Investment Behaviour of German Equity Fund Managers

An Exploratory Analysis of Survey Data

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Abstract

In order to shed light on the "black box" of institutional equity investing in a systematic manner, I conducted a broadly based questionnaire which received a large response from German mutual fund companies. The survey asked fund managers for their basic views and practices and for insights into their company's performance-measurement and compensation incentives. It was possible to identify three core types of investors, labelled *fundamentalists, tacticians* and *methodologists*, in the data on investment behaviour. Common to all types is the primary aim of achieving above-average returns on investment with due allowance being made for sluggishness in the reaction of market prices to new information. Another universal feature of institutional equity investing turns out to be a heavy reliance on information sources which offer a means of confirmation and through which the contagions of fear and exuberance may be transmitted. In general fund managers exhibit a pronounced preference for "winner-type" and "spotlight" stocks as well. All investor groups recognise, in the first instance, underlying economic information as a source of superior value. However, a potential for exaggerated market dynamics is suggested by the fact that the mere arrival of news from corporations or analysts' earnings revisions is generally thought to impart as strong a market impulse as the perceived mispricing of stocks relative to the market or sector as such. Furthermore, those who appear to be best suited to conduct fundamental arbitrage are nevertheless likely to be constrained, to a significant extent, by time horizons and the fear of market movements. Besides investment focus and basic attitudes towards market efficiency, agency problems are shown to have a bearing on equity fund managers' investment behaviour.

JEL Classification: G10, G11, G23

Key Words: Institutional investors' behaviour, mutual funds, equity markets, financial system stability

Zusammenfassung

Dieser Studie liegt eine breit angelegte Umfrage zugrunde, an der sich die Mehrheit der Aktienfondsmanager aus nahezu allen Investmentgesellschaften mit Sitz in Deutschland beteiligten. Die Fondsmanager sind zu ihren grundlegenden Ansichten sowie ihren Praktiken befragt worden, um auf systematische Weise Investmentprozesse institutioneller Anleger zu ergründen. In diesem Rahmen wurde auch um Angaben über die Leistungsbewertung der Fondsmanager seitens ihrer Unternehmungsleitung und über die angewandten Leistungsanreize gebeten. Aus den gewonnenen Daten über das Investitionsverhalten konnten drei Hauptgruppen von Anlegern festgestellt werden, die sogenannten *Fundamentalisten, Taktiker* und *Methodiker*. Allen Gruppen gemeinsam ist das vorrangige Ziel, überdurchschnittliche Anlagerenditen zu erzielen. Dabei dominiert zugleich eindeutig die Vorstellung, daß Marktpreise auf neue Informationen nur träge reagieren. Ihren eigenen Angaben zufolge greifen Fondsmanager auch sehr auf solche Informationsquellen zurück, die letztlich für ihre Anlageentscheidungen bestätigend wirken und auf diese Weise Ansteckungseffekte wie Befürchtungen und Euphorien übertragen können. Im allgemeinen besitzen sie außerdem eine ausgeprägte Vorliebe für "Erfolgs"-Aktien und Aktien, denen die Aufmerksamkeit im Markte gilt. Alle Anlegergruppen erkennen zwar in erster Linie den Schlüssel für überdurchschnittliche Anlageresultate in der Analyse grundlegender Wirtschaftsinformationen; allerdings gibt es ebenso Hinweise auf ein Zustandekommen übertriebener Marktdynamiken. Allein der bloße Eingang von Nachrichten aus dem Unternehmenssektor oder Revisionen von Analystenschätzungen werden schon durchweg als ebenso starke Handelsimpulse betrachtet wie die Wahrnehmung grundlegend fehl bewerteter Aktienkurse selbst. Darüber hinaus zeigt sich, daß sogar die Fundamentalisten - die für eine den Markt stabilisierende Arbitrage am ehesten in Frage kommen -. in erheblichem Maße durch begrenzte Zeithorizonte und die Furcht vor Kursschwankungen eingeengt sind. Eine weitere Analyse ergibt, daß neben dem Anlageschwerpunkt und der grundsätzlichen Einstellung zur Markteffizienz auch "Agency"-Probleme das Anlageverhalten von Aktienfondsmanager nennenswert beeinflussen.

Table of Contents

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Merck Finck Invest Kapitalanlagegesellschaft mbH, München (Munich)
MAINTRUST Kapitalanlagegesellschaft mbH, Frankfurt am Main
DEVIF Deutsche Gesellschaft für Investment-Fonds GmbH, Frankfurt am Main
State Street Global Investment GmbH, München (Munich)
Mannheimer Asset Management Kapitalanlagegesellschaft mbH, Mannheim
HANSAINVEST Hanseatische Investment-Gesellschaft mbH, Hamburg
Swiss Life Asset Management Kapitalanlagegesellschaft mbH, München (Munich)
Schroder Investment Management GmbH, Frankfurt am Main
Goldman, Sachs Investment Management GmbH, Frankfurt am Main
Deutsche Investment-Trust Gesellschaft für Wertpapieranlagen mbH, Frankfurt am Main
Siemens Kapitalanlagegesellschaft mbH, München (Munich)
METZLER INVESTMENT GMBH, Frankfurt am Main
Bankgesellschaft Berlin INVESTMENT GmbH, Berlin
ABN AMRO Asset Management Deutschland GmbH, Frankfurt am Main
Frankfurt-Trust Investment Gesellschaft mbH, Frankfurt am Main
Franken-Invest Kapitalanlagegesellschaft mbH, Nürnberg (Nuremberg)
Credit Suisse Asset Management Kapitalanlagegesellschaft mbH, Frankfurt am Main
Zürich Investmentgesellschaft mbH, Frankfurt am Main
Internationale Kapitalanlagegesellschaft mbH, Düsseldorf
Allianz Kapitalanlagegesellschaft mbH, München (Munich)
Münchner Kapitalanlage AG, München (Munich)
DG PanAgora Asset Management GmbH, Frankfurt am Main
Baden-Württembergische Kapitalanlagegesellschaft mbH, Stuttgart
Activest Investmentgesellschaft mbH, Unterföhring
Helaba Invest Kapitalanlagegesellschaft mbH, Frankfurt am Main
Universal-Investment-Gesellschaft mbH, Frankfurt am Main
Deutsche Asset Management Investment-Gesellschaft mbH, Frankfurt am Main
Merrill Lynch Mercury Kapitalanlagegesellschaft mbH, Frankfurt am Main
INVESCO Kapitalanlagegesellschaft mbH, Frankfurt am Main
GCR Kapitalanlagegesellschaft mbH, Köln (Cologne)
VERITAS SG Investment Trust GmbH, Frankfurt am Main
Lazard Asset Management Deutschland GmbH, Frankfurt am Main

Deka Investment Management GmbH, Frankfurt am Main
Deka Deutsche Kapitalanlagegesellschaft mbH, Frankfurt am Main
Commerzbank Investment Management GmbH, Frankfurt am Main
ADIG Allgemeine Deutsche Investment-Gesellschaft mbH, Frankfurt am Main
MEAG MUNICH ERGO Kapitalanlagegesellschaft mbH, München (Munich)
Bayern-Investment Kapitalanlagegesellschaft mbH, München (Munich)
SüdKa SüdKapitalanlagegesellschaft mbH, Frankfurt am Main
M.M. Warburg Invest Kapitalanlagegesellschaft mbH, Frankfurt am Main
Julius Bär Kapitalanlage AG, Frankfurt am Main
Oppenheim Kapitalanlage-Gesellschaft mbH, Köln (Cologne)
DWS Investment GmbH, Frankfurt am Main
Allfonds Bayerische Kapitalanlagegesellschaft mbH, München (Munich)
NORDINVEST Norddeutsche Investment-Gesellschaft mbH, Hamburg
J.P. Morgan Investment GmbH, Frankfurt am Main
UBS Investment Kapitalanlagegesellschaft mbH, Frankfurt am Main
Gerling Investment Kapitalanlagegesellschaft mbH, Köln (Cologne)
Deutsche Postbank Privat Invest Kapitalanlagegesellschaft mbH, Bonn
Deutsche Postbank Invest Kapitalanlagegesellschaft mbH, Bonn
Union-Fonds-Holding AG, Frankfurt am Main
WestKA Westdeutsche Kapitalanlagegesellschaft mbH, Düsseldorf
UBS Asset Management GmbH, Frankfurt am Main
BfG Investment-Fonds GmbH, Frankfurt am Main
Salomon Brothers Kapitalanlagegesellschaft mbH, Frankfurt am Main
CDC Asset Management Deutschland KAG mbH, Frankfurt am Main
AM Generali Invest Kapitalanlagegesellschaft mbH, Köln (Cologne)
AXA Colonia Kapital-anlagesellschaft, Köln (Cologne)

List of Tables and Figures *

* Where appropriate, the corresponding question in the questionnaire (see Appendix) is specified in parentheses.

Investment Behaviour of German Equity Fund Managers –
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1 Introduction

Critical observers of recent financial developments claim that equity markets are becoming more unstable. They argue that share prices frequently lose touch with economic fundamentals. To the extent that technological progress facilitates equity trading and the flow of information, so the argument runs, capital movements on the international markets - unbridled since deregulation - tend to jack up prices and drive them down again in an exaggerated manner. Market uncertainty increases, as does the fragility of financial systems. Powerful institutional investors are regularly seen as the "culprits" inasmuch as they are said to huddle together and cheer each other on, driving markets into states of irrational exuberance, and, then again, to collectively frighten each other into a panic. Be that as it may, such concerns definitely coincide with the rapid rise of institutional investors to the rank of dominant players on securities markets. The institutionalisation of asset management represents a major trend in Germany as it does in many other OECD countries, certainly in the last decade, if not longer (Friedman, 1995; Davis, 1997). Stability concerns such as those expressed above also manifest a new awareness in this country as to the sharply increased importance of the equity market for the domestic economy.

For investors, stock-market stability remains as interesting a topic as ever since it includes the issue of share-price efficiency, in the well known meaning established by Fama (1970) - or, in non-technical terms, the opportunities and pitfalls surrounding the quest for extraordinary returns. Volatility is important on its own terms to the rational investor as it effectively worsens expected returns adjusted for the investment risks to be assumed. The question whether stock market prices are informationally efficient or not has inspired numerous studies beginning with Kendall's first statistical analysis (1953). De Bondt and Thaler (1985, 1987) present evidence on the short-term underreaction and long-term overreaction of market participants to fundamental news, a behavioural pattern compatible with evidence found in psychological research (Kahneman and Tversky, 1982). Since the seminal papers by Sharpe (1966) and Jensen (1968), a great deal of performance studies related to market efficiency but dealing more specifically with equity funds have

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tried to determine whether active management is capable of persistently outperforming markets (Carhart, 1997; Grünbichler and Pleschiutschnig, 1999; Grinblatt and Titman, 1992; Trzcinka and Shukla, 1992; Wermers, 1995; Wittrock 1995). Most of them agree with Jensen's conclusion that, when risk is adjusted for, no evidence exists that mutual funds achieve above-average returns.

Inefficiency and volatility of equity prices are important from a central banking standpoint as well. They could be an indication, or even the cause, of fragility in the financial sector. In fact, price level or dynamic effects, e.g. a market crash or overvalued share prices, might harm the entire economy. This is the reason for the widespread consensus that central banks also have a mandate to maintain financial stability at large.

For a long time, institutional investing played a merely subordinate role in Germany, in particular, when compared with the UK and US, a chief reason being the pay-as-you-go based state pension scheme (Nürk, 1998). This, though, appears to be changing. By the end of 1999, German banks, insurance companies and mutual funds already owned 36% of all national assets held in equity (including direct corporate investments) - up from 23% at the beginning of the last decade. During this period, the share which investment fund companies have in the equity held by all domestic financial institutions rose from a fifth to roughly 38%. The ongoing intermediation of portfolio equity investments is mainly driven by two factors: First, private households progressively purchase certificates of share-based mutual funds instead of direct holdings in the stock markets, and secondly, banks and insurance companies themselves increasingly favour portfolio investments in specialised funds reserved for institutional investors.

Such institutionalisation involves opportunities for enhancing, and risks to, the smooth functioning of stock markets. In principle, the concentration of assets in the hands of investment professionals bodes well for an improved, i.e. faster, more comprehensive and thorough investment process, ranging from more efficient information-gathering and analysis to more consistent decision-making. Professionalism is, in essence, about well-reasoned decisions. Moreover, mutual funds can be expected to enjoy economies of scale in securities research and transactions which can be passed on to clients in the form of lower costs. Taken as a whole, institutionalisation may enhance trading liquidity on stock markets as much as it enhances the efficiency of equity pricing.

Paradoxically, trading liquidity appears on the risk side of institutionalisation as well. An excessive clustering of assets could, at least in some market segments, reduce the number of trading partners, effectively jeopardising market depth. Institutional investors may also prefer large-cap "blue chips", for instance, or else direct more attention to shares with par-

ticular features (Falkenstein, 1996; Friedman, 1995). As a consequence there could be unwelcome side-effects on local small-cap companies or high-risk start-ups stuck without adequate access to equity financing. An additional risk inherent in institutionalisation would be the higher probability of extreme volatility, volatility increasing as investor behaviour becomes more interdependent (Bouchaud and Cont, 2000), e.g. due to index-tracking or intentional herding. Another point bearing on market efficiency is that practitioners often confirm that their decisions are at times significantly influenced by other investors. Indeed, there are good theoretical reasons for rational investors to base their behaviour on what others do (Devenow and Welch, 1996). This will be discussed in more detail below. Finally, a major concern is short-termism which institutional investors are blamed for encouraging. Although one would like to see fund managers act swiftly on relevant new information, ideally one expects them to maintain a long-term view while doing so. By contrast, so-called "buy-and-hold" strategies are often associated with private investors. To be fair, it needs to be said that failure to trade for a long period after buying is not in itself indicative of a long-term view.

Institutional investors have become too important to allow our knowledge to rest on anecdotal or partial evidence – whatever their merits. That is why I chose to conduct a comprehensive questionnaire survey based on voluntary and anonymous participation. In keeping with the notion of the typical investment process as occurring within a level playing field, the study focuses on the "parvenus" in German institutional investing, the managers of share-based mutual funds. In the summer of 2000, I contacted all the German mutual funds which invest in equities and asked them to entrust all their equity fund managers with possibilities for personal participation. I solicited fund managers' basic views and information on their usual evaluation methods, data sources, time horizons, and decision-making as well as insights into their company's performance-measuring and compensation incentives. The results of this broad-based survey open new paths for the analysis of institutional investor behaviour.

The remainder of the paper is structured as follows. In section 2 the use of survey data in capital market research is explained briefly. Section 3 provides information on survey design and participation. Many of the results of the survey are discussed in section 4. Some correlation analyses, presented in section 5, help to probe for a basic consistency in response patterns. Section 6 investigates the heterogeneity of response patterns identifying three core groups of investors, labelled *fundamentalists*, *tacticians* and *methodologists*. Reponses are tested to determine whether certain styles are group-specific or universal in equity-fund investing. Section 7 takes a closer look at fundamentalists to gauge the potential for fundamental arbitrage as well as to explore conditions in the working environment

that may influence fund managers to be more fundamentalistic. Section 8 concludes the paper.

2 The use of survey data in capital market research

In most cases, financial market research relies on observable market quotes and volumes. This approach makes sense given that such data may be obtained rather easily at comparatively low costs for various times, frequencies and securities. However, the preference for market data does have another, more deeply rooted reason. Economic thinking is characterised by a consequentialistic understanding according to which all data that can be observed and measured objectively cannot "lie" and thus best reveal underlying behaviour, in this case, that of investors. There are at least two drawbacks involved in restricting analysis to market data. First, investors' behaviour may be the result of a multitude of factors which might not be properly identifiable and isolatable by means of market data alone. Secondly, we are often interested in the risks of instability stemming from investors' behavioural patterns. But we have great difficulty in assessing the soundness of markets where no instabilities are observable in the market data. Here, survey data can be more telling. The main advantage of carefully designed questionnaire research is that it systematically sheds light on key aspects of institutional investing, otherwise seen as something of a black box (Davis, 1997). Likewise, there is no need to adhere to the paradigm of the representative agent, as it is possible to explore directly the nature and degree of heterogeneity for this type of investor. Of course, besides the well-known difficulties involved in survey research such as selectitivity bias (Maddala, 1983), the possibility of participants giving idealised, distorted responses, or even untrue ones remain a fundamental concern. Such difficulties and concerns need to be addressed. But they do not argue against the use of surveys as a valid instrument in capital market research, so long as they are used not to replace, but to complement, conventional empirical analysis (Cheung and Chinn, 1999).[1]

3 Questionnaire design and survey participation

After consulting several senior fund managers, I designed a questionnaire with two main parts (the complete questionnaire, translated from the German, is reprinted in this paper's appendix). In the first part, fund managers are asked to discuss their background, experi-

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[1] Friedman and Savage (1948) draw an analogy between capital market participants and billiard players on the basis of the fact that the latter are able to play well without understanding the physics of the game. Such a view can be seen to underlie the sceptical attitude toward surveys in capital market research (Cheung and Wong, 1999). In applied market research, however, e.g. on consumer behaviour, surveys are a widely used instrument (Meffert, 1986).

ence and company-related circumstances. All of these questions can be answered objectively, the only exception being the characterisation of the typical equity fund managed. In the second part, participants are asked to assess the relevance of various behavioural options that, in reverse sequence, mirror a stylised investment process. The framework for such a process is illustrated in Figure 9 (in the Appendix). For the questionnaire, the sequence has been reversed in order to avoid "channelling" participants' answers, starting with the monitoring and compensation scheme and ending with basic views and objectives. All questions are closed ones, a necessity given the length of the questionnaire. Some answer categories are left to be specified by respondents so as not to exclude factors which had not been considered beforehand. Importantly, participants are given space at the end of the questionnaire for voluntary comments if they felt something critical had been left unmentioned.[2]

At the end of July 2000, I sent out a total of 540 questionnaires to executive directors of 62 German mutual fund companies. They had all been identified as managing equities in mixed or share-based funds that were either open to the public or for institutional clients or were available to both types of customer. Also, all companies had been requested to specify the number of fund managers engaged in equity investing, resulting in a total of 540. In the absence of any official statistic, this is the best estimate of how many equity fund managers were working in Germany at that time. Executive directors were asked to forward all questionnaires received to every equity fund manager in the company. Each equity fund manager thus had an equal opportunity to participate, with the result that the survey may be deemed representative. To guarantee anonymity, I proceeded in a "mail-ballot" manner. Participants were asked to send the questionnaire back under separate, prepaid cover. Independently of that, they were able to confirm their participation by returning a prepaid postcard with their addresses and company names. 89% of participants opted to do so. Hence in most cases I know who participated and where they work but I cannot associate questionnaires with any of them.

