

Ownership structure in the German equity market: general trends and changes in the financial crisis

The bulk of German equities are held by non-residents. The share of domestic stocks in foreign ownership declined during the financial crisis, with the heightened uncertainty and substantial liquidity needs prompting many investors worldwide to repatriate their assets, before going back up again in recent years; at last count, it stood at nearly 60%. The cross-border activity of investors, predominantly in the institutional segment, and the significant investment flows they can generate, are probably the main reasons for the substantial share of foreign ownership. The percentage of foreign ownership in the flagship index DAX is even greater. This is probably due to the high profile of its constituent enterprises, not to mention the comprehensive analyst and media coverage it receives, which ensures that information on the DAX is just as readily available for investors outside Germany. DAX securities are, moreover, highly liquid.

In the domestic segment, institutional investors are by far the largest group of investors, and their share has remained largely static over time, although a shift has taken place within this sector. By and large, banks and financial investors have tapered their investment in German equities over the course of the crisis, probably primarily in response to tighter regulatory requirements. They have been replaced by non-financial institutional investors such as holding companies, which have enlarged their stakes in resident listed enterprises. There exists a preference for larger German enterprises, especially among domestic financial investors. Private investors appear to prefer investments in smaller, local public limited companies.

Development and structure of the German equity market

How the German equity market ranks nationally and internationally

Of the roughly 3.7 million enterprises in Germany in 2012, just over 11,000 were public limited companies (*Aktiengesellschaften* or *Kommanditgesellschaften auf Aktien*). These public limited companies account for roughly 18% of aggregate revenues and employ just under 9% of employees subject to social security contributions.¹ Just a fraction of Germany's public limited companies are listed on a stock exchange. At the end of July 2014, shares of 711 enterprises were trading at the major trading venues of Deutsche Börse AG, and they had a market capitalisation of around €1,200 billion. In market capitalisation terms, this makes the German stock market the seventh largest worldwide and number three in Europe after the United Kingdom and France.² However, Germany's equity market capitalisation to gross domestic product (GDP) ratio is relatively meagre by international standards, at a long-run average of 40%, which is less than the figure for the euro-area countries (50%) and well below that of the Anglo-Saxon markets (United States: 111%; United Kingdom: 135%).³

Issuance activity over time

Since 1988 the value of German equities, as measured by the DAX, has grown more than ten-fold in three major cycles, which are also

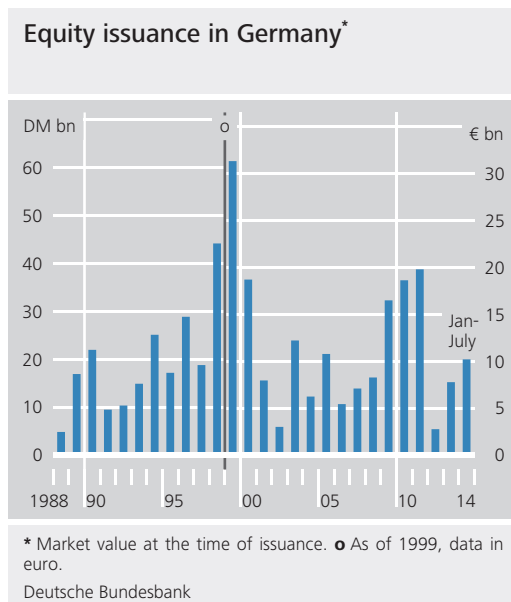
reflected in issuance activity (see the box on pages 21 and 22). All in all, enterprises in Germany have issued new shares with a market value of €296 billion since 1988. The Bundesbank's capital market statistics (see the chart below) reveal that issuing activity expanded strongly in the 1990s on the back of the New Economy boom before contracting sharply on account of hefty equity price losses in the years leading up to 2002, putting a damper on demand and curtailing the funding options available to enterprises. Annual issuance levelled off at less than €10 billion until the outbreak of the financial crisis in 2008, during the course of which issuance activity went back up, even though public offerings were virtually non-existent. This period was dominated by recapitalisations among financial institutions which, in some cases, saw governments subscribing all the shares issued in private placements. Initial public offerings only made something of a comeback beginning in 2012.

Ownership structure and investor behaviour in the German equity market

Data sets

The Securities Holdings Statistics (WPIInvest), which the Bundesbank began collecting at the end of 2005, can be used to shed more light on the ownership structure of German equities. WPIInvest captures both the reporting institutions' own securities holdings and those of their customers.⁴ It covers more than 95% of the total market capitalisation of German equities and assigns them to a domestic household, domestic institutional investor or non-resident,

Domestic institutions report securities holdings



¹ Source: Federal Statistical Office.

² Source: Thomson Reuters Datastream.

³ Source: *Factbook des Deutschen Aktieninstituts*, various editions. Long-run average derived from average values from 1989 to 2012.

⁴ Price data are sourced from the Eurosystem's CSDB (Centralized Securities Database); the domestic equity universe is defined using the Thomson Reuters Datastream categorisation criteria.

German share price developments

The German share price index, the DAX, is an important indicator for the German stock market. It is calculated by Deutsche Börse and tracks the share price developments of the 30 largest German public limited companies which are admitted to trading on the Frankfurt Stock Exchange.¹ The DAX is primarily calculated as a performance index and therefore also incorporates – unlike a price index – the accumulated distributions of the index constituents. In July 2014, the enterprises listed in the DAX index accounted for 64% of the stock capital admitted to trading in Germany with a market capitalisation of €776 billion. The index plays an important role as a benchmark for financial instruments (such as futures and options, but also index funds and certificates) both for institutional and private investors and is often referred to as the flagship index of the German stock market.

