Capital flows and the exchange rate

Cross-border capital flows have increased considerably world-wide during the past few years. Indeed, they have grown significantly faster than many real economic variables. The driving forces behind this development have been the liberalisation and deregulation of the financial markets as well as the rapid advance in information and communications technology, which, in turn, have resulted in a sharp reduction in transaction costs. Developments in international financial transactions have also been substantially stimulated by the increased cross-border integration of corporate financing during the past few years. Finally, the start of European monetary union (EMU) has given rise to far-reaching adjustments in portfolios, which many observers have associated with the weakness of the external value of the euro. Even so, it will be shown below that such short-term correlations between the exchange rate and capital flows cannot be simply interpreted as an automatic process of cause and effect. In the case of Germany, at all events, such a relationship has not proved stable over a lengthy period. This article explains the interrelationships and describes the "structural" changes in German financial transactions against this background.

Preliminary remarks

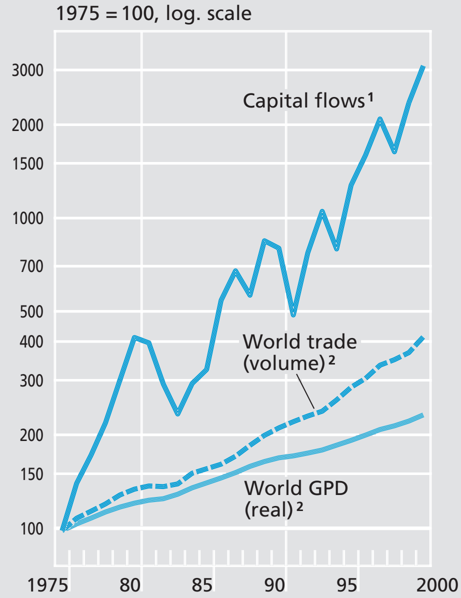
Developments in international capital flows

Globally recorded capital flows amounted to US$ 4,000 billion in the year 2000; this means that they have increased about 30-fold since 1975 whereas during the same period the world trade volume or the aggregate real gross domestic product (GDP) of all countries, for example, has risen by only 320 % or 140 %, respectively.[1] Portfolio investment, especially in shares, and direct investment have contributed most to the growth in cross-border financial transactions. After all, this development is a reflection of the ongoing process of economic globalisation. In view of the availability of a wide variety of financial market data, the speed and moderate cost of obtaining them as well as the substantial increase in the means of storing and processing the information, investors are including an ever growing volume of foreign financial products in their portfolio operations, especially as banks, insurance enterprises and investment companies are often involved in asset investment.[2] The global integration of enterprises has also become even closer as a result of the recent wave of mergers and acquisitions at the end of the nineties. UNCTAD puts total direct investment in the year 2000 at almost US$ 1,300 billion. More than 60,000 transnational corporations with more than 800,000 foreign branches are now operating world-wide; they account for about two-thirds of world trade.[3]

Relationships between financial transactions and the exchange rate

It seems reasonable to suppose that there will be a number of correlations between capital flows, on the one hand, and other financial variables, on the other. Movements in exchange rates and interest rates are the first to spring to mind. For example, the current exchange rates and exchange rate expectations – as well as other factors – are no doubt major determinants in the calculations of internationally operating investors and are therefore also reflected in the flows of capital. Conversely, capital flows also affect the (expected) movements in exchange rates. However, these relationships are only part of a whole series of interdependent factors, with the result that it is difficult to find simple cor-

International capital flows, world trade and output



Source: IMF. — 1 Sum of inward and outward investment; all countries. — 2 Indices derived from rates of change.

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1 For the individual figures see International Monetary Fund, Balance of Payments Yearbook and World Economic Outlook Database.
2 For the international integration of the German securities markets see Deutsche Bundesbank, International integration of German securities markets, Monthly Report, December 2001, pages 15 to 28.
3 See UNCTAD, World Investment Report 2001, page 1, and World Investment Report 1997, page 18.

