the EU27, %)



Source: Eurostat, ITC, CNB calculation

Note: The value of exports in euros in SITC category 781 was used for the calculation. “Other” denotes other states. The redder the map colour, the higher the export values to that state.

In 2023, Czech carmakers were also plagued by component shortages, yet the supply chain issues were not as pronounced as the year before. In many cases, these were one-off exceptional situations. Škoda Auto cancelled some production shifts at the end of January, in February and also in September. Overall, however, the carmaker had a successful year, both in terms of sales and profitability. Toyota was the most impacted in the Czech Republic last year. The Kolín plant did not operate for practically the whole of February and also for several weeks at the end of summer. It was the only one of the three Czech carmakers whose passenger car exports fell year on year for the year as a whole.

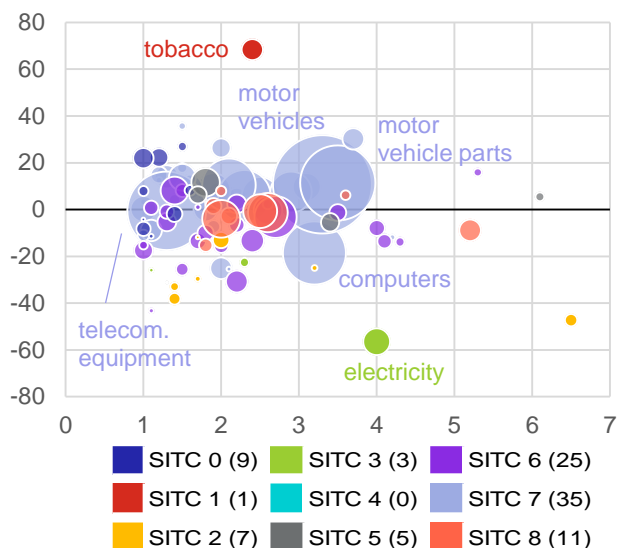
The Czech Republic exports most of its passenger cars to the European market, with one fifth heading to Germany. Although the Czech Republic’s interconnectedness with this country has decreased in recent years,¹⁵ it remains significant. Other important destinations include the United Kingdom (10%), France (8%), Poland (6%) and Italy (5%) (2023 data, SITC category 781). European countries also dominate passenger car imports to the Czech Republic. Germany has a share of over 25%. Japan is in second place (10%), with France, Slovakia and the United Kingdom ranging from 7% to 9%. The structure of the motor vehicle parts trade (SITC 784) is similar to that of passenger cars, albeit with an even more significant role for Germany in both exports (43%) and imports (34%). On the other hand, international trade in telecommunications equipment (another important export group) is more asymmetrical from the territorial point of view. While European states, led by Germany, dominate exports, accounting for 41% of all exported products, China is the unrivalled leader in imports, accounting for 70% of the total.

¹⁴ Although the year-on-year growth in the number of exported passenger cars was significant, it is still around 89% of the 2019 level. For comparison, in the case of the Czech Republic, exports reached 97.8% of the pre-COVID level.

¹⁵ Germany’s share in the pre-COVID years was around 25%. At the same time, the importance of this export market increased in the crisis years of 2009 and 2020.

Chart 14: Czech exports hold comparative advantage in machinery and vehicles

(RCA value in 2022, horizontal axis, and year-on-year change in exports in 2023, %, vertical axis)

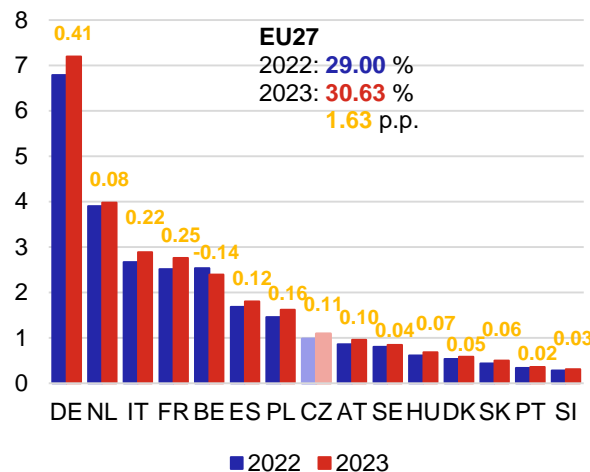


Source: UNCTAD, CZSO, CNB calculation

Note: The size of the bubble is proportional to the value of Czech exports in 2023. Goods are defined at the 3-digit classification level. The number of items in a given category is provided in parentheses in the legend. The chart shows only items for which the RCA > 1.

Chart 15: The Czech Republic's share in the global market increased slightly year on year

(share of each EU state in global exports, % and change in this share in percentage points)



Source: IMF-DOTS, CNB calculation

Note: The chart shows the most relevant EU states from the point of view of the Czech Republic. The first nine states shown in the chart (left to right) are also the first in the EU27. The change compared to 2022 is in the description above the column.

The Czech Republic has comparative advantages for a large number of exported goods. In other words, it is competitive on a global scale.¹⁶ Machinery and transport equipment form the dominant group (Chart 14). In addition to cars and their parts, the Czech Republic has comparative advantages in the export of electronic equipment, electric batteries and electricity distribution equipment. The second-largest group consists of semi-finished products and materials, but the quantity exported in individual groups is relatively small, with the exception of products made of basic metals. In the case of industrial and consumer goods, exports of furniture and furniture parts have the greatest comparative advantage. The year-on-year growth in goods for which the Czech Republic has a comparative advantage was similar to the year-on-year growth of the Czech Republic's total exports, but at the same time significant deviations from the average were evident for individual items (for example, revenues from electricity exports fell most visibly).

Overall, the Czech Republic's share of the global export market reached an almost record high¹⁷ of 1.09% in 2023, with a significant year-on-year increase of 0.11 percentage point (Chart 15). This increase is partly due to a continuous trend in which Czech exports of goods have been gaining increasing shares of the global export market for a long time (this increase has been 0.02 percentage point per year on average over the last 10 years),¹⁸ and partly reflects the fading of the adverse shocks that drove the

¹⁶ The Revealed Comparative Advantage (RCA) indicator, published by UNCTAD, was used for the calculation. Its calculation is as follows. Country A has a comparative advantage in trade in the good *i* if the ratio of exports of good *i* from country A to its total exports is equal to or greater than the ratio of global exports of good *i* to total global exports. The RCA was calculated based on export data in the SITC classification at the 3-digit code level. In this breakdown, in 2022 (the last available year), the Czech Republic exported 260 goods items, and had a comparative advantage in 96 of them, representing 37% of all exported groups in this aggregation, or 57% of the total export in koruna terms.

¹⁷ A record value (1.1%) was reached in the first pandemic year of 2020, which, however, is not representative due to deep declines in international trade volumes. The calculations are based on IMF-DOTS data.

¹⁸ In the previous period, the average increase was even higher, e.g. it averaged 0.04% per year from 1993 until the beginning of the global financial crisis.

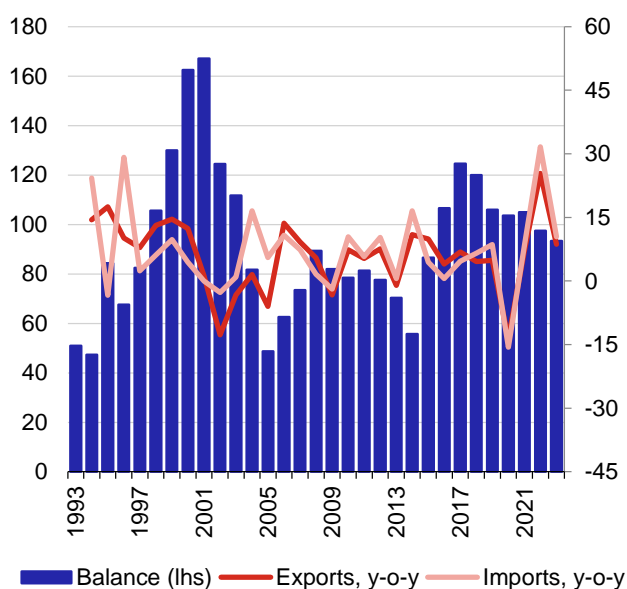
share of Czech exports on the global market to an unusually low value in 2022. All EU states except Belgium recorded year-on-year growth in global exports in 2023.¹⁹

II.2 SERVICES

In contrast to the balance of goods, the balance of services remained approximately at the level of the previous year. Net exports of services have been showing a slight downward trend for some time now, yet still contribute significantly to Czech GDP. In 2023, the balance of services was CZK 93.4 billion (1.3% of GDP). Similar growth rates of exports and imports contributed to the year-on-year stability of the balance (Chart 16). After the dramatic fluctuations in turnover between 2020 and 2022 caused by the COVID-19 pandemic, the dynamics of services credits and debits were slightly above the long-term average. The largest surpluses were recorded in the balance of IT services (CZK 57.6 billion) and manufacturing services (CZK 52.5 billion), while insurance services recorded the largest deficit (CZK 29.8 billion) due to a temporary increase in expenditure on auxiliary services in insurance.

Chart 16: In recent years, the services balance decreased, but still contributes markedly to GDP

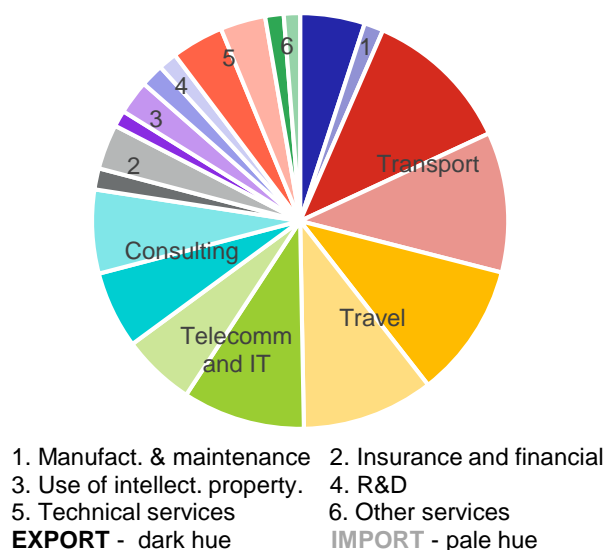
(international trade in services 1993–2023, CZK billions and %)



Source: CNB

Chart 17: Services trade is dominated by transport, tourism, telecom/IT and consulting

(turnover of services trade in 2023; shares in the total)



Source: CNB

Transport and tourism are the largest items in the structure of turnover, yet contribute little to the overall services balance (Chart 17). Transport accounts for less than a quarter of all service credits and debits, with road freight transport accounting for half of this. Due to the decrease in fuel prices and the prices of container and pipeline transport, there was also a decrease in the turnover of transport services, with imports falling more than exports, leading to a year-on-year increase in the balance of this item.

By contrast, the balance of tourism decreased year on year. Credits and debits, for both private and business trips, exceeded pre-pandemic levels.²⁰ The number of non-residents in Czech collective

¹⁹ The share of the global export market is also monitored by the new [CNB Scoreboard](#), first published in the Spring 2024 Monetary Policy Report.

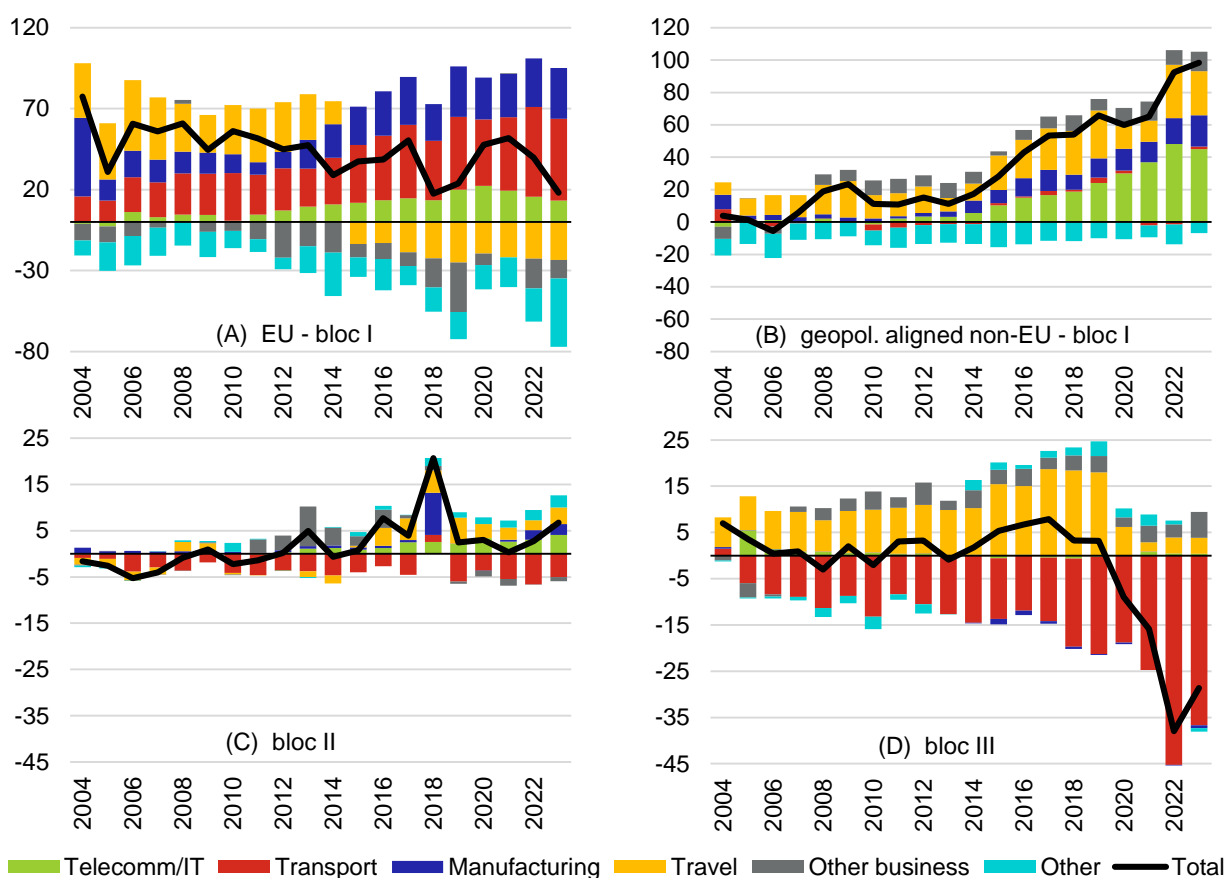
²⁰ As a result of the CZSO's refinement of the methodology for taking into account working foreigners who do not need a work permit (e.g. EU citizens and partly also foreigners with temporary protection visas), the data for business trips until 2022 are not fully comparable.

accommodation establishments increased by 30% year on year, yet still lags behind 2019. By contrast, the number of foreign trips by Czech residents increased both year on year and compared to 2019. The recovery of inbound and outbound tourism is also confirmed by the number of reviews of accommodation and dining on the internet.²¹ Total tourism receipts grew by 35% year on year, while expenditure grew at a rate of 48%. As a result, there was a significant year-on-year decline in the surplus and tourism contributed only marginally to the overall balance.

The recovery of air transport also had a positive effect on tourism. The number of flight connections has increased. Flights to South Korea and Taiwan were resumed, new direct charter flights to Thailand, the Dominican Republic and Sri Lanka were opened, as well as new routes within Europe. In 2023, passenger traffic via Prague Airport increased by 29% year on year, reaching 13.8 million passengers. Nevertheless, it still lags well behind the record year of 2019 (-22%).

Chart 18: The structure of trade in services shows a tendency towards friendshoring

(balance of trade in services by sector and with the most important partners in terms of the absolute balance, in CZK billions)



Source: CNB, CNB calculations

From a territorial point of view, services exports are concentrated in EU states and states with similar geopolitical positions.²² The share of services exports to these states reached almost 95% in

²¹ CNB calculations. For details, see Babecká Kucharčuková O., Brůha J. and P. Štěrbá (2023): Nowcasting of tourism using text mining. Balance of Payments Report 2022, pp. 40–48.

²² Friendshoring is the tendency to concentrate trade with states that have similar geopolitical positions. Based on an archetypal analysis applied to voting at the UN General Assembly, Babecká Kucharčuková and Brůha (GEO 11/2023) split states into three groups. The first group of states (Bloc I) consists of states with similar geopolitical positions as the Czech Republic. This group includes all EU states, most other advanced economies (the US, the UK, Japan, South Korea, Taiwan, Israel) and states aspiring to join the EU (especially the Western Balkan states). The second group (Bloc II) includes most developing states, while the third group (Bloc III) is made up of several states

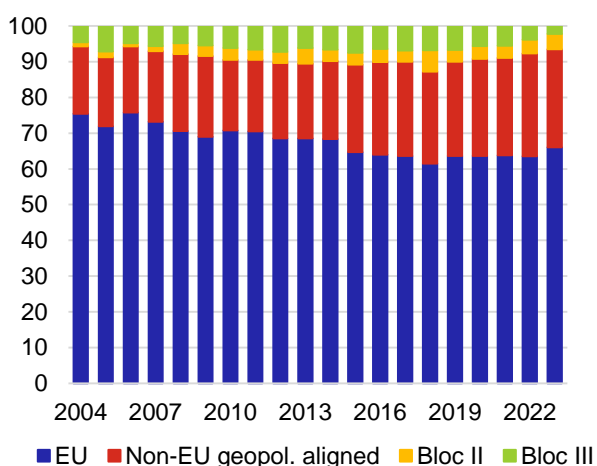
2023 (Chart 19). This is an increase over time, as this share was about 90% 10 years ago, while the share of services exports to the EU fell slightly and the share of exports to other states in the geopolitically close bloc (Bloc I) rose. The share of exports to geopolitically neutral states (Bloc II) has long been roughly stable, ranging between 3% and 4.5%. By contrast, the share of exports to the geopolitically distant bloc (Bloc III) is trending downwards and reached 2.2% last year, down by about 4 percentage points from ten years ago. In the case of exports of services, the tendency to favour friends is thus noticeable.²³

The share of services imports from states with similar geopolitical positions reached a record high in 2023, exceeding 90%. By contrast, it was unusually low at around 86% between 2021 and 2022, while the share of imports of services from Bloc III increased (Chart 20). The increase was mainly driven by imports of transport services, reflecting the rise in fuel prices in the above-mentioned years. If we abstract from these price effects, the shares of services imports from Bloc III are slowly declining. As with exports, the share of services imports from Bloc II has been stable over time, around 4%. Thus, friendshoring also exists in services imports, but it is weaker and may be masked by temporary price effects.