Between 1988 and the end of August 2014, the value of German shares, as measured by the DAX, has increased almost tenfold on the whole. Share price developments alone were responsible for just over half of the overall rise in the DAX index. The performance of the index follows a similar pattern to that of the enterprises' expected earnings 12 months ahead, which, just like the discount factors, are a fundamental determinant of equity price developments (see the chart on page 22).² Occasionally, however, there are differences in the development of share prices and expected earnings, which is reflected in the time-varying ratio of these variables, the price-earnings ratio (P/E ratio) (see the chart on page 22).³

On the whole, three major stock price cycles can be distinguished. The DAX index rose during the 1990s and into the second quarter of the year 2000, peaking at what was then a new all-time high of just over 8,000 index points. This trend was primarily

driven by shares in the telecommunications, media and technology (TMT) industries, the profit potential of which is dependent on market developments in the more distant future. During this period, share prices outpaced expected earnings 12 months ahead, pushing the P/E ratio to values in excess of 20 over a number of years. The high valuation of the DAX was therefore also a reflection of the exceptionally optimistic expectations for medium and long-term profit growth rates in technology-intensive sectors, which were ultimately disappointed.

The marked slump experienced by high technology "New Economy" stocks after March 2000 also weighed on the DAX, which had fallen to one-third of its peak level by the second quarter of 2003. However, given that the expected earnings 12 months ahead declined only around half as strongly, the P/E ratio dropped considerably during this period. The DAX increased again significantly in the course of the global economic recovery, reaching a new peak figure

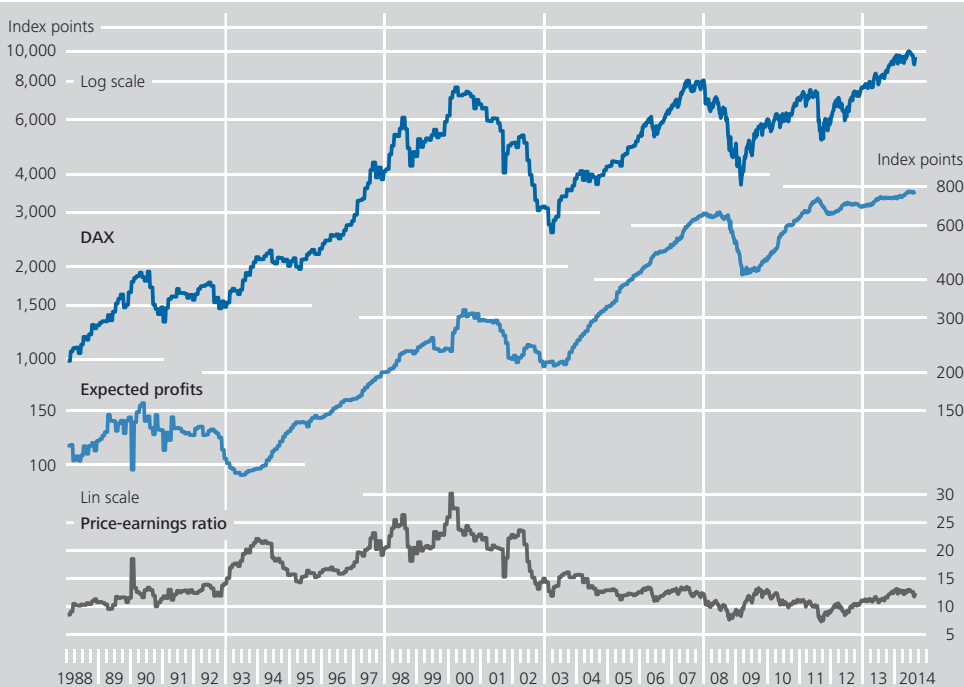
¹ All the index members have to be listed in Deutsche Börse AG's Prime Standard segment. The largest enterprises measured by stock exchange turnover and market capitalisation are admitted to the DAX index. It is not the overall market capitalisation which is decisive, but the market capitalisation of the shares in free float. Stocks held by shareholders with a stake of over 5% in the share capital are therefore not taken into consideration.

² Long-term profits are difficult to predict, which is why, in practice, the expected earnings 12 months ahead – determined on the basis of surveys – are often used instead for the sake of simplicity.

³ The actual payments made to shareholders are known as dividends. The payment of dividends is, however, subject to a dividend payment policy, which is, not least, influenced by certain legal provisions. Following an amendment in 1998 that made it easier for enterprises to repurchase their own shares, which also offered a tax advantage, share buybacks increased significantly and even replaced dividend payments. It would be wrong, therefore, to interpret the decline in the dividend-price ratio as a price increase, which is why the following evaluation concentrates on the profit as a payment, and the P/E ratio is used instead of the dividend-price ratio. Expected profits are based on a 12-month horizon.

Share prices, expected profits and price-earnings ratio of the DAX

Weekly values



Source: Thomson Reuters Datastream (Institutional Brokers Estimate System: I/B/E/S).
 Deutsche Bundesbank

of over 8,100 index points in the summer of 2007. Quotations and earnings expectations rose virtually in tandem during this period, and the P/E ratio contracted slightly despite an upward movement in share prices.

The financial market shock emanating from the US real estate market and the attendant fears about the soundness of a number of financial institutions weighed heavily on share prices and profit expectations, and did not leave DAX stocks unscathed. It also became apparent as the crisis progressed that disruptions in the financial markets were increasingly spilling over to the real economy, which would trigger a very severe downturn in the global economy. Share prices bottomed out in the second quarter of 2009. The ensuing recovery began with the expectation that the recession would come to an end in the major advanced and emerging market economies. Analysts began revising their profit expectations up-

wards again as a result of the increasingly positive economic data. Furthermore, share prices were shored up by the extremely accommodative monetary policy.