By the beginning of September 2000 I had received 278 completed questionnaires from 60 different companies, or 52% of all questionnaires sent out, from 97% of all mutual fund companies contacted. Only three questionnaires had to be cast aside because of gross incompleteness or obvious improprieties and doubts about the sincerity of answers.[3] This can be deemed an excellent result in itself but also when compared with a number of other sur-

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[2] Only very few participants added further comments, the vast majority of these providing extra information and some further thoughts. Almost none, however, expressed discomfort about or a failure to understand the reasons for particular questions.

[3] The maximum sampling error, calculated on the basis of these 275 valid questionnaires, is +/- 4%.

veys carried out in recent years among stock market investors or foreign exchange traders (Shiller and Pound, 1987, 1989; Shiller, 2000; Taylor and Allen, 1992; Menkhoff, 1998; Cheung and Wong, 2000; Cheung and Chinn, 1999; Freeman and Bartels, 2000). The participation rate may even be estimated to lie above 54% as some companies later reported having initially submitted too high a number of equity fund managers owing to a failure to separate investing adequately from distributional tasks. Total assets under management by the survey's respondents amount to some € 400 billion or 70% of all assets held in share-based and mixed mutual funds. One clear, if unavoidable, disadvantage of the survey set-up was the need for cooperation on the part of both executive directors and fund managers (Shiller and Pound, 1989). Indeed, some directors may have felt that a fair number of filled-out questionnaires from their company would have served perfectly well. Valuable support was given by the Bundesverband Deutscher Investment-Gesellschaften (Association of German Investment Companies) who appealed to its members to participate. This certainly helps to explain why coverage of German mutual fund companies with equity business was almost complete.

This type of coverage is very important if problems of selectivity among respondents are to be ruled out. The survey results show that almost 71% of fund managers make decisions on their own responsibility, albeit in keeping with the investment strategy prescribed by the mutual fund company or group; another 14% make joint decisions with their colleagues. Only 15% typically decide on their own without such a constraint. Here, what is most important are fair rates of response from a pool which, ideally, would have included all companies, a condition which appears to have been proximately fulfilled. That selectivity is not so much of a problem manifests itself in another way as well. Managers were asked to rank their companies according to size. The corresponding shares of assets managed in each of the resulting three categories very much resemble those that can be calculated on the basis of the Bundesbank's capital market statistics (see Table 17 in the Appendix).

4 Survey results

Information on the background, experience and company-related circumstances of equity fund managers are interesting in themselves, although not falling within the actual scope of this paper. Some key results are presented in Table 18 and Figures 6 to 8 (in the Appendix). Most notably, the typical German equity fund manager has, at age 35, spent a bit more than five years on the job and manages equities valued at some € 850 million. 59% of fund managers had earned a graduate university degree in economics or business administration, 54% had undergone two to three-years of professional training in banking, most probably as part of the dual-based German apprenticeship system, and 27% had received the professional degree of certified financial analyst. The typical fund managing mandate exhibits a

distinct preference for blue chips. Fund managers describe their strategies to be, on aggregate, relatively growth-oriented and their analytical approach to be more bottom-up than top-down. Index-tracking is seen to play a role. Next, the survey results are discussed in more detail, starting with managers' basic views and objectives, insofar applicable to the stylised investment process.

Market efficiency and investment philosophy

Whether fund managers pursue a more-or-less active or passive investment style is likely to depend on their philosophy. Passive investment strategies such as index-linked or index-related investments[4] imply acceptance of the assumption that markets are largely information-efficient. On this assumption, the type of primary value creation which passive funds offer their investors represents a deliberate adaptation of a profit-risk profile through the diversification of risk. By contrast, active fund management attempts to achieve above-average returns, i.e. to "beat the market". Thus the type of primary value creation which active funds try to offer their investors rests on the deliberate exploitation of suspected comparative advantages in the access to, and analysis of, information. It is only reasonable to assume this, if the distortions in market prices are sufficiently large to make the analysis of information worthwhile.

Whether active fund management can actually be expected to deliver extraordinary returns is another story altogether. Even so, the fundamental convictions of institutional investors concerning their own capacity for value creation continue to influence their decisions. The survey responses underscore the fact that German equity fund managers, in general, actually perceive their primary role to consist in the pursuit of above-average market-price increases (see Table 1 below). Value creation through the implementation of diversification strategies - and implicitly through the replication of indices - evidently plays a significant, if subordinate, role. Dividends or other strategic considerations such as tax or balance-sheet advantages tend, as a rule, to be unimportant.

With respect to the nature of markets, virtually all fund managers assume a lack of informational efficiency, an assumption which is consistent with the objective of identifying the

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4 In Germany, owing to legal portfolio share ceilings for individual securities it only became possible to introduce index funds which completely replicate such market indices as the DAX after the Third Financial Market Promotion Act took effect in September 1998. At the present time, index funds are subject to the provisions of the statutory ordinance as set down in the Act on Investment Companies. The Federal Banking Supervisory Authority confirms that as of the end of 2000 permission had so far been granted to only three specialised funds for the specific replication of market indices, but more than 30 funds are expected to request such a permission in 2001.

potential for above-average price increases. The view clearly prevails that faulty evaluations will also persist over the longer-term because new trends and developments are not recognised until they are well under way and new information is not fully reflected in market prices at once but, instead, only gradually (see Table 2 below). The notion that short-term distortions in market price might be introduced through initially inappropriate responses to new information on the part of investors is treated, for the most part, as a secondary consideration. Only a select few ascribe a relatively high degree of efficiency to the equity market in the sense that shares, on the whole, are thought to be fairly valued. German fund managers obviously see great potential for an active management approach.

Table 1: Investment objectives (Q8.b.)

	mean[a]	std. error mean	median
above-average performance	4.58	.049	5
diversification of market risk	3.28	.063	3
replication of a specific index	2.50	.086	3
above-average dividends and payouts	1.08	.086	1
other aims (tax and balance sheets considerations)	.54	.051	0

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role). Least number of valid responses n=272.

Means of acquiring information

If active fund management presupposes distortions in market prices, a consistent investment policy requires a corresponding use of resources to analyse the relevant information. Active fund management may also endeavour, through its own researches, to secure an informational advantage. Thus the strategy adopted in pursuit of information is not chosen arbitrarily. The survey results make evident where the vast majority of fund managers locate the key to successful fund management, namely in the consistent analysis of existing information and, to a slightly lesser extent, in their own active pursuit of information (see Table 3 below). However, it is difficult to identify a clear favourite between these two options. The reason for this may be that the active pursuit of information is expensive and

therefore also dependent on the fund manager's institutional environment. I shall be devoting more attention to this point later.

Table 2: Basic view on informational efficiency of stock market (Q8.a.)

frequency in %		view on stock market		
		gradual, longer-term price adjustments	**short term price distortions**	**generally fair-valued equities**
personal ranking	**most adequate**	**70.0**	22.0	8.1
	secondary	22.3	**57.5**	20.1
	least adequate	7.7	20.5	**71.8**
total[a]		100.0	100.0	100.0

a. Least number of valid responses n=273.

Table 3: Strategic options for information management (Q7.b.)

frequency in %		Above-average performance most likely to be achieved			
		...by actively searching for new information.	**...by subjecting information to in-depth analysis.**	**...by acting promptly on receipt of new information.**	**...as a matter of chance.**
personal ranking	**most adequate**	**40.1**	**43.1**	15.7	1.1
	secondary	37.6	32.8	27.4	2.6
	tertiary	20.1	22.3	**51.5**	5.8
	least adequate	2.2	1.8	5.5	**90.5**
total[a]		100.0	100.0	100.0	100.0

a. Least number of valid responses n=274.

Rational investment decisions presuppose that information is an input variable. Evidence that the potential for *epidemic contagion* exists among institutional investors may be found by establishing preferences among information sources. Only three of the possible responses in the questionnaire may be interpreted as primary information sources, these being conversations with management and industry experts and the investment group's economic and company forecasts. All other information sources are second-hand and thus represent a means of transmitting *informational contagion* among investors or investor groups (Shiller and Pound, 1989). They should, by contrast, be regarded to some extent as accidental and unsystematic. Given the fact that these types of information are prepared in order to be solicited, they also are, at least in part and from the very outset, the product of group dynamics. Informational diffusion poses a risk to financial market stability since it may elicit exaggerated and unbalanced market reactions, which cannot be counteracted, or only partially, by fundamental arbitrage (Shleifer and Vishny, 1997).

Table 4: Information channels (Q7.a.)

	mean[a]	std. error mean	median
conversations/ exchanges of views with company executives and sector experts	4.08	.069	4
conversations/ exchanges of views with professional colleagues	3.57	.061	4
media publications	3.46	.052	4
corporate earnings estimates by external analysts	3.36	.066	3
corporate earnings estimates prepared by own investment company	2.95	.093	3
economic forecasts by research institutes, banks and economic policy institutions	2.36	.073	2
economic forecasts prepared by own investment company	2.33	.082	2
portfolio investments of other market players	2.00	.070	2
investment news letters	1.05	.064	1

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role). Least number of valid responses n=273.

The survey indicates that fund managers consider their own conversations with management and with industry experts to be the most important source of information for their work (see Table 4 above). This finding supports the view that institutional investors would be capable of exercising a special function in corporate governance. Given the increasing integration of equity markets worldwide, it is worth noting that an integral part of the investment strategies pursued by domestic fund managers is apparently local in orientation; this suggests the existence of specialisation effects.[5] Alternatively, the survey results also indicate that "second-hand" reports, namely from professional colleagues and the media are, with second- and third-place rankings, of relatively great importance. One reason for the importance attached to these channels might be that they implicitly provide fund managers, when ranking information, with external confirmation at the same time. Earnings projections for public limited companies generally play a greater role than do economic forecasts, a circumstance which is hardly surprising because investment decisions on the stock market are taken primarily on the basis of bottom-up analyses. Still, it is the "second-hand" forecasts – notably, those by analysts from other investment firms, rather than those by analysts in the same company – which are most consulted. On the whole, observed portfolio investments by other market players are considered less significant but not irrelevant. Thus, in the fund managers' own estimation, a prerequisite for intentionally aligned investment strategies applies.

Methods of stock analysis

Investment decisions can be considered well-founded only if they are taken on the basis of relevant information. If active portfolio managers proceed with their analysis of stocks in a consistent manner, they should naturally gravitate towards those methods of analysis which are in keeping with their basic conception of how the equity market functions, i.e. of how price-efficient the equity market is. Technical analysis may be regarded as valuable when applied to markets where there is reason to believe that the adjustments of price to fundamental supply and demand factors are relatively inelastic or where overreactions exist. This method of analysis attempts to identify recurring - and hence predictable - trends in market prices exclusively on the basis of past prices and trade volumes. By contrast, other analysis procedures used to select stocks are usually thought to be more rigorous on account of their underlying economic models. However, they continue to belong, in essence, to the realm of so-called quantitative methods insofar as they, too, are heavily dependent on past data.

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[5] Indeed, informational advantages due to corporate headquarter nearness have increasingly been considered in the literature to explain pronounced home equity biases in institutional portfolios. Likewise, for equity traders on the German exchange Xetra, Hau (1999) finds evidence in high frequency data that profits are positively correlated with traders' geographic proximity to assets.

These procedures include not only the construction of efficiently diversified portfolios but also single- and multi-factor models. Although the latter, when explaining price formation, have explicit recourse to forecast values by use of fundamental estimates, econometric estimates of the model structures themselves are, by the very nature of the case, possible only on the basis of historical data. By contrast, fundamental analysis is, in its very conception, completely directed towards the future. This is because an attempt is being made to determine the intrinsic value of an equity investment by forecasting trends in the determinants, corporate profits, dividends and interest rates, without first having to arrive at a structural estimate of the corresponding equation of condition for this intrinsic value.[6] However, if expectations are formed by extrapolation or on the basis of estimated structures, past data implicitly become relevant as well.[7] Users of fundamental analyses are entitled to assume additional returns only if their evaluation schemes indicate that market prices do not fully reflect generally accessible, relevant information.

Table 5: Methods of analysis and forecasting horizons (Q6.b.)

		mean	std. error mean	median	valid number of responses
method of analysis (forecasting horizon)[a,b]	**fundamental**	4.15 (46 weeks)	.064	4 (51 weeks)	n=272 (266)
	technical	2.61 (8 weeks)	.096	3 (9 weeks)	n=271 (228)
	portfolio optimisation	1.20 (23 weeks)	.094	0 (26 weeks)	n=272 (121)
	econometric model	1.12 (29 weeks)	.091	0 (26 weeks)	n=272 (127)

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role).

b. Means of time estimated on a logarithmic basis.

6 In fundamental analysis, the usual valuation formulae such as the price-earnings ratio or the price-cash flow ratio mostly refer to the expected corporate earnings or operating result for the following fiscal year. Defined in the above terms, a value-oriented investment approach favours shares with low valuation while a growth-oriented approach favours stocks with significant potential for earnings growth. This is more of a practical distinction and indicates, in each case, a basic preference for certain risk categories since the actual purpose of fundamental analysis is to value all expected future earnings.

7 For company and macroeconomic analyses it is, of course, conceivable that estimates for underlying factors, upon which intrinsic values are calculated, are themselves based on econometric models. However, as to the typical work of a fund manager, estimating single or multiple factor models serves to predict equity returns, not underlying factors themselves.

In practice, portfolio managers tend to employ different evaluation strategies at the same time; quantitative instruments may be used, for example, to preselect securities out of an investment universe while individual choices are ultimately made in accordance with the results of fundamental analysis (Bruns and Meyer-Bullerdiek, 1996). Perhaps fundamental analyses are especially well-suited to identifying the returns potential over the longer term whereas quantitative methods find their primary use in the analysis of short-term fluctuations. This would explain why the overwhelming majority of foreign exchange market players, when questioned by Taylor and Allen (1992), indicated using instruments of technical analysis in conjunction with fundamental forecast methods. Technical analysis predominates in the preparation of short-term forecasts; fundamental criteria were more important for longer-term estimates. The results of the present survey confirm that methods of technical and fundamental analysis are not applied in a mutually exclusive manner but differ rather in terms of the time horizon for the forecasts produced (see Table 5 above). That having been said, fundamental analysis plays the more important role by far in everyday practice; the choice of a medium-term time horizon of roughly a year suggests that fund managers concentrate on corporate earnings estimates for the financial year to come.

Pro-cyclical, trend-reinforcing behaviour

Do fund managers tend to act pro-cyclically and, in doing so, accelerate market momentum or do they act anti-cyclically and thus dampen market fluctuations? Great importance has been attached to this question in the debate on financial market stability (Jegadeesh and Titman, 1993; Grinblatt, Titman, and Wermers, 1995). One thesis is that private investors generally tend to act pro-cyclically and, collectively, may therefore trigger exaggerated market price movements; by contrast, institutional investors would, through deliberate anti-cyclical behaviour, exercise a compensatory function which would serve to stabilise the capital market.[8]

Some explanations of procyclical behaviour invoke the possibility that investors undertake revaluations only gradually.[9] *Momentum strategies,* i.e. shifts into those stocks for which

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8 See Bundesverband der Deutschen Investmentgesellschaften on the economic benefits of investment fund saving (2001) www.bvi.de/tourdefonds/volkswirt_funktionen.html.

9 Barberis, Shleifer and Vishny (1998) summarise a whole series of more recent empirical studies which support the hypothesis that full market price adjustments may require a period of up to 12 months and overreactions a period of between three and five years. Their explanatory scheme incorporates psychological concepts having to do with conservatism and representative heuristics, which imply quasi-rational reactions on the part of financial market players. For more on this see also Menkhoff (1995). According to this theory, the rationality of investors is not only subject to cognitive constraints - as the expected utility theory in economics has traditionally taught - but is also prey to emotions (e.g. greed and fear) which colour their responses. What is meant by conservatism in this case is that human beings, when confronted

positive fundamental news are trickling in, might then bring the notations closer to the "fundamentally justified" value. Clearly, such considerations bear directly on the phenomenon under study. According to the data supplied by the fund managers, their investment decisions are strongly influenced by precisely such factors as higher profit expectations on the part of analysts for a certain public limited company and corporate announcements which are judged to be positive (see Table 6 below). By contrast, their strategies take almost no account of dividend expectations: a simple listing of their investment goals makes it clear that dividends are of no great concern anyway.[10]

Table 6: Potential buy signals (Q6.a.)

	mean[a]	std. error mean	median
a fundamentally low valuation by sector or market comparison	3.82	.069	4
positive corporate news/ announcements	3.76	.061	4
raising of corporate earnings estimates by analysts	3.34	.069	4
above-average rise in market price accompanied by higher turnover	2.72	.078	3
quotation stabilised at a price level sharply lower than its all-time-high	2.31	.074	2
observed purchases by other institutional investors	2.12	.073	2
growing expectations concerning higher dividends	1.23	.067	1

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role). Least number of valid responses n=270.

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with new information, tend to change their convictions only slowly, thus attaching less weight to information on, say, the latest earnings estimate than they do to the sum of the past data known to them. Human beings, who subscribe to a representative heuristic, tie their experiences to their hypotheses and base their estimate of the probability of a specific event occurring on a combination of the two. As a result, they may infer a pattern from a series of coincidences and so, for example, extrapolate from continuous past growth in a public holding company's earnings.

10 It is not a trivial observation that fund managers deem expected dividends unimportant while placing a high value on earnings estimates. Certainly, all dividends and payouts eventually have to be financed by a company's income. For asset pricing, however, dividends may have an information content on their own. Modigliani and Miller (1959) proposed that earnings themselves might be a quite noisy, imperfect measure of a company's income potential. Yet dividends might be more correlated with permanent earnings than with current earnings, and thus could be a better proxy for the earnings potential upon which fundamentally oriented investors, with foresight, base their valuation. Recent empirical work by Brief and Zarowin (1999) supports the view that dividends can have information value for stock prices.

An above-average rise in market price, accompanied by increasing turnover, is generally regarded as a clear buy signal from a chart-analytical standpoint. By contrast, a notation that has stabilised at a level markedly lower than its peak values represents an anti-cyclical buying opportunity since a reversal of the trend is expected on the basis of support levels hitherto sustained (Pring, 1998). As a rule, fund managers attach significantly less importance to these two technical buy signals than to fundamental criteria as such, which is not altogether surprising, given that the fund managers interviewed thought fundamental analysis much more relevant (see Table 5 on page 12).

The response option where fund managers regard a fundamentally low valuation in cross-market or cross-sectoral comparison as a buy signal is the only option which does not assume some form of momentum. Instead it implicitly depends on the crossing of a certain minimum threshold. Strictly speaking, only this type of response is likely to be adopted by investors who are exclusively acting in a fundamental and anti-cyclical style. In point of fact, this criterion does, on average, have a narrow lead over the others when the fund managers are deciding on stocks.