In addition to the shares themselves, the balance of trade in services also differs in its structure within individual blocs (Chart 18). The Czech Republic maintains a slightly positive balance with the EU states and the neutral Bloc II. The balance with geopolitically close states outside the EU is more positive and, moreover, growing over time, reaching CZK 98 billion in 2023. Telecommunications services and tourism are the biggest contributors.²⁴ Trade with Bloc III has shown interesting dynamics over time. In the pre-pandemic period, the services balance with this bloc was positive, with tourism offsetting the negative balance of transport services. However, during the pandemic and in the following years, tourism credits vis-à-vis this bloc fell markedly,²⁵ while debits on transport – linked to high fuel prices – remained high. The overall balance of services trade with Bloc III is thus negative, reaching CZK -29 billion in 2023.

Chart 19: Most services go to EU states, while the share of geopolitically close states is rising

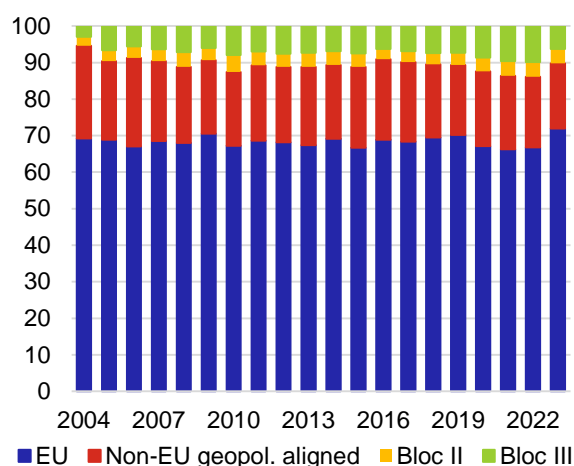
(exports of services, shares in %)



Source: CNB, CNB calculations

Chart 20: Share of imports from geopolitically distant states peaked in 2021–2022

(imports of services, shares in %)



Source: CNB, CNB calculations

geopolitically distant from the Czech Republic, such as China, Russia and Venezuela. There are no data on trade in services from other states in this group. The breakdown of states used generally corresponds to the results of similar analyses based on other statistical data.

²³ Although this may be partly due to a change in the shares of individual sectors in the overall structure of international trade, the tendency to favour friends remains clear despite this effect, for example it can also be observed in manufacturing services and other groups of services.

²⁴ In 2022, the balance of tourism was affected on a one-off basis by consumption by temporary-protection visa holders (predominantly Ukrainian citizens). In 2023, their consumption was only partially included in tourism.

²⁵ The arrival of Asian tourists (in Bloc III from China) was hampered by the cancellation of long-haul flights during the pandemic. Following Russia's invasion of Ukraine in February 2022, the Czech Republic adopted a number of restrictions that allow visas to be granted to Russian and Belarusian citizens only in humanitarian cases.

III. OTHER REAL FLOWS

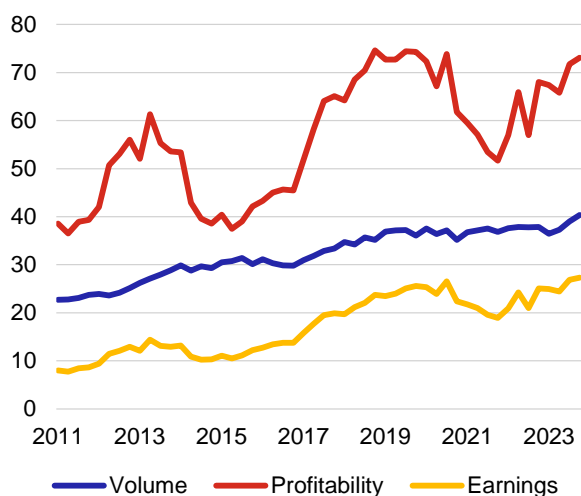
Net investment income and income from the EU aided the return of the Czech economy to an external surplus in 2023.²⁶ The investment income deficit decreased year on year. While non-residents' net income on direct investment in the Czech Republic was flat year on year (and fell relative to GDP), the CNB's income on reserve assets increased significantly. Revenues from the EU also recorded a year-on-year increase thanks to the fulfilment of the conditions for the disbursement of further tranches from the European recovery plan (NGEU) and the full ramp-up of revenues from the EU Modernisation Fund.

III.1 INVESTMENT INCOME

The investment income balance posted its lowest deficit relative to GDP in 15 years (-4.5%), driven by one long-term and several temporary factors. The long-term trend shows a convergence of the volume of direct investment (FDI) of domestic investors abroad and the volume of FDI in the Czech Republic. While there was five times more direct investment in the Czech Republic than domestic FDI abroad in 2009, there was only two-and-a-half times more in 2023. The average profitability of incoming and outgoing investment is converging even faster (Chart 21).²⁷ The convergence of volumes and unit revenues is gradually erasing the gap in the value of income on incoming and outgoing direct investment. The gap remains significant – incoming income was 27% of outgoing in 2023 – but was only 9% in 2012.

Chart 21: The ratio of outbound to inbound FDI income has tripled since 2012

(indicators of FDI abroad in relation to FDI in the Czech Republic, %)

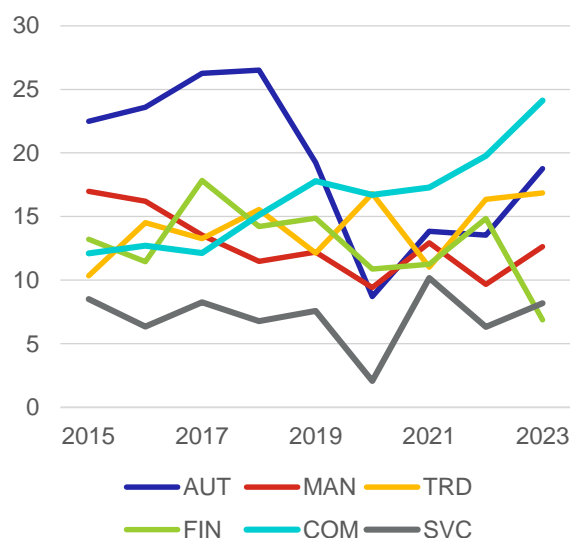


Note: Volume is FDI stocks, profitability is the ratio of FDI income to FDI stocks in the previous year, earnings are FDI income. The profitability-earnings ratio curves are expressed as a 2-year moving average due to the higher volatility.

Source: CNB, CNB calculation

Chart 22: FDI profitability in the Czech Republic grew in automotive and IT/telecommunications

(inv. income/FDI volume in the Czech Republic in previous year, %)



Note: AUT = manufacture of motor vehicles, MAN = other manufacturing, TRD = wholesale, retail trade, FIN = financial and insurance activities, COM = information and communication activities, SVC = other services

Source: CNB, CNB calculation

²⁶ The current and capital account sub-balances described in this chapter include cross-border payments for capital and labour (primary income), unilateral transfers without consideration (secondary income) and transactions of a different nature (capital account).

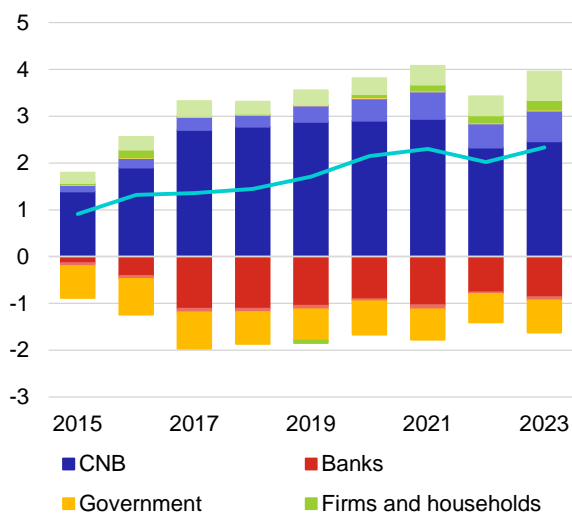
²⁷ The convergence of the average profitability of direct investment in the Czech Republic and abroad reflects the Czech Republic's real convergence, accompanied by convergence in the marginal product (and thus cost) of capital. However, it may also be due to different phases of incoming and outgoing investment in the FDI life cycle. Income changes over the entire cycle are discussed in the article in chapter VI-2.

A significant year-on-year decline in income from domestic financial corporations (of 1.2% of GDP) also contributed temporarily to a lower deficit on direct investment income. The lower profits of – largely foreign-owned – banks in 2023 were mainly due to a drop in interest margins (the spread between lending and deposit rates). However, various forms of tax optimisation, in response to the tax on extraordinary profits, may also have contributed. In addition, the year-on-year comparison of banks’ investment income was affected by the high dividend payments in 2022 from profits retained during the COVID years. On the other hand, the profitability of most other sectors grew, so total income from direct investment in the Czech Republic fell by only 0.7% of GDP year on year. In recent years, the return on foreign capital invested in information and telecommunications activities has risen most visibly (Chart 22).

The second temporary factor moderating the deficit in investment income was a rise in foreign interest rates. Excluding direct investment, the Czech Republic’s international investment position is significantly positive (a “creditor” position), mainly due to the central bank’s large international reserves (Chart 23). The corporate and household sectors are also net creditors (excluding FDI), while banks and the government are net debtors. As most of the Czech Republic’s external assets are in foreign currency and debt-based, income on portfolio investment, other investment and reserve assets responds to foreign interest rates. By contrast, most external liabilities are in korunas (including most government bonds held by non-residents), so expenditure on portfolio and other investment is more responsive to domestic rates. In 2023, koruna rates were no longer rising, while foreign currency rates were. Taken together, the Czech Republic’s net creditor position and the declining interest rate differential increased net income on non-direct investment by almost 0.5% of GDP year on year (Chart 24).

Chart 23: Excluding FDI, the Czech Republic has a large creditor investment position

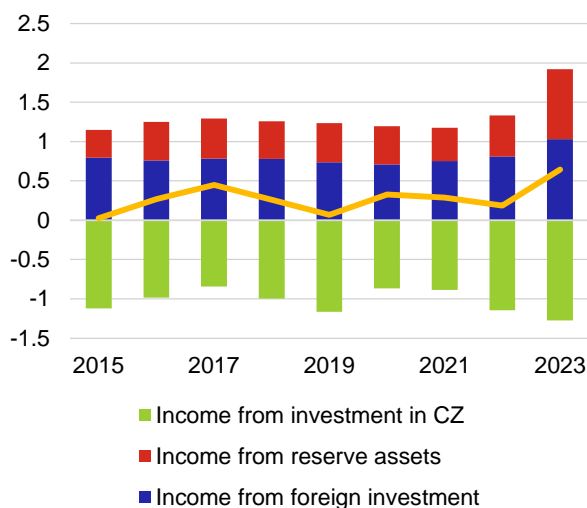
(composition of the net international investment position excl. FDI, dark colour – debt instruments, light colour – other, CZK trillions)



Source: CNB, CNB calculation

Chart 24: Non-direct investment earnings cushioned the deficit on investment income

(income on portfolio investment, other investment and reserve assets, % of GDP)



Source: CNB, CNB calculation

III.2 CROSS-BORDER WORK

Wages of cross-border workers had a neutral effect on the external position of the Czech Republic in 2023. While net income from cross-border, short-term and seasonal work slightly increased the current account balance until 2022, the inclusion of expenditure on wages of Ukrainian refugees in the Czech Republic (or temporary protection visa holders) led to a deficit on this balance in 2022. From a statistical perspective, these foreigners were already regarded as residents in 2023. Thus, despite the rise in their employment and wages, they did not foster a deeper cross-border labour income deficit in 2023.

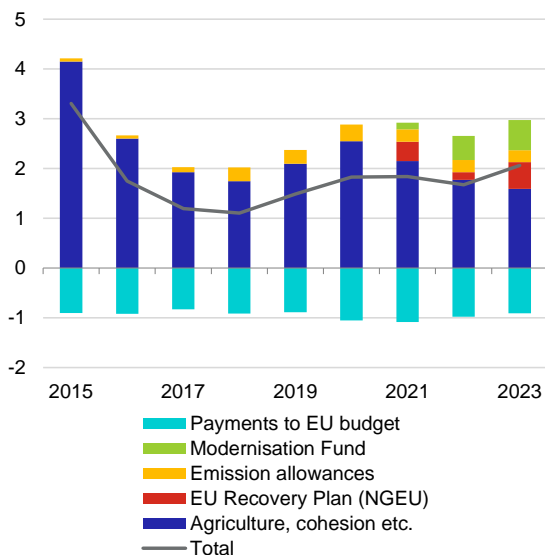
Roughly twice as many foreigners live or work in the Czech Republic on a long-term basis as there are Czechs living or working abroad. However, remittance flows into and out of the country are comparable.²⁸ In 2022, Ukrainian war refugees sharply raised the total number of foreigners working in Czechia to almost one million people (Chart 26). By contrast, the number of Czechs who live abroad for a long time or go there for work (including cross-border commuters) has not changed much for five years and is around half a million. However, the remittances sent back by cross-border workers and long-term migrants are similar in volume in both directions. Czechs living or working in particular in Germany, Austria and the UK sent CZK 98 billion back in 2022 (1.4% of GDP), while foreigners living or working in Czechia – mainly Ukrainians, Slovaks and Poles – sent CZK 88 billion back to their homelands (1.3% of GDP).

III.3 FINANCIAL RELATIONS WITH THE EUROPEAN UNION

The drawing of ‘traditional’ EU funds was the lowest relative to GDP since 2008, but thanks to new funds for modernisation and decarbonisation, total net revenues from the EU were the second-highest on record (2.1% of GDP, Chart 25). Agricultural subsidies, structural funds, cohesion subsidies and other traditional revenues from the EU budget fell for the third year in a row to 1.6% of GDP in 2023, while payments to the EU budget have long been stable at around 1% of GDP. However, new instruments have been added in recent years, above all funds from the European recovery plan (NGEU),²⁹ but also revenues linked to the European Emissions Trading System (EU ETS). Revenues from emission allowance sales – directly to the state budget or via the EU Modernisation Fund – are not formally part of the EU budget, and the Ministry of Finance excludes them from the net position vis-à-vis the EU budget. However, they are real financial flows earmarked for the green transformation of the Czech economy.

Chart 25: Falling cohesion revenues are more than offset by new resources from the EU

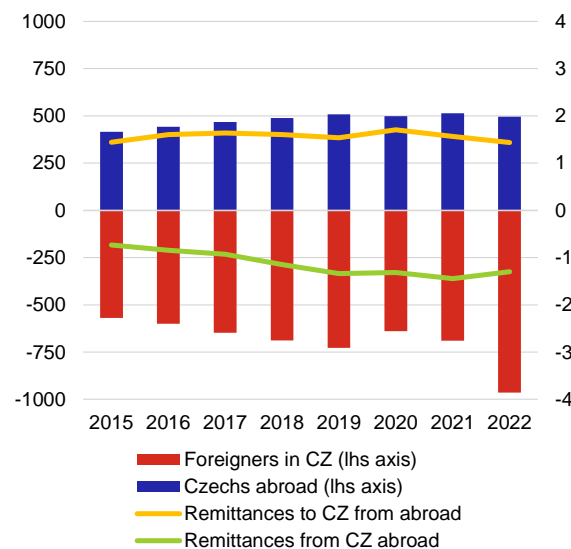
(selected revenues and payments between Czech general government and the EU, % of GDP)



Source: MF, CNB, European Commission, CZSO, CNB calculation

Chart 26: More foreigners live or work in Czechia than Czechs abroad, but remittances are balanced

(number of persons in thousands and remittances as % of GDP)



Source: CZSO, CNB calculation

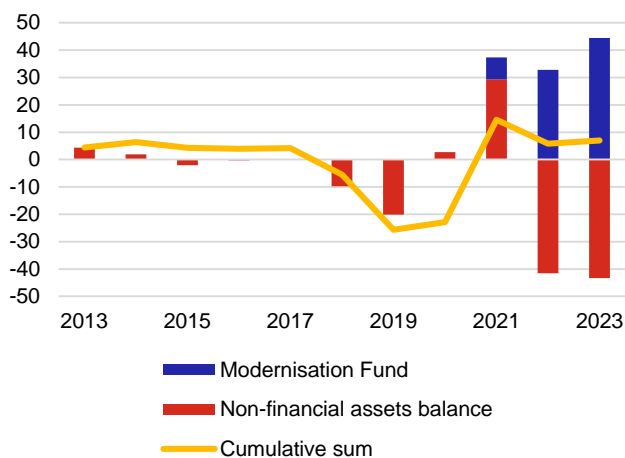
²⁸ This is due to the significantly higher average wages achieved by Czech workers abroad than by foreign workers in the Czech Republic. Here, we use the definition of remittances from national accounts, which (in the case of incoming remittances) is the sum of compensation to employees who are Czech citizens working abroad with permanent residence in the Czech Republic and personal transfers of Czech non-resident households abroad (i.e. funds that long-term migrants send back to the Czech Republic).

²⁹ For more details on the NGEU and other European financial instruments related to the COVID-19 pandemic, see the 2020 and 2021 Balance of Payments Reports and the December 2021 Global Economic Outlook.

However, the system of emission allowances has not yet significantly affected the external balance of the Czech Republic. In recent years, Czech government revenues from the sale of allowances have been almost offset on average by net purchases of allowances by domestic energy and industrial firms (Chart 27).³⁰ The similarity of the two flows is no coincidence, as the shares of individual states in the revenues from the allowance auctions are largely determined by their emissions.³¹ The impact of the system on the external balance is complex and hard to measure. The most accurate statistical estimate available shows that the cumulative effect of allowances has been roughly balanced over the past decade.