The escalation of the European sovereign debt crisis in the second half of 2011 only briefly interrupted this upward trend. The persistent low-interest-rate policies of all major central banks and a widespread search for yield sent the DAX to new record levels in July 2014, and the P/E ratio increased from a low level.⁴ The heightened geopolitical tensions as well as – in a probably related development – some weaker-than-expected business indicators recently, notably for the euro area, subsequently dragged down stock prices.

⁴ The price index excluding reinvested dividends is around one-fifth down on the historical high it reached in March 2000 during the New Economy boom.

in keeping with the reporting template (see the table on page 24). The WPIInvest data thus allow the ownership structure of listed German public limited companies to be analysed in detail. Only account-keeping financial institutions domiciled in Germany are required to report securities holdings. Just under 5% of the German market capitalisation is held in custody outside Germany, which means that it is not captured by WPIInvest. This share is assigned in full to non-resident investors for the purpose of this article. The stock data for residents thus represent a minimum level of holdings, since German equities held abroad by German residents are assigned to the non-resident share.

Possible explanations for high coverage of foreign ownership share in WPIInvest

It might appear surprising, initially, that the bulk of German equities held by non-residents are also reported in WPIInvest, even though only domestic account-keeping institutions are required to report their holdings.⁵ One possible explanation for this is that non-resident investors are just as keen to seek out the main trading venue of an equity they wish to purchase because that is normally where the security is guaranteed to be at its most liquid. Another possibility is that settlement and safe custody in the country of issue are still more cost-effective than transferring securities to the securities deposit account holder's home country.⁶

Non-resident holdings

Non-residents hold just over 57% of German market capitalisation

More than half of the market capitalisation of German public limited companies (57.1%) was in foreign ownership at last count (see the table on page 24). The foreign ownership share was once even a tick higher – at the end of 2007 – before receding to 51.6% in the wake of the collapse of Lehman Brothers. This was a spell in which investors around the world repatriated their assets. But the longer-term trend towards cross-border investment regained the upper hand relatively quickly, pushing the share of German equities in foreign ownership back up.

However, the options offered by WPIInvest for researching the structure of non-resident depositors in greater detail are limited. Only around 10% of foreign holdings are held directly by non-resident households, financial and non-financial institutional investors with reporting domestic banks or central securities depositories. The remainder of the foreign ownership share is held in custody by foreign central securities depositories and banks with reporting domestic account-keeping institutions. The reported data cannot be drilled down further to distinguish between proprietary and third-party holdings, as with the data for domestic investors. Yet it can be plausibly assumed that the non-resident investors are almost entirely institutional investors.⁷

WPIInvest cannot categorise foreign depositors in greater detail

Ownership structure of domestic depositors

The domestic share of German public limited companies' market capitalisation at the end of May 2014 amounted to 42.9%, meaning that it has diminished slightly, by 2.6 percentage points, in recent years, albeit amid some fluctuation during the financial crisis (see the table on page 24). At last count, domestic institutional investors as a whole held just under a third of all German equities (29.4%), with 18.3 percentage points being attributable to non-financial investors and 11.1 percentage points to financial investors. Non-financial investors include all enterprises which predominantly produce goods and non-financial services as well as holding companies which hold stakes in other non-financial corporations. Domestic mutual funds held 6.3% at last count, making

Domestic depositors hold just under 43% of German stocks

⁵ The only fraction missing from a full account of securities holdings is the almost 5% mentioned earlier in this article; this portion is not captured by the reporting template.

⁶ The launch of TARGET2-Securities in June 2015 will take the efficiency of cross-border settlement in the European securities markets to the next level.

⁷ See, for example, M Dahlquist and G Robertsson (2001), Direct foreign ownership, institutional investors, and firm characteristics, *Journal of Financial Economics* 59, pp 1839-85.

Ownership structure of listed public limited companies*

%

Owners	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Residents	45.5	46.4	41.2	48.4	45.4	44.9	45.8	44.6	42.8	42.9
<i>of which</i>										
Households	13.3	11.2	10.0	10.3	12.6	12.8	13.1	12.2	11.4	11.8
Institutional investors	29.8	32.7	29.4	36.1	31.1	30.6	31.1	30.3	29.6	29.4
Non-financial investors	12.7	16.1	15.8	22.9	19.4	19.2	18.7	18.3	18.9	18.3
Financial investors	17.2	16.6	13.6	13.2	11.7	11.4	12.3	12.0	10.7	11.1
Banks	4.7	4.7	3.1	3.5	2.6	2.3	2.2	1.9	2.1	2.7
Mutual funds	8.0	7.7	5.8	5.3	5.9	6.2	6.9	6.8	6.4	6.3
Insurers	2.6	2.5	2.5	2.1	2.1	1.9	1.5	1.6	0.8	0.9
Other financial investors	1.8	1.7	2.2	2.3	1.1	1.0	1.9	1.7	1.5	1.3
Non-residents	54.5	53.6	58.8	51.6	54.6	55.1	54.2	55.4	57.2	57.1

* Data for 2014: as at end-May 2014, otherwise year-end data. Weighted by market capitalisation.

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them the most important group of owners in Germany's financial sector, followed by domestic banks (2.7%) and other financial institutions (1.3%). Insurers – which, for the purposes of this classification, also include pension funds – held a relatively small fraction of German equities as this report went to press (0.9%). Households, meanwhile, held an 11.8% share at the end of May 2014.