Further valuation criteria governing stock choices

If institutional investors have other investment preferences than do private investors, the ongoing intermediation with regard to stock investments will also have a corresponding effect on relative market prices (Friedman, 1995). Several studies on institutional investment behaviour, especially by US investment funds, suggest that fund managers make a deliberate effort to meet certain secondary criteria. There is, for example, a well-documented preference for large, liquid assets (Falkenstein, 1996; Gompers and Metrick, 1998). One type of criteria relevant to the choice of portfolio holdings includes all stock characteristics which, in the eyes of the fund manager, influence indirectly the expected profit-risk profile of a portfolio. Thus high liquidity in securities trading lowers the transaction costs while derivatives may enable risk transformation and offer, in principle, additional information on market expectations and uncertainty. Such key stock characteristics probably only begin to come into their own when the large volumes and the more complex trading and hedging strategies of institutional investors have been reached. Even so, the fund managers surveyed assigned trading costs, as measured by the bid/offer spread, as well as the availability of tradable derivatives only a far secondary status (see Table 7 below). Although the bid/offer spread is regarded as an indirect measure of secondary market liquidity, adverse trading effects arising from a lack of market depth might perhaps, with even more justification, have been subsumed under the criterion of market capitalisation, which is deemed very relevant.

Moreover, investment decisions may be taken so as to appear comprehensible and reasonable to other market observers. Fund managers, unlike private investors, have to offer an immediate justification for their decisions as part of the internal control and evaluation process; at the same time the law prescribes that they "administer the trust for the joint accounts of the shareholders (i.e. holders of certificates) with the caution of a responsible business man".[11] At all events, institutional investors have particular reason to exercise caution. More conservative evaluation criteria for choosing stocks are market capitalisation as *proxy* for the size and reputation of a public holding company; the frequency of news reporting and the availability of independent analysts' valuations as an indicator of the amount of attention surrounding, and flow of information concerning, a particular stock. Finally, although past corporate trends and market performance have no predictive value *per se*, general market acceptance can be treated as a quality category whenever a choice has to be made. According to the survey, fund managers typically regard all three criteria as being of equal and considerable importance.

Table 7: Secondary criteria in selecting stocks (Q6.c.)

	mean[a]	std. error mean	median
market capitalisation	3.71	.055	4
previous corporate development as well as stock market performance	3.67	.064	4
frequent reports and availability of independent analysts' forecasts	3.52	.069	4
trading costs such as bid/offer spread	1.95	.079	2
availability of tradable derivatives for transactions or source of additional information	1.50	.078	1

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role). Least number of valid responses n=271.

11 Bundesgesetzblatt (Federal Law Gazette) of September 17, 1998, No. 62, part 1, section 10 (1) of the Act on investment companies (*Gesetz über Kapitalanlagegesellschaften*), otherwise the only explicit requirement that section 1 (1) makes is that the investment respect the principle of risk diversification. For the United States, Badrinath, Gay and Kale (1989) mention strict statutory trustee provisions applicable to fund managers. Under US law fund managers may be held personally liable if it can be proved that they violated their obligation to exercise due care in composing their portfolios or even in choosing particular securities investments.

Methodology of decision-making

When formulating strategies, information is processed for the purpose of reaching decisions. But it is not only of interest to know which information sources and methods of analysis have been used in the process but also the manner in which the manager actually arrives at his valuations and acts on them. The choice of a valuation procedure already appears to commit the decision-maker to a specific selection process since he primarily processes information that is directly relevant to the decision itself. Nevertheless information-processing and the methodology of decision-making are two components within a process which may, in principle, be distinguished from one another.

This becomes evident in the case of a fund manager confronted with an investment decision. Fund managers are intensely competitive in responding to markets. They are under pressure to take investment decisions quickly, even in the face of great uncertainty. Simultaneously, they have access to a veritable wealth of potentially relevant information. Competition at the workplace further increases the pressure to perform. The findings of behavioural science indicate that human beings under such working conditions tend to simplify the decision task in line with their experiences and means.

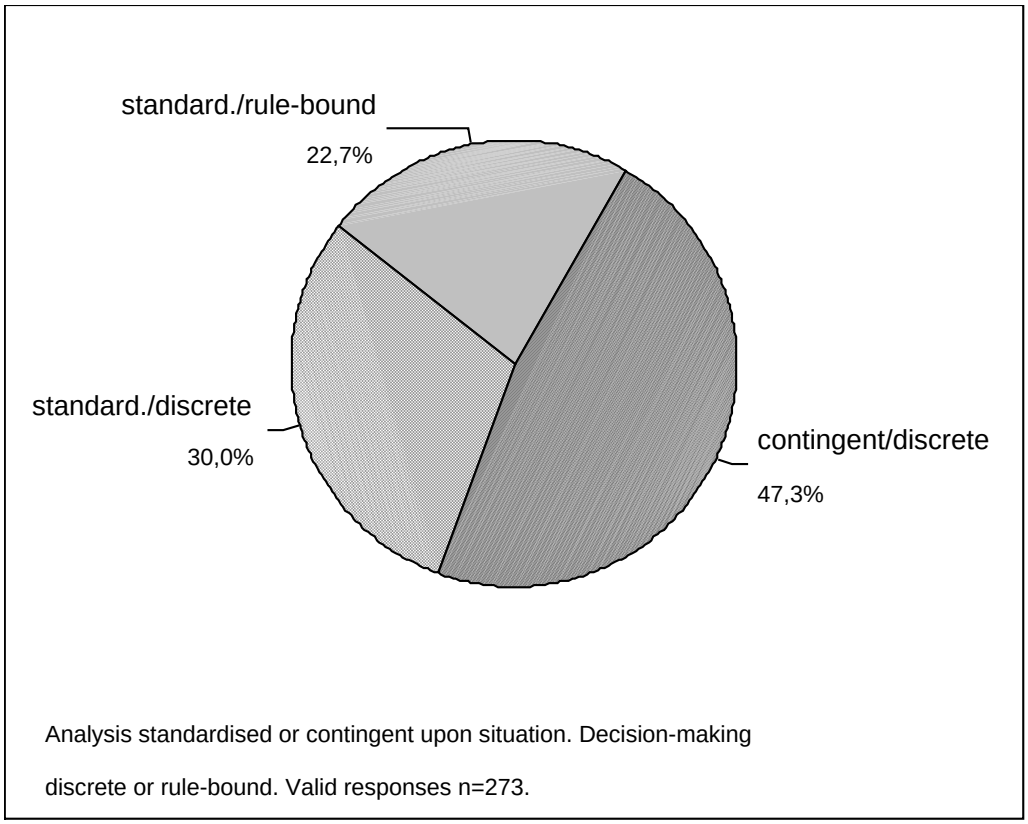
Indeed, every person has cognitive limits, i.e. a constraint to absorb and process information only up to a certain point. Such limits bind utility-maximising rationality, as conventionally conceived in economics. What is more, the investment-making process includes *quasi-rational* motives, which satisfy psychological needs (Menkhoff, 1995). In the latter case, the paramount need is likely to be the desire to continue being able to decide at all, followed by the desire to control actions and to minimise cognitive dissonance, for example, with regard to previous decisions (Shefrin and Statman, 1985).

This being the case, one means of facilitating decision-making is to rely on proven organisational patterns to structure the surfeit of information (which, in any case, for a fund is already restricted to the investment universe). Beyond that, the decision-making process may itself be structured. In this way, prior commitment to a specific form of information analysis may offer an efficient means of simplifying complex choice processes. As a consequence, valuation procedures need not be devoted exclusively to the purpose of validating suspected above-average earnings potential; they may also serve to organise new information into pre-determined patterns and, in doing so, greatly streamline the decision-making process. Moreover, trading strategies that are based on fixed valuation procedures, i.e. strictly rule-based investment decisions, are equally well-suited to reduce the psychological costs associated with complex decisions. Not only are investors most likely subject to cognitive restraints but they are also presumably prey to emotions such as euphoria and

defeatism, greed and fear. Thus a binding pre-commitment to definite decision-making procedures may also help to reduce the influence of emotional factors during periods of great uncertainty.

Consistent with this train of thought, it is, in fact, a major management responsibility in institutional asset investing to position the decision-making process between a rules-bound and a purely discretionary policy. Further evidence in support of this view may be found in the fact that investment consulting firms, which are increasingly being commissioned by banks and insurance companies to choose suitable asset managers, evidently place great emphasis on consistent and rigorously implemented investment strategies (Dietz and Leser, 1998). The corresponding advantage ascribed to the rule-based decision procedure, which in ordinary practice is referred to as *structured portfolio management*, is that it enables the establishment of a systematic, comprehensible and relatively emotion-free investment process. Here quantitative analyses are mainly used (Marquardt and Sauer, 1999). Possible drawbacks arising from its reliance on past data, which means that it is inevitably tied to empirical circumstances, are rated lower accordingly. However, reduced flexibility in decision-making, or discretionary latitude, incurs a cost of its own. It may result in non-optimal decisions whenever unexpected factors and structural discontinuities originating in the firm or in the overall economy intervene.

Figure 1: Decision-making process (Q5.a.)



Analysis standardised or contingent upon situation. Decision-making discrete or rule-bound. Valid responses n=273.

The survey results show that almost one-half of the fund managers reserve for themselves the greatest possible degree of flexibility when taking an investment decision (see Figure 1 above). They tend to analyse stocks in a manner dependent on the current situation, coming to a general judgement only after a personal appraisal. Almost one-third of the managers surveyed made such discretionary judgements, albeit only after systematic analysis. According to the data collected, only slightly more than one-fifth of the fund managers engage in systematic analysis and then apply a fixed decision rule.

Hedging and risk management strategies

Further investment decision rules may be inferred from strategies designed to limit market risks. Only funds which gear their investment strategies consistently to changes in the indices can be said to have no conscious interest in shifting market price risks. This does not apply, however, to passive investors in general. Their task might precisely consist in achieving a certain risk-profit profile through the adoption of strategic measures. Index options, for example, are suitable instruments for managing market portfolio risks since they are usually relatively liquid and – on account of the lower volatility of indices – relatively cost-effective (Bruns and Steiner, 1995). By contrast, active fund management attempts to achieve above-average earnings from stock market investments by intentionally deviating from the market portfolio.[12] In so doing, portfolio managers may be seeking to neutralise systematic risk in order to profit, independently of the general market trend, from suspected errors in the valuation of specific stocks. Fund managers typically employ futures contracts to this end (Bodie, Kane and Marcus, 1996). The survey results indicate that derivatives are used more for hedging purposes and less as a means of flexibly building or dismantling a portfolio position. Even so, German equity fund managers do not attach great importance to hedging strategies based on options and futures in their everyday dealings (see Table 8 below).

Dynamic hedging strategies are intended to limit losses in the portfolio's value in the event of a general market downturn while simultaneously allowing the portfolio to profit from market-price changes. The share held in stocks is adjusted in accordance with the trend in market prices to ensure that the portfolio does not fall below a specific minimum value. If stock market prices rise, the cost of hedging will drop, it being less likely that the floor will

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12 This assumption is justified by the fact that betting against the market, i.e. the attempt to exploit fluctuations affecting the entire market gainfully, entail a very much higher risk since, by definition, opportunities for diversification are lacking. Institutional investors find it very difficult to time such decisions properly.

be reached. A greater proportion of the funds will then be invested in stocks. Conversely, if stock market prices fall, larger collateral provisions will be accumulated and the share of stocks in the portfolio will be correspondingly reduced (Bruns and Steiner, 1995). On account of the implied pro-cyclical investment behaviour, such dynamic portfolio hedging strategies have been accused of exerting a destabilising effect on stock market price trends, especially since the stock market crash of 1987.[13] To judge from the data supplied by the fund managers surveyed, such rules do not play a significant role here to date; instead, fund managers freely adjust the ratio of stocks to cash in their portfolios, depending on their reading of the general market situation.

Finally, stop-loss rules are a very simple heuristic for decision-making. They are used to protect value of individual stocks, where a drop in market price to or below the predetermined level leads to the abandonment of the corresponding position. Stop-loss strategies are thus static and path-bound and, as such, compatible with technical stock analyses. It is not the gathering of new and fundamental information which prompts the decision but rather the market development itself. Generally speaking, the fund managers surveyed also considered this rule to be of minor relevance.

Table 8: Risk management techniques (Q5.b.)

	mean[a]	std. error mean	median
flexible weighting of cash and shares	3.06	.094	4
hedging by means of options and futures	2.16	.097	2
stop-loss techniques	1.61	.084	2
futures and options as flexible vehicles for acquiring and selling stocks	1.40	.089	1
dynamic portfolio hedging rules	1.02	.084	0

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role). Least number of valid responses n=272.

[13] Genotte and Leland (1990) provide an overview on this topic and argue that portfolio hedging strategies can have destabilising effects on markets even if they are not widely used.

Appreciation of risk

One of the criticisms that has been directed against the *Capital Asset Pricing Model* is related to the symmetric character of the concept of risk underlying it (Eakins, Stansell and Below, 1996).[14] However, the results of surveys where corporate finance executives were asked about their appreciation of capital investment risk suggest that the perception of *downwards risk*, i.e. the danger of failing to attain certain target variables, is more pronounced (Brocket, Cooper, Kwon and Ruefli, 1997). The assumption that the asymmetric perception of risk plays a not inconsiderable role in the formulation of investment strategies applies to fund managers. Unlike private investors, they take their decisions as members of organisations with routine performance controls. Thus one of their investment aims is not to lag behind other fund managers with comparable investments. However, indices or other comparative criteria do not suffice if the investments shall also guarantee a certain minimum return.[15] Given the statistically abnormal distribution of stock market returns, which is well-confirmed empirically, it is safe to assume that the perception of risk when valuing stocks leads, in each case, to their being assigned different rankings.[16]

Only on one point do the survey results send an unequivocal message: risks arising from foregone opportunities, conceivable in the light of fears that the distribution of information in the market is asymmetric, play a subordinate role. As for the rest, the primary risk was most often perceived by fund managers as being one of underperformance, followed by price volatility and market price losses. Still, for each of the three types of risk, a majority of the fund managers did not agree with the ranking most often chosen (see Table 9 below).

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14 In modern portfolio theory, the predicted dispersion of returns (standard deviation) from stock market investments represents a valid measure of their total risk while the estimated contributions of individual securities to a market portfolio return variance (betas) are a relevant measure of security-specific risks.

15 The fund owner might have instigated this agreement in the expectation that he would be able to redeem liabilities. This is sometimes a relevant consideration for institutional clients such as banks and insurance companies.

16 Babak, Pedersen and Satchell (2000) propose as relevant capital market measures for earnings risk the variance, the semi-variance and the lower partial moment. While the variance construes the entire standard deviation of the expected return as earnings risk, above-average results are not included in the case of semi-variance. Semi-variance is thus an asymmetric measure of "downwards risk". The lower partial moment is defined in the same manner as semi-variance, with the risk-relevant area under consideration beginning below a fixed parameter.

Table 9: Personal notion of investment risk (Q5.c.)

frequency in %		foregone investment opportunities	significant price losses	considerable price fluctuations	danger of underper-formance
personal ranking	**most adequate**	7.5	25.8	31.2	**36.4**
	secondary	13.4	26.6	**37.9**	21.6
	tertiary	20.9	**30.6**	20.1	27.9
	least adequate	**58.2**	17.0	10.8	14.1
	total[a]	100.0	100.0	100.0	100.0

a. Least number of valid responses n=269.

Institutional aspects of incentives and performance control

Basically, every time the responsible party delegates authority for certain actions – in this case equity investments – there is a corresponding need on his part not only to offer his subordinates incentives conducive to the attainment of the desired goal but, in the end, to control their actions as well. Depending on how stringent they are, incentive-building and control measures may be expected to influence investment decisions (Baker, 1998). In the theoretical literature on capital markets, principal-agent approaches, which show that coordinated group behaviour among institutional investors can be optimal, are based on remuneration incentives and signal effects relating to excellence in fund management (Roll, 1992; Brennan, 1993; Maug and Haig, 1995).

Effectively, a mutual fund investment company with a graduated commission business finds itself in a twofold principal-agent situation. On the one hand the company as such is agent for the investing client. Rational clients prefer, for their part, fund certificates from which they expect opportune return-risk ratios. Their interest often centres on funds which have previously achieved above-average gains in value.[17] On the other hand the company acts as a principal in organising its own internal affairs, designing a remuneration structure

[17] An empirical observation from the United States (Sirri and Tufano, 1992): The flow of capital into funds is more sensitive to the most recently observed increase in value than the flow of capital out of funds is to the most recently observed instance of underperformance.

which is to encourage fund managers to take portfolio decisions aggressive enough to make above-average returns possible; in so doing, however, fund managers should not incur undue risk, i.e. they should not, as a matter of policy, pursue potentially higher returns by taking greater risks. Thus, from the standpoint of a mutual fund company, effective risk management leads to a desired, optimal degree of risk within each product segment.[18]

The portfolio manager's incentive to deliver an above-average performance may be defined in terms of the expected value of the advantages which accrue to him thereby. These include increased job security, possibly a bonus and/or other positive prospects (promotion). By contrast, a performance that is significantly under par would rule out the possibility of additional income and quite possibly jeopardise the portfolio manager's position and professional advancement as well.

A simple reflection based on a model extending over two time-periods will illustrate the effect which the incentive system may have on investing. On accepting an asset management assignment, a fund manager receives a basic salary G. He cannot lose this money as long as he opts for a passive strategy that replicates the index. Only if he pursues an active strategy, however, can he hope to earn the bonus B – and even then only if he tops a previously agreed benchmark (index). If it is assumed that stock markets are price-efficient in a strong sense, then the likelihood of this outcome obtaining, p, is exactly ½. Thus the expected payment flow for an active strategy is G+ ½ B. If the assignment is limited in advance to a single time-period, a fund manager will always choose the active strategy since G+ ½ B > G. The reason for the latter is that the portfolio manager incurs no costs for missing his target, i.e. for underperforming the index. If, however, by mutual agreement, the assignment will be renewed for a second period only if the goal for the first period has been met, then the total expected payment flow for both assignment periods will be result by adding ½ (G+ ½ B). Thus the probability is ½ that the fund manager will no longer have the assignment in the subsequent period. That being the case, will he once again decide in favour of an active strategy? That depends entirely on the size of the bonus. In the example cited, the bonus would have to amount to more than $^2/_3$ of the basic salary. Recursion over a larger period number t yields $[1+p(B/G)]/(1-p)>t$ as the universally valid condition for active investment strategies. The willingness to pursue an active strategy is critically dependent on two (three, depending on how t is counted) factors, i.e. the bonus in % of the

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[18] Orphanides (1996) examines risk management and compensation factors indirectly. He interprets the presence of seasonal effects in the changes in value of US investment funds as a sign that compensation incentives influence the risk tolerance of professional investors. Chevalier and Ellison (1995) present evidence that mutual fund companies react to implicit incentives given by the relationship between fund performance and subsequent investment flows by changing risk toward the end of year.

basic salary and the portfolio manager's own judgement as to whether he can surpass a predetermined benchmark.