Chart 27: The European system of emission allowances has a roughly neutral effect on the external position of the Czech Republic

(EU ETS transactions in CZK billions)



Note: The balance of non-financial assets also includes other transactions, yet those with emission allowances are dominant. State budget revenues from the sale of allowances and payments from issuing firms are included, as are secondary market transactions.

Source: CNB, European Commission, CNB calculation

³⁰ Both flows are recorded in the capital account of the balance of payments. Net purchases of allowances by corporations and government revenues from auctions affect the balance of “non-produced non-financial assets”. Indirect government revenues through the Modernisation Fund are recorded under the same heading as investment subsidies from the EU budget (“capital transfers”).

³¹ The overall impact of allowances on the Czech Republic’s balance of payments is also affected by transactions on secondary markets, profits and losses from the development of prices of allowances held, and derivative trades derived from allowances.

IV. CAPITAL FLOWS

The external surplus of the Czech economy in 2023 was reflected in a net increase in foreign assets. After two years of external imbalances (2021 to 2022) financed by an inflow of foreign capital (i.e. an increase in the Czech Republic's foreign debt) and the sale of international reserves, last year brought a return to a net capital outflow from the Czech Republic of CZK 143.9 billion (2% of GDP).

The capital outflow from the Czech Republic was reflected mainly in the repayment of foreign government loans and growth in the CNB's reserve assets. In addition, the interest of domestic entities in debt and equity investment abroad was reflected in growth in the net foreign assets of enterprises and households. By contrast, domestic banks deepened their net foreign debt, mainly by accepting foreign currency deposits from non-residents. The overall outflow of capital from the Czech Republic was further mitigated by the net inflow of foreign direct investment, which in the Czech Republic has long exceeded the volume of capital directed abroad.

IV.1 DIRECT INVESTMENT

The net inflow of foreign direct investment into the Czech Republic fell year on year to CZK 16.3 billion (0.2% of GDP) in 2023. Inward foreign direct investment in the Czech Republic has long exceeded outgoing foreign direct investment,³² primarily due to reinvested earnings from the much higher stocks of foreign direct investment in the Czech Republic than domestic direct investment abroad.

The year-on-year increase in outflows of domestic investment abroad confirms the long-term trend of growth in the financial strength of domestic investors. This is reflected in the growing volumes of foreign acquisitions by domestic investors. This trend will continue to reduce net inflows of direct investment into the Czech Republic in the future. The higher year-on-year outflow of direct investment was mainly due to record investment by domestic entities in the registered capital of foreign companies totalling CZK 70.6 billion (1% of GDP), of which almost two fifths went to wholesale and retail trade. Other significant investments were made in real estate and professional, scientific and technical services.

On the other hand, inward direct investment in the Czech Republic fell year on year despite higher estimated reinvested earnings, which reached an all-time high in Q4. Adjusted for the estimated value of reinvested earnings, which do not represent actual cross-border capital flows, a very modest net outflow of foreign capital from the Czech Republic was evident, in the form of both debt capital and equity interests. The absence of new major investment on the Czech market is thus still apparent.

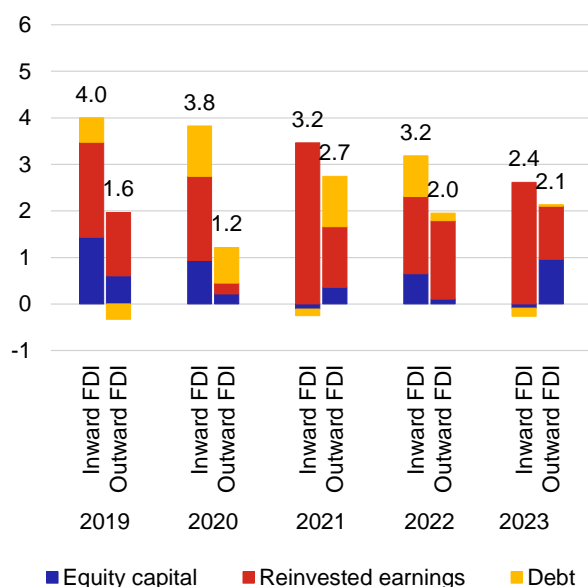
IV.2 PORTFOLIO AND OTHER INVESTMENT

Czech households and corporations bought shares and holdings in foreign firms worth CZK 50.9 billion (0.7% of GDP). The historical trend of increasing equity investment by residents is influenced by the very limited domestic stock market that does not satisfy the increasing demand for equity investment. The attractiveness of this investment in 2023 was further increased by expectations of future interest rate cuts, which were reflected in higher equity investment by residents. Despite the limited supply, non-residents' equity investment in Czech companies also increased. The volume of long-term bonds issued by Czech companies held by foreign investors grew by CZK 23.4 billion and thus surpassed the growing interest of Czech households and companies in foreign debt securities.

³² The exceptions were 2013 and 2015, when the net outflow of domestic debt capital abroad exceeded the net inflow of reinvested earnings.

Chart 28: New investment by residents abroad contributed to a decline in net FDI inflows

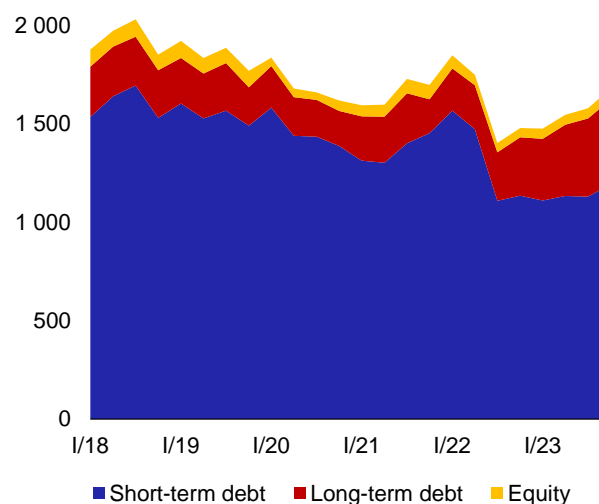
(direct investment structure; % of Czech GDP)



Source: CNB, CZSO, CNB calculation

Chart 29: The average maturity of banks' external liabilities is getting longer

(banking sector liabilities vis-à-vis other states, in CZK billions)



Source: CNB

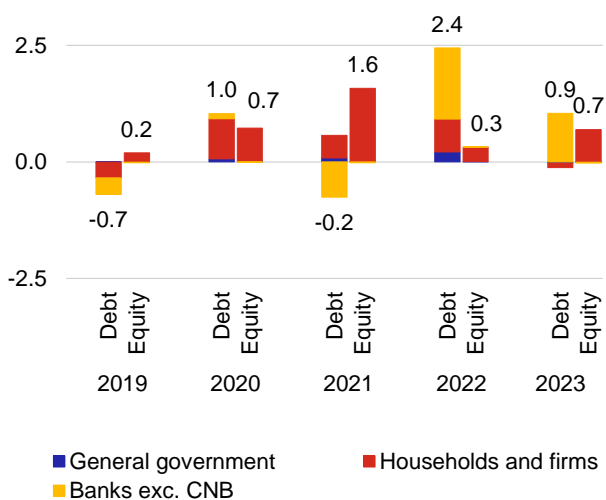
The general government sector reduced its net debt to non-residents by CZK 55.6 billion (0.8% of GDP). The year-on-year decrease in the government's external debt was mainly due to the repayment of short-term loans acquired in the previous year.³³ By contrast, purchases of Czech government bonds by non-residents and the drawing of a tranche of a long-term loan provided by the European Investment Bank for the modernisation of national railways fostered higher external debt. Although net repayments have taken place, the value of external government debt has increased, as it is affected not only by flows but also by market revaluations. Overall, the external debt of general government (in market valuation) rose to CZK 673.5 billion (from 8% of GDP to 9.2% of GDP year on year).

Banks' net external debt deepened by CZK 95.9 billion (1.3% of GDP). The simultaneous growth in external assets and liabilities of Czech banks vis-à-vis non-residents has been accompanied by a change in the structure of these flows. Instead of short-term debt financial instruments, foreign investors put a larger proportion of their funds into longer-term instruments (Chart 29). Similarly, domestic banks increased the volume of funds held in the form of long-term bonds and deposits abroad by 52% year on year, while their short-term variants declined by 15% year on year. The currency structure of capital also changed, with an increase in the share of foreign currency assets and liabilities of Czech banks, both for financial instruments with short and longer investment horizons. The preference for foreign currency deposits over koruna deposits and long-term instruments over short-term instruments may reflect, in addition to regulatory requirements, expected changes in domestic and foreign monetary policy.

³³ A description and the purpose of these short-term government loans from 2022 is provided in the 2022 Balance of Payments Report, p. 36.

Chart 30: Czech firms and households renewed purchases of shares in foreign firms

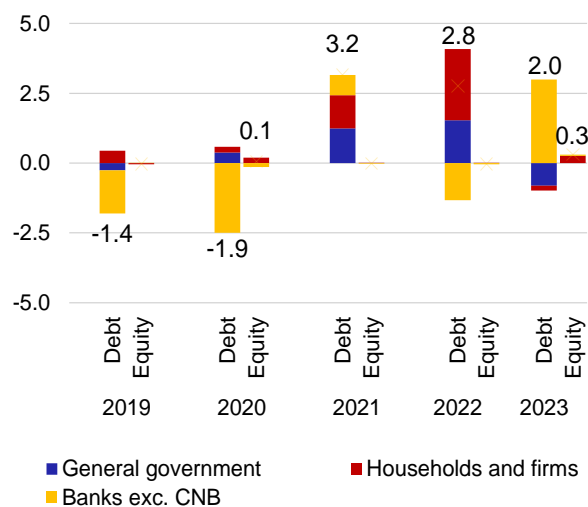
(changes in portfolio and other inv. assets by sector as % of GDP)



Source: CNB, CZSO, CNB calculation

Chart 31: Banks' external debt increased but government institutions tended to repay theirs

(changes in portfolio and other inv. liabilities by sector as % of GDP)

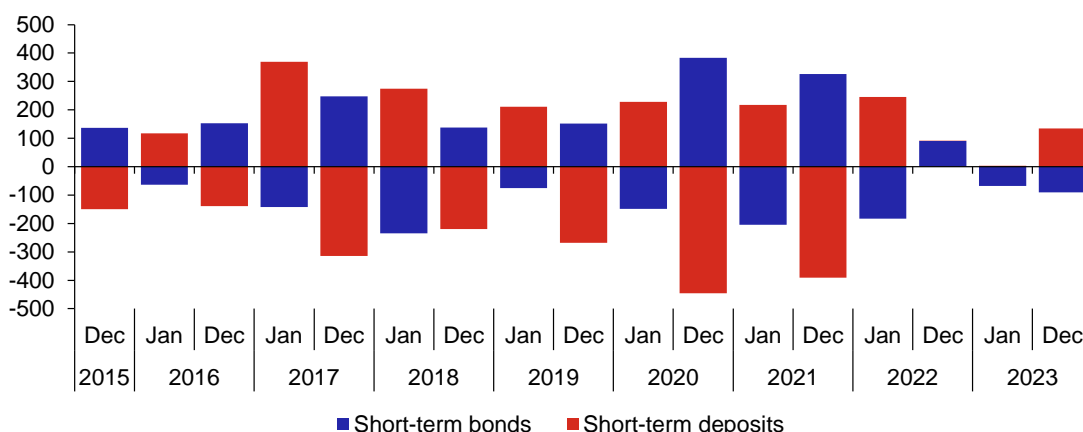


Source: CNB, CZSO, CNB calculation

Since the introduction of mandatory regular contributions to the Resolution Fund aimed at preventing crises in the financial sector, significant changes in the behaviour of Czech banks have been observed.³⁴ Contributions to the fund are based on the size and risk profile of the banks, as measured by selected financial indicators.³⁵ Since the beginning of the contributions, banks have been engaging in “window dressing” behaviour, i.e. to optimise their balance sheets at the end of the year, when the indicators are evaluated. This is also evident in the financial account of the balance of payments, where the short-term deposits of non-residents in Czech banks are temporarily converted into short-term securities issued by banks at the end of the year. In 2023, the fund was fully funded with approximately CZK 36.5 billion. As a result, banks lost their incentive to carry out such optimisation transactions, and so the December flows no longer reflected the usual pattern observed in previous years (Chart 32).

Chart 32: The December bank optimizations did not occur after the Resolution Fund was filled

(flows of selected banking sector assets, in CZK billions)



Source: CNB

³⁴ In addition to banks, this also includes branches from non-EU states, credit unions, building societies and selected investment firms.

³⁵ See the website of the Financial Market Guarantee System at: <https://www.garancnisystem.cz/en/about-crisis-resolution>.

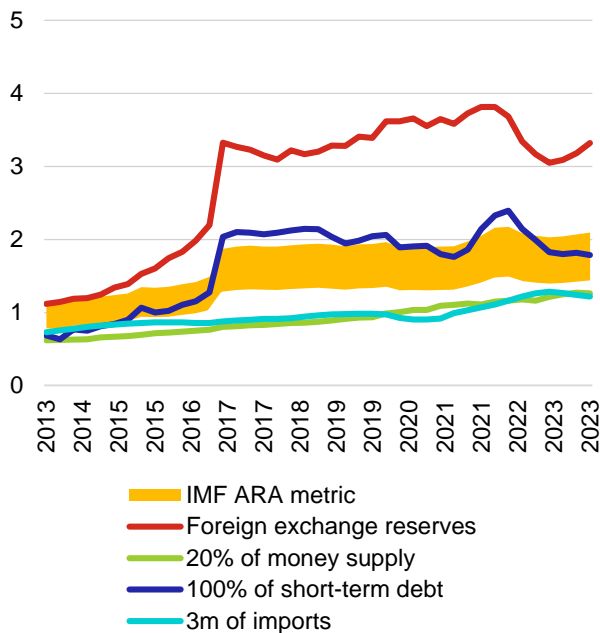
V. CNB RESERVES

After last year’s fall in reserves as a result of the CNB’s interventions in the foreign exchange market, international reserves resumed their growth trend in 2023 to reach CZK 3.32 trillion (45.2% of GDP) at year end, up by CZK 154 billion (2.1% of GDP) year on year. The value of the CNB’s net external assets³⁶ grew even more sharply by CZK 274.4 billion (3.7% of GDP) to CZK 3.18 trillion (42.5% of GDP). The Czech Republic thus still has one of the largest international reserves in relation to GDP worldwide. The size of its reserves also far exceeds the level needed to prevent and resolve balance of payments crises, such as a sharp outflow of foreign capital or a shock, for example a sudden rise in the prices of key raw materials on global markets (Chart 33).

Purchases of net income from the EU were the biggest contributor to the growth in the CNB’s reserve assets. By this operation, the central bank eliminates the impact of the net drawdown of funds from the EU on the exchange rate of the koruna (based on a prior agreement with the Czech government). The reinvestment of income from reserves also fostered growth in reserve assets, but since August 2023, the central bank has been selling most of the proceeds on the market to slow down the growth of its balance sheet.³⁷ The rise in the CNB’s net foreign assets of CZK 157.8 billion resulting largely from these operations was, however, only partially reflected in the international reserves, as the CNB used a large part of the funds to repay its short-term liabilities of CZK 133.2 billion, that are the result of the central bank’s past operations in search of profitable opportunities in the management of international reserves.

Chart 33: FX reserves have far exceeded those needed for crisis prevention and resolution

(CNB reserve assets and adequacy indicators, in CZK trillions)

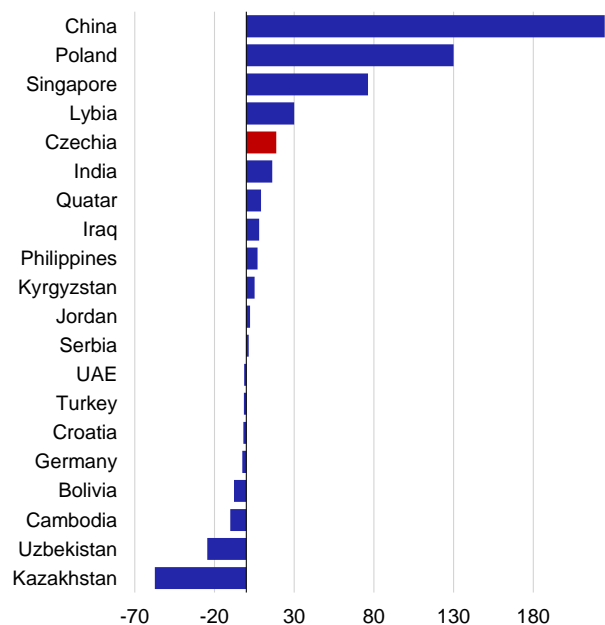


Note: The IMF ARA metric is a weighted average of exports, money supply, and short-term and long-term liabilities. Short-term external debt is listed here according to the original maturity and without intercompany loans.

Source: CNB, CNB calculation

Chart 34: The Czech Republic ranked 5th in terms of the largest gold purchases in 2023

(central bank purchases and sales of more than 1 tonne of gold in 2023, in tonnes)



Source: Gold World Council

³⁶ which remove the central bank’s external liabilities from the reserves

³⁷ The amount of the sold proceeds since August 2023 was roughly equivalent to all revenues achieved in that period.

The growth in the CNB's international reserves was also significantly fostered by the market revaluation of the bond and equity portfolios and, in particular, by the depreciation of the koruna against the euro. Market developments resulted in a reversal of the weighted average koruna yield from -7.95% p.a. in 2022 to +8.65% p.a. in 2023.

The CNB also made significant adjustments to the composition of its international reserves last year. On the one hand, all assets held in the Chinese renminbi were divested due to heightened geopolitical risks and lower profitability. In parallel, the CNB increased the volume of gold holdings, the total amount of which rose to 30.7 tonnes (Chart 34), and the share of gold in total international reserves rose to 1.6% from 0.4% at the end of 2022.³⁸ Securities remain the most important item in the CNB's reserve assets, accounting for almost 80% of total reserves.