Households hold fewer equities

The overall decline in the proportionate value held by residents observed since 2005 is largely the outcome of a drop in household equity holdings. The fractional value held by institutional investors, by contrast, has remained almost static over time. However, there was a shift within this sector towards non-financial investors.⁸

Determinants of investor behaviour

Enterprise size

Ownership structure dependent on enterprise size

One possible determinant of the ownership structure of equities is the size of the public limited company. In this section, we therefore arrange the shares of German enterprises in order of market capitalisation and divide them into five groups with an equal number of enter-

prises (quintiles) in an attempt to shed more light on the relationship between an enterprise's size and its appeal to individual investor groups (see the table on page 25). Comparing the first quintile (smallest firms) with the fifth (largest) reveals that, among large cap enterprises, domestic institutional investors and non-resident owners, which are likewise predominantly made up of institutional investors, grow in importance (by 15 and 17 percentage points respectively) as the size of the enterprise increases. Institutional investors in Germany and abroad focus their investments primarily on large cap enterprises, whereas the shares held by domestic households shrink as enterprises grow in size. The quintile comparison shows that their fractional share diminishes steadily from 46.5% to 14.0%.

One reason why households are strongly over-weighted in smaller caps might be their preference for local firms. It can be shown for Germany that private investors weight local enterprises much more heavily than they normally would, were they to assemble a portfolio diver-

Local bias among households

⁸ The sharp growth visible in the non-financial sector between 2007 and 2008 can mainly be explained by the exceptional movement shown by the Volkswagen AG common share, which briefly became the most expensive stock worldwide (in terms of market capitalisation) during a takeover attempt by Porsche AG.

Relationship between enterprise size and ownership structure*

%

Owners	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Residents	69.4	69.3	68.1	64.7	52.2
<i>of which</i>					
Households	46.5	34.8	31.7	23.1	14.0
Institutional investors	21.8	33.4	35.7	40.3	36.8
Non-financial investors	18.9	28.7	29.5	32.8	24.3
Financial investors	2.9	4.6	6.2	7.5	12.5
Banks	0.7	0.8	0.9	0.9	3.2
Mutual funds	0.3	0.9	1.6	2.8	4.6
Insurers	0.1	0.2	0.7	0.7	2.0
Other financial investors	1.7	2.8	3.0	3.1	2.6
Non-residents	30.6	30.7	31.9	35.3	47.8

* Breakdown of all German enterprises into five size quintiles with the smallest enterprises in the 1st quintile and the largest in the 5th. Average over the 2005-14 time frame. Data for 2014: as at end-May 2014, otherwise year-end data.

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sified by market capitalisation.⁹ The outcome is not affected by holdings of staff shares which, owing to households' usual proximity to the workplace, would also be assigned to the local equities category.¹⁰ Some papers in the relevant literature posit that informed (ie rational) investor choice is a possible explanation for households' tendency to overweight local equities. They assume that local investors enjoy a positive information asymmetry in respect of local firms, which translates into excess returns on local shareholdings.¹¹ However, the empirical evidence for a positive information asymmetry in respect of local equity investments is ambiguous, with a raft of other papers indicating that investors with a local bias do not achieve superior returns, or even that they systematically underperform.¹² A corresponding study of German private investors likewise concludes that households do not generate significant excess returns. Rather, the local bias in portfolios can be explained by a "flight to familiarity" which does not translate into measurable superior returns.¹³ Familiarity appears to be a major factor in the composition of household equity portfolios. This regionally bounded investor behaviour is particularly pronounced because, interestingly, it is a phenomenon that can also be observed across national borders.¹⁴

Domestic financial investors, by contrast, have a clear preference for larger cap enterprises. While the first to fourth size quintiles in the table above show a relatively modest rise in the percentage share, the fifth quintile jumps significantly to 12.5%. This pattern is even more pronounced among non-resident investors, a group which likewise sees the ownership share rising in almost a linear fashion up to the fourth quintile before climbing sharply to 47.8% in the quintile containing the largest caps. This increase is consistent with the existing research findings, which have identified less pronounced

Bias towards larger caps particularly evident among financial and non-resident investors

⁹ See M Baltzer, O Stolper and A Walter (2014), Home-field advantage or a matter of ambiguity aversion? Local bias among German individual investors, The European Journal of Finance, forthcoming.

¹⁰ Given that staff share ownership at German enterprises usually amounts to no more than 1% of the total share capital, this only partly explains the phenomenon; see Deutsches Aktieninstitut, Mitarbeiterbeteiligung mit Aktien: Eine Umfrage unter börsennotierten Unternehmen in Deutschland, November 2013.

¹¹ See, for example, A Bodnaruk (2009), Proximity always matters: evidence from Swedish data, Review of Finance 13, pp 629-56; or Z Ivkovic and S Weisbenner (2005), Local does as local is: information content of the geography of individual investors' common stock investments, Journal of Finance 60, pp 267-306.

¹² See, for example, M Seasholes and N Zhu (2010), Individual investors and local bias, Journal of Finance 65, pp 1987-2010.

¹³ See M Baltzer, O Stolper and A Walter (2014), op cit.

¹⁴ See M Baltzer, O Stolper and A Walter (2013), Is local bias a cross-border phenomenon? Evidence from individual investors' international asset allocation, Journal of Banking and Finance 37, pp 2823-35.

information asymmetries as the driving force behind non-resident investors' bias towards larger German enterprises.¹⁵ Larger cap enterprises are normally the subject of relatively strong information flows, as reflected, for instance, by the broad coverage they enjoy from equity analysts. Moreover, evidence from the German market confirms that shares in large cap enterprises also tend to be increasingly held by mutual funds and other institutional investors, besides featuring regularly in the media. This reduces the likelihood of there being additional information about a particular enterprise that is more readily available for domestic investors than for foreign ones. What is more, large cap equities are more liquid, which is probably another major reason for their appeal to non-resident investors.¹⁶

DAX membership

Foreign investors show strong preference for DAX enterprises

The preference of foreign investors for equities of large caps with low information asymmetry and high liquidity is particularly evident in the case of DAX enterprises, which are the 30 most important public limited companies in Germany. In addition to the aforementioned factor of enterprise size, membership of a well-known national index is an additional incentive for foreign investors to invest in these enterprises.¹⁷ Conversely, the greater presence and recognition of the DAX among the international public leads to a reduction in the perception of DAX enterprises as local enterprises, causing the previously observed overweighting of local enterprises to diminish significantly for this group.¹⁸

DAX enterprises, which account for nearly two-thirds of overall German stock market capitalisation, will be examined in more detail in this section. This disaggregated analysis allows additional insights into the investment behaviour of various investor groups to be gained.