How relevant are these considerations to German equity fund management, as usually practised? The survey results indicate that, within the investment company, the performance of fund managers is reviewed every three months on average to ascertain changes in the value of the investible funds entrusted to them. However, the average value is misleading in that it masks considerable differences (see Figure 10 in the Appendix). Benchmark indices are clearly the preferred means of identifying individual contributions to fund performance (see Table 10 below). Risk-adjusted measurements of performance rarely use formal measures such as Jensen's alpha, or Information-, Sharpe- and Treynor-ratios. Instead, it is apparently much more common to take comparable funds as a measure. Absolute fund performance does play a role, albeit a subordinate one. The salaries of almost all fund managers include performance-based components, and for the vast majority of these managers, the performance-based components are in the order of up to 60 % of their gross basic annual salary, with 30% being the median (see Figure 2 below). Normally the primary criterion for bonus awards is relative performance (see Table 11 below). But, notably, a subjective evaluative criterion, namely in-house appraisals by colleagues and superiors, is also quite important. On average, criteria which are more closely tied to the marketing success of the investment company's product, such as corporate profit, influx of fund monies, customer satisfaction, or the acquisition of new customers (in the specialised fund business), are used less often as a basis for assessment. Yet, these criteria were the only ones among all the six-tier Likert-scaled categories in the questionnaire to show a bimodal frequency distribution. This means that a comparatively large number of fund managers considered these criteria to be either irrelevant or significantly relevant. I shall be returning to this point later.

Table 10: Evaluation criteria for fund performance (Q4.b.)

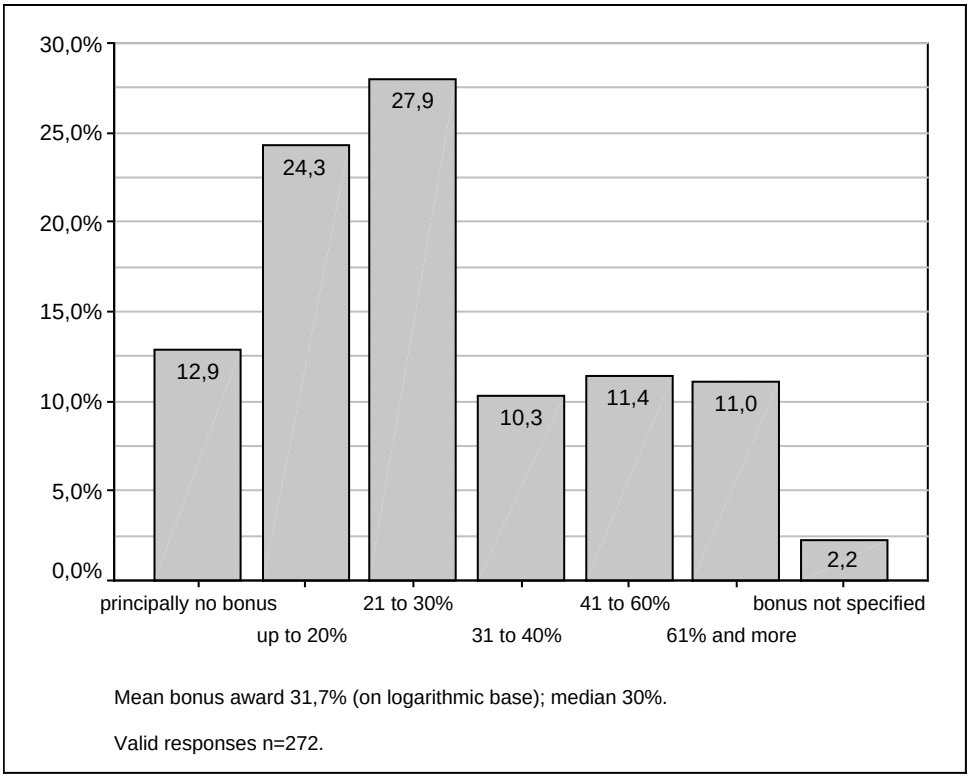
	mean[a]	std. error mean	median
performance differential to relevant market or sector index	4.49	.049	5
performance of comparable funds	3.15	.092	3
fund's absolute performance	2.24	.089	2
risk adjusted measures of relative performance, e.g. Jensen's alpha[b]	1.67	.087	2
other measures[c]	.15	.044	0

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role). Least number of valid responses n=270.

b. Further measures included: Information-, Sharpe-, Treynor-ratios.

c. Interpreted as irrelevant whenever left blank while all other categories crossed.

Figure 2: Bonus awards as % of annual gross basic salary (Q4.c.)



Mean bonus award 31,7% (on logarithmic base); median 30%.

Valid responses n=272.

Table 11: Bonus award criteria (Q4.c.)

	mean[a,b]	std. error mean	median
fund's relative performance	3.79	.097	4
in-house appraisal by colleagues or superiors	3.37	.092	4
promotion of fund inflows/ profitability of company	2.38	.106	3
marketing aspects like customer satisfaction and acquisition of new clients	2.23	.113	2
fund's absolute performance	1.81	.099	2

a. As measured on a scale from 0 (plays no role) to 5 (plays dominant role).

b. Least number of valid responses n=235. Fund managers receiving bonus awards total 237.

5 In search of some fundamental consistency among fund managers

The next step of analysis involves the use of bivariate correlations to determine whether fund managers, as a whole, exhibit some fundamental consistency in investment policies implemented, objectives chosen and notion of market efficiency assumed. The rationale behind the search for internal consistencies in the behavioural patterns of fund managers is twofold. First, the search allows the authenticity of responses to be checked with regard to their economic plausibility. One major concern with survey data analysis is that respondents might give one answer but do or mean something else entirely. If this were, on aggregate, the case, then, given the multitude and complex nature of the questions in this survey, one might expect to detect gross inconsistencies. Second, consistent behaviour on the part of fund managers appears to be a key to group efficiency and thus to their possibly stabilising role on the markets. To see this point, one might conceive of a situation in which fund managers with ample research resources assume efficient stock market prices and discard presumably superior first-hand-information to track indices or otherwise mimic market participants. By the same token, managers with scarce resources and second-hand-information might do just the opposite. This scenario would clearly run counter to the pic-

ture of investment professionals' effectively contributing to the market's information content.

Table 12: Investment approach and notion of market efficiency

Spearman rank correlation coefficients		basic view on market nature		
		gradual price adjustments	generally fair stock prices	degree of index tracking
generally fair stock prices		-.339**		
investment approach	degree of index tracking	**-.172****	**.179****	
	index replication as objective	**-.251****	**.275****	.643**

**. Correlation is significant at the 0,01 level (one-tailed test). Least number of valid responses n=267.

Certainly, consistency implies that active fund managers noticeably pursue price inefficiencies the exploitation of which is, in essence, their task. More passive managers, by contrast, are expected to consider markets less inefficient. The survey data reveal that such an association does indeed exist (see Table 12 above). As a proxy for the passivity versus activity of fund management, I use the perceived degree of index tracking, as derived from the description of the managers' typical fund, and, alternatively, the rating on index replication as an investment goal. The two measures are themselves highly correlated, which makes sense. High ratings for the notion of fairly efficient equity market prices accompany a more passive investment approach, whereas the approach becomes more active the greater the belief in price inertia. These correlations are all highly significant, albeit not very pronounced, indicating that a straight-line relationship cannot be assumed to hold.

Consistency further implies that fund managers who typically seek to outperform the market through their own investigative efforts also rate information obtained first-hand as more important and, consequently, analyse it in a fundamental manner. The existence of such a behavioural pattern cannot be rejected on the basis of correlation analysis, even if technical analysis and portfolio investments of other market participants are taken into account (see Table 19 in the Appendix).

Table 13: Company size, resources and use of privileged information

Spearman rank correlation coefficients		number of analysts and portfolio manager in the investment group[a]	mutual fund company size	(1)	(2)
mutual fund company size		.173**			
information sources[b]	corporate management, sector experts (1)	**.045**	**.243****		
	corporate earnings forecasts of investment group (2)	**.324****	**.087**	.283**	
	economic forecasts of investment group	**.145***	**-.025**	-.028	.505**

**. Correlation is significant at the 0,01 level (one-tailed test).

*. Correlation is significant at the 0,05 level (one-tailed test).

a. Least number of valid responses n=209.

b. Least number of valid responses n=271.

As information is costly, efficiency implies a positive association between the resources committed to market and stock analyses and asset management by mutual fund companies and the portfolio managers' investment approaches. This is consistent with the existence of several arbitrage equilibria in a stock market where prices are never completely informationally efficient, with the result that exploitation of the remaining inefficiencies produces enough profits to just cover the expense involved in discovering them (Grossman and Stiglitz, 1980). Do fund managers in large investment companies with ample research resources then behave consistently, using available informational input in an appropriate manner? Indeed, the larger the research resources within an investment group are, when proxied by the number of equity analysts and fund managers, the more relevant fund managers find their groups' own economic forecasts and, in particular, company estimates. Although the size of mutual fund companies is positively correlated with these research capacities to a slight degree, these two categories certainly need to be regarded separately. In Germany, a small subsidiary of a fairly large foreign financial institute may, for example, have broad access to very proficient capital market research. However, there is a positive relationship between mutual fund company size on a national scale and the propensity to interview corporate executives and sector experts, while research resources seem unrelated to the latter (see Table 13 above). Fund managers working in an investment company with a rather large share in the local market are not necessarily better informed, but their role

seems to change a bit as they are more likely to inform themselves directly while invoking some form of discretion under corporate governance. It is for this reason, perhaps, that passivity in equity investing appears to be negatively correlated with both research resources and size (see Table 20 in the Appendix). Furthermore, fund managers in companies with less local market share and less research and investment are less inclined to pursue research-intensive bottom-up investment approaches but rather assemble portfolios according to top-down criteria, suggesting that fund managers in the aggregate do behave in a quite consistent manner.

In the next section the focus shifts to response variations among fund managers. I identify three core groups and summarise the main aspects of their investment behaviour, thus detecting universal versus group-specific factors in equity fund investing.

6 A clustering of investors according to their behavioural patterns

At the two extremes, an exploratory analysis of the survey data would reveal either that all equity fund managers follow a quite similar investment approach, or that they all behave very differently. Presumably, however, it should be possible to establish core groupings among fund managers according to their behavioural patterns. A longstanding concern in the finance literature on market stability centres on the limits and existence of fundamental arbitrage (Shleifer and Vishny, 1997). Given their resources and know-how together with their apparent belief in exploitable market inefficiencies, as evidenced by our survey data, professional fund managers ought to be more apt than any other market player to help ensure that the prices on equity markets remain anchored to values calculated on the basis of a balanced assessment of fundamental information. For this reason, we are interested in whether the survey data enables a subgroup to be identified which resembles fundamental arbitrageurs or, at least, demonstrates a certain potential which would enable them to be qualified as such. There is also a second rationale behind the search for core groups of fund managers. Institutional investors are often said to have specific preferences and investment styles (Badrinath, Gay and Kale, 1989; Falkenstein, 1996). If so, which of them appear to be universal for professional equity investors and which of them specific to certain subgroups?

Given the existence of comprehensive survey data, it is possible to investigate equity investors' behaviour using market research instruments which are conventionally applied to other groups of buyers, e.g. households in product markets. Where information on group membership or on the number and size of groups is unavailable, cluster analysis is the primary tool for grouping cases on the basis of measured distances - in this case, between

selected response variables. Clusters are formed such that grouped cases are more homogenous relative to one another and more distinct from other groups (Hartung and Elpelt, 1992). Rather than classifying fund managers according to some arbitrarily chosen criteria, it would seem more appropriate to take advantage of the rich information contained in the survey data by using cluster analysis to provide a segmentation. However, this analysis comes at a cost as clustering is exploratory and does not yield a unique solution. Thus, to avoid misinterpretations, it should be pointed out that clustering, by itself, does not serve to test hypotheses of a given underlying model.

A two-stage procedure has proven useful for our purposes. First, cluster means are obtained by applying Ward's method, which begins with a completely partitioned set and groups cases stepwise to ensure that group variances are kept minimal.[19] A best possible number of clusters can be identified by analysing the sum of mean square errors prior and subsequent to each merger of cases. Also, the desired number of clusters shall be restricted to a very few in order to allow further reasonable analysis. On this basis an appropriate segmentation into three core groups may be deduced from the survey data. Three out of the 275 valid questionnaires were set aside prior to clustering in order to avoid unnecessary inhomogeneity of clusters. They came from respondents who declared themselves to be purely passive (index-) fund managers and who could also be consistently recognised as such. All remaining cases may thus be assumed to correspond, in effect, to managers with predominantly active mandates.

In a second step, the variable means obtained for each of these three clusters are inputted as initial cluster centres in a K-means clustering process.[20] In the clustering that yielded my results, convergence was achieved after just four iterations. Robustness of the results is further supported by mostly high F-ratios calculated from the variances between and within groups. Obviously, more homogeneous subsets result from clustering the selected variables. These variables are the responses given to questions regarding the use of information sources, time horizons, methods of analysis and decision making, buying signals, secondary criteria for stock selection, portfolio management with hedging rules and investment

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19 This technique is said to be conservative, i.e. it does not tend towards dilatation or contraction (Backhaus, Erichson, Plinke and Weiber, 1990) and has been found to partition very well relative to alternative methods in Monte Carlo simulation studies (Milligan and Cooper, 1985).

20 Hierarchical agglomerations like Ward's method are rigid because cases, once joined, always remain together. To overcome this disadvantage, one may consider K-means clustering as a partitioning method for a specified number of clusters. Each case is then grouped into its nearest cluster, nearness being measured in terms of the squared Euclidean distance to the cluster means. In an iterative process, means are updated and cases regrouped until no further changes occur in cluster centres.

objectives.[21] Since we are interested in identifying groups of fund managers who exhibit certain behavioural patterns, they may all be deemed relevant cluster variables.

Importantly, the clusters obtained appear not to depend too strongly on the approach taken. Ward's method, applied by itself with or without casewise standardised variables, and K-means-clustering with or without initial cluster centres all point to one and the same underlying kind of cluster profile. Nevertheless, the chosen solution seems best because the three identified clusters are most equidistant. Ultimately, and most importantly, the validity of any suggested cluster solution depends on whether the results can be interpreted in a theoretically intelligible manner. This is the case.

Fundamentalists, tacticians and methodologists

The first group is estimated to have 83 members representing about 30% of all equity fund managers or almost 40% of assets under their management (see Figure 11 in the Appendix). Within the classical typification of investors according to use of analytical methods, these fund managers distinguish themselves through their supreme emphasis on fundamental evaluations. Technical or chartist analyses play only a minor role for them, whereas forecasting based on econometric or portfolio optimisation models is rated as virtually irrelevant (see Table 21 in the Appendix). Further, the vast majority of them exercise discretion in decision-making, although they are evenly split as to whether, in so doing, they follow a systematic analytical procedure or one based on the underlying market situation (see Table 14 below). The second group is the largest with 125 instances, or 46% of all fund managers (42 % of assets under management). The main difference between it and the first group is the somewhat lesser reliance on fundamental analysis and the markedly higher rating for technical analysis. These managers are very likely to be influenced in their analysis by the market situation and hence appeal to their discretion in making decisions. The smallest cluster is made up of 64 fund managers, or 23% (17%) of all fund managers (assets under management). They stand out because only they classify forecasting on the basis of both econometric and portfolio optimisation models as quite relevant. It should come as no surprise that a broad majority of them follow clear and standing decision rules after systematically analysing the market.[22] For simplicity, the first group shall henceforth

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[21] The variables entered are standardised to neutralise effects from different scales. For the Ward's method response variables are further standardised across cases to ensure that differences in response patterns are accounted for effectively. Eventually, time horizons other than those for fundamental predictions are dropped in order to prevent their influence from being inflated through high positive correlations. Also, six response items have again been omitted to avoid unnecessary inhomogeneity of clusters, after ANOVA showed them to be too similar across all survey participants.

[22] Such practices are often called "quantitative management" or "structured investment" approaches.

be labelled *fundamentalists*, the second *tacticians* and the last one *methodologists*.[23] This represents a simplification because the results clearly show that, in a general sense, behavioural differences among investment fund managers are not so much a matter of choosing among various options; rather, fund managers differ by degrees, depending on how much weight they attach to different types of alternatives.

Table 14: How are decisions made?

frequency in %	cluster		
	fundamentalists	**tacticians**	**methodologists**
analysis contingent on market situation, discrete decision-making	40.2	70.2	14.1
standardised analysis, discrete decision-making	41.5	25.0	26.6
standardised analysis, rule-bound decision-making	18.3	4.8	59.4

The cluster results also seem relevant as they support the prior finding of a fundamental consistency with respect to specialisation among fund managers. For example, Table 22 (see Appendix) presents the group means for the appraisal of various possible buy signals. Unlike both tacticians and methodologists, fundamentalists attribute much less importance to technical factors such as an above-average increase in share price accompanied by rising volume or a bottomed-out share price sharply lower than historic values. But they consistently give a top rating to a low fundamental valuation relative to the market or sector, one that is significantly higher than other groups.

Group means for all behavioural characteristics are listed in Tables 21 to 26 (in the Appendix). As the data are ordinal by nature, the nonparametric Kruskal-Wallis-H-statistic is calculated along with the ANOVA-F-ratio to test for overall differences in distribution between clusters. The Levene-statistic serves to test for homogeneity of group variances. If

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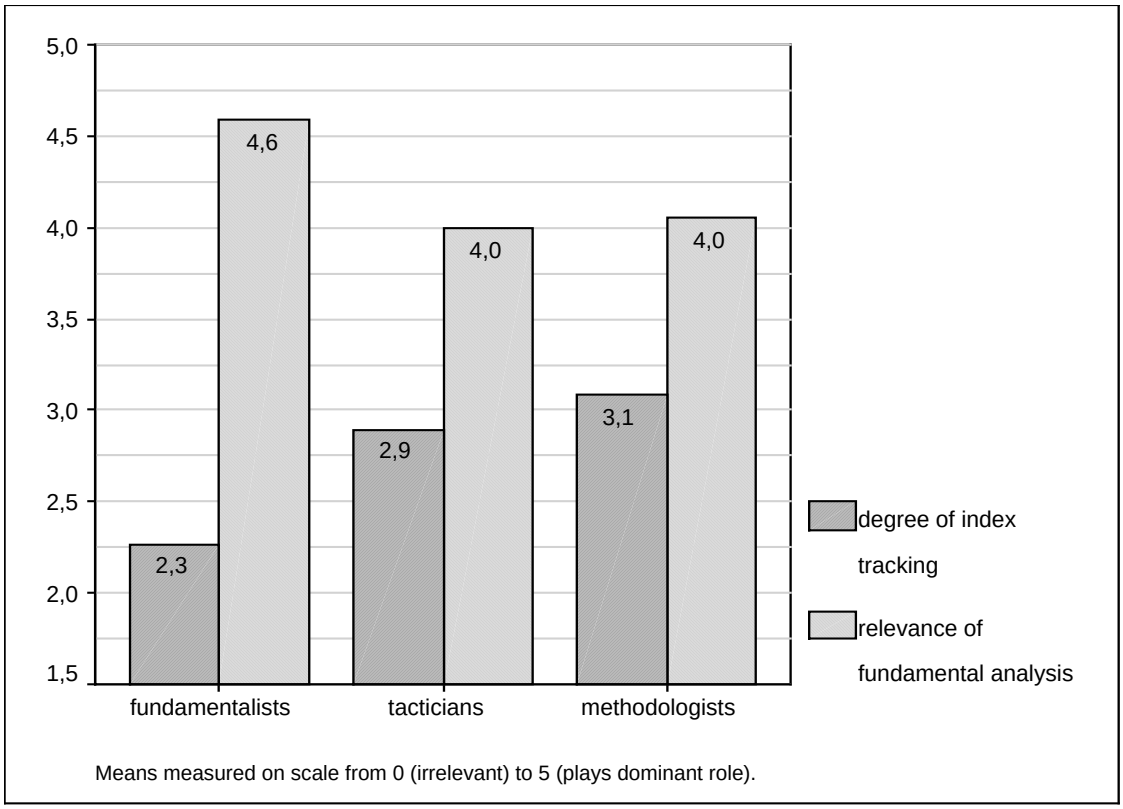
[23] Statistically, fundamentalists differ from methodologists to a slightly greater degree than from tacticians, the latter two groups being, however, most akin. Further, not only the variance but also the mean of distances between cases and its cluster centre is greatest for methodologists, indicating that this group is, independent of its smaller group size, the least homogenous cluster. In this respect, the other two groups are roughly alike.

these are significantly different, the Games-Howell-procedure is used to test for differences in mean between groups; otherwise, the Scheffé test is applied. On this basis some behavioural patterns can be identified as group-specific which are apt to induce or exacerbate procyclical tendencies in the stock market.