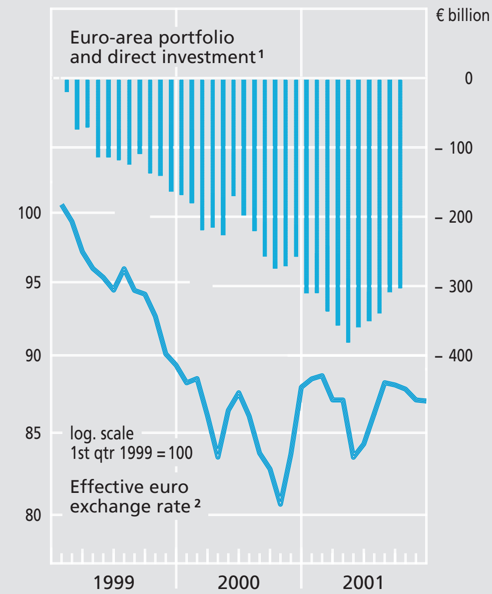
relations which are also clear-cut and lasting in their effect. For example, exchange rate expectations also influence other financial market prices, notably interest rates (interest rate parity), and these at least moderate the overall effect on investment decisions and therefore on capital movements. It must also be remembered that, by definition, a country's total external transactions must always be in balance; in other words, every capital outflow (inflow) is offset elsewhere in the balance of payments by a corresponding inflow (outflow), with the result that, regarding the financial relationships under consideration here, the sub-balances within the financial account are possibly more important than the balance of the financial account as a whole.

Financial transactions in the euro area and the euro exchange rate

Net capital exports and euro weakness

The temporary spate of funds leaving the euro area gave a certain amount of credence to the theory that there is a close connection between financial transactions and the exchange rate. Financial market observers were quick to point out the parallelism between the (cumulated) net capital exports of the euro area through portfolio and direct investment and the depreciating trend of the euro.[4] Indeed, from the start of monetary union until the end of October 2001, the latest month for which euro-area balance of payments figures are available, a total of approximately € 300 billion net was exported from the euro area in these two segments. At the same time, the effective exchange rate of the euro tended to depreciate; at the end of October 2001 it was about 15 % lower than on 4 January 1999. The correlation coefficient between the two variables, when based on monthly figures, amounts to 0.80.

Capital flows and the exchange rate



Source: ECB. — **1** Cumulated balances since January 1999. — **2** End-of-month levels.

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Correlation smaller for monthly values

Although the parallelism between cumulated net capital exports and the depreciating euro exchange rate appears plausible at first sight, this parallelism says nothing about the interrelationship between the two variables because it may also be due to a third factor. Furthermore, the course of the two time series, which seems to follow a downward trend, needs to be analysed more closely. If, therefore, the monthly euro exchange rate move-

4 Owing to several large corporate mergers and acquisitions which were frequently settled, at least in part, by an exchange of shares, it has proved sensible to consider direct investment and portfolio transactions (or share transactions) together.

ments are considered instead of the level of the currency's effective exchange rate and – in the corresponding month – the net capital exports (through portfolio transactions and direct investment) instead of the cumulated financial account balances, the correlation proves to be less convincing than in the case of the cumulated data. The correlation coefficient is now only 0.42 for the period from January 1999 to October 2001. The correlation between the monthly change in the euro-dollar exchange rate and the net monthly capital exports from the euro area is somewhat higher (0.45). The US dollar plays a relatively significant role in the euro area's cross-border financial transactions with third countries.[5]

Other determining variables

Seen as a whole, the results show that the interrelationships are more complex than they initially appear from a simple comparison of cumulated capital exports and exchange rates. Evidently, other determinants are having an effect on the financial transactions and exchange rates. However, both the interest rate differential between long-term dollar and euro paper and the relative price movements on the US and European share markets prove, when viewed in their entirety, to be of less relevance for financial transactions (portfolio and direct investment) than exchange rate movements.[6]