According to the WPIInvest classification, 63.7% of the market capitalisation of DAX enterprises is held by non-residents (see the table on

page 27).¹⁹ The interest shown by foreign investors in DAX enterprises is therefore significantly higher than their interest in the average enterprise located in the top size quintile.

The share of the DAX held by foreign investors has increased by 7.8 percentage points since 2005. As the composition of the DAX changes regularly, this raises the question of whether this significant change is purely attributable to changes in the DAX's composition. For example, it is conceivable that enterprises that have exited the DAX since 2005 were primarily held in the portfolios of domestic investors, whereas the ownership structure of enterprises joining the DAX were dominated to a greater extent by foreign investors.²⁰ A corresponding analysis shows that this, however, is not the case. If we take the current DAX members and factor in their ownership figures from 2005, this actually results in a slightly greater increase in the share held by foreign investors. The same change is seen if we only consider DAX enterprises that have been members of the DAX continuously since 2005. Compositional changes to the DAX can therefore be ruled out as a cause of the changed ownership structure. Indeed, foreign investors deliberately added to their DAX holdings. The relatively high current level of foreign ownership had, in fact, already been attained prior to the financial and sovereign debt crisis at the end of 2007. The share of DAX securities held by foreign investors then fell sharply following the collapse of Lehman

Share of DAX held by foreigners on the rise since 2005

¹⁵ See M Dahlquist and G Robertsson (2001), op cit.

¹⁶ See L L Tesar and I M Werner (1995), Home bias and high turnover, *Journal of International Money and Finance* 14, pp 467-93.

¹⁷ See also the line of argument on stock index membership and local investments put forward by Z Ivkovic and S Weisbenner (2005), op cit.

¹⁸ See M Baltzer, O Stolper and A Walter (2014), op cit.

¹⁹ As already mentioned in the discussion on investor classifications, it must be noted that these figures represent an upper limit. For example, this measurement deems domestic market participants to be foreign if they happen to hold their portfolio abroad or manage it via a foreign central securities depository.

²⁰ An enterprise may be required to exit the DAX if its market value and stock exchange trading volume relative to that of other enterprises drop sharply, or if it is involved in a merger or takeover.

Ownership structure of DAX companies*										
%										
Owners	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Residents	44.1	41.9	35.1	43.9	36.9	36.5	38.1	36.6	35.4	36.3
<i>of which</i>										
Households	14.4	12.2	10.6	11.5	13.7	13.9	14.3	13.7	12.7	12.9
Institutional investors	27.1	27.2	22.3	30.0	21.1	20.9	21.8	20.9	21.0	21.7
Non-financial investors	7.6	8.8	9.3	17.8	10.1	10.2	10.2	9.6	9.7	9.8
Financial investors	19.5	18.4	13.0	12.2	11.0	10.7	11.7	11.3	11.2	11.9
Banks	6.3	5.8	3.3	3.5	2.3	2.0	2.2	2.1	2.7	3.3
Mutual funds	10.7	10.4	7.6	7.3	7.6	7.7	8.7	8.5	8.0	7.7
Insurers	1.7	1.6	1.7	1.0	0.9	0.8	0.7	0.6	0.4	0.5
Other financial investors	0.8	0.6	0.5	0.4	0.2	0.2	0.1	0.1	0.2	0.3
Non-residents	55.9	58.1	64.9	56.1	63.1	63.5	61.9	63.4	64.6	63.7
<i>of which</i>										
EU (excluding Germany)	29.5	30.9	35.2	31.3	34.6	32.4	27.9	32.7	34.6	33.8
Switzerland	5.0	4.3	4.2	4.0	4.9	5.3	5.4	5.5	5.2	5.2
United States	13.1	15.0	16.8	14.2	15.9	18.6	20.7	16.9	16.4	16.5
Other countries	6.3	5.4	5.5	5.0	6.5	7.0	6.7	7.5	7.8	7.6

* Data for 2014: as at end-May 2014, otherwise year-end data. Weighted by market capitalisation.
 Deutsche Bundesbank

Brothers at the end of 2008, only to then quickly return to previous levels. The swift recovery of the German economy after the economic downturn in 2008-09 and the high competitiveness of the largely internationally oriented DAX enterprises evidently made DAX equities attractive to foreign investors.

utable to investors from Luxembourg, on account of its mutual fund industry, and France. Asia plays an almost negligible role as a direct investment location for DAX securities. Excluding investor groups from the EU (including Germany), Switzerland and the USA, the remaining share of DAX holdings attributable to residents of all other countries, including those in Asia, amounted to just 7.6% at the end of May 2014.