Procyclical investment behaviour

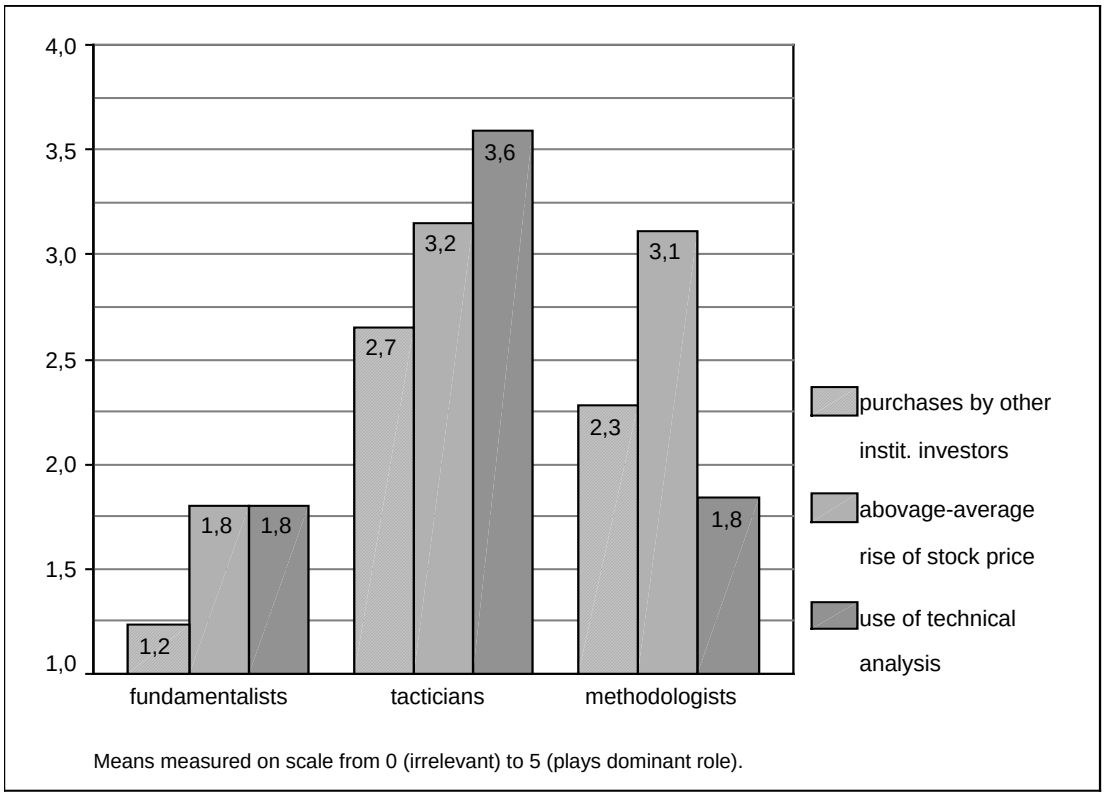
Much recent research has focused on establishing a theoretical and empirical basis for rational herding on the part of investors in financial markets (Devenow and Welch, 1996; Wermers, 1999). As a matter of fact, the relevant question does not appear to be whether institutional investors herd but rather, given the fact that they do, to what extent. Herding, in a general sense, can be conceived of as correlated investment patterns between investors independent of fundamentals. Equity fund managers do widely, though to varying degrees, follow indexation in the form of a benchmark, which effectively serves as mechanism for synchronising investment behaviour. The survey results confirm that indices are relevant for all types of managers. Still, fundamentalists feel under significantly less pressure to track an index than do the other two groups (see Figure 3 below). Further, diversification and index replication are seen as more important investment objectives by tacticians and methodologists, although the primary goal remains overperformance in all three groups (see Table 23 in the Appendix). Consequently, fundamentalists turn out to be the most willing to pursue active strategies.

Figure 3: Index-tracking and fundamental analysis



Conventional empirical investigations using market data have, to date, failed to distinguish adequately between spurious forms of herding and intentional ones among institutional investors. Herding clearly leads to correlated trading but the reverse need not be true. Given the multitude of factors that might affect an investment decision, it may be impossible to determine the sources of correlated, procyclical investment behaviour, even if such could be found in the market data (Bikchandani and Sharma, 2000). However, reliable survey data, conceived as yielding supplementary information, may be of help.

Figure 4: Deriving information from the behaviour of other investors



With a view to information-based herding, survey participants have been asked to appraise observed institutional purchasing activity as a signal to buy (specific) stocks. Such signals play a much larger role in the investment decisions of methodologists and tacticians – and for the latter more than for the former - than they do for fundamentalists. This is also consistent with the significantly higher rating given to technical buying signals, as indicated above. On balance, investors in these groups are much more inclined to derive information from the behaviour of other market participants (see Figure 4 above). Intentional herding

therefore appears to be a group-specific form of behaviour. This, in turn, speaks in favour of fundamentalists being able to assume a stabilising role in markets.[24]

Arguments for reputation-based herding among institutional investors have been voiced alongside arguments for information-based herding. Fund managers may simply prefer to move with the crowd as they are risk-averse when it comes to "lone" decisions which might eventually turn out to be bad ones (Scharfstein and Stein, 1990). Procyclical behaviour may result from investor preferences for stock criteria which, insofar as they suggest superior stock quality, implicitly offer some protection for fund managers' own reputation (Badrinath, Gay and Kale, 1989). In the questionnaire I have therefore asked respondents to rate the importance of a corporation's past performance as well as that of its stock price as an additional criterion for portfolio selection. Indeed, the fairly high average scores for all groups indicate that such considerations are deemed very relevant by fund managers in general, although tacticians exhibit the most pronounced preference for "winner-type" shares (see Table 24 in the Appendix).

Investment decision rules and portfolio techniques, such as stop-loss-orders, margin purchases or dynamic hedging, may - unintentionally but effectively - contribute to procyclical price tendencies (Davis, 1997). Here, tacticians, in line with their greater reliance on technical factors, are the only ones to assign a role to stop-loss-techniques in their investment approach. Together with methodologists they attest to the use of options and futures at a substantial level, albeit primarily for hedging purposes and not for position-taking on margin. Group differences also exist with regard to dynamic hedging strategies. Such strategies appear to be adopted by methodologists, albeit only to a minor extent. On balance, these results suggest that the risk management techniques employed by equity fund managers have quite a limited potential to induce procyclical tendencies (see Table 25 in the Appendix).

Procyclical tendencies need not be contrary to fundamentals. Rather, they can be triggered by independent, yet similar, responses to the arrival of new information. A common concern regarding the ongoing institutionalisation of portfolio investment decisions presupposes an implicit trend towards standardised behavioural patterns or strategies. If that were the case, price adjustment processes would at least be sped up, manifesting themselves in an increase in short-term volatility. These processes may move prices towards,

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[24] *Positive feedback strategies*, which represent procyclical trading based on price signals, may be regarded as optimal by participants, provided they assume that investors better informed on fundamentals move market prices (Banerjee, 1992; Bikhchandani, Hirshleifer and Welch, 1992; Diamond and Verrechia, 1981). Speculative bubbles are conceivable if uncertainty exists in the market as to the proportion of correctly informed trading, and investors, as a consequence, are not able to recognise whether trading reflects new information or herding (Avery and Zemsky, 1998).

rather than away from, equilibrium values (Nofsinger and Sias, 1999). If, however, information arrival as such provides the basis for momentum strategies which come to supersede a fundamental assessment independent of market dynamics, then worries over possible overreactions are warranted. Consequently, I have asked fund managers to rate upbeat fundamental news as a buying signal (see Table 22 in the Appendix). In all three groups, positive company announcements are rated equally high. An upgrade in analysts' corporate earning forecasts presents virtually the same picture. Interestingly, only fundamentalists have a clear preference for a third category of buy signals which has nothing to do with the arrival of news as such but which reflects the relative share price level insofar as it is based on fundamentals. Seen from this angle, tacticians and methodologists appear to act as much on positive news alone as on its implications for relative pricing.

Informational input and sources of contagion

Do fundamentalists differ from the other groups in relying on relevant information obtained through their own or through their companies' research? The answer is a qualified yes. Fundamentalists clearly value first-hand information derived from interviews with company management or sector experts most (see Table 26 in the Appendix). Further, they regard in-house company analyses and forecasts as quite relevant. Methodologists share this assessment with fundamentalists but tacticians' ratings drop off significantly. However, both tacticians and methodologists rate macroeconomic predictions as more important for their decision-making than fundamentalists. This observation is again consistent with fund managers' descriptions of their typical mandates. Unlike fundamentalists, managers in both these groups grant a significantly greater role to top-down analyses. Thus, these types of investors seem more likely to "trade markets", or sectors, and not stocks. Indeed, it is market-wide and cross-market herding which has increasingly been observed in recent years and which has been cited as the main cause of concern (Davis, 1997).

It is also interesting to note where fund managers' assessments do not differ. Exchanges of views with professional colleagues, media coverage and company forecasts by external analysts are rated equally high and relevant in all three investor groups. This tallies with the observation that all groups assign the same importance to frequent reports and availability of independent analysts' forecasts (see Table 24 in the Appendix). Apparently, the possibility to be influenced in an implicit, indirect and hence unintended manner remains quite pertinent to all fund managers, also to fundamentalists.

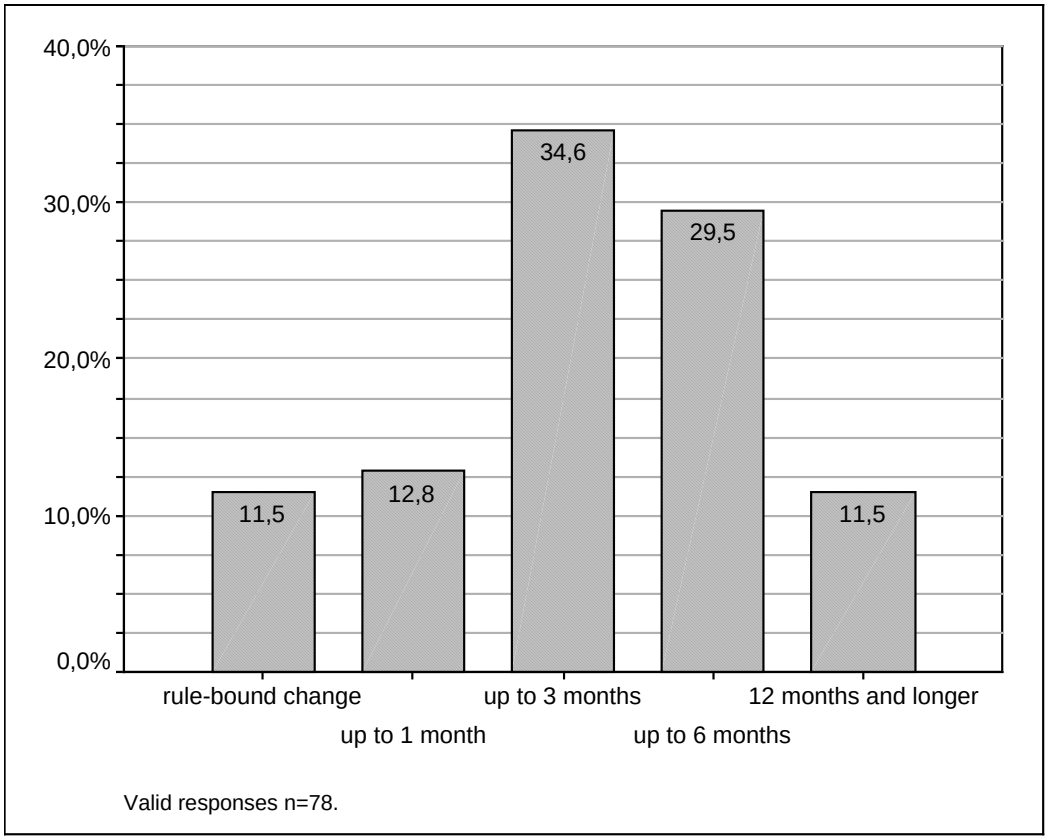
7 On the limits of fundamental arbitrage

To summarise, I was able, using cluster analysis, to identify three core groups of investors in the behavioural survey data, which I dubbed *fundamentalists, tacticians* and *methodologists*. In general, these groups are not completely different from one another but differ, in part, in their priorities or, in most cases, in the emphasis they place on various behavioural options. On balance, responses from tacticians and methodologists reveal a more pronounced inclination to follow market dynamics, in particular on non-fundamental grounds. Judging from the assessed relevance of informational resources and analysis methods, fundamentalists seem most apt to assume the role of stabilising arbitrageurs. Such investors buy when prices are below fundamentals and sell when they are above, seeking and using all relevant information (Friedman, 1953). However, some styles and preferences, which are ill-suited to this role, turn out to be common to professional equity management in general. These include, most notably, a heavy reliance on sources of information which offer some type of confirmation and through which the contagions of fear and exuberance might be transmitted, and a pronounced preference for "winner-type" or "spotlight" stocks.

With regard to the price efficiency of a stock market investor's contribution is often appraised in terms of the method of financial analysis used. This has nothing to do with the potential merits of one method vis-à-vis another as a source of predictions. For instance, the greater the number of non-fundamental factors driving equity prices, the more appropriate it apparently is to apply technical instruments (Menkhoff, 1998). However, the use of non-fundamental techniques cannot be expected to result in a systematic correction of market mispricings. Moreover, the existence of a substantial number of predominantly fundamental investors is, in itself, neither a sufficient nor necessary condition for financial market stability. Rather, such investors must have the freedom to implement strategies according to their assessments if they are to exert an influence significant enough to counteract non-fundamental tendencies. Even so, there are good theoretical reasons for considering the fundamental arbitrage of mutual fund managers ineffective. Fundamentalists may shy away from arbitrage because they perceive a risk of further mispricing due to a dominance of endogenous market forces triggered by non-fundamentalists, which can be called "noise trader risk" (Shleifer and Summers, 1990). For this fear to become actual it is only necessary that professional investors be unable to afford unlimited time horizons. As a matter of fact, evaluation and compensation schemes may place effective constraints on fund managers' time horizons. Further, fund managers run the risk of forced liquidations when clients start to withdraw funds. If fundamentalists try arbitrage and fail to succeed in due time, voluntary or involuntary liquidations make mispricing in the markets, or financial crises, even worse.

But, then, what is to be considered "due" time? Fundamentalists face a dilemma. On the one hand, for them to be active in the markets and undertake arbitrage they must believe in price inefficiencies. On the other hand, each of them must also believe that price inefficiencies are arbitraged away in "due" time. The survey results help us to gauge the potential for fundamental arbitrage. More than 85% of fundamentalists - a share significantly greater than in other groups (see Table 27 in the Appendix) - favour the view that investors dither in recognising new trends and developments and, hence, only gradually adapt prices to new information sets. Thus, one necessary condition for fundamental arbitrage is obviously satisfied.

Figure 5: Endurance of fundamentalists



Also, the analyses of fundamentalists typically have the longest time horizons; for fundamental predictions these extend to little over one year (see Table 21 in the Appendix). Broadly speaking, it seems as if they benchmark equities on the basis of expected company results up to the end of the following financial year.[25] But when asked how long they

[25] Freeman and Bartels (2000) present some recent survey results which, on the whole, point to a special preference on the part of equity managers for practicable benchmarking tools like ratios of price to earnings, price to book value, and return to equity, in the given order and before all other indicators.

would hold on to a portfolio strategy if the markets turned against them and underperformance became significant, the average response was just over three months. Less than a quarter of fundamentalists indicated they would keep it up for half a year, and only less than ⅛ for a year or more (see Figure 5 above). Since internal monitoring and evaluations may play a pivotal role here, it should be added that a thin majority of fundamentalists are evaluated once a year at most, the remainder are evaluated more often. As a consequence, for the bulk of fundamentalists sheer endurance seems enough to weather a storm. But is it enough for them to get through the winter?

Table 15: Which is more likely to make fund managers nervous, market news or the market itself? (Q5.d.)

		market dynamics versus [news][a]	
frequency in %		**first ranked**	**second ranked**
cluster	**fundamentalists**	78.3% [21.7%]	46.9% [53.1%]
	tacticians	91.8% [8.2%]	57.2% [42.8%]
	methodologists	78.2% [21.8%]	62.1% [37.9%]

a. Participants were to rank the following five scenarios: periods of sharply falling or rising market prices or without a clear market trend (market dynamics) as well as periods prior to announced publications of important economic or corporate data and decicions (news). Least number of valid responses n=263.

The survey results on sentiment cast more doubt on whether fundamentalists can stand the tide. All survey participants were asked to rank different scenarios in terms of their potential for generating particular tension during professional decision making. Almost all fund managers cited market dynamics, especially when they are on the downside, but even, to a considerable extent, when they are on the upside, as the most likely source of nervousness. Fundamentalists were the only ones to have "voted" with a slight majority for economic and company-related news as the second-ranked source of nervousness (see Table 15 above). On this score there can be little doubt: market movements must be on virtually everyone's mind, including those who expressly adhere to fundamentals when investing. On balance, much evidence therefore exists to validate arguments in support of limited arbitrage, as suggested by the behavioural finance literature on noise trading (Shleifer, 2000).

Finally, the survey results imply that, as far as financing constraints on arbitrage are concerned, discretion in the maintenance of cash reserves is considered the most important

way to protect the portfolio, regardless of investor type. Nevertheless, tacticians allow themselves a much higher degree of discretion in this regard than, for instance, fundamentalists (see Table 25 in the Appendix). In turn, fundamentalists are relatively more dependent on the reaction of clients to asset-price variations, and thus have a greater effective exposure to liquidation risk. One possible reason for this kind of behaviour can be found in the type of funds managed by fundamentalists, which will be discussed briefly below.