³⁸ See the Annual Financial Report of the Czech National Bank for 2023 at https://www.cnb.cz/en/about_cnb/performance/financial-reports/.

VI. THEMATIC ANALYSES

VI.1 THE ECONOMIC VULNERABILITY OF THE CZECH REPUBLIC TO GEOPOLITICALLY DISTANT COUNTRIES³⁹

Growing geopolitical tensions around the world are contributing to the retreat of global economic integration. The process for which the term “gloeconomic fragmentation” has been adopted can manifest itself through various channels – the redirection of foreign trade flows in goods and services, the movement of capital and the migration of people. In this article, we focus on trade in goods and ask how gloeconomically vulnerable the Czech Republic actually is, i.e. to what extent the country may be harmed by the further disconnection of trade ties caused by geopolitical factors. We focus on vulnerability across the entire supply chain and identify 150 strategically important products for which the Czech Republic is highly dependent on geopolitically distant countries. These include items related to security, health, the green transition and energy self-sufficiency.

HOW DO WE IDENTIFY IMPORT VULNERABILITIES?

One of the key sources of economic vulnerability is dependency on imports of strategically important products from countries that are not geopolitical allies. To this end, we divide the world into two groups of countries depending on geopolitical distance.⁴⁰ In this scenario, the European Union, together with the United States, Britain, Japan, South Korea, Canada, Australia and several other developed countries⁴¹, ranks among the countries that are geopolitically close to the Czech Republic (together we can call them the “Western bloc”), while the second group – geopolitically more distant from the Czech Republic – is made up of the remaining states, whose views on geopolitical issues differ from that of the first bloc, but often also from each other’s (so they do not necessarily form a unified geopolitical bloc). To determine import dependency, we then use a “bottom-up” approach⁴² in which we first identify all imported products at a highly disaggregated level, and then filter out negligible items in terms of volume.⁴³ We then classify the remaining products according to three indicators, the intersection of which determines the imported products on which the Czech Republic is dependent on geopolitically distant countries.

We call the three conditions that together determine import dependency ‘concentration’, ‘significance’ and ‘substitutability’. The first indicator is *concentration*.⁴⁴ Its role is to identify products whose imports are highly concentrated from a few geopolitically distant countries. The higher the concentration of an imported product, the more dependent our position becomes, as there are only a small

³⁹ Written by Anna Drahozalová (CNB). The views presented here are those of the author and do not necessarily reflect the official position of the CNB. The author would like to thank her colleague Martin Kábrt (CNB) for his valuable comments.

⁴⁰ To this end, we fully adopt the division proposed by the International Monetary Fund (2022), where the authors determine the extent to which individual countries agree with each other on important geopolitical issues through their voting in the UN General Assembly. Their demarcation of the “Western” bloc is slightly narrower than in other approaches based on UN voting (e.g. Góes and Bekkers, 2022 or Babecká and Brůha, 2023). They do not include, for example, non-EU European countries in the Western Balkans and Turkey. When defining countries geopolitically close to the Czech Republic, our analysis can therefore be seen as rather cautious.

⁴¹ E.g. Switzerland, Norway, New Zealand and Israel.

⁴² Similar e.g. to the approach of the European Commission (2021). However, we use our own dependency and vulnerability indicators.

⁴³ We use data on the movement of goods across borders using the HS6 digit classification for all products whose import value in 2022 exceeds CZK 1 million.

⁴⁴ To calculate concentration, we use the Herfindahl-Hirschman Index (HHI), which is constructed as follows: $H_1 = \sum_{i=1}^n (s_i)^2$, where s_i is the market share of geopolitically distant country i in Czech imports and n is the total number of geopolitically distant countries. For our analysis, we set a threshold value of $H_1 > 0.4$, which corresponds to a concentration of imports from less than 2.5 countries on average.

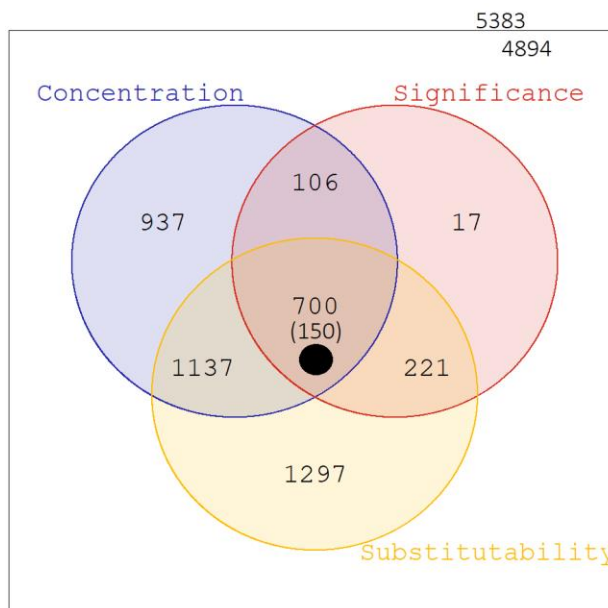
number of countries that can substitute imports of that product.⁴⁵ For our analysis, we identify all products that are imported from on average less than 2.5 countries as highly concentrated⁴⁶ and thus are part of our selection. The second indicator is *significance*,⁴⁷ which aims to find products for which we rely on geopolitically distant countries for most of our imports. The intersection of these two indicators then defines products for which we rely on a small number of geopolitically distant countries for most of the products' imports. The third indicator is *substitutability*⁴⁸, which determines whether our (Western) geopolitical bloc can fully secure a given product through its own production. The products that fall into this set are therefore those in which we, together with our geopolitically close partners, are not self-sufficient in terms of production. Finally, the intersection of all three indicators defines products for which we rely on a small number of geopolitically distant countries for most of their imports, while at the same time our bloc is not able to fully replace them with its own production.

However, import dependency does not yet necessarily imply vulnerability.

Products identified as dependent may include, for example, tropical fruit or various types of toys, a shortage of which may reduce the diversity of the consumer basket but may not significantly threaten the production potential of our economy or the well-being of consumers. At the other end of the spectrum, there are products that represent only a small proportion of total imports yet can play a key role in production (e.g. rare minerals or specialised intermediate products) or consumption (e.g. face masks or vaccines). It is therefore important to identify products that we have to import and which are also crucial for our economy.⁴⁹ The above methodology and the number of products identified are summarised in Chart VI-1.1.

Chart VI-1.1: The Czech Republic is dependent on 150 strategic products

(Venn diagram showing the number of imported HS6 products through a “bottom-up” analysis, imports for 2022)



Source: CZSO, Cross-border movement of goods, and the UN Comtrade database, own calculation

⁴⁵ A limitation of this analysis is that it only examines Czech imports, so this indicator does not take into account the fact that other geopolitically distant countries may also export the product and thus potentially provide an import substitute. This view is all the more important because, unlike the Western bloc, which usually acts together in matters of international trade, geopolitically distant countries do not have a unified trade policy and so the disruption of ties with individual trading partners can be compensated from other sources.

⁴⁶ This threshold is somewhat more conservative than recommended by the economic literature, which considers imports from fewer than four countries to be a high concentration.

⁴⁷ We calculate significance for individual products as follows: $I_2 = \frac{\text{value of imports from geopolitically distant countries}}{\text{total value of imports}}$, while we use the threshold value of $I_2 > 0.5$, i.e. we identify products whose imports are mostly from geopolitically distant countries.

⁴⁸ To calculate substitutability, it is sufficient to calculate for individual products: $I_3 = \frac{\text{value of imports to Western bloc from geopolitically distant countries}}{\text{value of exports from Western bloc to geopolitically distant countries}}$, for our analysis, we use the value $I_3 > 1$, which states that the Western bloc is a net importer of the product in question. Ideally, this indicator would use production data, but these are not available in a sufficiently detailed breakdown. Hence, as an approximation, we use export data, which indicate whether the Western bloc as a whole is a net exporter or net importer of a given product.

⁴⁹ To this end, the U.S. Department of Commerce (2021) created a list of 1,059 products considered critical in the areas of public health, information and communication technology and energy, and which includes other critical minerals and materials of importance for industrial production.

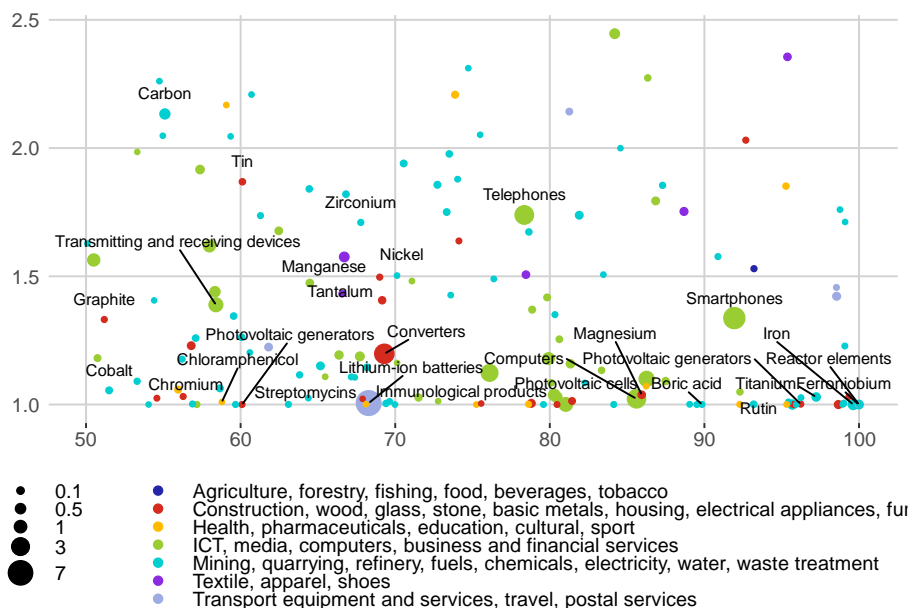
Of the more than 5,300 imported products, we identify 700 with significant import dependency. 150 of these are strategically important. As can be seen from Chart VI-1.1., out of a total of 5,383 imported products, 489 did not pass through the volume filter, as their imported value for the whole year did not exceed one million koruna. Of the remaining products there are only 17 in which the Western bloc is fully self-sufficient, but the majority of Czech imports still relies on a large number of geopolitically distant countries (e.g. clothing, tyres and certain types of processors and control units), while there are 106 for which we have to rely on only a small number of geopolitically distant countries (e.g. fabrics, jewellery, and some types of machines and motor vehicles). Such low numbers of products are not too surprising, as the self-sufficiency of the Western bloc in production means we tend to trade with countries that are geopolitically, and generally also geographically, closer to us. On the other hand, we identify 221 products for which we are not fully self-sufficient but for the majority of import we rely on a large number of geopolitically distant countries, and there are as many as 700 products with low diversification across countries. From these 700 products we exclude those that are not strategically important (e.g. furniture, sports equipment, nuts, fruit and clothing)⁵⁰ and obtain a set of 150 critical products, the imports of which rely on a small number of geopolitically distant countries and at the same time our bloc is not self-sufficient in their production.

WHAT PRODUCTS ARE OUR GREATEST VULNERABILITY?

The degree of vulnerability varies even among the resulting 150 product groups. Chart VI-1.2 shows how the 150 “import-vulnerable” product groups are distributed in relation to the concentration and dependency indicators. The vertical axis represents the average number of geopolitically distant countries from which we import a given product, while the horizontal axis indicates the share of imports from these countries in total imports in the Czech Republic. Therefore, products in the lower right-hand corner have the highest degree of dependency, as almost all of their imports to the Czech Republic come from a very small number of geopolitically distant countries. Our analysis identified two strategically significant products whose total imports are from a single geopolitically distant country.⁵¹

Chart VI-1.2: The most import-vulnerable products of the Czech Republic are mainly electronics and minerals

(y-axis: average number of geopolitically distant countries that import a given product into the Czech Republic, x-axis: share of imports from geopolitically distant countries in total imports of a given product in %, legend (bubble size) in EUR billions, imports in 2022)



Note: The colour-coded product categories correspond to the BEC classification.

Source: CZSO, Cross-border movement of goods, own calculation

⁵⁰ HS6 digit classification products are already highly disaggregated, so it would always be more accurate to state “certain types of these products”.

⁵¹ The third indicator of substitutability and the fourth of strategic importance are implicitly included in Chart VI-1.2. The Western bloc cannot fully replace any of these products through its own production, and all of them are strategically important.

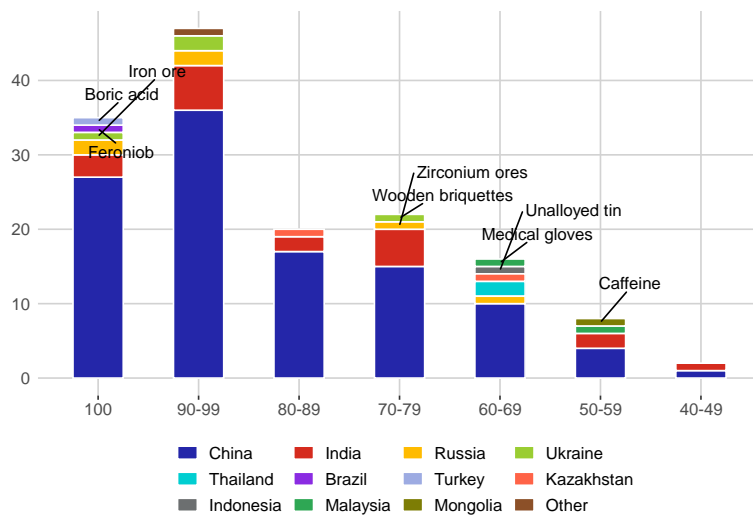
These are reactor cells used in nuclear reactors, the only importer of which to the Czech Republic in 2022 was Russia. The second product is the pesticide chlordimeform, which is used to kill mites and other insects, although its imported value is relatively low.

Products for which we have high import vulnerability include rare elements, minerals, ores and chemicals, as well as industrial products such as chips, converters and photovoltaic generators.

Many of them are key for the green transition, which will require access to raw materials such as borates,

Chart VI-1.3: China is the top importer for most “vulnerable” products, followed by India

(y-axis: number of product groups, x-axis: top importer share of total imports from a geopolitically distant bloc, imports in 2022)



Source: CZSO, Cross-border movement of goods, own calculation

cobalt, nickel, manganese, natural graphite and niobium, needed for the production of lithium-ion batteries, fuel cells, photovoltaic panels, and even wind turbines. The import of medicines, antibiotics, and other materials and aids used in healthcare is also crucial. In the field of electronics, various types of computer technology, devices for recording and reproducing sound, and smart cards are vulnerable. The import of photovoltaic components is crucial for the development of solar energy.

Almost a quarter of all “vulnerable” products are imported from just one country.

For each product, we identify the most important geopolitically distant importer, and Chart VI-1.3 shows all

150 products sorted by this importer and their share in total imports from geopolitically distant countries.⁵² For 35 products there exists only one importer – this is China in 27 cases, India in 3 and Russia in 2. For products where a single country accounts for 90%–99% of total imports from geopolitically distant countries, China dominates with 36 products. While we import most of our raw materials and pharmaceuticals mainly from China and India, there are also a few smaller countries that are top importers to Czech Republic of certain products. Kazakhstan is our main importer of ferrochrome, used in steel production, while Turkey is our only geopolitically distant importer of boric acid, used in nuclear reactors. From Malaysia, we import medical gloves and sound reproduction devices.

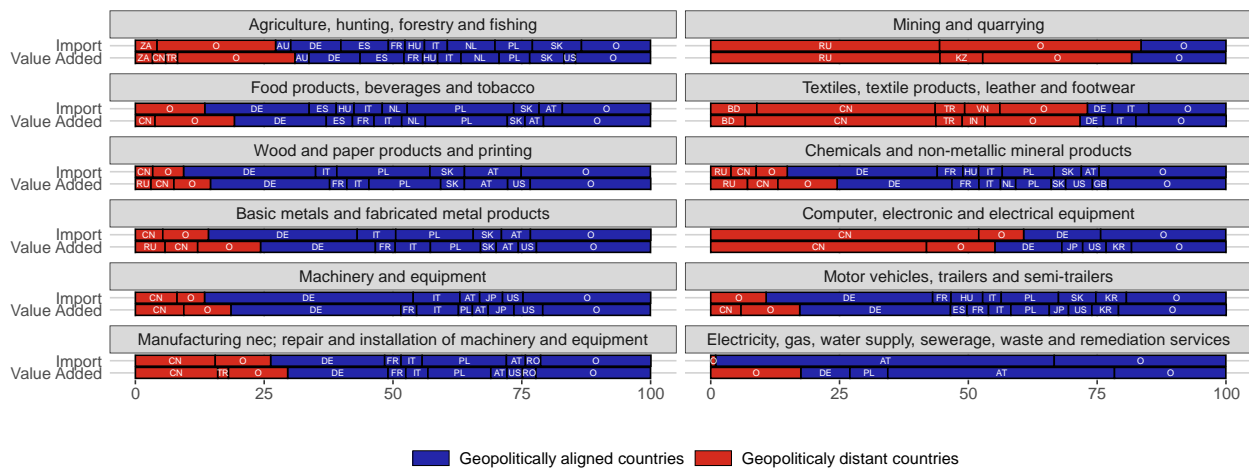
OUR ACTUAL VULNERABILITY IS EVEN HIGHER DUE TO INDIRECT LINKS

However, our actual dependency on geopolitically distant countries is even higher, because the import statistics do not take into account the origin of the added value in products we import from our friendly neighbours. While the import statistics attribute the total value of an imported product to the exporting state, Trade in Value Added (TiVA) analysis goes deeper and examines the added value at every stage of the production chain across countries. In other words, while our analysis identifies direct import dependency on China for lithium-ion batteries, it cannot determine to what extent e.g. Germany is dependent on the material for their production, and therefore our indirect dependency through their import from Germany. TiVA statistics allow us to distinguish the shares of individual countries in imports of

⁵² Once again, it is concurrently true that the share of geopolitically distant countries in total imports is more than half (see the *significance* criterion). Unlike reactor cells and pesticides (in the extreme lower-right corner of Chart VI-1.2), the total imports of which into the Czech Republic are covered by only one country, here we are talking about products imported from other Western countries in addition to a geopolitically distant bloc (the extent to which we import these products from Western countries is determined by the x-axis in Graph VI-1.2).