Studies by international organisations confirm results

These results are confirmed to some extent by empirical studies undertaken by international organisations. For example, the Bank for International Settlements (BIS) has established that, although there are close correlations between changes in the share market indices of the United States, on the one hand, and those of Japan and Germany, on the other, the exchange rate movement and the balance of cross-border share transactions prove in this study to be virtually uncorrelated in the long term.[7] In another study, the IMF, by contrast, established a significant positive correlation between the net bilateral capital flows arising from EMU-US share market transactions and the euro-dollar exchange rate. The corresponding estimates for bonds and direct investment, however, are not significant statistically.[8]

German financial transactions and the Deutsche Mark exchange rate

Long-term correlation in German financial transactions

The correlations between German financial transactions with non-residents and the

5 According to figures taken from the US balance of payments, the estimated net bilateral capital outflows (direct and portfolio investment) from the euro area to the United States up to the end of September 2001 add up to the equivalent of approximately € 500 billion; there is no corresponding regional breakdown of financial transactions in the euro-area balance of payments.
6 The correlation coefficients amount to 0.22 in the case of the interest rate differential and 0.04 in the case of the relative price movement on the share market. If individual instruments are examined in the case of portfolio investment, some of the correlations, for example, those between the balance of the share transactions and the relative share market performances of the euro area and the United States, are actually negative.
7 See Bank for International Settlements, Quarterly Review, August 2000, pages 31 to 34, here page 32.
8 See International Monetary Fund, World Economic Outlook, May 2001, pages 66 to 75, here page 72, and R. Brooks, et al., Exchange Rates and Capital Flows, IMF Working Paper WP/01/190, November 2001. Both studies use the regional breakdown of the US balance of payments. For lack of long time series for the euro area, the transactions of the 11 countries which introduced the euro on 1 January 1999 are aggregated and calculated back to 1988. A "synthetic" euro is used to provide an exchange rate. The different results might also be due to the fact that – in contrast to the BIS study and the correlation analyses described above, which are based on monthly figures – the IMF study used quarterly data.

weighted external value of the Deutsche Mark are also informative in this connection. Between January 1971 and October 2001 the correlation coefficient between the combined balance arising from direct investment and portfolio transactions and the changes in the external value of the Deutsche Mark amounted to 0.10.[9] Fairly similar results are achieved even if only the time up to the start of EMU is considered or the period of analysis is restricted to the nineties when the financial transaction flows in both of the segments mentioned expanded particularly strongly. This therefore shows that for Germany, too, the correlation between capital flows and exchange rate movements tends to be slight in the long term.

Short-term correlation very volatile

A different picture emerges, however, when the correlations examined here are monitored for shorter periods. To this end the correlation was analysed over a moving observation window of 36 months – which corresponds more or less to the length of time used as a basis for the EMU study above. It emerges that the correlation coefficient thus defined was much higher for a time but that it also fluctuated sharply over the period, ranging from – 0.35 to + 0.60. This means that in the past there were periods in which – to put it simply – net capital imports (exports) through portfolio and direct investment tended to be associated – as one would assume – with an appreciation (depreciation) of the Deutsche Mark, as happened, for example, at the end of the eighties and the beginning of the nineties. This, however, was not invariably the case. For a time Germany's net capital imports (exports) – contrary to expectation – also tended to coincide with a depreciation (appreciation) of the Deutsche Mark. This type of situation occurred, for example, in the mid-eighties and mid-nineties.

Recent correlation coefficient almost zero

Fairly similar results to those obtained here for the net capital flows arising from direct and portfolio investment can also be derived for individual sub-items of the financial account. Stable correlations do not arise in the longer term here either. However, it is interesting in this connection that – apart from a very brief period – the correlation between variously defined financial account balances and monthly exchange rate movements was almost zero in recent years. This is particularly true of portfolio transactions, notably transactions in bonds.