The largest international investor groups come from the EU and the USA

A region-based view shows that approximately one-third of German equities, as measured by market capitalisation, are held by EU residents. However, this figure also includes foreign central securities depositories, whose holdings cannot be attributed with complete certainty to end-investors on a regional basis. It must also be taken into account that the EU figure includes holdings in London's financial centre, and the data do not allow a distinction to be made between securities holdings of UK investors and those of clients based in other parts of the world. At last count, the share held by US residents amounted to 16.5%, and here too – similarly to London – the fact that various large mutual funds and other institutional investors are domiciled there is likely to have had an impact on this figure. Investors in both the EU and the USA have increased their share of the DAX since the end of 2005. Approximately one-fifth of the DAX's market capitalisation is held by investors from the euro area, with a particularly notable portion being attrib-

Past performance (momentum effect)

The momentum effect means that shares which have shown above-average price gains in the past will continue to outperform past "losers". This anomaly can also be shown to exist for the German equity market, the topic of this article (see the box on pages 29 to 31).

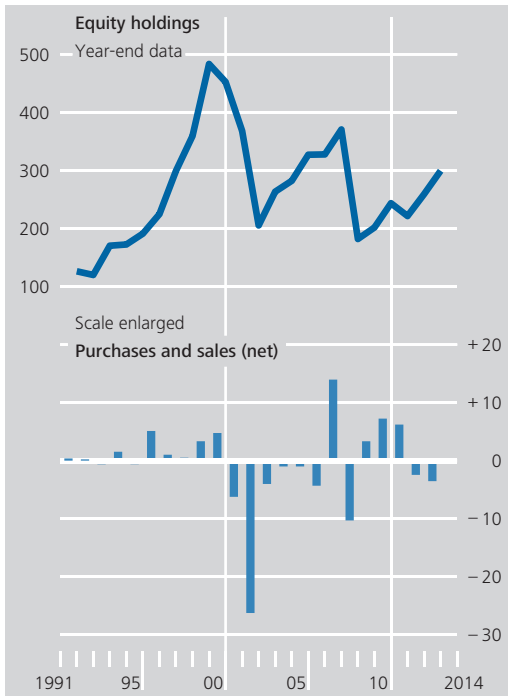
Momentum effect also in evidence on the German market

The question arises as to whether and to what extent the momentum effect has been systematically exploited by individual investor groups on the German equities market. A corresponding analysis shows there is a strong positive correlation between the change in the share of foreign ownership and past cumulative returns, which could be an indication that foreign investors have been following a momentum strategy. It therefore follows that domestic investors, on aggregate, formed the anticyclical counterpart to this strategy. The breakdown of

Foreign investors and mutual funds as momentum traders

Equity holdings and purchases/sales by domestic private investors*

€ billion

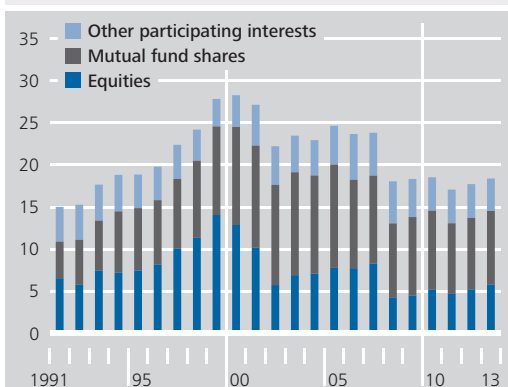


* The definition used here includes households as well as non-profit institutions serving households.
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investor groups shows that only households pursued this contrarian approach. By contrast, financial investors, including mutual funds and banks in particular, were among those who followed a momentum strategy.

Equities held by private investors as a percentage of their financial assets*

Year-end data



* The definition used here includes households as well as non-profit institutions serving households.
 Deutsche Bundesbank

Preference for "safe" securities during the financial crisis

If one looks at equity holdings of domestic private investors over a long period, large cyclical fluctuations become apparent.²¹ Private investors' holdings of direct equities were strongly influenced by share price developments (see the adjacent chart).²² For example, rising prices in the wake of the New Economy boom at the turn of the millennium and the sharp downturn that followed are reflected in the level of equity holdings. In the years that followed, equity holdings grew continuously, before once again experiencing a sharp downturn during the 2008 financial crisis. The effect of price fluctuations on assets is amplified by the pro-cyclical purchasing and selling behaviour of investors, which seems to be particularly pronounced during crisis periods. Heavy selling occurred in 2001-02 and 2008 on the back of sharp price falls. In 2008, for example, the equity holdings of private investors fell by a total of €188½ billion or nearly 51%, of which only €9½ billion (equivalent to 2.6% of equity holdings at the end of 2007) was attributable to net sales.

Large fluctuations in household equity portfolios

An analysis of private investors' financial assets confirms that holdings of equities, mutual fund shares and other participating interests fell sharply as a percentage of total assets, particularly in 2008 (see the adjacent chart). The fall was most pronounced for direct share holdings, which subsequently represented just 4.2% of overall wealth, therefore marking a historic low.²³ Since then, the share of equities

Fall in total equity holdings during the crisis, ...

²¹ The equities universe is widened here to include all equities held directly by households, ie also foreign equities. In order to be able to observe a slightly longer development, aggregated data are taken from the financial accounts. It should be noted, however, that the investor group definition used here is slightly broader than the WP-Invest definition. In addition to households, non-profit institutions serving households are also included in the category "private investors", which at last count accounted for nearly one-quarter of all private investor equity holdings.

²² In addition, households also hold equities indirectly via mutual funds.