Chart VI-1.4: The added value in imports from geopolitically distant countries is higher than the import statistics suggest

(share of individual countries in total imports into the Czech Republic and their value added, imports in 2019)



Note: AU – Australia, AT – Austria, CN – China, DE – Germany, ES – Spain, FR – France, HU – Hungary, IT – Italy, JP – Japan, KZ – Kazakhstan, NL – Netherlands, O – Other, PL – Poland, RO – Romania, RU – Russia, SK – Slovakia, TR – Turkey, US – United States, ZA – South Africa

Source: OECD, TiVA tables, own calculation

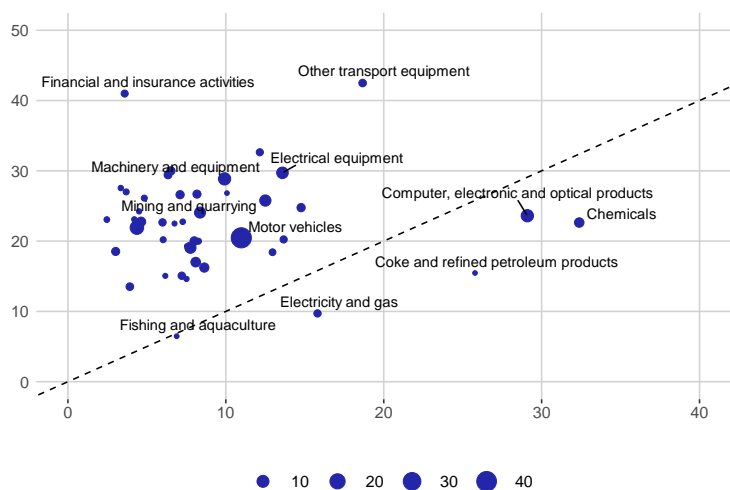
products into the Czech Republic and compare them with the added value that these countries contribute to their production, at the level of individual sectors. Chart VI-1.4 shows that in almost all sectors, the added value from geopolitically distant countries is higher than the direct foreign trade statistics suggest. Thus, the above-mentioned dependencies may be much higher, as part of the value of key products imported from the Western bloc actually comes from geopolitically distant countries. This applies mainly to metals, chemicals, pharmaceuticals and minerals.

THE VULNERABILITY OF EXPORTS IS ALSO A RISK

Import dependency threatens not only domestic demand, but also Czech exports. As an export economy, the Czech Republic imports raw materials and intermediate products needed for production, which is intended for subsequent export. Without these raw materials and other inputs, we would therefore not be able to add “our” value and further export the product. This “subcontractor dependency” is shown in Chart VI-1.5.

Chart VI-1.5: Demand from geopolitically distant countries is more important for Czech exports than their supply

(y-axis: share of geopolitically distant countries in final demand for Czech exports, x-axis: share of added value from geopolitically distant countries in Czech exports, in thousands of USD)



Source: OECD, TiVA tables, 2019, own calculation

The horizontal axis indicates the share of added value from a geopolitically distant bloc in the export of Czech products. It can be seen that geopolitically distant countries contribute most (around 30%) to Czech exports of chemicals, computers and other electronics. These groups represent significant (although not the most important) items for Czech exports (indicated by the size of the bubbles in the chart). By contrast,

value added by geopolitically distant countries in the largest Czech export category – motor vehicles – accounts for around 12%.

In the final phase of value chains, geoeconomic vulnerability also threatens demand for Czech exports. Just as import statistics do not take into account all preceding stages of production, export statistics do not take into account the following ones, and thus not even the country of final demand. As Drahozalová et al. (2023) show, Czech exports of goods are dominated by intermediate products (such as metal products and machine parts) that are used as inputs in subsequent production processes. Therefore, the countries of final demand may often differ from those to which the product is directly exported. The same goes for Czech exports to geopolitically distant countries. The vertical axis in Chart VI-1.5 shows the share of geopolitically distant countries in final demand for Czech exports. For most products exported from the Czech Republic, the geopolitically distant bloc plays a greater role in their demand than in the value they add to these products. Hence, even if subcontracting for our exports is secured, demand for them may be at risk.

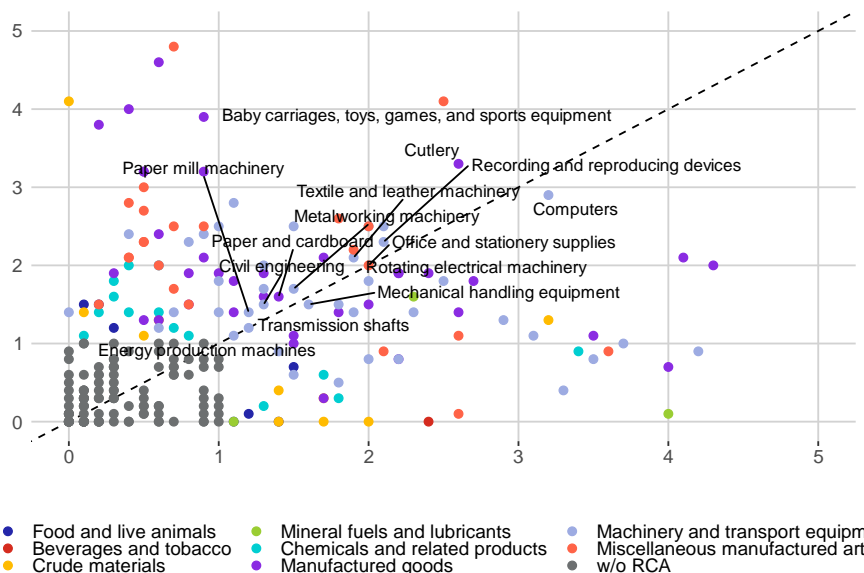
FRAGMENTATION AS AN OPPORTUNITY

From a different analytical angle, the costs of geoeconomic fragmentation can be understood in terms of resource allocation efficiency. According to the Ricardian theory of comparative advantage, each country should specialise in producing the products in which it is most efficient. If countries interfere with free markets and create trade barriers (for example, trading only with geopolitically close neighbours), the overall well-being of society will fall as production will not necessarily be concentrated in the places where it is most efficient. If we apply this theory to the Czech Republic and China, which is the dominant importer to the Czech Republic within the geopolitically distant bloc, the costs of geoeconomic fragmentation relate to products in which China has a comparative production advantage while the Czech Republic does not.

Chart VI-1.6 shows the revealed comparative advantage (RCA) of China and the Czech Republic. A value greater than one means that the given country has a revealed comparative advantage in the production of the product. Compared to the Czech Republic, China has a comparative advantage especially in the production of goods such as fabrics and textiles, silk, ceramics and industrial products, such as footwear, clothing, and photographic and optical devices.

Chart VI-1.6: The Czech Republic competes with China mainly in the production of machinery, transport equipment and consumer goods

(y-axis: index of the revealed comparative advantage of Chinese exports, x-axis: index of the revealed comparative advantage of Czech exports)



Note: A country has a revealed comparative advantage (RCA) in a product if RCA > 1. This means that the share of a given product in a country's total exports is higher than the share of the product in global exports.

Source: UNCTAD, own calculation

However, geoeconomic fragmentation can bring not only costs but also opportunities. The disruption of trading links can lead to the creation of new ones. If, for example, the West decides to trade

some products only within its bloc, the Czech Republic can meet the demand for some goods that its allies previously imported, for example, from China, and thus take a larger part of the global market for itself. Another channel may be the transfer of production capacities of Western companies from geopolitically distant countries to friendly neighbours. This phenomenon, also known as “friend-shoring”, would be reflected in an influx of investment and the opening of factories for products in which the Czech Republic has a comparative advantage. The Czech Republic has a similar comparative advantage to China, for example, in various types of machinery and equipment, and to a lesser extent also in industrial products.

CONCLUSION

Aggregated views of geoeconomic fragmentation fail to satisfactorily capture vulnerability that may be concentrated in a relatively small number of strategically important products. Using a “bottom-up” approach, the analysis in this article identified 150 products in which the Czech Republic is highly geoeconomically vulnerable. These include products needed for security, products used in healthcare, and minerals and technologies key to the green and digital transitions.

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VI.2 FOREIGN DIRECT INVESTMENT PROFITABILITY LIFE CYCLE: APPLICATION TO THE CZECH REPUBLIC⁵³

The development of the current account balance is determined by different factors in different countries. In the case of countries that underwent economic transformation in the 1990s, previous foreign direct investment (FDI) inflows were one of the most important factors. An empirical analysis of the FDI profitability life cycle is therefore a stepping stone for a better understanding of both the current and future evolution of the external economic position. This article estimates the trajectory of the expected life cycle of the initial direct investment in a sample of Central and Eastern European countries. The estimated annual profitability increases in the first years and, after reaching its maximum (in around the seventh year), there is a gradual decrease in profitability. The overall life cycle is closed after 18 years. If the average FDI inflow into the Czech Republic continued at its level between 2015 and 2019, absolute FDI earnings in the Czech Republic would increase until 2032. If, on the other hand, the inflow of new FDI into the Czech Republic were to dry up completely from 2023, the absolute FDI earnings would gradually decrease every year and would reach zero before 2040.

THE RELATIONSHIP BETWEEN THE PRIMARY INCOME BALANCE AND THE CURRENT ACCOUNT

The primary income balance, specifically the balance of investment income, is an important component of the current account in countries with a high volume of foreign direct investment (FDI) in the economy. In these countries, therefore, it is not enough to look only at the goods and services balance when assessing the sustainability of the current account, but also at the balance of primary income. Moreover, there is interdependence between the two balances. Growing surpluses in the balance of goods and services are usually accompanied by widening deficits in the balance of primary income. Depending on the type of direct investment, i.e. market-seeking, efficiency-seeking or resource-seeking investment (Dunning, 1993), the trade balance is affected by FDI inflows in two ways. While market-seeking investment replaces imports with local production, efficiency- or resource-seeking investment is expected to increase exports from the host economy.⁵⁴ However, one characteristic feature of any investment is an effort to maximise its return, so earnings from direct investments will also cause a deterioration in the balance of primary income.⁵⁵

In approximately the middle of the first decade of the new millennium, when the Czech Republic joined the EU, the competitiveness of its economy improved, as evidenced by a growing surplus of the balance of goods and services (Chart VI-2.1). The export performance of the Czech economy was due mainly to foreign-controlled enterprises (i.e. the volume of FDI in the economy), so the outflow of earnings on the primary income account increased symmetrically. The parent companies collected earnings from their investments in this way. As can be seen from Chart VI-2.1, the dynamics of the primary income balance are predominantly determined by the development of earnings from direct investment. Moreover, if we adjust the total current account balance for reinvested earnings, which do not actually leave the domestic economy,⁵⁶ we find that the actual external economic position of the Czech economy was already positive in 2005. The current account balance then switched to slightly positive values in 2014. Although this newly established external position of the Czech economy was disrupted in 2021 and

⁵³ Author: Filip Novotný. The views presented here are those of the author and do not necessarily reflect the official position of the CNB.

⁵⁴ Barrell and Holland (2000) document the positive effects of FDI on labour productivity growth in manufacturing in the Czech Republic, Hungary and Poland. Weill (2003) also points to the positive effects of foreign ownership on the cost-effectiveness of the banking sector.

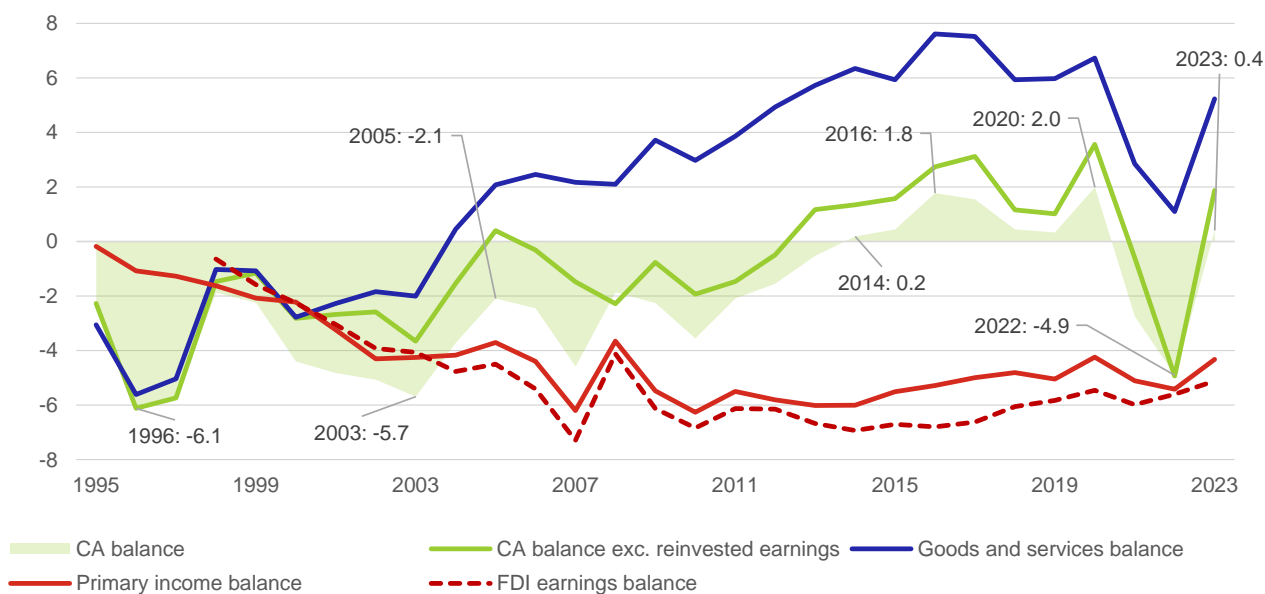
⁵⁵ However, it should be mentioned that the motives of multinational companies may include maximising up to the total consolidated profit of the multinational company, e.g. by setting arbitrary transfer prices at which the parent and its foreign subsidiaries trade with each other (Novotný, 2008) or by paying for licenses, etc.

⁵⁶ The reinvested earnings (profit) are calculated as the direct investor's share (equal to the share in the registered capital) in profit (loss) reduced by dividends paid.

2022 by the coronavirus pandemic and subsequently by the war in Ukraine, last year showed that the current account of the Czech Republic is getting back to its old ways.

Chart VI-2.1: The Czech Republic's current account and its components

(in % of GDP)



Source: CNB, own calculations

THE LIFE CYCLE OF FOREIGN DIRECT INVESTMENT

An analysis of the current account in countries where a substantial part of the economy is under foreign control requires a theoretical grasp of FDI earnings, to which the FDI profitability life cycle, *inter alia*, contributes. Brada and Tomšík (2003) and later Brůna (2015) distinguished three theoretical phases of the life cycle of direct investment. The entry phase is characterised by zero profit or even loss. The second phase already shows growth with a gradual increase in profitability, and is followed by the third phase in which profitability stabilises.⁵⁷

In this publication, we use the approach from Novotný (2018) to estimate the rate of return on initial direct investment, or the course of the FDI life cycle, using Eurostat⁵⁸ data on a sample of eleven Central and Eastern European countries, whose common feature is a significant inflow of FDI into their economies since the 1990s. Specifically, Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia are included in the analysis. From the data point of view, we only need two time series at an annual frequency for each country. One of these time series is the FDI stock in individual years from the liabilities side of the investment position, while the other time series is the FDI earnings outflows recorded on the debits side of the primary income balance.

Our longer time series (up to 2022) compared to previous analyses will help us capture the course of the FDI profitability life cycle with greater statistical reliability, as in most cases the available observations exceed twenty years and, in some cases, approach thirty.

⁵⁷ Empirical estimates of the financial life cycle of FDI have been made, for example, by Brada and Tomšík (2009), Altzinger (2006), Geršl and Hlaváček (2007) and Novotný and Podpiera (2008).

⁵⁸ Balance of payments by country - annual data (BPM6) [bop_c6_a__custom_10396259], International investment position - quarterly and annual data (BPM6) [bop_iip6_q__custom_10396742]

The hypothesis of a non-linear time profile for cumulative FDI⁵⁹ profitability is tested using a cubic polynomial function (1). If only the first term is statistically significant, the cumulative profitability increases linearly until the end of its life cycle. However, if the other terms are also statistically significant, then either a quadratic or a cubic time profile describes the profitability cycle. At the same time, we use three control variables that should affect cumulative profitability. These are growth in real gross domestic product (RGDP), the development of nominal wages (wage) and the development of the real effective exchange rate deflated by unit labour costs in the countries under review. The regression also includes a dummy variable for 2021 and 2022, which were strongly affected by the one-off effects of the coronavirus pandemic and the war in Ukraine. We estimate equation (1) using panel regression with fixed effects:

$$\rho_{j,\tau}^i = \alpha_{\tau}^i + \beta(j - \tau) + \gamma(j - \tau)^2 + \delta(j - \tau)^3 + \zeta \Delta \ln(RGDP_{j-\tau}^i) + \lambda \Delta \ln(wage_{j-\tau}^i) + \sigma \Delta \ln(REER_{j-\tau}^i) + \psi dummy_{2021,2022}^i + \varepsilon_{j,\tau}^i \quad (1)$$

where $\rho_{j,\tau}^i$ is the cumulative profitability of the FDI stock of the same age, $j - \tau$ is the number of years j from the moment τ of the foreign direct investment. The parameter α_{τ}^i captures country-specific effects on cumulative profitability, such as differences in taxation or cost-effectiveness. The coefficients β , γ and δ represent the linear, quadratic and cubic trend. RGDP is real gross domestic product, wage is nominal wages, and REER is the real effective exchange rate. The source of the data for these variables is Eurostat.