Which conditions favour fundamentalism?

As efficient fundamental arbitrage is a desirable feature of capital markets from a macroeconomic point of view, special interest attaches to the question of what may influence investors, in the first place, to behave in a fundamental manner. The survey data on potentially influential factors like compensation and monitoring arrangements have been presented above, likewise the styles of the typical fund under management as well as the basic views and beliefs of equity fund managers. Subsequently, I have found that fundamental behaviour is most likely to occur in a cluster of 83 fund managers, who I have consequently been dubbed *fundamentalists*. In the absence of a completely specified behavioural model, it seems appropriate to identify factors that favour the managing of funds associated with this type of investor using a probit estimation on group membership as a binary dependent variable. The results of the regression are presented in Table 16 below.[26] McFadden's R^2, at 0.34, looks promising, indicating a reasonable degree of explanatory power in the regression. Likewise, analysing the classification of predicted cases reveals a sensitivity of 64% and a specificity of 91%, with 82% of all cases being correctly classified. In comparison with constant probabilities, a total gain in predictive power of 15 percentage points is achieved. Methodologically, there is good reason to take the results as robust.[27]

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[26] The variables are the evaluation criteria from Q4.b. (EVALU) and the award criteria from Q4.c. (BONUS) with bonus size and evaluation frequencies (EVALUTIME) also being included. Further explanatory variables are criteria, derived from Q3.d., which specify the investment focus and style of the typical fund managed (STYLE). Fund managers' views on how to achieve an above-average performance (OVERP) constitute rankings according to which the last category from Q7.b. is redundant and hence is not included. Likewise, only the second answer option from Q8.a., the price-inertia-view (EFFIC2), is entered as the first option corresponds implicitly to the third one in Q7.b.

[27] Since the regression includes a good number of cases, a robust estimate of covariances and thus of standard errors can be obtained using the quasi-maximum likelihood (Huber-White) model. Also, individual application of the Newton-Raphson, Goldfeld-Quandt and Berndt-Hall-Hall-Hausman algorithms for non-linear optimisation results in only very minimal, insubstantial changes. Finally, as regards goodness-of-fit, the Hosmer-Lemeshow test statistics, calculated for both quartiles and quintiles, fails to indicate significant misspecification (see Eviews User's Guide, 1997, pp. 415-466).

Table 16: Summary of a PROBIT-Analysis on Fundamental Behaviour

Dependent Variable: FUNDAMT

Method: ML - Binary Probit
Included Observations: 204 out of 272
Convergence after 24 iterations
Berndt-Hall-Hall-Hausman estimation algorithm
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
EVALU1	-0.18	0.12	-1.53	0.1253
EVALU2	0.06	0.08	0.69	0.4873
EVALU3	0.16	0.15	1.08	0.2817
EVALU4	-0.04	0.10	-0.42	0.6746
EVALU5	0.06	0.11	0.49	0.6251
EVALUTIME	0.03	0.10	0.32	0.7492
BONUSSIZE	0.32	0.17	1.84	0.0663
BONUS1	0.09	0.11	0.79	0.4320
BONUS2	0.07	0.09	0.88	0.3805
BONUS3	-0.04	0.08	-0.45	0.6558
BONUS4	-0.36	0.09	-3.81	0.0001
BONUS5	0.07	0.09	0.83	0.4084
STYLE1	-0.44	0.14	-3.12	0.0018
STYLE2	0.13	0.12	1.09	0.2775
STYLE3	-0.18	0.10	-1.69	0.0913
STYLE4	0.00	0.09	0.02	0.9843
STYLE5	-0.01	0.10	-0.13	0.8946
OVERP1	-0.53	0.41	-1.31	0.1903
OVERP2	-0.88	0.42	-2.13	0.0334
OVERP3	-0.38	0.37	-1.01	0.3141
EFFIC2	-0.90	0.24	-3.68	0.0002
constant	4.48	3.11	1.44	0.1492

Mean dependent var	0.33	S.D. dependent var	0.470798
S.E. of regression	0.39	Akaike info criterion	1.054886
Sum squared resid	27.55	Schwarz criterion	1.412723
Log likelihood	-85.60	Hannan-Quinn criter.	1.199638
Restr. log likelihood	-129.14	Avg. log likelihood	-0.419600
LR statistic (21 df)	87.09	McFadden R-squared	0.337190
Probability(LR stat)	0.00		

Obs with FUNDAMT=0	137.00	Total observations	204
Obs with FUNDAMT=1	67.00		

Annotations: EVALUTIME (time period between fund managers' performance evaluations) and BONUSSIZE are on a logarithmic basis. EVAL1 to EVAL5 represent the evaluation criteria for fund managers' performance (contribution) arranged in the same order as in Q4.b. of the questionnaire. The same applies to the categories BONUS1 to BONUS5 which constitute the criteria for bonus awards. They have been valued at 0 (irrelevant) if no bonus is awarded at all. Likewise, STYLE1 to STYLE5 are derived from Q3.d., the first three variables describing the investment focus, and the other two indicating the importance of a growth or value investment style, respectively. As for basic attitudes, OVERP1 to OVERP3 correspond to the first three answer categories in Q7.d. and EFIC2 to the second category in Q8.a. FUNDAMENT is the dependent variable with 1 for fundamentalists.

Economically, the results are in accord with basic expectations about fundamental attitudes. A strong price-inertia view of the market makes it more likely that fund managers will be fundamentalists (EFIC2).[28] A fervent belief in the ability to overperform by subjecting already known data and information to in-depth analysis (OVERP2) is an equally good indicator. Conversely, the stronger the investment focus on blue chips (STLYE1), the less likely it is that fundamentalism has been embraced. Either fund managers assume blue chips to be more efficiently priced than other stocks, thus offering fewer opportunities for fundamental arbitrage. Or they regard the nonfundamental market dynamics of blue chips as being, at least at times, more pronounced and thus more likely to thwart attempts at successful fundamental arbitrage. Indeed, as blue chips effectively make up a large chunk of the most widely used indices, concerns about nonfundamental dynamics arising from benchmarking may be particularly warranted.

Bonus size can play a role, as I have argued above, in inducing the active management style typical of a fundamentalist. Although the sign of the corresponding coefficient (BONUSSIZE) is positive, the significance level falls short of the 5% level by a small margin. However, the greater the dependence of bonuses on marketing aspects like customer satisfaction or the acquisition of new clients (BONUS4) the less likely fundamental investment behaviour becomes. Rationally, such marketing-related bonus awards are paid only when fund management also involves client-relationship tasks. While this is certainly not practicable for funds open to the public, bonuses are more habitual in the specialised fund business for institutional clients. In fact, when membership in the fundamentalists' group and the categories of age, professional experience, education, company size and principal type of fund managed respectively are examined on associations, only the last category proves to be important.[29] Thus an overproportionate fraction of fundamentalists are engaged in managing funds open to the public, whereas non-fundamentalists are more highly concentrated in the specialised fund business.

What could account for the difference? Lakonishok, Shleifer and Vishny (1992) postulate "an extra layer of agency problems" in the U.S. pension fund industry – the one most comparable to the German specialised fund business – that is lacking in the mutual fund industry, which offers services to private customers. Individuals invest their own wealth. But corporate treasurers who are in charge of selecting fund services may want to shift responsibility for the investment outcome to fund managers. It is possible to outsource most

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[28] Given the ordinal nature and diversity of the data, the only matters that will concern us here are the meaning of the coefficients and the direction of their influence, and not their size as such.

[29] Pearson's χ^2 equals 10.1 at an asymptotic significance level of 0.1%.

of the responsibility by choosing active, mixed funds, thus assigning fund management a role in the allocation of assets as well. As a matter of fact, 84% of total assets in specialised German equity-related funds are mixed funds.[30] What is more, this tallies with the survey's finding that non-fundamentalists are leaning more towards top-down approaches in securities analysis.

It goes without saying that institutional clients can exert a much greater and more direct influence on fund managers. Investing on behalf of institutional clients is clearly different in cases that the job no longer involves simply investing monies but also entails promoting inflows, advising clients and explaining the investment strategy to them (Perry, 1992). At any rate, these additional tasks occupy time and resources. Although I do not know whether the effect thereof on the investment outcome for German funds has ever been examined, I have found evidence in the survey data that it does, in fact, impact on investment behaviour as such. Burdened by more responsibility and working under greater pressure, fund managers obviously shift risk, too. They do so by tracking the market movements themselves more closely, either by using a benchmark or technical analysis or directly, by copying other market participants. Their time horizons become shorter and they are less willing to engage in fundamental arbitrage. I am far from suggesting that this way of investing is worse, or even wrong. Still, it certainly is more liable to generate non-fundamental dynamics in stock markets. It is apparent that agency problems, as have been discussed previously in the finance literature, play into this.

8 Concluding remarks

With the ongoing institutionalisation of portfolio investment, professional managers have moved to centre stage on equity markets. At the same time, high volatility market phases seem to have become more frequent, although there is no clear evidence of such higher volatility over the longer term (Blommestein, 1998). At any rate, the debate over how such institutions impact on financial market stability is gaining ground, attracting not least the attention of central banks. Yet, institutional investing is often looked upon as a black box, and excessive attention has been paid to the analysis of investment outcomes. Under that approach, however, behavioural styles may remain concealed which are apt to have implications for market stability. Thus, the primary objective of this paper has been to shed light, in a systematic manner, on key aspects of institutional investment processes. To this end, I have conducted a broad-based survey directed towards all German equity fund managers,

[30] The corresponding figure for retail mutual funds is a mere 14% (Deutsche Bundesbank, capital market statitics, July 2000, own calculations).

in which an estimated 54% of fund managers of 97% of the investment companies contacted participated. A careful review of the data, including the examination of subgroups, reveal associations and patterns that are economically plausible and coherent. Since the fund managers surveyed were granted anonymity, there is no reason to assume that they did not respond to the best of their knowledge, offering, to a large extent, their own subjective assessments as well. Also, there are no indications that selectivity in response has tainted the survey data obtained. For these reasons, I regard the results as providing a reliable source of information on equity fund managers' beliefs and practices.

Some key findings with implications for market efficiency and stability may be briefly summarised as follows: First, fund managers generally identify longer-term price inefficencies on stock markets and pursue predominantly active strategies with the principal aim of achieving above-average returns for their clients. Second, in analysing investment patterns, I have identified three core types of managers, which I have dubbed fundamentalists, tacticians and methodologists. With the help of these categories, some investment styles and approaches can be shown to be group-specific whereas others turn out to be common to all forms of professional equity investing. For instance, information-based herding, i.e. the intentional mimicking of other market players, or the practice of following non-fundamental market signals is more pronounced among tacticians and methodologists. Third, of all the groups, fundamentalists, in keeping with their name, seem best suited to assume the role of arbitrageurs, returning equity prices to, and stabilising them at, fair and sound levels. However, doubts concerning the effectiveness of such fundamental arbitrage, as voiced in the recent literature on behavioural finance, are reinforced by this survey's data. For the great majority of fundamentalists, investment time horizons are quite restricted and, in the intervening period, the fear of becoming caught up in a negative market environment seems to prevail. Fourth, the survey results nevertheless endorse the view that institutional investors can generally contribute to more efficient stock market pricing. Managers from all groups demonstrate a clear preference for stock analyses based on underlying economic factors. Fifth, this assertion is corroborated by the priorities fund managers generally assign to fundamental buy signals. By the same token, the level of stock valuations, i.e. their intrinsic values, does not appear to be the only criterion which matters. In addition, fund managers indicated that they commonly react as much to the market dynamic itself, which is set in motion by the arrival of corporate news or earnings revisions. Then, if enough fundamental momentum is triggered, stock price overreactions become possible. Sixth, there are still other practices and preferences which the survey data show to be common to all forms of professional equity management and which carry some risk to market stability. In particular, fund managers clearly rely to a great extent on information from external analysts, the media, and professional colleagues. While all these sources involve some type of confirmation, they are also channels for contagions of fear

and exuberance. Likewise, there is evidence that fund managers tend to favour stocks which receive ample attention from analysts or in the form of reports; they also prefer stocks with a proven record of outstanding corporate and stock price performances. That having been said, and provided institutional equity investors' behaviour is taken as the sole criterion, there is much evidence to indicate that market dynamics can persist well beyond economically justified equilibrium levels. Finally, the survey results reveal that agency problems due to the intermediate nature of the equity fund business are likely to have a bearing on managers' investment behaviour.

Appendix

Table 17: A comparison with official statistics to control for selectivity

share of all equity investments in %		according to official statistics[a]	according to the survey
size of mutual fund company by equity investment volume	**up to 8 billion Euro**	18.8	13.5
	over 8 but less than 20 billion Euro	26.3	27.3
	over 20 billion Euro	54.9	59.2
total		100% (575.2 billion Euro)	100% (400.0 billion Euro)

a. Deutsche Bundesbank, capital market statistics, published October 2000, for all equity-based and mixed funds in the reporting month August 2000.

Table 18: Brief profile of the typical fund manager (Q1.b./c., Q2.a.)

	mean[a]	95%- confidence intervall	median	valid responses
equity investments under management in million Euro	848.5	751.8 - 957.6	900	n=239
age (in years)	35.4	34.9 - 35.9	35	n=275
professional experience on the job (in years)	5.2	4.8 - 5.5	5	n=272

a. Estimated on a logarithmic basis.

Table 19: Information - Where from, what for?

Spearman rank correlation coefficients		active pursuit of new information	(1)	(2)	(3)
information sources	corporate managment, sector experts (1)	**.221****			
	portfolio investment of other market participants (2)	**-.130***	.028		
methods of analysis	fundamental (3)	**.177****	.481**	-.042	
	technical	**-.140***	-.169**	.315**	-.130*

**. Correlation is significant at the 0,01 level (one-tailed test).

*. Correlation is significant at the 0,05 level (one-tailed test). Least number of valid responses n=271.

Table 20: Company size, resources and investment approach

Spearman rank correlation coefficients		number of analysts and portfolio manager in the investment group[a]	mutual fund company size	(1)	(2)
mutual fund company size		.173**			
investment approach[b]	bottom up analysis (1)	**.132***	**.169****		
	top down analysis (2)	**-.133***	**-.148****	-.412**	
	degree of index tracking	**-.168****	**-.172****	-.271**	.243**

**. Correlation is significant at the 0,01 level (one-tailed test).

*. Correlation is significant at the 0,05 level (one-tailed test).

a. Least number of valid responses n=202.

b. Least number of valid responses n=257.

Table 21: Group analysis: Methods of analysis and time horizons (Q6.b., Q5.e.)

		cluster			Kruskal-Wallis-h [a]	Levene-statistic [b]	metric tests of mean differences			
		fundamen-talists (1)	tacticians (2)	methodo-logists (3)			ANOVA F-Test [c]	Games-Howell or Scheffé test, respectively [d]		
								(2) - (1)	(3) - (1)	(3) -(2)
method of analysis	**technical**	1.80	3.59	1.84	87.3*	11.7*	61.2*	+1.78*	+0.03	-1.75*
	fundamental	4.61	4.01	4.05	21.1*	4.0 (0.019)	11.4*	-0.60*	-0.56*	+0.04
	econometric model	.43	.67	2.98	107.5*	3.6 (0.030)	114.7*	+0.25	+2.56*	+2.31*
	portfolio optimisation	.60	.76	2.90	88.0*	3.4 (0.035)	75.9*	+0.16	+2.31*	+2.14*
forecasting horizon in natural days, estimated on logarithmic basis	**technical**	~64	~63	~40	4.8 (0.091)	1.9 (0.033)	3.0 (0.051)	-	-	-
	fundamental	~451	~288	~247	16.5*	3.5 (0.033)	10.5*	-163*	-204*	-41
	econometric model	~295	~246	~151	9.9*	0.1 (0.91)	4.0 (0.022)	-49	-144	-95
	portfolio optimisation	~164	~207	~126	4.5 (0.104)	4.4 (0.014)	3.0 (0.051)	-	-	-
maximum time tolerance before changing a significantly underperforming investment strategy (in natural days, estimated on a logarithmic basis)		~107	~70	~91	12.1*	0.03 (0.97)	4.4 (0.013)	-37 (0.015)	-16	+21

a. Parametric test of homogeneity of the underlying group-specific distributional functions (Ho). ´*` indicates that Ho can be rejected at a significance level of 0.01; otherwise significance level is indicated in ( ).

b. Test of homogeneity of variance (Ho); ´*` indicates that Ho can be rejected at a significance level of 0.01; otherwise significance level is indicated in ( ).

c. One-way analysis of variance for the three unbalanced clusters to test for equality of means (Ho);´*` indicates that Ho can be rejected at a significance level of 0.01; otherwise significance level is indicated in ( ).

d. Post-hoc test for multiple pairwise comparisons of means on the basis of linear contrasts; Games-Howell method in case of inhomogenous cluster variances; iff homogeneity of variances cannot be rejected on the basis of the Levene-test then Scheffé method is applied; ´*` indicates that Ho of equal means can be rejected at a significance level of 0.01.

Table 22: Group analysis: Potential buy signals (Q6.a.)

	cluster			Kruskal-Wallis-h[a]	Levene-statistic[b]	metric tests of mean differences			
	fundamen-talists (1)	tacticians (2)	methodo-logists (3)			ANOVA F-test[c]	Games-Howell or Scheffé test, respectively[d]		
							(2) - (1)	(3) - (1)	(3) - (2)
above-average rise in market price accompanied by higher turnover	1.80	3.15	3.11	57.7*	3.9 (0.021)	40.8*	+1.35 *	+1.31*	-0.04
quotation stabilised at a price level sharply lower than its all-time-high	1.72	2.73	2.31	35.0*	0.05 (0.953)	19.8*	+1.01*	+0.59*	-0.42
growing expectations concerning higher dividends	.77	1.34	1.64	22.9*	6.6*	13.4*	+0.57*	+0.87*	+0.30
raising of corporate earnings estimates by analysts	3.20	3.22	3.89	17.1*	10.5*	9.3*	+0.02	+0.69*	+0.67*
observed purchases by other institutional investors	1.23	2.66	2.28	69.4 *	5.4*	48.1*	+1.42*	+1.05*	-0.38
positive corporate news/ announcements	3.89	3.82	3.59	3.0 (0.225)	1.8*	1.9 (0.16)	-	-	-
a fundamentally low valuation by sector or market comparison	4.18	3.66	3.77	11.45*	3.0*	6.1*	-0.52*	-0.41	-0.11

a. See Table 21.

b. See Table 21.

c. See Table 21.

d. See Table 21.