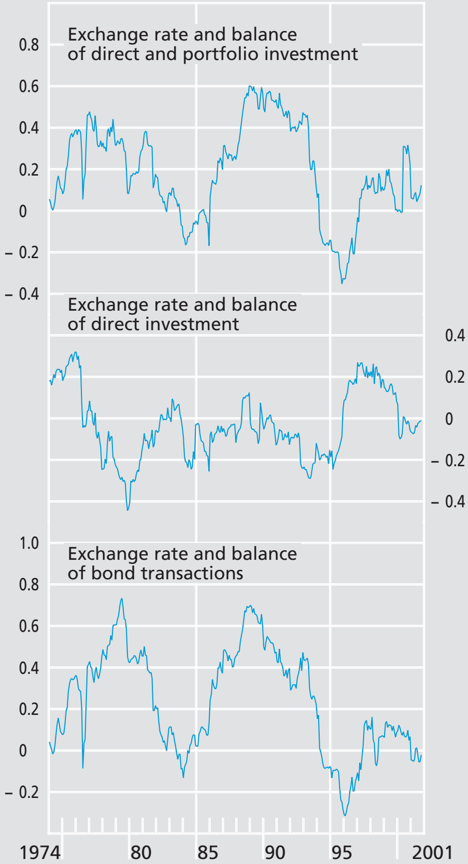
Impact of structural changes

Significant structural changes had an impact on Germany's financial transactions during the period under review, and these altered the correlation between financial transactions and the exchange rate. With the introduction of the euro, for example, the exchange rate risk completely disappeared for a significant part of German financial transactions, namely those within the single currency area. This resulted in German investors reorganising their portfolios – especially through increased purchases of bonds issued in other euro-area countries. However, it might also explain why it has recently become virtually impossible to discern any correlation between an exchange rate movement and the balance arising from direct investment and portfolio transactions. Furthermore, the globalisation of financial

9 The changes in the effective exchange rate of the euro have been used as a basis from January 1999.

Correlations in German financial transactions

Correlation coefficients [1]



1 Correlation coefficients between the monthly changes in the external value of the Deutsche Mark (up to the end of 1998) or of the effective exchange rate of the euro (from 1999) and the balance of the financial transactions as defined above, each covering the period of the previous 36 months.

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markets and of enterprises has left its mark on the German financial account. The significance that the transactions within the euro area have for the German financial account and what other changes this account had undergone in the nineties are therefore examined below.

The role of EMU in Germany's financial account

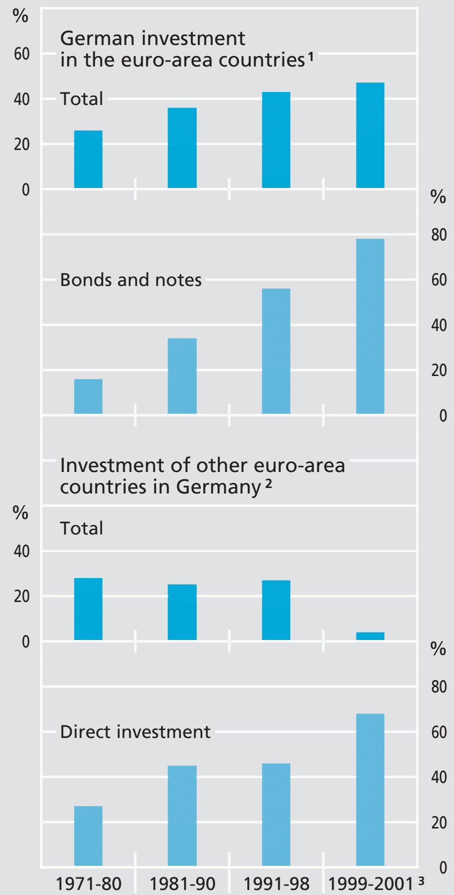
General trend

The present euro-area countries have played a major role in Germany's financial account for quite some time. In the seventies 26 % and in the eighties 36 % of Germany's financial investments abroad flowed into these partner countries. During the run-up to stage three of monetary union and even more so with the introduction of the euro at the beginning of 1999 financial integration with these countries grew further. In the period of just under three years following the start of EMU for which a regional statistical breakdown of capital flows is currently available German banks, enterprises, individuals and public authorities invested about € 450 billion there. This means that between January 1999 and September 2001 the euro-area countries accounted for about 47 % of German financial investment abroad. In the opposite direction, i.e. the statistically recorded foreign investment in Germany, the proportion of investors from other euro-area countries declined to only 4 %, by contrast. Prior to the introduction of the euro this proportion on a longer-term average had been approximately one-quarter. However, special statistical anomalies play a role here, and these will be dealt with in more detail below.