Momentum strategy in the German equity market

In the momentum effect, shares whose prices rose faster than average in the past will continue to outperform past “losers”. First documented for the US equity market by Jegadeesh and Titman (1993), this effect contradicts the efficient markets hypothesis, introduced by Fama (1970), which holds that past share price movements cannot predict current or future share prices.¹ Unlike other equity market anomalies, this phenomenon has been proven to exist even after it was first described, and it has been identified even outside the US equity market and in other asset classes.² Using quarterly data on the German equity market from end-2005 to end-2012 obtained from the Securities Holdings Statistics (WPIInvest), this box will investigate whether a momentum effect can be found to exist for German equities, too, as well as which groups of investors follow this strategy.³ WPIInvest covers the German equity market nearly fully; its advantage over other data sets used for internationally comparable studies is that the trading strategies of various groups of investors can be analysed simultaneously. If a group of investors buys shares whose past returns were above average or sells shares with above-average losses, there has to be at least one other group of investors doing the exact opposite. WPIInvest can therefore be used to identify not only momentum investors but also the group of trading partners. The detailed reporting template also permits a more detailed breakdown of institutional investors than has been the case in the international research literature.⁴

Momentum strategy for German shares

The first step in this analysis is to arrange all German shares in order of return over a pre-defined period – known as the “forma-

tion period”.⁵ The highest-yielding 30% of shares are put into a winner portfolio and the lowest-yielding 30% into a loser portfolio.⁶ The next step is then to create a portfolio for which the shares in the winner portfolio are purchased at the same weights and those of the loser portfolio are short-sold at the same weights (zero-cost strategy). Now the portfolio’s performance over a second period, the “holding period”, is tracked.⁷ This “winners-minus-losers”

¹ See N Jegadeesh und S Titman (1993), Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency, *Journal of Finance* 48, pp 65-91; E F Fama (1970), Efficient Capital Markets, A Review of Theory and Empirical Work, *Journal of Finance* 25, pp 383-417.

² N Jegadeesh and S Titman (2001), Profitability of momentum strategies: An evaluation of alternative explanations, *Journal of Finance* 56, pp 699-720, show that the momentum strategy has demonstrably continued to exist, even after publication of the original research. K G Rouwenhorst (1998), International momentum strategies, *Journal of Finance* 53, pp 267-84, and J M Griffin, X Ji and J S Martin (2003), Momentum investing and business cycle risk: Evidence from pole to pole, *Journal of Finance* 58, pp 2515-47, demonstrate the existence of momentum effects in international equity markets (the effect is weakest in Asia, especially in Japan). C S Asness, T J Moskowitz and L H Pedersen (2013), Value and momentum everywhere, *Journal of Finance* 68, pp 929-85, document the existence of the momentum effect not only in equities but in other asset classes as well.

³ The results for the German equity market discussed in this box are based on the forthcoming Deutsche Bundesbank discussion paper by M Baltzer, S Jank and E Smajlbegovic, entitled “Who trades on momentum?”.

⁴ Institutional investors can be broken down into non-financial and financial investors, and financial investors can be broken down even further into banks, mutual funds, insurers and other financial investors. The data set of 13-F SEC filings usually used in the US literature contains only the large institutional investors, which cannot be broken down any further.

⁵ A formation period usually lasts from one to four quarters. This investigation is based on a four-quarter period, although the results are robust to the length of the formation period.

⁶ This classification is attributable to E F Fama and K R French (1993), Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics* 33, pp 3-56.

⁷ This study is based on a one-quarter period. However, positive momentum profits are visible up to a holding period of four quarters.

(WML) strategy turns out to be highly profitable for Germany, which is in line with results for the United States and other countries. For Germany, this leads to an economically and statistically significant annualised difference between winner and loser portfolio returns of over 11%. Although the WML strategy proves profitable on average across the observation period, there are also isolated quarters with heavy losses, particularly in the second and third quarters of 2009, when the markets were beginning to recover from the drastic collapses following the Lehman Brothers bankruptcy. The reason for the losses is that, although the losers reacted particularly sensitively to the financial market shock, following the subsiding of tensions, they subsequently rebounded more strongly than the winners.⁸

Different strategies pursued by individual groups of investors

The investigation in this box of the application of the WML strategy in the German market by individual groups of investors begins with a calculation, for every share i , of the percentage ownership share held $OS_{i,j,t}$ by investor group j at time t .

$$OS_{i,j,t} = \frac{\text{Number of shares}_{i,j,t}}{\text{Outstanding shares}_{i,t}}$$

For the shares in the winner (loser) portfolio, the average quarterly change in the percentage share for each investor sector is calculated.⁹ A positive (negative) difference in the change in the investor share between the winner and loser portfolios indicates that the group of investors is following a WML (“contrarian”) strategy.

To adjust for other potential effects, a panel data regression is run for each group of investors which not only regresses the change in the ownership share $\Delta OS_{i,j,t}$ on the re-

turns of the formation period ($ret_{i,(t-4,t-1)}$) but also controls for firm-specific variables ($controls_{i,t-1}$):¹⁰

$$\Delta OS_{i,j,t} = \alpha_t + \beta \cdot ret_{i,(t-4,t-1)} + \gamma \cdot controls_{i,t-1} + \varepsilon_{i,j,t}$$

The results indicate a significant positive influence on the foreign percentage share of returns achieved over the formation period; foreign investors are therefore pursuing a WML strategy, confirming existing research.¹¹ By construction, domestic investors, in the aggregate, accordingly constitute the segment of “contrarian” investors. A sector-specific look at domestic investors shows, however, that only households are pursuing a contrarian strategy, which is likewise consistent with the results of international research for the United States.¹² Domestic institutional investors, and particularly mutual funds, are likewise following a WML strategy.¹³

⁸ This development is also visible in other markets; see K Daniel and T Moskowitz (2013), Momentum crashes, Swiss Finance Institute Working Paper.

⁹ In order to adjust the demand for certain shares for possible general trends in equity market investment, for each investor sector the specific demand for a share is corrected for average demand at that particular time.

¹⁰ These firm-specific factors include size, book-to-market ratio, volatility, beta factor, age, dividend return, index membership and stock exchange turnover.