Table VI-2.1: Estimate results

Constant	0.017 (0.013)
$j - \tau$	0.064*** (0.007)
$(j - \tau)^2$	0.004*** (0.001)
$(j - \tau)^3$	-0.002*** (0.00004)
$\Delta \ln(RGDP)$	0.003*** (0.001)
$\Delta \ln(wage)$	-0.002*** (0.0007)
$\Delta \ln(REER)$	0.004*** (0.0006)
Dummy (2021, 2022)	-0.038*** (0.01)
$\sigma_u/\sigma_e/\rho$	0.14/0.11/0.61
R ² /R ² within/R ² between	0.77/0.86/0.7

Number of observations: 1,744; number of groups: 230; dependent variable: cumulative profitability of FDI stocks; asterisks indicate statistical significance: *** 1%; standard deviations are in parentheses.

The results of the estimate confirm our hypothesis of the non-linear course of cumulative profitability of the original FDI stock, as all three time coefficients are statistically significant. In addition, the coefficients of the control variables used are also statistically significant. Growth in economic activity and appreciation of the real effective exchange rate lead to higher cumulative FDI profitability in the countries under review, while nominal wage growth reduces this profitability, a situation in line with economic intuition. The dummy variable, which filters out the effect of the external one-off shocks in 2021 and 2022, is also statistically significant. The shape of the time profile of cumulative profitability is close to the logistic curve, where the implied annual profitability first increases but then begins to decline after reaching its maximum (around the seventh year). The life cycle of a given initial investment is completed after the 18th year of the investment's existence, i.e. at the moment when cumulative profitability begins to decline and the implied annual profitability is therefore negative. We assume that by the time negative annual profitability is reached, the initial FDI is already exhausted and its life cycle is completed. At the same time, we believe that the time series used are already long enough to cover the entire life cycle of an investment, as most investors usually consider a time horizon of around 10 to 15 years when making a new investment abroad (the cycle of fixed investments usually lasts around 7 to 11 years).

The time profile of the cumulative and calculated annual profitability using the time coefficients estimated by us is shown in Chart VI-2.2. The chart shows that, on average, the annual profitability in the Central

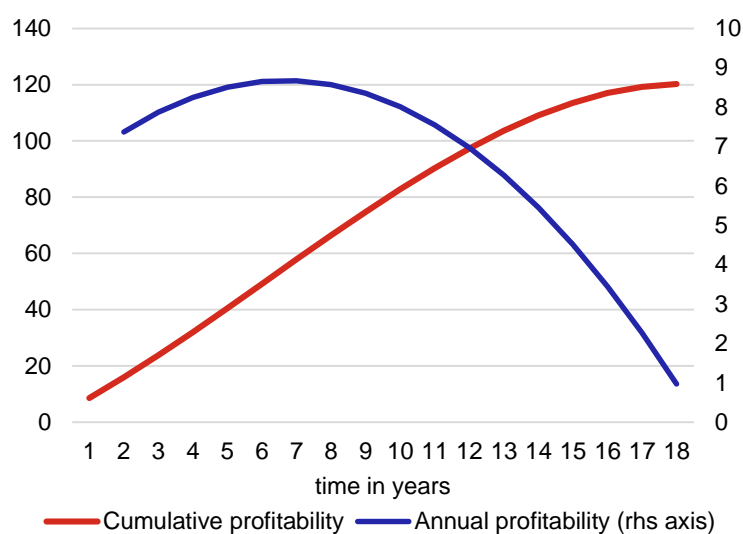
⁵⁹ The calculation of cumulative FDI profitability is described in Novotný (2018).

and Eastern European countries reaches its maximum of 9% in the seventh year of investment, and then gradually decreases until the original foreign direct investment is completely exhausted in the eighteenth year, when the annual profitability approaches zero. At the same time, the cumulative profitability reaches its maximum.

The estimated FDI life cycle is slightly longer than in previous estimates, which probably stems from the availability of longer time series in the current estimate. In Novotný (2018), maximum annual profitability was achieved in a sample of Central and Eastern European countries in the eighth year of the initial investment. At the same time, however, the overall life cycle was shorter, namely 15 years.

Chart VI-2.2: Estimated shape of the cumulative and implied annual profitability on initial FDI in Central and Eastern European economies

(profitability in %)



Source: Eurostat, own calculations

only in the form of reinvested earnings, which means that existing foreign investors will reinvest one third of their previous year's earnings in the Czech Republic, similar to what has been the case in the last few years.⁶¹ We do not expect any other FDI inflows to the Czech Republic in this scenario. In the third scenario, we combine the two previous scenarios. Specifically, half the average total FDI inflow from 2015 to 2019 will flow into the Czech Republic and, in addition, one third of FDI earnings from the previous year will be reinvested in the Czech Republic. The fourth and final scenario represents an extreme (i.e. unlikely) situation in which no new FDI will flow into the Czech Republic and existing investors in the Czech Republic will not reinvest their profits. In this scenario, foreign investors will decide to repatriate all their FDI earnings, and the Czech Republic will also become unattractive for new foreign investment. The primary income balance will therefore be affected only by the changing time structure of the existing FDI stock in the economy. The simulations are not primarily about accurately quantifying the absolute

IMPLICATIONS FOR THE FUTURE DEVELOPMENT OF THE CZECH REPUBLIC'S CURRENT ACCOUNT

Knowledge of the FDI profitability life cycle enables us to construct various scenarios for the future development of FDI earnings.⁶⁰ The variable about which we make expert assumptions is the future inflow of FDI (i.e. changing FDI stock). In the case of the Czech Republic, the level of observed profitability is higher than in the other countries used in the estimate.

We assume four alternative scenarios for the Czech Republic. In the first scenario, we consider a year-on-year increase in FDI stock in the Czech Republic of the same magnitude as the average between 2015 and 2019, i.e. EUR 11.1 billion. The second scenario assumes future FDI inflows

⁶⁰ At the same time, it should be noted that the Czech Republic's development from an originally transitional to an advanced economy means it has begun to make significant direct investments of its own abroad. These Czech direct investments are also reflected in an increase on the credit side of primary income. In the future, the balance of FDI earnings will depend not only on the inflow of FDI into the Czech Republic, but also on direct investments by residents abroad, which have been almost comparable in some years.

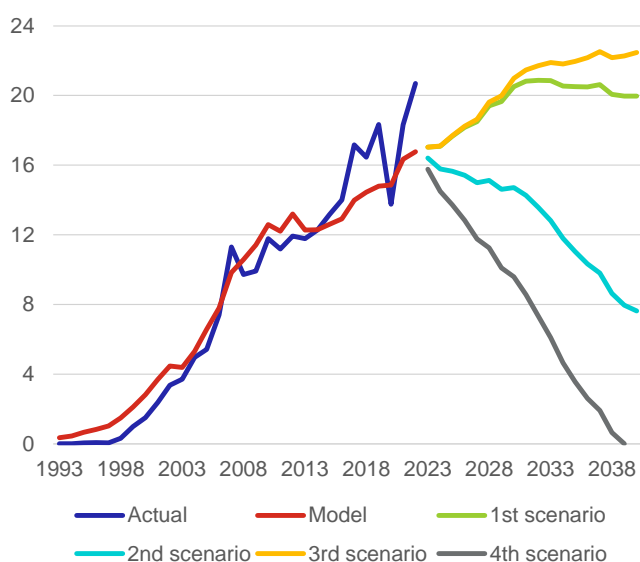
⁶¹ The share of reinvested earnings in total FDI earnings has been decreasing in the Czech Republic since 1993, partly related to the ageing of initial direct investment in equity capital, with reinvestments being the largest at the beginning of the direct investment (Brada and Tomšík, 2003).

expected FDI earnings, but rather about understanding the expected trajectories of their future development.

In the first scenario, the volume of FDI earnings will continue to grow until 2032. The absolute volume of annual earnings will subsequently stabilise. In the second scenario, in which the Czech Republic only has reinvested profits from existing FDI, the absolute volume of FDI earnings will initially decline gradually, with this decline then accelerating from 2030 onwards. In the third scenario, under which the Czech Republic stays relatively attractive to foreign investors, the absolute volume of FDI earnings continues its current growth trend from previous years. On the other hand, we can expect a further relative improvement in the goods and services balance, as FDI earnings in the Czech Republic are generated mainly by the export industry.

Chart VI-2.3: Scenarios of future outflow of FDI earnings in the Czech Republic

(earnings in EUR billions)



Source: Eurostat, author's simulations and calculations

profitability peaking in the seventh year of the initial investment. The application of the estimated FDI profitability profile to the Czech Republic enables us to model the expected total FDI earnings depending on the expected future FDI inflow into the Czech Republic, which is useful for assessing the external economic position given their significant weight in the overall current account of the Czech Republic's balance of payments.

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The fourth scenario, which assumes a complete halt in FDI inflows into the Czech Republic in the form of both new investment and reinvested earnings, assumes a gradual decline in absolute FDI earnings until 2039, when the life cycle of even the youngest component of the currently observed total FDI stock in the Czech Republic ends.

CONCLUSION

The profitability of FDI stocks has a non-linear time profile. At the beginning of the life cycle, annual FDI profitability grows faster, then its growth slows down, and finally profitability decreases. At the moment when annual profitability is zero, which means that cumulative profitability reaches its maximum, we consider the FDI life cycle to be complete. The estimate for our eleven countries from Central and Eastern Europe is an FDI profitability life cycle of 18 years, with annual

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VI.3 THE HISTORY OF CAPITAL FLOWS IN THE CZECH REPUBLIC⁶²

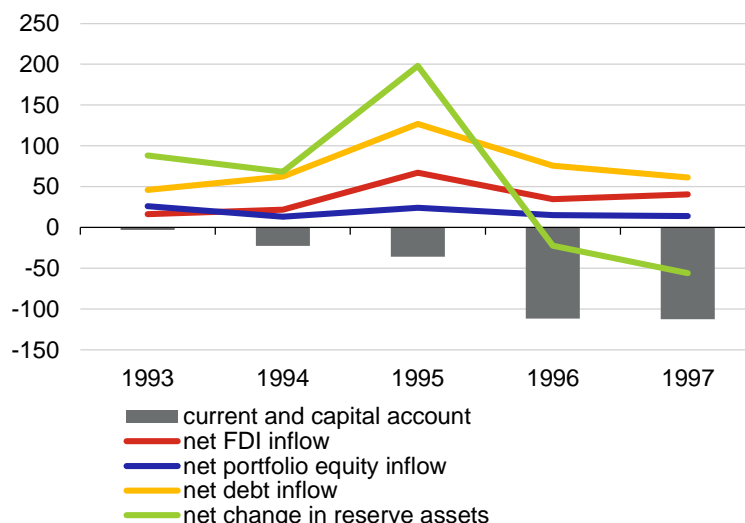
When it came into existence in 1993, the Czech Republic had low external debt, an approximately balanced current account of the balance of payments, and a stable koruna exchange rate as a nominal anchor for economic transformation. On the other hand, it suffered from its economy's weak external competitiveness and extremely low foreign exchange reserves. In this article, I describe the history of the 30 years of changes in the Czech economy from a socialist closed, uncompetitive economy to a developed country fully integrated into the global economy, from the perspective of changes in its involvement in international financial flows.

1. THE PERIOD OF DRAWING ON FOREIGN LOANS TO BUILD UP FOREIGN EXCHANGE RESERVES AND FINANCE CURRENT ACCOUNT DEFICITS (1993–1997)

At the beginning of its transformation, the Czech Republic did not enjoy strong confidence from foreign investors and financial markets. Most firms were state-owned or freshly privatised, mainly through 'coupon privatisation'. A standard legal environment was not even in its infancy. It was also necessary to "create" private capital and find the ultimate owners of a huge number of firms. The banking sector consisted of large banks created from banks existing during the period of socialism, and newly created private domestic banks with weak capital bases. Banking supervision was something completely new. Firms' and banks' access to international financial markets was thus very limited. Of the banking sector at that time, only ČSOB and, to a limited extent, Živostenská banka were able to borrow on international markets. At the beginning, a key role in obtaining resources from abroad⁶³ was played by the state's agreed direct loans from international institutions (including the World Bank)⁶⁴ and direct loans from abroad of the CNB. The drawdown of these loans was subject to an agreement between the Czech Republic and the IMF and its regular assessment by the Czech Republic. These resources, including government loans, were directed to the CNB, which directly balanced supply and demand on the foreign exchange market to the detriment or benefit of foreign exchange reserves. The second major source of capital during that period was the sale of assets. The state directly sold some firms to foreign bidders. Other forms of private capital inflows played a marginal role.

Chart VI-3.1: Developments 1993–1997

(CZK billions)



Source: CNB, own calculations

Given the approximate balance of the current account at the beginning of the period described, there was no significant need for CNB intervention on the market (Chart VI-3.1) and the above-mentioned loans and state asset sales

⁶² Written by Vladimír Žďárský (CNB). The views presented here are those of the author and do not necessarily reflect the official position of the CNB.

⁶³ Initially to strengthen foreign exchange reserves, and later to finance the current account deficit

⁶⁴ At the time it came into existence, the Czech Republic also had loans from the European Community and the G-24 group, but it has practically not increased these since 1993.

enabled the CNB to build up the necessary foreign exchange reserves. The aim was to gradually reach a level corresponding to international standards⁶⁵. In 1994, thanks to their favourable development, it became possible to repay the relatively costly loans from the IMF associated with the introduction of koruna convertibility in 1991. The ability of Czech entities to borrow from abroad also gradually started to improve⁶⁶. At that time, however, the first signs of future problems were already visible, in particular the still weak external competitiveness of the economy and the high volume of loans provided by the domestic banking sector, often under very non-standard conditions.

In 1995 and 1996, the Czech Republic's external imbalances in the form of a current account deficit deepened rapidly. This was due to a combination of factors. In many cases, the chosen form of privatisation did not ensure the ultimate owners of companies with the necessary know-how, capital and secured sales channels would be found. The competitiveness of Czech goods on foreign markets gradually increased, but exports grew much more slowly than imports. This growth in imports was also made possible by the rapid abolition of existing restrictions on capital movements, including the introduction of external convertibility of the koruna. Domestic demand was further fuelled by fiscal policy and the functioning of the banking sector, which (especially in 1994–1996) underestimated credit risk and provided loans even under completely non-standard conditions (Böhm and Žďárský, 2003). The current account deficit of the balance of payments for 1996 exceeded the usually acceptable limit of 5% of the GDP, and the situation continued to deteriorate.

The external imbalance was financed by debt capital inflows, motivated by the interest rate differential and low exchange rate risk thanks to the exchange rate targeting regime. To maintain the exchange rate target, the CNB had to draw excess foreign exchange from the market but, by buying it, it created new koruna liquidity that jeopardised the fulfilment of its second money growth target. The withdrawal of liquidity resulted in a rise in interest rates and thus a further inflow of debt capital from abroad, and the cycle repeated. The widening of the fluctuation band for exchange rate movements to $\pm 7.5\%$ did not significantly contribute to a solution.

The situation culminated in 1997 Q2 with domestic and foreign entities doubting the sustainability of the existing system of foreign exchange market operations and a stable exchange rate. Demand for foreign exchange rose sharply and the CNB had to intervene to maintain the exchange rate of the koruna. The situation quickly became unsustainable and the CNB abandoned the existing fixed exchange rate mechanism with a narrow fluctuation band. The exchange rate began to be determined by supply and demand on the market, and the CNB switched to a managed floating exchange rate system, where the balance on the foreign exchange market is ensured by the banking sector. The koruna weakened quite significantly, by around 12% against the Deutsche Mark (Dědek, 2000).

2. THE PERIOD OF MASSIVE INFLOWS OF DIRECT INVESTMENT INTO THE CZECH REPUBLIC (1998–2008)

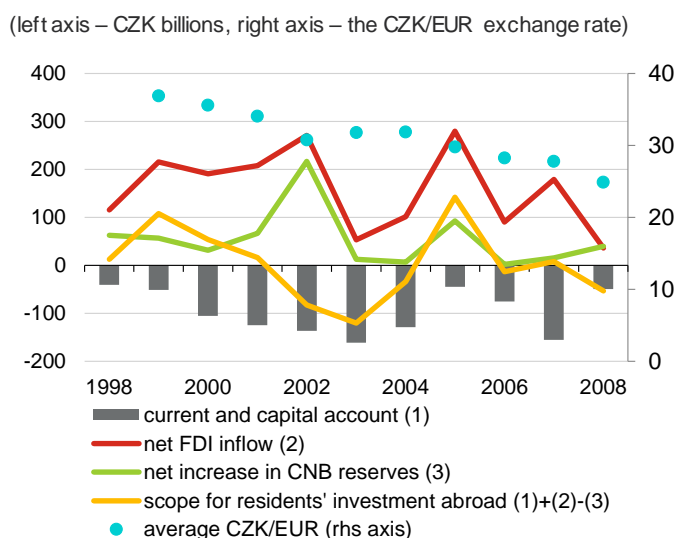
The currency turbulence led to fundamental changes in the government's strategy. The policy of preferring domestic owners during the privatisation of the economy was abandoned, and the functioning of the banking sector also changed. There followed a wave of failures of small domestic banks, the rescue of large ones with state support, and their subsequent sale to foreign owners. Banking supervision tightened with the gradual adoption of international standards. Last but not least, the monetary policy objective also changed, with the fixed exchange rate and money supply targeting being replaced with a floating exchange rate, and the CNB switched to an inflation targeting regime at the beginning of January 1998.

⁶⁵ Coverage of imports of goods and services for 6 months

⁶⁶ Exporting firms gained access to foreign credit markets by pledging export receivables, thus significantly reducing their interest expenses.

The changes that occurred in the second half of 1997 were reflected in interest from non-residents in investing in the Czech Republic. The average FDI inflow per year was just under CZK 40 billion between 1993 and 1997. In the 1998–2008 period, with one exception, it has not fallen below CZK 100 billion, while it reached an average of CZK 200 billion over 10 years and, in 2008, when the global financial crisis was already emerging, it was still around CZK 150 billion. These investments took the form of the sale of existing assets to foreign owners, who only supplied know-how, sales networks, the necessary capital or new technologies, as well as the construction of completely new enterprises on greenfield sites. The inflow of investment changed the Czech economy significantly and its competitiveness on global markets increased sharply.