Table 23: Group analysis: Investment objectives (Q8.b.)

	cluster			Kruskal-Wallis-h[a]	Levene-statistic[b]	metric tests of mean differences			
	fundamen-talists (1)	tacticians (2)	methodo-logists (3)			ANOVA F-test[c]	Games-Howell or Scheffé test, respectively[d]		
							(2) - (1)	(3) - (1)	(3) -(2)
above-average performance	4.69	4.61	4.60	1.1 (0.59)	1.1 (0.335)	0.4 (0.645)	-	-	-
diversification of market risk	2.89	3.38	3.77	28.3*	0.4 (0.658)	14.2*	+0.49*	+0.88*	+0.40
replication of a specific index	1.72	2.76	2.89	34.6*	0.02 (0.981)	67.7*	+1.03*	+1.17*	+0.13
above-average dividends and payouts	.77	1.24	1.22	13.9*	0.1 (0.924)	12.5*	+0.47	+0.45	-0.02
other aims (tax and balance sheet considerations)	.29	.65	.69	14.4*	8.2*	8.0*	+0.36	+0.40	+0.04

a. See Table 21.

b. See Table 21.

c. See Table 21.

d. See Table 21.

Table 24: Group analysis: Secondary criteria in selecting stocks (Q6.c.)

	cluster			Kruskal-Wallis-h[a]	Levene-statistic[b]	metric tests of mean differences			
	fundamen-talists (1)	tacticians (2)	methodo-logists (3)			ANOVA F-Test[c]	Games-Howell or Scheffé test, respectively[d] (2) - (1)	(3) - (1)	(3) -(2)
trading costs such as bid/offer spread	1.44	2.14	2.21	16.9*	1.6 (0.213)	9.2*	+0.69*	+0.77*	+0.07
market capitalisation	3.62	3.74	3.81	1.8 (0.413)	3.9 (0.021)	0.8 (0.437)	-	-	-
frequent news coverage and availability of independent analysts' forecasts	3.61	3.47	3.65	2.1 (0.342)	0.5 (0.623)	0.7 (0.516)	-	-	-
previous corporate development as well as stock market performance	3.44	3.93	3.63	8.9 (0.012)	11.3*	6.4*	+0.49*	+0.19	-0.30
availability of tradable derivates for transactions or as a source of additional information	.62	1.85	1.94	58.6*	10.4*	34.5*	+1.23*	+1.31*	+0.09

a. See Table 21.

b. See Table 21.

c. See Table 21.

d. See Table 21.

Table 25: Group analysis: Risk management techniques (Q5.b.)

	cluster			Kruskal-Wallis-h[a]	Levene-statistic[b]	metric tests of mean differences			
	fundamen-talists (1)	tacticians (2)	methodo-logists (3)			ANOVA F-Test[c]	Games-Howell or Scheffé test, respectively[d]		
							(2) - (1)	(3) - (1)	(3) -(2)
stop-loss techniques	.76	2.35	1.32	71.3*	2.2 (0.111)	47.0*	+1.60*	+0.56	-1.04*
hedging by means of options and futures	1.33	2.60	2.43	34.4*	6.0*	19.1*	+1.28*	+1.10*	-0.18
dynamic portfolio hedging rules	.49	1.03	1.75	28.6*	17.6*	16.4*	+0.54*	+1.26*	+0.71*
flexible weighting of cash and shares	2.50	3.81	2.43	47.8*	38.9*	32.1*	+1.31*	-0.07	-1.39*
futures and options as flexible vehicle to acquire and sell stocks	.89	1.65	1.57	20.6*	3.0 (0.049)	15.3*	+0.75*	+0.68	-0.07

a. See Table 21.

b. See Table 21.

c. See Table 21.

d. See Table 21.

Table 26: Group analysis: Information channels (Q7.a.)

	cluster			Kruskal-Wallis-h [a]	Levene-statistic [b]	metric tests of mean differences			
	fundamentalists (1)	tacticians (2)	methodologists (3)			ANOVA F-Test [c]	Games-Howell or Scheffé test, respectively [d] (2) - (1)	(3) - (1)	(3) -(2)
conversations/ exchanges of views with professional colleagues	3.47	3.68	3.52	2.7 (0.266)	3.0 (0.054)	1.2 (0.293)	-	-	-
media publications	3.25	3.55	3.56	7.9 (0.02)	0.2 (0.829)	3.5 (0.03)	-	-	-
conversations/ exchanges of views with company executives and sector experts	4.57	3.94	3.84	24.7*	5.8*	11.2*	-0.63*	-0.72*	-0.09
observed portfolio investments of other market players	1.29	2.50	1.98	55.8*	0.5 (0.615)	34.5*	+1.21*	+0.70*	-0.52*
corporate earnings estimates by external analysts	3.34	3.41	3.41	0.48 (0.787)	3.6 (0.03)	0.1 (0.873)	-	-	-
corporate earnings estimates prepared by own investment group	3.34	2.55	3.31	20.2*	1.0 (0.372)	9.3*	-0.79*	-0.03	+0.76*
economic forecasts by research institutes, banks and economic policy institutions	1.93	2.42	2.84	20.2*	0.5 (0.616)	11.7*	+0.49	+0.92*	+0.42
economic forecasts prepared by own investment group	1.95	2.35	2.86	16.1*	1.7 (0,.88)	8.6*	+0.40	+0.91*	+0.50
investment news letters	.55	1.48	.89	42.2*	6.4*	22.6*	+0.92*	+0.34	-0.59*

a. See Table 21.

b. See Table 21.

c. See Table 21.

d. See Table 21.

Table 27: The price-inertia view of the market by group (Q8.a.)

frequency in %		cluster		
		fundamen-talists	**tacticians**	**methodologists**
personal ranking	**most adequate**	85.4	64.5	59.4
	secondary	13.4	25.8	26.6
	least adequate	1.2	9.7	14.1

Figure 6: Educational background in terms of degrees earned (Q2.b.)

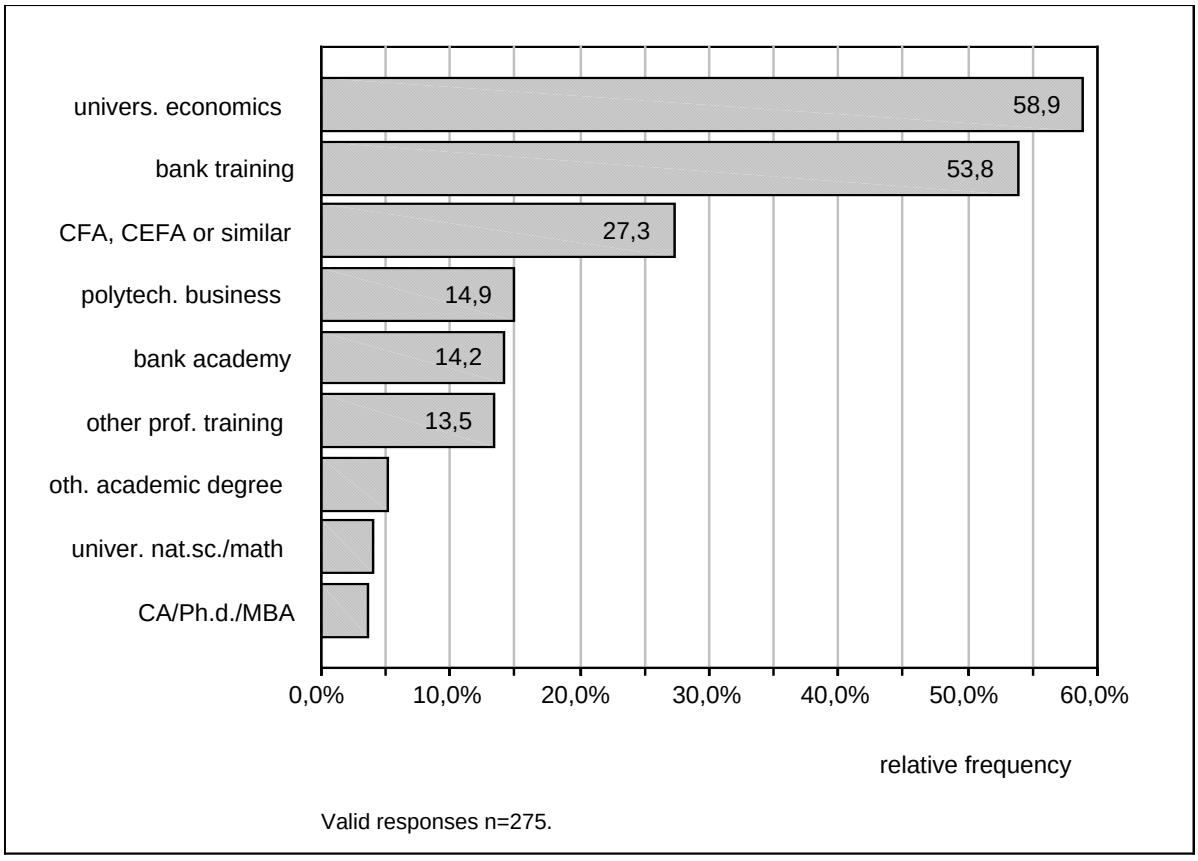


Figure 7: Finance-related education of fund managers

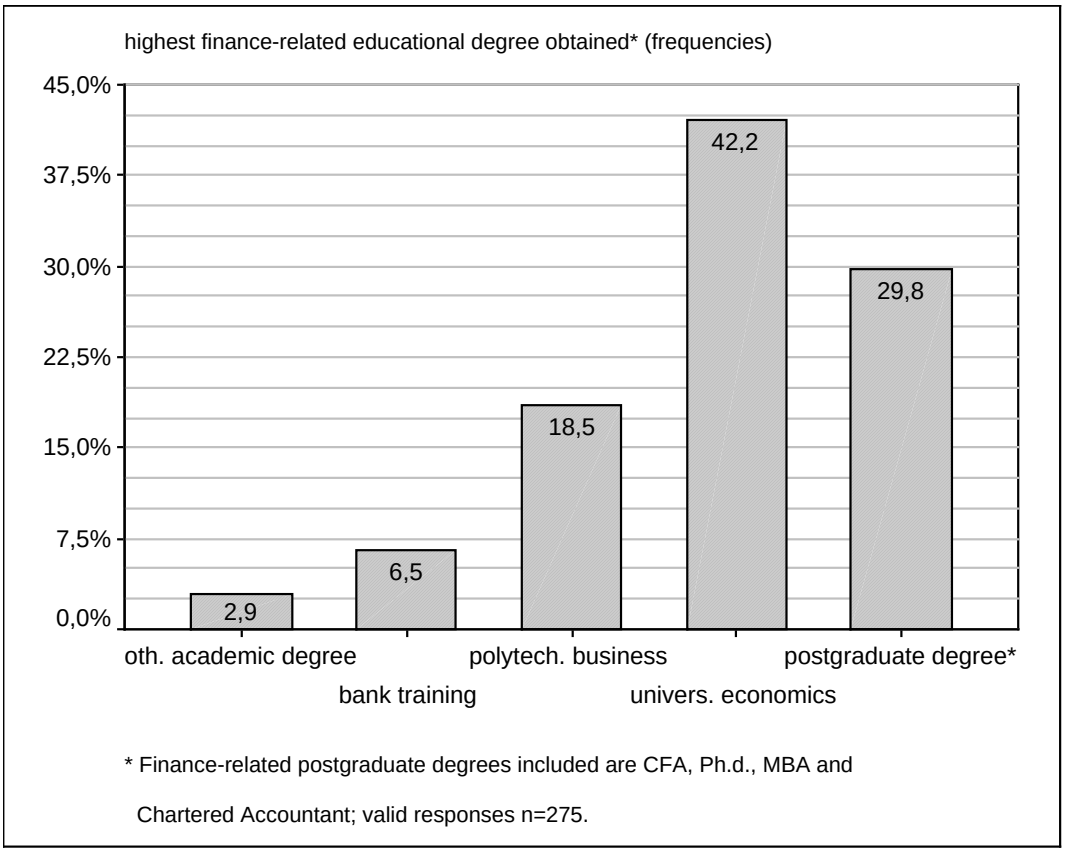


Figure 8: Description of the typical fund (Q3.d.)

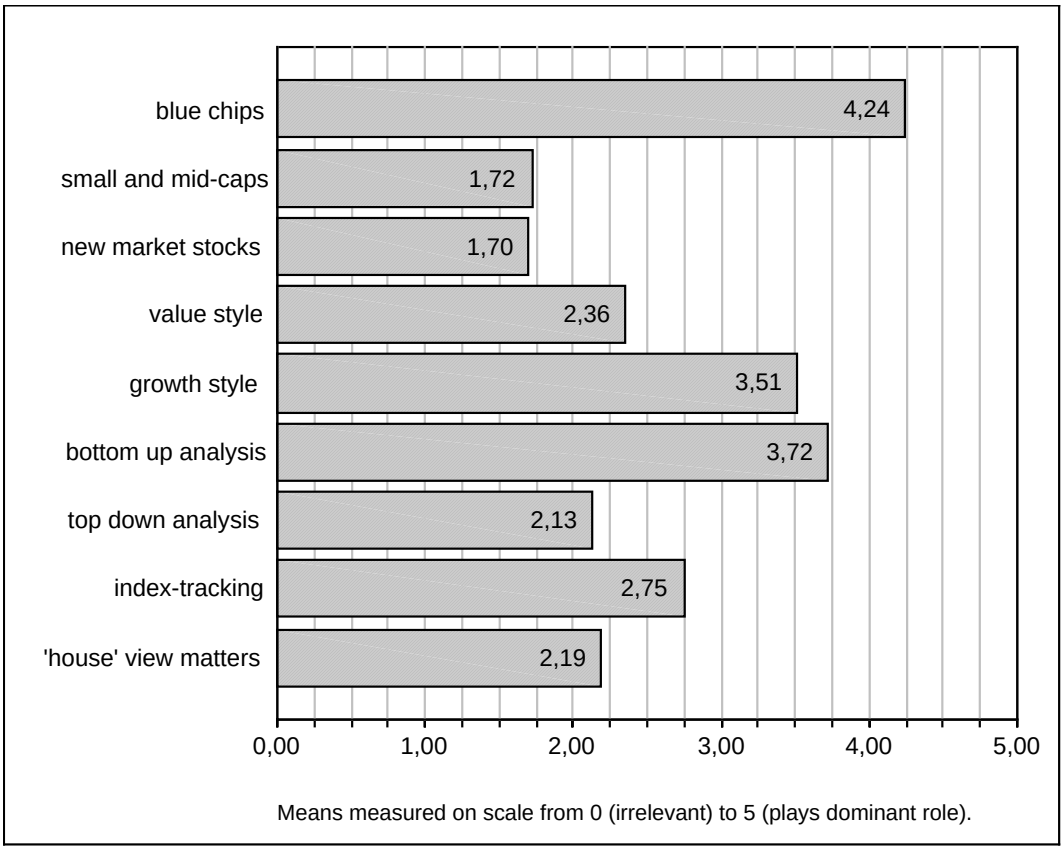


Figure 9: Framework of a stylised investment process

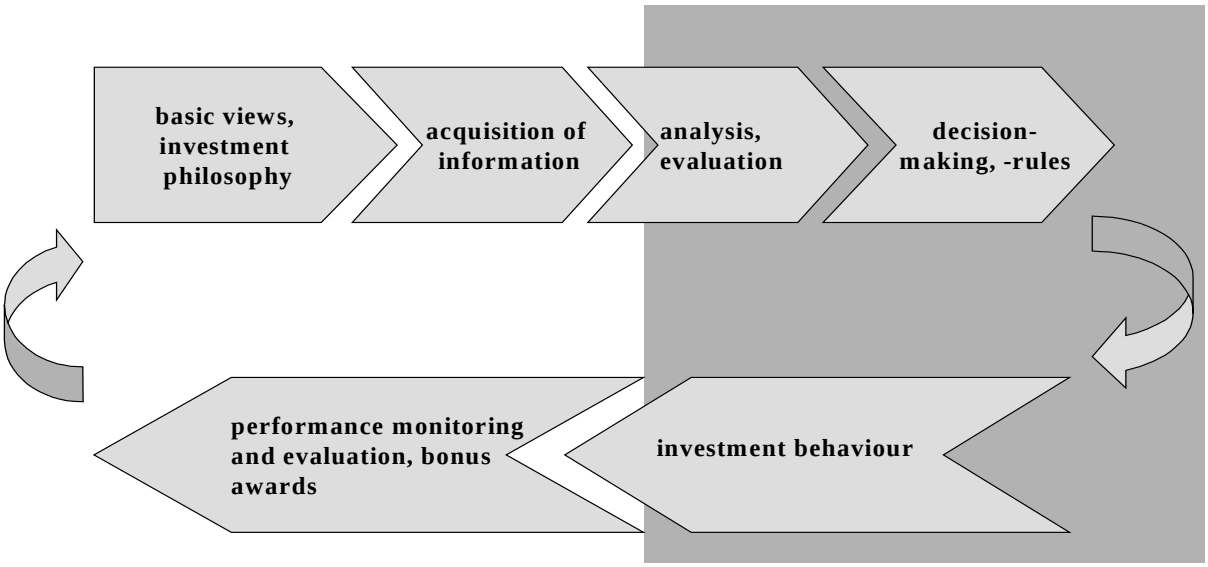
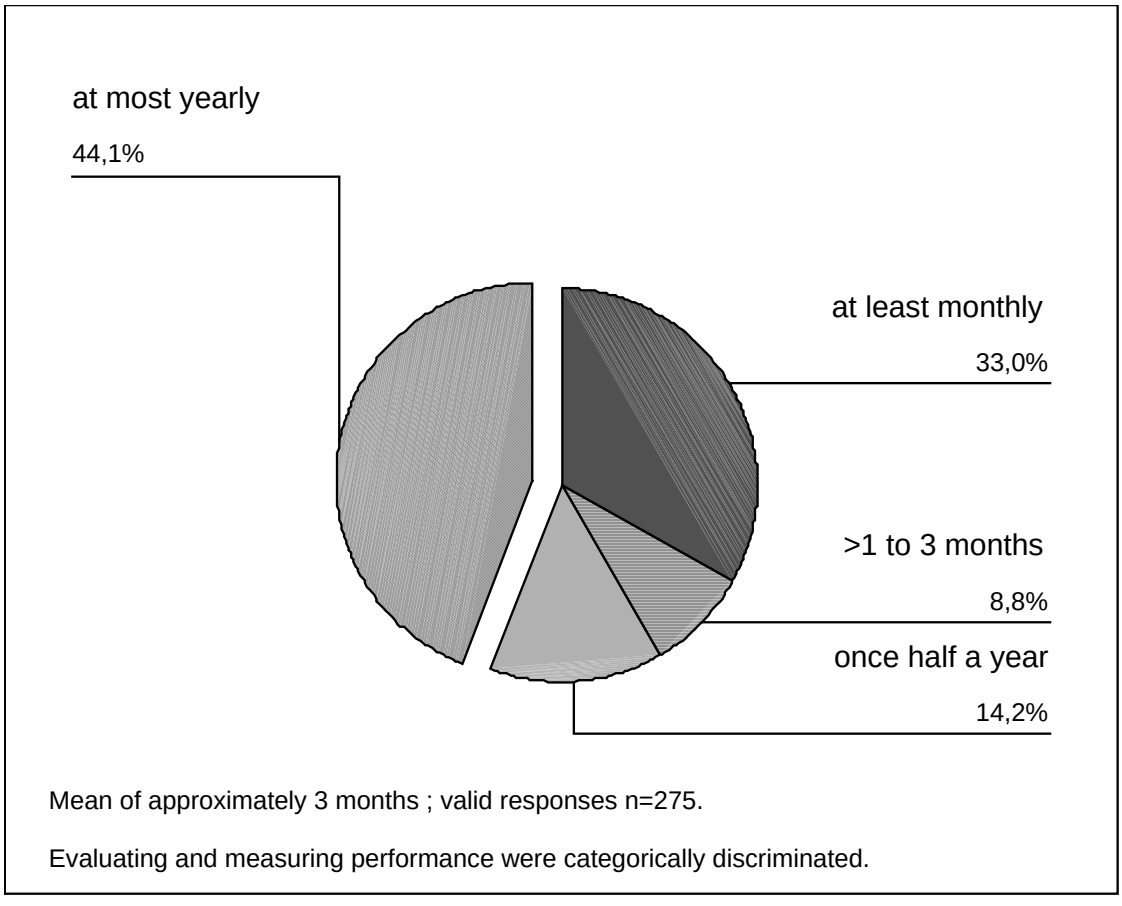