Two-thirds of portfolio investment in euro area

The main reason for the fact that recently almost one-half of German financial investment abroad flowed into other euro-area countries was the trend in portfolio transactions, which are still more strongly geared to the euro area than other segments of the financial account. Since the beginning of monetary union German residents have, on balance, invested two out of every three euros spent on acquiring securities abroad in the partner countries. This strong EMU orientation applies in particular to investment fund certificates (EMU share 94 %). The reason is that from the German point of view the most important foreign fund companies are established in Luxembourg and Ireland. However, the euro-area countries also attract by far the largest share (78 %) of German bond purchases abroad. It is precisely in bonds and notes, which in terms of value represent the most important segment of portfolio investment, that the EMU share has risen steeply since the introduction of the euro even though German residents had already invested enthusiastically in issues by other (potential) euro-area countries in the months prior to that in expectation of profit-taking from the interest rate convergence in the "high-yielding" countries ("convergence trade"). German savers concentrate less on the euro area when investing in the share market abroad; only 38 % of this form of investment flowed into the other euro-area countries while the United States and the United Kingdom, whose share markets are among the world leaders in terms of market capitalisation and market liquidity, each absorbed 27 %.

Importance of the euro area for German financial transactions



1 Share of Germany's respective foreign investment. — 2 Share of non-residents' respective investment in Germany. — 3 From January 1999 to September 2001.

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Problems recording foreign purchases of paper in Germany

In contrast to the case with German portfolio investment abroad, the regional statistical breakdown of non-residents' securities acquisitions in Germany is not very informative in economic terms because the regional classification has to be made according to the immediate counterparty's country of domicile and not according to the ultimate investor. For that reason, neither the purchases of German securities by non-residents nor the sales and redemptions can be reliably classified by region. The extent of the problem becomes clear when it is remembered that since the start of EMU all foreign investors, taken together, have purchased German paper worth more than € 300 billion net while – according to the statistics – investors whose domicile or safe custody deposits are in other euro-area countries reduced their net holdings of German securities by € 200 billion. Evidently a substantial amount of German paper held by investors outside the euro area was resold or redeemed through institutions in other euro-area countries – irrespective of who had once purchased or held the paper. The large custodians of securities in Belgium and Luxembourg are among those playing a significant role here.

Direct investment from other euro-area countries

With respect to direct investment, capital flows appear to have been moving in the opposite direction from those in portfolio transactions in a way. In this case it is mainly investors from other euro-area countries that are becoming increasingly important for Germany. Since 1999 more than two-thirds of foreign direct investment in Germany has been coming from these countries, notably from the Netherlands, Belgium and Luxembourg where major holding companies are located. In some cases, however, investors from countries outside the euro area are also associated with these holding companies.

German direct investment in other euro-area countries low

The proportion of German outward investment in the euro area is much less, by contrast, and for some time it has also been tending to fall. Since the start of monetary union only 7 % of German enterprises' foreign direct investment has flowed into the other euro-area countries. This is linked to the fact that in the past few years German enterprises have been acquiring firms in the United States and the United Kingdom and this has absorbed an extremely large amount of their investable funds. In the case of direct investment, moreover, credit transactions with foreign subsidiaries in the euro area have recently been playing a major role, and the outcome of this has been a reduction in the (financial) investment of German enterprises in the single currency area (reverse flows). Finally, it must not be forgotten that during their preparations for the single European market German firms invested heavily in the partner countries at the end of the eighties and the beginning of the nineties and therefore had already consolidated their position in these countries at that time. For example, more than 50 % of German direct investment abroad flowed into the current euro-area countries between 1988 and 1994.