Chart VI-3.2: Developments 1998–2008



Source: CNB, own calculations

The current account deficit, except in 1998 and 1999 when domestic demand was severely depressed, was deeper than the levels in the crisis years 1996 and 1997, and was on average around CZK 130 billion. However, its relative ratio to GDP declined as a result of economic growth. Rapid export growth was also an important factor. If exports just exceeded CZK 600 billion a year in 1998, they were already 3.5 times higher in 2007. The improvement in export capacity was reflected in a gradual reduction in the trade deficit, which became a surplus in 2005. This confirmed the Czech Republic's rapidly growing external competitiveness. Moreover, the way the current account deficit was financed changed diametrically.

The latter did not exceed the net inflow of direct investment on average and thus did not require further growth in the Czech Republic's external debt and even allowed residents to invest abroad to some extent.

After accession to the EU in 2004, net capital inflows from the EU became another, albeit initially insignificant, source of financing. In addition, the Czech Republic began to visibly profit from EU membership itself, which brought the free movement of goods, services, people and capital. The visibly changing Czech economy and its growing competitiveness led to rapid appreciation of the Czech koruna. While in 1997, i.e. after the currency turbulence, the exchange rate of the koruna was about CZK 18 to the Deutsche Mark, i.e. about CZK 36 to the hypothetical euro, in the summer of 2008, before the outbreak of the financial crisis, it fell below CZK 23 to the euro (Chart VI-3.2). The koruna was thus about one-third stronger⁶⁷ than a decade earlier. However, this certainly unique period in economic history will be very difficult to repeat. The cost of the economic transformation in the Czech Republic is an exceptionally high share of economic ownership by non-residents, who control most of its most profitable and successful entities. In 2021, foreign-controlled enterprises employed 28% of all workers, but accounted for 42% of value added in the Czech economy and the same share of profits. It is the income of foreign investors in the Czech Republic that leads to the relatively large difference between GDP and gross national income (GNI), which adjusts GDP for income that is due to non-residents. In the balance of payments, non-

⁶⁷ In addition, it should be noted that in this period, on the basis of an agreement with the Ministry of Finance of the Czech Republic, the CNB did not release the proceeds from the sale of state assets to the foreign exchange market and purchased them into its reserves through a "privatisation account". Privatisation proceeds therefore had no effect on the appreciation of the koruna. These totalled around CZK 370 billion.

residents' profits from direct investment are imprinted in the primary income deficit and reduce the surplus or deepen the current account deficit.

3. THE GRADUAL DECREASE IN EXTERNAL FINANCING NEEDS AFTER THE GREAT RECESSION (2009–2013)

The Great Recession of 2008–2009 led to a temporary moderation of the current account deficit. In 2009 in particular, there was a significant decline in exports, but the drop in imports was even greater. Thereafter, in 2010, the current account deficit returned above CZK 100 billion, but started to fall rapidly in the following years. This was due to a rapid increase in the trade surplus, mainly reflecting structural changes in the economy associated to a large extent with direct investment by non-residents in the previous period. The gradually declining need for foreign financing of the Czech economy also reflected in capital flows, especially in the form of growing investments by residents abroad (Chart VI-3.3).

The structure of the capital inflows from abroad also changed.

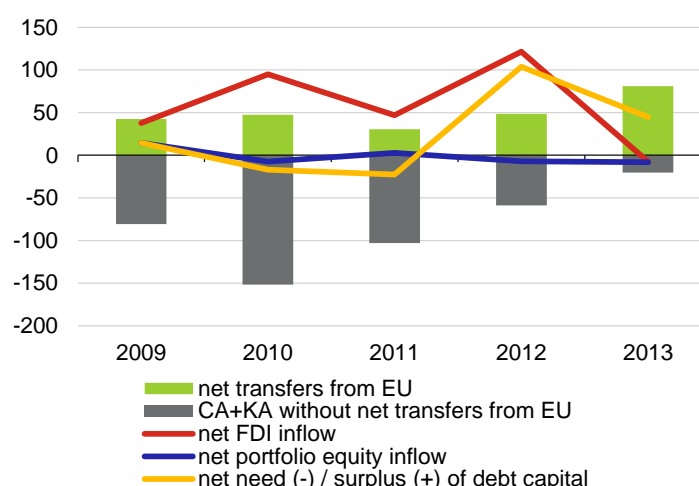
Direct investment inflows, until then the main source of financing current account deficits, fell on average by about a third compared to the 1998–2008 average. Initially, this was mostly the usual reaction of investors to a crisis, but gradually long-term factors began to prevail, and these are basically still valid today. The Czech Republic has become economically less advantageous for investors compared to the other V4 countries (Poland, Slovakia and Hungary) due to the development of wages, the koruna exchange rate, and the possibility of providing investment incentives. On the other hand, the longer-term existence of domestic entities and their gradual building of an international "reputation" has opened up for some of them the possibility of foreign financing through the issuance of bonds at more favourable interest rates. In the case of government bonds, foreign investors have also become interested in domestic koruna issues. By contrast, initial public offerings (IPOs), as possible sources of corporate financing, have not taken off in the Czech Republic.

On the other hand, interest from Czech investors in direct investment abroad has continued to grow along with the economic maturity of the Czech Republic. By contrast, there was a significant and paradoxical decline in portfolio investment by residents abroad. This decline in interest can probably be explained by losses in the value of shares during the crisis, the decrease in foreign bond yields as a result of the decline in interest rates, and probably also by more favourable domestic conditions for investing.

From 2008 onwards, the importance of net receipts from the EU budget also started to increase. The CNB eliminated the impact of these operations on exchange rate developments on the basis of an agreement with the Ministry of Finance of the Czech Republic. As a result, these funds were purchased and placed abroad as part of the CNB's international reserves. Changes in the balance of payments

Chart VI-3.3: Developments 2009–2013

(CZK billions)



Source: CNB, own calculations

associated with the economic crisis, as well as EU membership, did not lead to a renewed need for debt financing of external imbalances⁶⁸. In 2012, the Czech Republic became a net exporter of capital.

4. THE MASSIVE INCREASE IN THE PRESENCE OF SHORT-TERM DEBT CAPITAL IN THE CZECH REPUBLIC DURING THE CNB EXCHANGE RATE COMMITMENT PERIOD (NOVEMBER 2013 TO APRIL 2017)

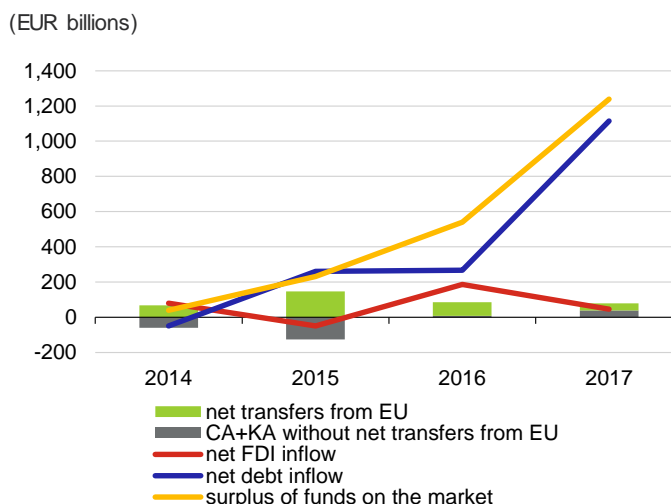
At the beginning of November 2013, the CNB's efforts to ease monetary conditions at a time when inflation was below-target led to a decision to use the exchange rate as an additional monetary policy instrument. This involved the 'exchange rate commitment', namely the decision by the CNB to weaken the exchange rate of the koruna through foreign exchange interventions by around 5.5% to above CZK 27 to the euro and not to allow it to fall below this level during the announced period. This period was extended due to prolonged adverse economic developments and ended at the beginning of April 2017. The exchange rate commitment also modified the regime for

balancing supply and demand on the foreign exchange market. It was a combination of two methods, depending on where the exchange rate of the koruna was against the euro. If the koruna was weaker than CZK 27 against the euro, the banking sector balanced supply and demand on the market. If demand for the koruna pushed the exchange rate below CZK 27 to the euro, the CNB purchased foreign currency (euros) until the koruna weakened above this level.

An increase in the balance of goods and services, associated with faster growth in exports than in imports, was evident during the exchange rate commitment. With the practical stagnation of the balance of primary income, and a slight decrease in secondary income, the current account went from a very modest deficit to a surplus, which then gradually grew. At the same time, capital account surpluses increased, mainly due to higher net absorption of EU resources. Unlike in the past, the Czech Republic became a net exporter of capital, to an extent slightly exceeding CZK 100 billion a year on average. With some simplification, however, it can be said that almost the entire surplus generated in this period was the result of net subsidies from the EU, which on average exceeded CZK 90 billion in this period. The CNB continued to purchase them into its reserves and reinvest abroad. Apart from the growth in the CNB's reserves, virtually no financial account operations were needed to finance external (im)balances, and the volume of financial operations could have declined significantly.

Despite these facts, however, the volume of financial operations on the financial account increased many times over. Central banks' monetary policies eased extremely in the wake of the Great Recession. As a result, in developed countries, especially in the euro area and countries with monetary policies closely linked to it⁶⁹, it became difficult to appreciate capital. The combination of the CNB's exchange rate commitment and the ECB's extremely relaxed monetary policy did not have a significant impact on capital flows to the Czech Republic for some time. This remained the case as long as the financial markets did not expect a change in the CNB's monetary policy due to low inflation and economic

Chart VI-3.4: Developments 2014–2017



⁶⁸ A small amount of debt capital was needed only in 2010 and 2011.

⁶⁹ Especially Denmark, Sweden and Switzerland

growth in the Czech Republic. This was the period from November 2013 to June 2015. The CNB was not present on the foreign exchange market at all in this period, and the exchange rate was above CZK 27 to the euro.

In the second half of 2015, however, a gradual change in the situation began. With the gradual recovery of the domestic economy, non-residents began to show an interest in investing in the Czech economy. This took the form of short-term investments which, due to the limited domestic supply, were directed to government koruna bonds and short-term koruna deposits with domestic banks. To a considerable extent, these were operations by foreign parent companies (or institutions linked to them) of major domestic banks⁷⁰. As a result, an excess of foreign exchange supply over demand was created on the market and thus pressure on the koruna to appreciate (Chart VI-3.4). The CNB had to intervene in the market to maintain its commitment, but its presence in the market was not permanent.

However, from September 2016 until the end of the exchange rate commitment in April 2017, the inflow of short-term capital from abroad was already massive. Based on economic growth and inflation in the Czech Republic, the financial market had expected an early exit from the exchange rate commitment and future appreciation of the koruna. Given the persisting very relaxed monetary conditions in developed countries, investing in the koruna seemed an attractive opportunity under the given conditions. However, the CNB wanted to do what it had said regarding the announced end date of the commitment (the end of March 2017 at the earliest) and so had to intervene massively. While the CNB was not present on the market from December⁷¹ 2013 to June 2015, and purchased approximately EUR 14.5 billion between July 2015 and August 2016, the CNB purchased approximately EUR 54 billion, i.e. almost CZK 1.5 trillion between September 2016 and the end of the exchange rate commitment at the beginning of April (i.e. the last seven months of the commitment).

The CNB's exchange rate commitment helped restore economic growth and led inflation to rise to the inflation target⁷². However, one consequence of the last two quarters of the exchange rate commitment in particular was a sharp increase in short-term foreign capital in the Czech Republic. This reversed the banking sector's external indebtedness from a marginal creditor position to a net debt of CZK 1.15 trillion, mainly because of the growth in short-term koruna deposits by non-residents at domestic banks. The inflow of speculative capital also increased the government's external debt by more than CZK 300 billion, i.e. by more than one half, due mainly to growth in holdings of koruna bonds by non-residents. Transfers of funds in the range of tens of billions of koruna from abroad to koruna accounts in the Czech Republic were also evident at major companies with foreign owners. On the other hand, as a result of the foreign exchange interventions, the CNB's international reserves increased significantly, by around CZK 2 trillion.

The exchange rate commitment thus fundamentally changed the structure of the Czech Republic's investment position vis-à-vis the rest of the world. On the one hand, it significantly increased the volume of short-term debt capital of non-residents in the Czech Republic. This could deepen the economy's vulnerability to external shocks because it is highly mobile and sudden flight can cause sharp depreciation pressure and, in extreme cases, a currency crisis. At the same time, however, the central bank's foreign exchange reserves, i.e. liquid foreign assets that the CNB could sell to compensate for such outflows of foreign capital, increased to a similar extent.

⁷⁰ The domestic banking sector is predominantly owned by non-residents.

⁷¹ The initial intervention to weaken the koruna amounted to about EUR 7.5 billion.

⁷² Although the available studies differ in terms of the quantitative estimates, most find that the exchange rate commitment had a positive effect on economic growth and inflation (see, for example, Brůha and Tonner, 2017, Opatrný, 2017, Baxa and Šestořád, 2019).

5. CAPITAL FLOWS IN THE CZECH REPUBLIC'S PERIOD OF EXTERNAL EQUILIBRIUM (2017–2019)

In the period after the discontinuation of the exchange rate commitment (2017–2019), the current and capital account surpluses of the Czech Republic began to gradually decline. This was mainly due to a slight reduction in the trade surplus and a gradual widening of the primary income deficit. With some simplification, it can be said that the first was due to a rise in prices of imported, especially energy-related, raw materials after the subsiding of the adverse global economic developments, and the second to a rise in CNB interest rates. After the crisis, Czech subsidiaries of foreign banks had about CZK 2.6 trillion deposited with the CNB, which, when rates rise, increases the net profits of banks that are then transferred abroad in the form of dividends.

The amount of foreign short-term capital present in the Czech Republic decreased by CZK 300 to 350 billion. However, the decisive part of it remained in the Czech Republic, probably predominantly due to the ECB's still extremely relaxed monetary policy, which pushed short-term capital abroad. However, the Czech economy was probably "protected" from further inflows of short-term capital associated with the rise in CNB interest rates in this period by similar rate increases in several other developed countries, predominantly the USA.

6. THE IMPACTS OF THE COVID-19 PANDEMIC AND THE WAR IN UKRAINE ON CAPITAL FLOWS (2020–2023)

Overall, the economic constraints following the outbreak of the COVID-19 pandemic led to a record current account surplus in 2020. Although the Czech Republic lost its external surpluses generated by tourism, this effect was outweighed by a decrease in the prices of imported energy and a sharper decline in domestic rather than foreign demand. The relatively significant decline in corporate profitability was also reflected in a moderation of the negative balance of investment income. The capital account surplus also increased significantly, owing to higher net transfers from the EU and emissions trading. The record current and capital account surpluses led to significant net exports of capital abroad, with the decline in banks' short-term foreign currency debt to other countries being the most significant in terms of volume.

However, 2021 – and especially 2022 – were another major turning point in the Czech Republic's external balance. Merely two years after the country achieved its largest ever external surplus (in absolute terms), the country fell into its deepest deficit. The sharp change was due to several factors, two of which were key – the problems of the domestic automotive industry with procuring inputs abroad amid the global supply chain disruptions and the sharp rise in the prices of raw materials on world markets, especially natural gas and oil. Other, less important, factors were a deepening of the negative balance of investment income (dividends paid abroad) and a sharp reduction in the capital account surplus (expenditure on emission allowances).

Financing the large external imbalances of the Czech economy required a net inflow of foreign capital. Instead, however, foreign capital began to leave the Czech Republic. This was because in the summer of 2023, the CNB Bank Board was replaced, with the market expecting a more accommodative monetary policy. The combination of deep external imbalances and short-term debt capital outflows would normally lead to a sharp depreciation of the koruna.

However, the actual development of capital flows differed to this due to the CNB's decisive intervention. In an effort to dampen the considerable inflation pressures in 2022, the central bank decided to prevent a sharp depreciation of the koruna and to use the koruna exchange rate as a monetary policy instrument to alleviate inflationary pressures. With its direct foreign exchange interventions of around EUR 26 billion (between May and early October 2022), the CNB forced a slight appreciation of the koruna. The extent of the interventions thus not only covered the external imbalances, but also allowed for a smooth outflow of the short-term capital of non-residents. The interventions helped significantly reduce the net external indebtedness of the banking sector by more than CZK 300 billion and, to a small extent, government external debt.

The outflow of short-term debt capital from the Czech Republic continued in 2023, as the interest rate spread between the koruna and the euro continued to narrow amid rising euro rates and stagnating koruna rates. The pace of the outflows increased especially in the second half of the year after the formal termination of the CNB's intervention regime, which had not actually been used for almost three quarters of a year but could have been perceived by investors as a hedge against a sharp weakening of the koruna. The depreciation effect of the capital outflow was partly offset by the external surpluses of the Czech economy which, after the fading away of the production difficulties in manufacturing and the decline in prices of imported energy, returned to a current account surplus in a single year.

CONCLUSION

The Czech economy was transformed relatively successfully and quickly in the first 15 years of its existence. The original closed economy with dominant state ownership, in which the external balance was ensured by restricting imports and access to convertible currencies, was transformed into a developed economy with full external currency convertibility. The main factors that ensured this situation were the transfer of significant parts of the economy into foreign hands and significant shifts of production, especially from Western Europe to the Czech Republic. In later years, net subsidies from the EU and, of course, the Czech Republic's integration in the EU's single market also helped.

From the point of view of policymakers, the steps taken at the beginning of the introduction of convertibility and during the period of monetary separation with Slovakia (the stability of conditions during the transformation of the economy, the minimal indebtedness of the Czech Republic, and the building up of foreign exchange reserves) and the steps taken after the crisis in 1997 (increasing the competitiveness of the economy through measures to encourage inflows of direct investment with an impact on the later restoration of the external balance of the Czech Republic) **can be considered a successful period.** The exchange rate commitment in 2013–2017 also encouraged the then-subdued economic and price growth.