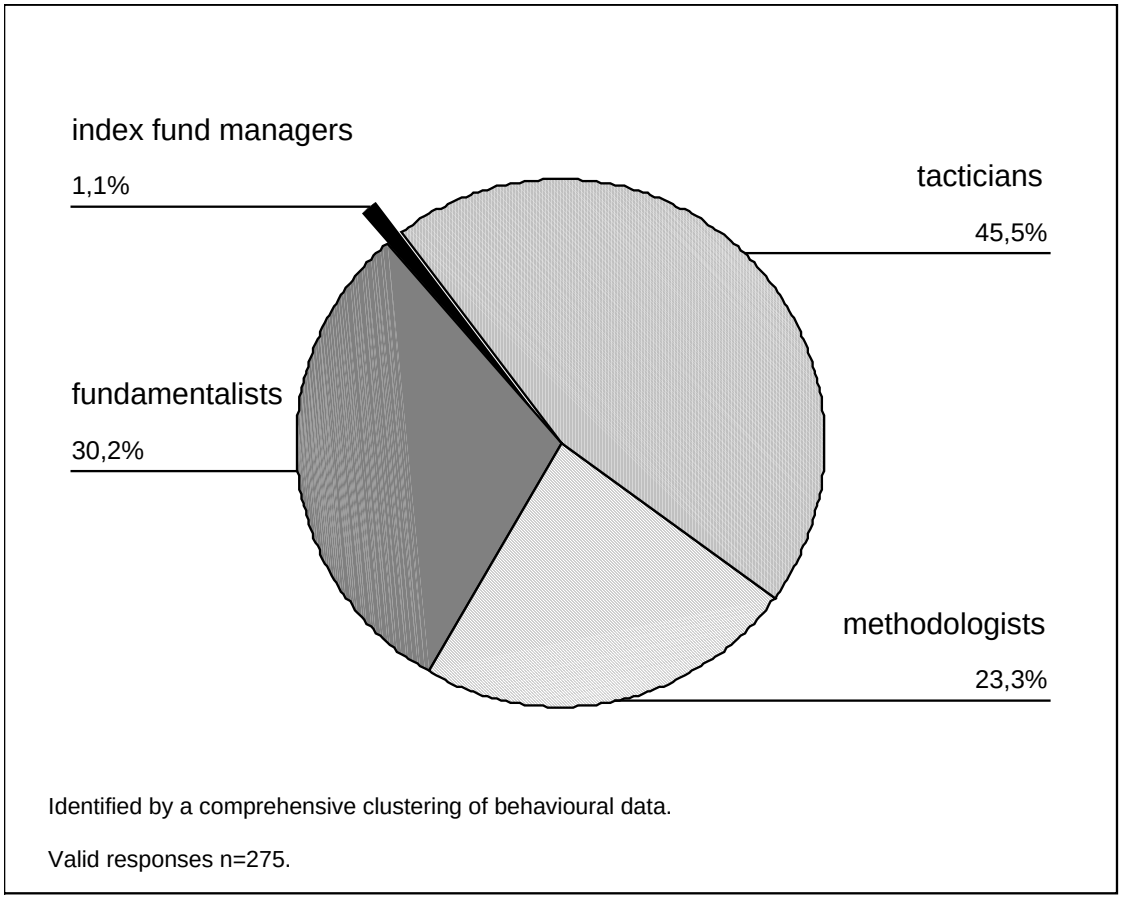
Figure 10: Frequency of performance evaluation (Q4.a.)



Mean of approximately 3 months ; valid responses n=275.

Evaluating and measuring performance were categorically discriminated.

Figure 11: Core investor types



Identified by a comprehensive clustering of behavioural data.

Valid responses n=275.

Deutsche
Bundesbank

A survey of equity fund managers on portfolio management

questionnaire

Economic Research Group

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If you like to comment on the topics touched upon in the questionnaire, we would certainly appreciate a more detailed response of yours. Please feel free to use the space provided at the end of this questionnaire for this purpose.

Q1: Data on professional status

a. Which position do you currently hold within your investment company?

1 junior equity manager.

2 senior equity manager.

3 head of equity team.

4 chief executive officer.

b. How long have you been working as a professional asset manager?

|_|_| years.

c. How large is the total volume of equity under your management, and for which you are personally responsible?

|_|_|_|_| million EURO.

I am unfortunately unable to provide specific data.

d. How do you take investment decisions for most of the funds in your charge?

Please cross only **one** category.

1 on my own responsibility, but in keeping with the investment strategy prescribed by my investment company or group.

2 on my own responsibility, there being no prescribed investment strategy in my investment company or group.

3 as a joint decision with colleagues.

4 after consultation.

5 after authorisation.

Q2: Personal data

a. How old are you?

⌊_⌋⌊_⌋ years.

b. Which educational level have you attained?

Please cross **all** the categories that are applicable in your case.

- ☐ 3-year apprenticeship as a banker, or comparable professional training.
- ☐ banking academy/technical college.
- ☐ university degree in law.
- ☐ university degree in economics or business administration.
- ☐ university degree in natural sciences/ mathematics.
- ☐ chartered accountant, M.B.A., doctorate in economics.
- ☐ C.F.A., C.E.F.A.
- ☐ doctorate or postgraduate degree in another area.
- ☐ other form of academic training
  Which? _____
- ☐ other form of vocational training.
  Which? _____

Q3: Description of the fund

a. How many analysts and portfolio managers does the entire investment group for which you work as a fund manager employ in its stock market divisions, both in its foreign branches and in the parent company?

Please answer to the best of your knowledge.

|_|_|_|_|_|

☐ I am unfortunately unable to provide specific data.

b. How large is the domestically domiciled investment company, for which you work as fund manager, as measured in terms of those assets which it manages as stocks- and mixed securities-based investment funds?

Please cross only **one** category.

1 ☐ up to € 8 billion.
2 ☐ over € 8 billion but less than € 20 billion.
3 ☐ over € 20 billion.
4 ☐ I am unfortunately unable to provide specific data.

c. In which type of fund do you primarily manage stock market investments?

Please cross only **one** category.

1 ☐ investment fund open to the general public.
2 ☐ specialised investment fund of an insurance company.
3 ☐ specialised investment fund of a credit institution.
4 ☐ other specialised fund.

d. Please describe the assignment most typical of your type of work or the largest fund which your decisions help manage.

Please cross **all** categories.

5 = very pronounced ↔ 0 = minimal.

	5	4	3	2	1	0
Investment focus: blue chips	☐	☐	☐	☐	☐	☐
Investment focus: second-tier stocks	☐	☐	☐	☐	☐	☐
Investment focus: new market stocks	☐	☐	☐	☐	☐	☐
Investment style: value-oriented	☐	☐	☐	☐	☐	☐
Investment style: growth-oriented	☐	☐	☐	☐	☐	☐
Method of analysis: bottom up	☐	☐	☐	☐	☐	☐
Method of analysis: top down	☐	☐	☐	☐	☐	☐
Investment policy: index orientation	☐	☐	☐	☐	☐	☐
Investment decisions: role played by “house opinion”	☐	☐	☐	☐	☐	☐

PLEASE TAKE ALL FURTHER QUESTIONS AS REFERRING EXCLUSIVELY TO THE TYPE OF FUND DESCRIBED ABOVE.

Q4: Performance appraisal and performance incentives

a. How often is your own personal contribution to fund performance measured?

Please cross out what does not apply.

Every ⌊_⌋⌊_⌋ years / months / weeks.

How often is your own personal contribution to fund performance appraised?

Every ⌊_⌋⌊_⌋ years / months / weeks.

b. Your personal contribution to fund performance is judged by which criteria?

Please cross **all** categories.

5 = plays a predominant role ↔ 0 = plays no role.

practical relevance:	5	4	3	2	1	0
absolute fund performance.	☐	☐	☐	☐	☐	☐
the performance of other comparable funds.	☐	☐	☐	☐	☐	☐
the difference between fund performance and a relevant market or sector index.	☐	☐	☐	☐	☐	☐
risk-adjusted measures of relative performance such as Jensen´s Alpha.	☐	☐	☐	☐	☐	☐
other criteria: which ones? _____	☐	☐	☐	☐	☐	☐

c. How large was your performance-related bonus last year, expressed as a % of your gross annual basic salary?

Please provide a rough estimate.

☐ I do not, as a rule, receive performance-related bonuses.

☐ ⌊_⌋⌊_⌋⌊_⌋ % of my annual basic salary (gross).

→ **What was the criterion used to determine the size of the bonus?**

Please cross **all** categories.

5 = plays a predominant role ↔ 0 = plays no role.

practical relevance:	5	4	3	2	1	0
absolute fund performance.	☐	☐	☐	☐	☐	☐
relative fund performance (e.g. vis-à-vis a benchmark index or the median of comparable funds).	☐	☐	☐	☐	☐	☐
the promotion of capital flows into the funds or the profitability of the investment company.	☐	☐	☐	☐	☐	☐
marketing aspects such as customer satisfaction or the acquisition of new clients.	☐	☐	☐	☐	☐	☐
in-house (subjective) appraisal by colleagues or superiors.	☐	☐	☐	☐	☐	☐

Q5: Decision procedures, attitude towards risk

a. Which method do you follow in reaching an investment decision?

Please select **only** that option which you believe corresponds most closely to your method of reaching a decision.

1 I have committed myself in advance to a few auspicious selection criteria. I reach my investment decision by weighting these criteria according to my own personal estimate of the situation and in this way I arrive at a final summary assessment.

2 The focus of my stock analysis is chosen either on a case-by-case basis or depending on the market situation and available information. I reach my investment decision by weighting these criteria according to my own personal estimate of the situation and in this way I arrive at a final summary assessment.

3 I have committed myself in advance to certain auspicious selection criteria or to a certain selection algorithm. I then set about identifying stocks that satisfy these criteria. My investment decisions follow, as a matter of course, from these criteria.

b. What is your primary means of adequately hedging positions in the portfolios you manage, assuming you hedge your portfolio at all?

Please cross **all** categories.

5 = plays a predominant role ↔ 0 = plays no role.

practical relevance:	5	4	3	2	1	0
stop-loss techniques.	■	■	■	■	■	■
hedging transactions involving options/ futures contracts.	■	■	■	■	■	■
dynamic hedging of the entire portfolio through the rule-governed weighting of stocks and cash.	■	■	■	■	■	■
flexible weighting of shares and cash, depending on how I read the current market situation.	■	■	■	■	■	■
I use futures contracts and options almost exclusively to ensure flexibility in taking or abandoning investment positions or to acquire stocks at good value.	■	■	■	■	■	■

c. Which of the following attempts at a definition best reflects your personal understanding of the risk posed by stock market investments?

Please indicate an **order of priority** by assigning the number one to the definition to which you personally ascribe the most importance in your work, and the number four to the definition with the least importance.

Stock market investments involve a special kind of risk because …

_____ the wide variety of investment opportunities makes it easy to overlook the better ones.

_____ significant price losses may be sustained.

_____ the value of the portfolio may be subject to considerable fluctuations.

_____ there is a significant danger of performance falling below a specific benchmark.

d. As a fund manager, you bear a heavy responsibility on account of the investment capital that has been entrusted to you, and must take decisions in the face of uncertainty and under time pressure.

In which of the following situations are you most likely to experience particular tension?

Please indicate an **order of priority** by assigning the number one to the situation that you consider most likely to cause tension, and the number five to the situation that is least likely to have this effect.

_____ a period in which there is a sharp rise in market prices

_____ a period in which there is a sharp fall in market prices

_____ a period in which the price trend remains unclear

_____ a period prior to the announced publication of important macroeconomic data or of economic policy decisions.

_____ a period prior to the announced publication of important corporate data or decisions.

e. Please try to imagine a situation in which your portfolio underperformed significantly.

How long would you, generally speaking, refrain from modifying your investment strategy?

Please cross out what does not apply.

☐ Up to ⌊__⌋⌊__⌋ years/months/weeks.

☐ From the outset, the investment strategy was so conceived that significant underperformance results in an automatic adjustment of the strategy.

Q6: Evaluation methods

a. Please rate the importance of the following potential buy signals for the inclusion of stocks in the portfolio that you manage:

Please cross **all** categories.

5 = strong buy signal ↔ 0 = no purchasing demand.

strength of the buy signal:	5	4	3	2	1	0
an above-average rise in market price accompanied by an increase in turnover.	■	■	■	■	■	■
a market price that has stabilised at a level significantly lower than its all-time high.	■	■	■	■	■	■
growing expectations concerning higher dividends.	■	■	■	■	■	■
the raising of corporate earnings estinates by analysts.	■	■	■	■	■	■
observed purchases by other institutional investors.	■	■	■	■	■	■
corporate announcements and statements that are perceived as being positive.	■	■	■	■	■	■
a low valuation, on a cross-market or cross-sector comparison, based on profit expectations for the coming financial years.	■	■	■	■	■	■

b. Which method of analysis do you primarily apply to the selection of stocks?

Please cross **all** categories.

5 = plays a predominant role ↔ 0 = plays no role.

practical relevance:	5	4	3	2	1	0
technical analysis of price trends, price formation and turnover trends.	■	■	■	■	■	■
fundamental analysis based on forecast factors.	■	■	■	■	■	■
a structural econometric estimate of single- or multiple-factor models.	■	■	■	■	■	■
a portfolio optimisation approach, based on estimated yields and covariances.	■	■	■	■	■	■

How far in the future does the forecasting horizon for your different portfolios typically, i.e. on average, lie?

Please cross **all** categories. Enter 00 if that particular method of analysis is not employed by you.

Technical analysis/chart analysis: ⌊_|_⌋ years/months/days.

Fundamental analysis: ⌊_|_⌋ years/months/days.

Single- or multiple-factor models: ⌊_|_⌋ years/months/days.

Portfolio optimisation approach: ⌊_|_⌋ years/months/days.

c. To which other criteria do you attribute special importance when taking investment decisions?

Please cross **all** categories.

5 = plays a predominant role ↔ 0 = plays no role.

practical relevance:	5	4	3	2	1	0
trading costs, such as bid-offer spread.	■	■	■	■	■	■
market capitalisation.	■	■	■	■	■	■
frequent reports and availability of independent analysts' estimates.	■	■	■	■	■	■
previous corporate development as well as performance on stock market.	■	■	■	■	■	■
availability of tradable derivatives for transactions or as a source of additional information.	■	■	■	■	■	■

Q7: Data procurement

a. Please rate the following sources of information in terms of their personal importance for you in conducting your work.

Please cross **all** categories.

5 = plays a predominant role ↔ 0 = plays no role.

practical relevance:	5	4	3	2	1	0
conversations/ exchanges of views with professional colleagues.	■	■	■	■	■	■
publications in the financial press and electronic media.	■	■	■	■	■	■
conversations/exchanges of views with company executives and sector experts.	■	■	■	■	■	■
studying the portfolio investments of other market players.	■	■	■	■	■	■
official corporate earnings estimates by external analysts.	■	■	■	■	■	■
corporate forecasts prepared by own investment company.	■	■	■	■	■	■
economic forecasts by research institutes, banks and economic policy institutions.	■	■	■	■	■	■
economic forecasts prepared by own investment company.	■	■	■	■	■	■
information from investment news letters.	■	■	■	■	■	■

b. What do you consider the best way to achieve above-average performance?

Please indicate an **order of priority** by assigning the number one to the criterion to which you personally ascribe the most importance in your work and the number four to the criterion with the least importance.

_____ by actively searching for new information that is relevant to decision-making.

_____ by subjecting data and information already known to in-depth analysis.

_____ by acting promptly on receipt of new information.

_____ achieving above-average performance seems to me to be more a matter of chance than design.

Q8: Basic views, investment philosophy

a. Which of the following attitudes corresponds most closely to your basic view of how the market segment which is most relevant to your work functions?

Please indicate an **order of priority** by assigning the number one to the criterion to which you personally ascribe the most importance in your work, and the number three to the criterion with the least importance.

_____ Market participants often tend to respond inappropriately at first to new information. Hence particular profits may best be earned over the short term by positioning one-self correctly at the right time.

_____ Investors are often slow to recognise new trends and developments, and only gradually price new information into market prices. Hence particular profits may best be earned over the longer term by strategically positioning oneself.

_____ In general, most companies in the market are evaluated fairly, since market prices tend to reflect most of the accessible information.

b. Which of the following best describes the guiding principle which you pursued in compiling your present portfolio?

Please cross **all** categories.

5 = plays a dominant role ↔ 0 = plays no role.

strength of the buy signal:	5	4	3	2	1	0
I expect above-average dividends and pay-outs in future from each of the shares included in your portfolio.	■	■	■	■	■	■
I expect each of the shares included in your portfolio to experience above-average increases in their market price.	■	■	■	■	■	■
I expect each of the stocks included in your portfolio to contribute to a diversification of market risk.	■	■	■	■	■	■
I include stocks in my portfolio such that a specific stock market index is replicated.	■	■	■	■	■	■
I am guided by other expectations (e.g. tax or balance-sheet advantages for investors): _____	■	■	■	■	■	■

Further comments

If you wish to provide any further information (participation entirely optional), we would, of course, be greatly interested in learning more about your views on the topics mentioned in the questionnaire. Please make brief informal comments (e.g. using key words) in the space provided below.

Return of the questionnaire

Please avoid writing **either** your name **or** that of your investment company anywhere on the questionnaire.

Place the completed questionnaire in the large, postage-prepaid envelope provided and mail the sealed envelope to us.

To show our appreciation we have already reserved a copy of the research study in which you have just participated for your own personal use. In order to ensure that you receive your free copy, please place your name and address on the accompanying postage-prepaid card to confirm your participation. Please return this card to us **under separate cover.**

Thank you for your assistance.

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