Other financial transactions

The introduction of the euro is likewise clearly reflected in the structure of the other financial transactions, which at present are largely characterised by the short-term credit transactions of banks. Since January 1999 German creditors have granted 42 % of their non-securitised foreign loans to borrowers in other euro-area countries whereas only 16 % of the loans raised abroad have come from these countries. Most of the foreign funds accruing to German banks in particular have arisen through operations with countries outside the euro area; at the same time, the banks have been granting (net) loans to borrowers in other euro-area countries. [10]

Interim conclusion

In view of the generally great importance which the transactions with other euro-area

10 This "turntable" function performed by Germany within the euro area has already been studied in detail elsewhere; see Deutsche Bundesbank, German balance of payments in 2000, Monthly Report, March 2001, pages 59 to 71, especially page 67 f.

countries have for Germany's financial account, especially in the case of capital outflows, it is not surprising that the correlation between capital flows and the exchange rate has been comparatively low recently. Even if not all capital movements within the euro area are denominated in euro, the vast majority are. Other factors then play the key role in investors' decision-making considerations.

Structural changes in the German financial account

Sharp increase in capital movements and reversal of financial account balance

Besides the effects of the introduction of the euro, the German financial account was subjected in the nineties to other major structural changes which affected the relationships between capital flows and the exchange rate. Two developments immediately spring to mind:

– firstly, the significant increase in the financial flows to and from Germany which had begun in the mid-eighties and accelerated again during the second half of the nineties;

– secondly, the fact that Germany was a net capital importer in the nineties whereas previously capital exports had predominated.

The increasing financial integration of the German economy internationally becomes clear from the steep rise in cross-border capital flows in both directions. Whereas the average annual German capital investment abroad in the seventies was still below 3 % of GDP (or the equivalent of approximately € 15 billion), in the year 2000 it amounted to approximately € 350 billion, or just over 17 % of GDP; the ratios for foreign capital investment in Germany are similar. These growth rates are largely due to developments in portfolio investment and in direct investment.

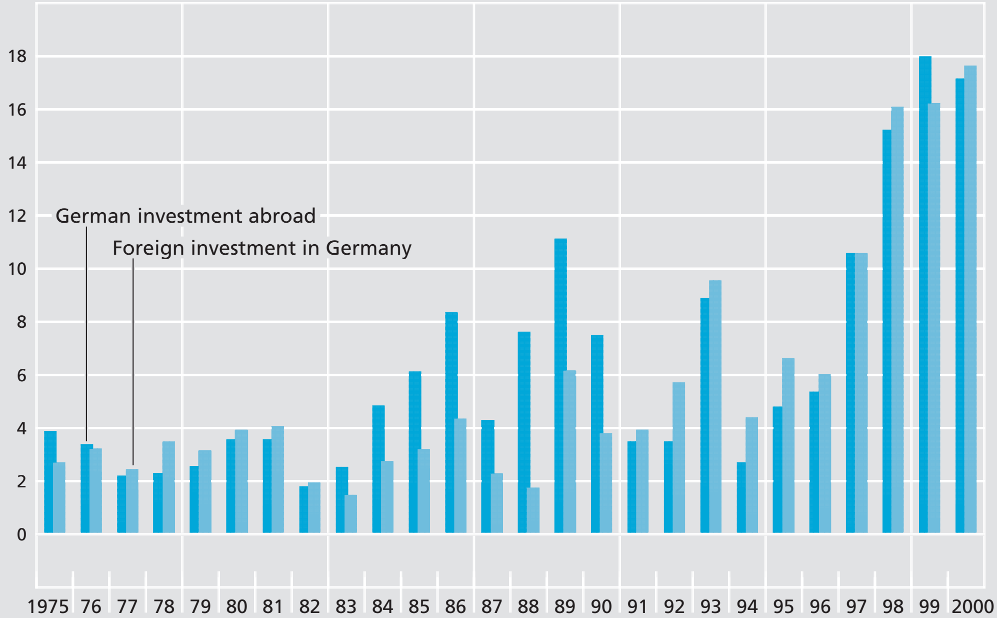
Turnover in portfolio transactions increases tenfold