¹¹ M Grinblatt and M Keloharju (2000), The investment behaviour and performance of various investor types: a study of Finland’s unique data set, Journal of Financial Economics 55, pp 43-67, likewise identify foreign investors as momentum traders. The main justification given is that the foreigners are primarily institutional investors.

¹² See T Odean (1998), Are investors reluctant to realize their losses?, Journal of Finance 53, pp 1279-98.

¹³ See M Grinblatt, S Titman and R Wermers (1995), Momentum investment strategies, portfolio performance, and herding: a study of mutual fund behavior, American Economic Review 85, pp 1088-1105, and S G Badrinath and S Wahal (2002), Momentum trading by institutions, Journal of Finance 57, pp 2449-78.

Possible explanatory approaches

There is contentious debate in the literature on the possible causes of the momentum effect. They centre on the question of whether the observed price movement is an underreaction or an overreaction. In favour of overreaction, Daniel et al (1998) argue that (institutional) investors are too sure of their own assessment of a share and, moreover, tend to see new information as, in particular, confirming their decisions and assessments (overconfidence bias).¹⁴ Successful investment decisions are seen as reflecting one's own abilities, whereas the other decisions are put down to bad luck. If a share's price is correctly forecast to rise, investors increase their positions in these instruments, causing their prices to rise and to become further removed from their fundamental values. Negative information, by contrast, initially does not impact on behaviour, which accordingly leads to a positive momentum effect.

Whereas the overconfidence hypothesis is chiefly associated with momentum traders, Grinblatt and Han (2005) focus on the "disposition effect" among counterparty investors who are slow to respond to new fundamental data and therefore "underreact".¹⁵ Investors hold their losers too long while selling their winners too quickly. What this means is that good news about a share causes only a gradual adjustment to the new (higher) fundamental value.

By interacting heterogeneous investor groups, the approach postulated by Hong and Stein (1999) unifies underreaction and overreaction. One group, the "newswatchers", acts upon fundamental information, only gradually processing news. The other group, "momentum traders", observes leading price indicators and enters the market as prices are rising, thus achieving a

new fundamental value. However, the momentum traders do not know this fundamental value, and will thus continue to invest owing to persistent positive price signals, causing the share price to overheat. Negative reports about the enterprise lead to similar effects.

On balance, the existence of a disposition effect for households, which enables institutional and foreign investors to pursue a profitable WML strategy, can be regarded as being consistent with the analysed data set. What the data also show, however, is that, particularly in times of uncertainty, a momentum strategy can yield heavy losses. Within this explanatory approach, this would be the case if the share prices were initially to overreact, owing to increased price pressure from momentum traders, followed by subsequent corrections.

¹⁴ See K Daniel, D Hirshleifer and A Subrahmanyam (1998), Investor psychology and security market under- and overreactions, *Journal of Finance* 53, pp 1839-85.

¹⁵ See M Grinblatt and B Han (2005), Prospect theory, mental accounting, and momentum, *Journal of Financial Economics* 78, pp 311-39.

as a proportion of total assets has increased continuously, but two-thirds of this increase is attributable to rising prices. At the end of 2013, equities accounted for 5.8% of total assets. Private investors obviously restructured their assets at the peak of the financial crisis, switching out of equities and into other, less risky investments.

... but an increase in holdings of DAX securities

A look at changes in holdings of domestic equities using the detailed data from WPIInvest provides a more nuanced picture for households. On the one hand, it confirms that the proportion of households' total assets held in portfolios (as measured by the market capitalisation of all domestic stocks) declined steadily from 13.3% to 10.0% between 2005 and 2007 (see the table on page 24). However, it also shows that this proportion increased slightly to 10.3% in the crisis year of 2008. Interestingly, this change is attributable solely to DAX securities, which experienced a relatively significant rise from 10.6% to 11.5% (see the table on page 27).

Shifts within the same asset class during the financial crisis as well

The investment behaviour of households during the financial crisis shows that they not only switched investments from one asset class to another, but also took a nuanced approach to investments within the same asset class. While selling off foreign equities, they also made net purchases of domestic securities. A decisive role here is likely to have been played by investors' familiarity with large domestic enterprises, familiarity being of particular relevance during crises.²⁴ A decline in risk appetite (or an increase in risk aversion) may also have been a key factor in causing equity investments to be repatriated in the short run.²⁵

■ Conclusion

More than half of the market capitalisation of German equities is held abroad, which can be seen as a manifestation of increasing international interconnectedness. Even though a significant fall in foreign holdings of German equities was observed in connection with the collapse of Lehman Brothers, the trend towards cross-border securities investments rebounded relatively quickly. In general, banks and financial investors reduced their investment in German equities over the course of the crisis, with non-financial institutional investors such as holding companies stepping in to fill the gap. Households account for just over 12% of domestic market capitalisation. It is apparent that large enterprises are the preferred choice of foreigners and financial investors, while smaller enterprises, by contrast, are held primarily by households. It is also possible to identify different trading strategies among different investor groups. While foreign investors and, above all, mutual funds pursue a momentum strategy, households take the opposite approach. Moreover, it appears that company familiarity plays a role in equity investments, particularly for households. For example, during the financial crisis, private investors not only switched investments from one asset class (equities) to another (bonds), but also slightly increased their holdings of DAX securities.

²³ The highest percentage of equities in households' financial assets was recorded in 1999 during the New Economy boom, when it amounted to 14.0%, more than three times the current rate.

²⁴ See G Huberman (2001), Familiarity breeds investment, *Review of Financial Studies* 14, pp 659-80.

²⁵ See S Babilis and V Fitzgerald (2005), Risk appetite, home bias and the unstable demand for emerging market assets, *International Review of Applied Economics* 19, pp 459-76.