The years 1994–1997 were **less successful**, with the hasty completion of the convertibility of the koruna in 1995, the slow adoption of international banking supervision standards resulting in the provision of a significant amount of substandard loans, and the growth of the country's external imbalance above a safe level, followed by a forced depreciation of the koruna and the exit from the exchange rate regime. With the benefit of hindsight, the late exit from the exchange rate commitment in 2017 can be seen as a second less-successful period. Although it protected the CNB's credibility after the publicly announced commitment, it led to an unnecessary inflow of short-term capital to the extent of almost CZK 1.5 trillion. In these periods, foreign short-term capital profited from an accurate appraisal of the economic situation of the Czech Republic. This contributed to the CNB's negative financial result in 2021 and 2022.

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VI.4 HOW TO DISTINGUISH PRICE AND QUANTITY EFFECTS IN INTERNATIONAL TRADE IN GOODS⁷³

In recent years, the global economy has undergone a series of shocks that affected the prices and quantities of traded goods via different channels. Although both Czech exports and imports have increased in nominal terms compared to 2019, by breaking down this change on prices and quantity factors, preferably on a sectoral level, one could better understand the drivers of the observed changes and the implications for the Czech Republic's external balance and competitiveness. This article explains the decomposition of international trade dynamics into price and quantity factors using the Bennet decomposition. The result is illustrated using data aggregated by the main SITC categories. At the CNB, this approach has been used since 2024 to break down changes in the balance of international trade in goods in the Chartbook of the CNB's Monetary Policy Report (MPR).

WHY IS DECOMPOSITION INTO QUANTITY AND PRICE EFFECTS NOT EASY?

Deciphering the quantity and price effects of the international trade turnover and balance is important for discussions on an economy's external sustainability and competitiveness. If, for example, there is a decline in the international trade balance in the economy, it makes a difference whether this is due to a temporary price shock, let's say to the prices of imported commodities, or, conversely, to a gradual decline in the export performance of the economy. The first case – a temporary price shock – is not crucial for the external sustainability of the economy in the long run, unlike the second case, which would lead to a steady decline in quantities and relative prices of exports. Identifying quantity and price effects, preferably in a more detailed structure, can thus contribute to discussions on the external sustainability of an economy.

Breakdown into price and quantity effects is however not straightforward. Let us illustrate the issue of the decomposition of changes in trade using exports (the procedure is similar for imports). We will consider two periods to compare: periods 0 and 1. Total exports V_0 in the base period (labelled 0) are the sum of the products of real export quantities for individual groups of goods q_{i0} and their prices p_{i0} :

$$V_0 = \sum_i p_{i0} q_{i0},$$

similarly, for the period 1: $V_1 = \sum_i p_{i1} q_{i1}$. We need to decompose the change in exports between periods 1 and 0 into price P_i and quantity Q_i effects for the individual groups of goods i :

$$V_1 - V_0 = \sum_i Q_i + \sum_i P_i,$$

where $\sum_i Q_i$ will be the total quantity effect and $\sum_i P_i$ the total price effect.

Decomposition into price and quantity effects would be trivially simple if prices or quantities remained unchanged. Specifically, if only the quantities and not the prices of individual groups of goods were to change (i.e. $p_{i1} = p_{i0}$), the price effects would clearly be zero ($P_i = 0$) and the indicator of quantity effects for individual groups of goods would be given as the change in quantity multiplied by the price of the specific group of goods: $Q_i = (q_{i1} - q_{i0}) p_{i0} = (q_{i1} - q_{i0}) p_{i1}$. If, on the other hand, the real quantities of exports of individual groups of goods did not change (i.e. $q_{i1} = q_{i0}$), it would be easy to identify the effect of price changes. The quantity effects would be zero ($Q_i = 0$) and the resulting indicator of price effects for each group would be the price change multiplied by the quantity of the particular group of goods, or: $P_i = (p_{i1} - p_{i0}) q_{i0} = (p_{i1} - p_{i0}) q_{i1}$.

In reality, however, both trade prices and quantities change, complicating the issue. The considerations above make it tempting to use the formula $Q_i = (q_{i1} - q_{i0}) p_{i0}$ to estimate the quantity effects and the formula $P_i = (p_{i1} - p_{i0}) q_{i0}$ to estimate the price effects (analogous to the Laspeyres index). Indeed, this approach has some real advantages: it is simple and straightforward to interpret. For example, the

⁷³ Author: Oxana Babecká Kucharčuková (CNB). The views presented here are those of the author and do not necessarily reflect the official position of the CNB. The author thanks J. Brůha for his useful comments and discussions on the first version of this text.

price effect tells us how the nominal value of exports of goods i would change in period 1 if we exported the same quantity of goods as in the base period 0. On the other hand, there are a number of shortcomings in such a calculation. First, the sum of all price and quantity effects may not equal the overall change in exports. The residual is particularly significant in periods where sharp changes in the prices or structure of exports occur.⁷⁴ Another unpleasant feature is that if we wanted to cumulate decompositions between individual years, e.g. years 0, 1 and 2, the residual would also cumulate and could increase over time. Furthermore, it is also not true (regardless of the above residual) that the decomposition between years 2 and 0 must be equal to the sum of decompositions between years 2 and 1, and years 1 and 0. We would run into similar problems if we used period 1 instead of period 0 as the reference for the calculation, i.e. $Q_i = (q_{i1} - q_{i0})p_{i1}$ as the estimate of the quantity effects and the formula $P_i = (p_{i1} - p_{i0})q_{i1}$ as the estimate of the price effects (analogous to the Paasche index). Again, the sum of price and quantity effects would not equal the overall change in exports, and the residual would cumulate over time.

THE BENNET DECOMPOSITION

Is there a method of decomposing quantity and price effects that would not produce a decomposition residual and at the same time would have generally desirable statistical properties? In this article, we present one of the methods offered by economic theory, the Bennet decomposition (Bennet, 1920), the application of which does not produce a residual. Bennet's decomposition for quantity effects weights the change in quantities by the average of prices in years 0 and 1, thus: $Q_i = \frac{1}{2} (q_{i1} - q_{i0}) (p_{i1} + p_{i0})$ and, by analogy, the price effects are defined as the difference in prices weighted by the average of the quantities: $P_i = \frac{1}{2} (p_{i1} - p_{i0}) (q_{i1} + q_{i0})$. In other words, it is the arithmetic mean of the two direct methods described above. It can clearly be seen that for the price and quantity effects defined in this way, the decomposition of the change in exports will be accurate, i.e. no residual will arise.

This method has other important characteristics. In particular: **(1) The decomposition is independent of the units:** it makes no difference whether the prices are given in koruna or hellers – the decomposition is simply multiplied by the ratio of the units. **(2) The decomposition does not depend on the base year:** if we take year 1 instead of year 0 as the base year, only the sign of the decomposition changes. **(3) The decomposition is monotonic:** the price effects are an increasing function of price changes and a decreasing function of quantity changes (and vice versa for the quantity effects). **(4) The decomposition has consistent aggregation:** if price indices are constructed using the given approach, they do not depend on the degree of aggregation of the data. **(5) The decomposition is transitive:** we get the same result if we decompose the change directly between years 2 and 0 and if we calculate the decomposition between years 2 and 1 and then between years 1 and 0, and sum these decompositions. The results can thus be cumulated, which is important for application in this article.

We will illustrate practical use through an example of the decomposition of changes in the international trade balance compared to 2019. The decomposition was carried out on annual export and import data from the CZSO. The resulting effects of quantities and prices are aggregated into the most significant groups using the Standard International Trade Classification (SITC). The most important for Czech foreign trade are SITC 3 (mineral fuels, lubricants) and SITC 7 (machinery and transport equipment). For these groups, we calculate the effects of prices and quantities separately; the effects of prices and quantities of the other main SITC groups are summed.⁷⁵ The result confirms that the price effects stemming from the dramatic increase in the prices of energy commodities were a significant driver of the temporary decline in the balance of goods into negative territory in 2021 and 2022 (Chart VI-4.1). The quantities of trade in machinery and transport equipment in the years under review showed a lower

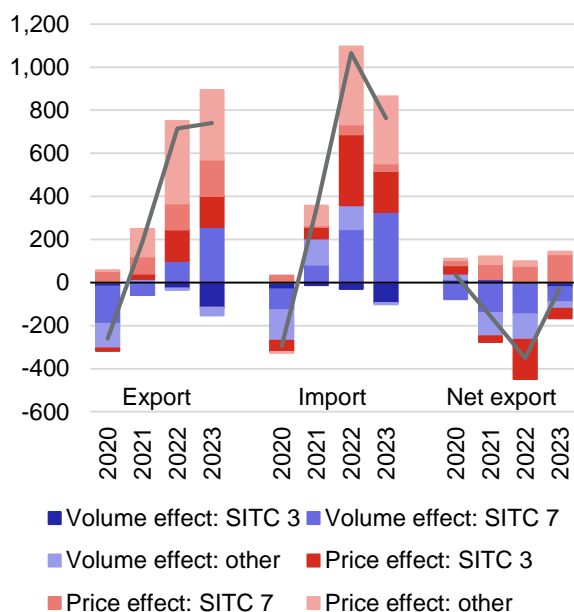
⁷⁴ This is what happened, for example, in the goods balance last year.

⁷⁵ Two SITC groups (4 and 9) do not have their own price index, so the price index for total exports or imports was used. Due to the low weight of these groups, this should not pose a major problem for the interpretation of the results. Since the Bennet decomposition satisfies the condition of consistent aggregation (see above), the result of the price and quantity effects for the other groups will be independent of which deflator is used for these two groups (of course, the decomposition of these groups 4 and 9 will be affected).

surplus than in 2019. On the other hand, the appreciation of the terms of trade (i.e. faster growth in prices of exports than imports) increased the trade balance in the machinery group compared to 2019. The concurrent appreciation of the terms of trade, together with the growing quantities of exports, can be interpreted as evidence for the continuing competitiveness of Czech exporters, as they are able to sell larger quantities at relatively higher prices. The increasing competitiveness is also evidenced by the slowly continuing increase in Czech exports' share of global exports (see Chart VI-4.2).

Chart VI-4.1: Decomposition into prices and quantities

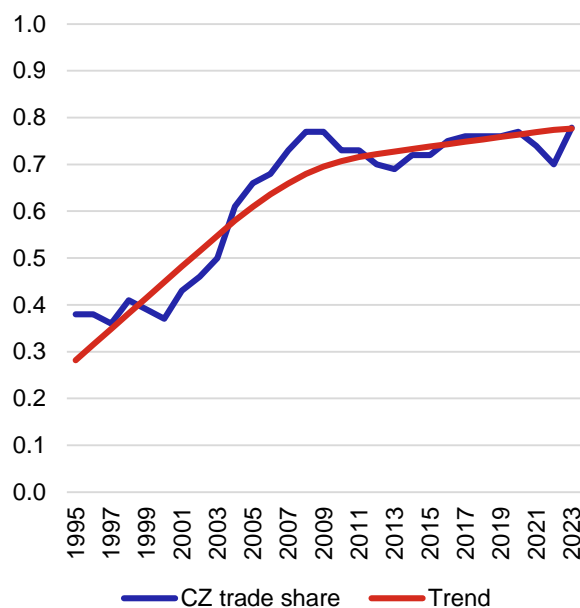
(change from 2019; in CZK billions)



Source: CNB, author's calculations

Chart VI-4.2: Market share of exports of goods and services

(%)



Source: Eurostat, IMF-DOTS, CNB, author's calculations

Note: The share of the Czech Republic's exports of goods and services in global exports of goods and services. [CNB Scoreboard](#) indicator, published in the Monetary Policy Report Spring 2024.

ALTERNATIVE APPROACHES

Is the Bennet decomposition the only method that gives an accurate analysis and satisfies the reasonable properties above? No. There are other methods based on logarithmic averages, for example, which also provide an accurate analysis and have some of the above properties, an overview of which is commented on in detail by De Boer and Rodrigues (2020). However, due to the simplicity of the Bennet approach and the fact that it meets other requirements, it was chosen as the basic approach. At the same time, the calculations in this methodological note have been verified using alternative analyses and the qualitative conclusions remain valid.

Table VI.4-1 presents other additive methods. These analyse changes in the values of exports and imports, so their results can be read directly, and thus a decomposition of net exports into price and quantity effects can be obtained.⁷⁶ The table only summarises 'ideal' methods, i.e. methods in which price and quantity indicators are approached symmetrically. The well-known Laspeyres and Paasche indexes (and their additive analogies) are not 'ideal' from this perspective.

⁷⁶ There are also analogous multiplicative decompositions (where the Bennet decomposition would correspond to the Fisher ideal price index and the Montgomery decomposition to the Montgomery-Vartia index). These multiplicative decompositions would be useful for distributing export and import growth. Given that net exports represent the difference between export and import levels, the use of multiplicative breakdowns is not appropriate for the purposes of this article.

Table VI.4-1: Decomposition into price and quantity effects using ‘ideal’ methods

Method	Weights	Price effect	Volume effect
Bennet	–	$P_i = \frac{q_{i1}+q_{i0}}{2}(p_{i1} - p_{i0})$	$Q_i = \frac{p_{i1}+p_{i0}}{2}(q_{i1} - q_{i0})$
Montgomery	$w_i = L(p_{i1}q_{i1}, p_{i0}q_{i0})$	$P_i = w_i \ln\left(\frac{p_{i1}}{p_{i0}}\right)$	$Q_i = w_i \ln\left(\frac{q_{i1}}{q_{i0}}\right)$
Additive Sato-Vartia	$w_i = \frac{L(s_{1i}, s_{i0})L(V_1, V_0)}{\sum_j L(s_{1j}, s_{j0})}$	$P_i = w_i \ln\left(\frac{p_{i1}}{p_{i0}}\right)$	$Q_i = w_i \ln\left(\frac{q_{i1}}{q_{i0}}\right)$

where $L(a, b)$ is the logarithmic average defined as $L(x, y) = \frac{x-y}{\ln x - \ln y}$ for $x \neq y$ (and $L(x, x) = x$), $s_{1i} = \frac{p_{i1}q_{i1}}{\sum_j p_{j1}q_{j1}}$ is the nominal share of the i-th group on total exports in a given period (and analogically for s_{0i}).

Source: De Boer and Rodrigues (2020)

CONCLUSION

This article presents a method for decomposing data on international trade in goods into price and quantity effects. The methodology is based on the Bennet decomposition and was applied to the decomposition of changes in the Czech Republic's trade balance compared to the last pre-crisis year of 2019. Since January 2024, the Bennet decomposition has been in regular use in the MPR Chartbook to illustrate selected price and quantity effects, and therefore this methodological note may be beneficial for any readers interested in the motivation for, and methodological aspects of, decomposition.

The application of this methodology to data on Czech international trade in goods has shown the importance of price effects for the overall balance. On the one hand, the adverse shock to the prices of mineral fuels temporarily worsened the balance in 2021 and 2022, while on the other, the gradual appreciation of the terms of trade in industrial goods, especially in machinery and transport equipment, improved the trade balance and more than compensated for the declining real volumes of net exports. This means that the Czech Republic enjoys a long-term capability to exchange its exports for larger quantities of foreign goods, i.e. we trade at better prices.

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VII. STATISTICAL ANNEX: BALANCE OF PAYMENTS 2019–2023

CZK billions	2019	2020	2021	2022	p. 2023
A. Current account	19.2	113.7	-168.0	-332.8	29.2
Goods	239.8	280.3	69.0	-22.6	290.4
<i>Exports</i>	3,579.1	3,388.7	3,809.5	4,313.6	4,371.4
<i>Imports</i>	3,339.2	3,108.4	3,740.5	4,336.2	4,081.0
Services	106.0	103.5	105.0	97.5	93.4
<i>Manufacturing and repair services</i>	47.3	45.7	47.5	56.3	59.0
<i>Transport</i>	23.3	20.2	12.5	0.9	10.8
<i>Travel</i>	32.4	5.0	-3.1	13.9	3.6
<i>Other services</i>	3.0	32.5	48.1	26.3	19.9
<i>Total credits</i>	698.3	603.5	647.5	811.7	882.0
<i>Total debits</i>	592.3	499.9	542.5	714.2	788.7
Primary income	-292.2	-242.2	-312.0	-367.2	-317.3
<i>Compensation of employees</i>	16.3	24.1	13.0	-11.3	-0.9
<i>Investment income</i>	-333.6	-292.8	-347.8	-367.2	-328.0
<i>Other primary income</i>	25.1	26.5	22.8	11.3	11.6
<i>Total credits</i>	304.9	231.1	279.4	331.6	376.7
<i>Total debits</i>	597.1	473.4	591.4	698.8	694.0
Secondary income	-34.4	-28.0	-30.0	-40.4	-37.3
<i>Credits</i>	91.4	108.4	113.0	135.2	137.3
<i>Debits</i>	125.8	136.4	143.1	175.6	174.6
B. Capital account	24.5	66.8	103.8	48.0	88.5
<i>Credits</i>	104.3	165.6	328.9	400.4	456.7
<i>Debits</i>	79.8	98.8	225.2	352.3	368.2
C. Financial account	8.4	163.3	-40.0	-293.9	143.9
Direct investment	-137.1	-149.1	-28.5	-83.5	-16.3
<i>of which: net reinvested earnings abroad</i>	-39.4	-89.8	-131.7	1.9	-108.6
<i>in the Czech Republic</i>	109.0	44.2	251.5	130.7	167.9
Portfolio and other investment	246.2	193.2	280.1	214.1	184.2
CNB	34.3	253.8	-249.3	141.8	122.9
<i>Banks</i>	9.5	-2.1	-119.2	-44.3	134.2
<i>Banks</i>	57.7	164.6	-136.8	297.0	-95.9
<i>General government</i>	13.8	-13.1	-65.3	-74.1	55.6
<i>Other sectors</i>	-46.8	104.4	72.0	-36.8	29.0
Financial derivatives	1.0	10.8	-58.2	-45.1	1.2
Reserve assets	110.2	47.8	296.1	-307.1	36.1
D. Balance from current and capital account	43.6	180.5	-64.3	-284.8	117.7
<i>Balance from fin. acc. (+ lending / - borrowing)</i>	8.4	163.3	-40.0	-293.9	143.9
<i>Errors and omissions</i>	-35.3	-17.2	24.2	-9.1	26.2