Advancing globalisation of the financial markets and the resultant diversification of investments as well as the increasing securitisation of assets and liabilities provided portfolio investment with a particularly strong stimulus. In the past ten years alone gross turnover in securities has increased more than tenfold. In the year 2000 it was three and a half times greater than gross domestic product. Institutional investors, who traditionally invest more heavily in foreign securities than private investors and who have further increased their foreign investments over the past few years, are playing a major role in the growing process of international financial integration.[11] Lower information and transaction costs, the greatly increased means of data analysis and the widening range of hedging instruments have stimulated growth in Germany's cross-border portfolio transactions. This development presumably took place quite independently of the interest rate and exchange rate movements.

Direct investment boosted by ...

An upswing akin to that in portfolio flows can also be observed in direct investment. Whereas German direct investment abroad and foreign direct investment in Germany had both been below 1 % of GDP for the

11 See Deutsche Bundesbank, International integration of German securities markets, Monthly Report, December 2001, pages 15 to 28.



* Data on financial transactions and on GDP are for western Germany up to June 1990 and up to the end of 1990, respectively.

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most part until the middle of the nineties, they increased discernibly after that. In the year 2000 non-residents' acquisition of participating interests in Germany amounted to no less than 9 ½ % of GDP (or € 191 billion).[12]

... corporate restructuring ...

The wave of corporate acquisitions and the unusually high valuation of many high-tech firms on the share markets until the spring of 2000 also greatly inflated the direct investment flows to and from Germany. However, both developments are – or were – also a reflection of a repositioning of many enterprises with respect to global competition. Another factor is that for the past few years intra-group credit transactions have played a significant role in the figures on direct investment shown in the German balance of payments. These flows often have more to do with company-specific liquidity considerations and less with locational policy or theoretical portfolio calculations. That apart, the surge in direct investment recorded up to last year has again petered out following the sharp fall in share prices and the global cyclical downturn. However, the tax relief measures that came into force at the beginning of January 2002 might provide new stimuli for sales of corporate participating interests.

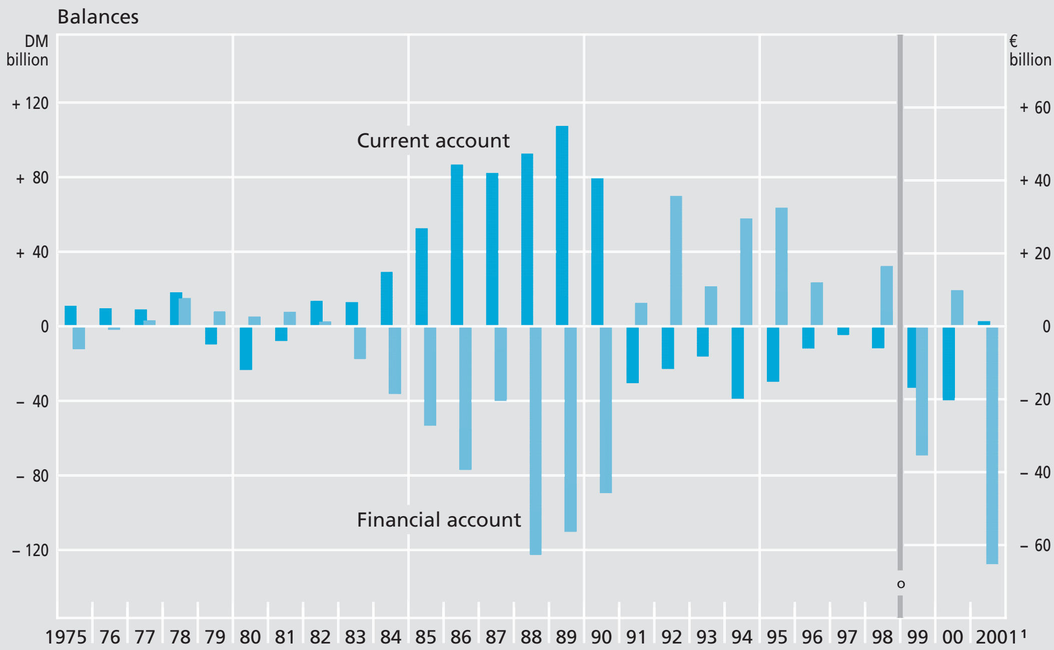
... and growing intra-group liquidity movements

"Structural" deficit on direct investment

Compared with other countries, Germany was relatively late in benefiting from the

12 This peak figure arose as a result of one unusually large single transaction and therefore certainly overstated the importance of foreign direct investment in Germany. At the same time, settling the corporate acquisition reduced German direct investment abroad, with the result that German outward investment was comparatively low in the year 2000. For details see Deutsche Bundesbank, German balance of payments in 2000, Monthly Report, March 2001, pages 59 to 71.

Current account and financial account*



* Up to June 1990 western Germany. — **1** From January to November 2001. — **o** From January 1999 data in euro.

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world-wide direct investment boom. It did not do so until after its price competitiveness had improved as a result of exchange rate movements, increased productivity and comparatively moderate wage agreements. Conversely, German firms – for a wide variety of motives – have long been extremely interested in extending their presence abroad.[13] This ultimately meant that Germany "traditionally" recorded net capital exports through direct investment; in that respect, the year 2000 with its large net capital inflows was an exception for the reasons described.

Turnabout in financial account

Generally speaking, a remarkable turnaround occurred in the German financial account in the nineties, especially in the first half of the decade. Whereas capital amounting to the equivalent of more than € 270 billion (net) was exported between 1981 and 1990, Germany had to draw on foreign funds with an equivalent net value of approximately € 120 billion during the next ten years owing to the large need for finance following German reunification. This remarkable swing in the financial account reflects a corresponding reversal in the current account, which, after substantial surpluses at the end of the eighties, slipped appreciably into deficit as a result of reunification and did not run a small surplus again until last year, according to the figures so far available.

13 See T. Jost, Direct investment and Germany as a business location, Economic Research Group of the Deutsche Bundesbank, Discussion paper 2/97, and Deutsche Bundesbank, Development and determinants of international direct investment, Monthly Report, August 1997, pages 63 to 81.

Non-securitised credit transactions the key factor

This change in the direction of financial flows is particularly pronounced in (non-securitised) credit transactions, in which large inflows of funds were recorded during the past decade (approximately € 250 billion net). The operations of enterprises and individuals account for the smaller part of this turnaround. Owing to the liquidity advantages of the "Euromarket", the minimum reserve burden on German bank deposits and the debate on taxing capital income in Germany, these two groups invested fairly large net sums abroad until about the middle of the nineties. Subsequently, however, they imported funds on balance. The banks' external transactions, which have expanded extraordinarily sharply during the past few years as a result of the German credit institutions' greater international orientation, were of much greater importance in terms of value, however. The banks' external liabilities, in particular, have risen considerably, with the result that, overall, the banking system has recorded substantial inflows of funds through unsecuritised credit transactions (from 1991 to 2000: approximately € 270 billion net). These net capital imports ultimately represented the counterpart to the outgoing payments in the other areas of the balance of payments, notably transactions in the current account and direct investment.

Conclusion

No simple cause-and-effect relationships

Events on the international financial markets occur amid the interplay of individual decisions made by a large number of actors who, for their part, plan and trade against the background of legal, political and technological conditions which are continually in flux. The capital movements and exchange rates that are observed are the result of these market processes and structural changes. They co-exist with other variables in a close reciprocating interrelationship. As a rule, simple unidimensional relationships are therefore found at best in the short term. Experience shows that they are not a reliable basis for forecasts or guideline for political action. This also applies to the correlations between the euro exchange rate and the net capital flows arising in the euro area as a result of direct investment and securities transactions. While it is perfectly plausible that future capital imports into the euro area might be linked to an appreciation of the euro, experience in Germany has shown that this is not necessarily the case. Even so, the fact that, with the abatement of the wave of mergers, the euro-area financial account has actually improved since mid-2001 and that, at the same time, the euro has gained ground on a weighted average is consistent with a positive correlation.