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**IAS versus US GAAP:
A "New Market" Based Comparison**

**No.48
January 2000**



WORKING PAPER SERIES: FINANCE & ACCOUNTING

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Comments welcome

First draft: 7. August 1999
Revised: 17. November 1999

* I acknowledge helpful comments from Anne d'Arcy, Peter Knutson and workshop participants at Tilburg University and JW Goethe University Frankfurt. I would also like to thank Mark-Andreas Weth (Deutsche Börse AG) and Rainer Jäger (PwC) for generously providing data for this study, and Tobias Herwig for his excellent research assistance.

IAS versus US GAAP:

A "New Market" Based Comparison

Abstract

This paper investigates whether firms employing IAS or US GAAP exhibit measurable differences in proxies for information asymmetry and market liquidity. Sample firms are drawn from the "New Market" at the Frankfurt Stock Exchange. All firms listed in this market segment are required to provide financial statements in accordance with either IAS or US GAAP as part of the listing agreement. The sample choice provides a market-based comparison of the two standards holding disclosure requirements and standard enforcement constant. I find that differences in the bid-ask spread and trading volume are relatively small and more likely to be driven by firm characteristics than the choice of accounting standards. In contrast, New Market firms have lower spreads and higher turnover when compared with size-matched firms in other market segments following German GAAP. The results suggest that rigid disclosure regulation of the New Market matters in terms of information asymmetry and liquidity, but that the choice between IAS and US GAAP is of second order importance.

JEL Classification: D82, G30, M41

Keywords: Disclosure, IAS, US GAAP, Neuer Markt, Liquidity

1. Introduction

The globalization of capital markets has created a demand for a single set of universally accepted, high-quality accounting standards (Levitt, 1998). In the ensuing competition among accounting standards, International Accounting Standards (IAS) and US generally accepted accounting principles (US GAAP) are the prime contenders. Challenging FASB and US GAAP, the IASC is currently seeking the endorsement of its revised IAS by IOSCO for cross-border listing and the approval by the SEC for security offerings of foreign issuers in the US.

There has been much debate about the quality of IAS and its comparability to US GAAP (e.g., McGreggor, 1999). But as others have noted, there is little market-based research that explicitly compares the two standards and hence could assist the SEC and IOSCO in their assessment of revised IAS.¹ The current policy debate is often based on conjectures and on comparisons of the stipulated accounting methods. Based on its recent comparison project, the FASB concludes that IAS are inferior to US GAAP (*WSJ*, 10/18/1999). It is, however, not obvious whether the ascertained differences between the two standards matter to investors and hence have any discernible economic consequences in capital markets.

This study exploits a recent innovation in the German institutional setting to provide a market-based comparison of (revised) IAS and US GAAP. The sample comprises firms listed at the so called "New Market" of the Frankfurt Stock Exchange, a market segment designated to innovative growth firms. Its salient feature is that all firms in this segment have to prepare financial statements in accordance with IAS or US GAAP as part of the listing agreement with the exchange. This requirement yields a sample of firms employing IAS or US GAAP, for which many important institutional factors are held constant by

¹ See e.g. Frost and Lang (1996) and Pownall and Schipper (1999).

design. In particular, sample firms face the same capital market and disclosure regulation as well as comparable enforcement of accounting standards.

Using this unique experimental setting, I investigate whether US GAAP and IAS firms exhibit measurable differences in proxies for information asymmetry and market liquidity - two constructs that are of primary concern to security and accounting regulation (e.g., Levitt, 1998). Economic theory suggests that more and higher quality disclosure should result in less information asymmetry and more liquid markets (e.g., Copeland and Galai, 1983; Glosten and Milgrom, 1985; Diamond and Verrecchia, 1991). Thus, if US GAAP provide more and higher quality as is frequently claimed, firms employing US GAAP should experience lower information asymmetry and higher liquidity than firms using IAS.

The main result of the paper is that differences in the bid-ask spread and trading volume across IAS and US GAAP firms are relatively small. They appear to be driven more by firm characteristics than the choice of accounting standards. That is, controlling for firm characteristics, the differences across the two groups become insignificant. However, I find that New Market firms exhibit lower (higher) spreads (turnover) than size-matched firms using German GAAP and trading in market segments with less rigid disclosure requirements.²

Thus, the evidence suggests that rigid disclosure regulation and international reporting standards result in comparatively low bid-ask spreads and high share turnover, but that the choice between IAS and US GAAP is of second order importance to market participants. It is conceivable that the current policy debate based on a comparison of the standards per se exaggerates differences between IAS and US GAAP and that IAS are comparable to US

² Similarly, Leuz and Verrecchia (1999) find that IAS or US GAAP reporting is associated with lower bid-ask spreads and higher share turnover compared to German GAAP reporting. They are also unable to document significant differences across IAS and US GAAP firms, but their comparison is based on a relatively small sample.

GAAP once they are embedded in the same regulatory framework and subject to the same enforcement as US GAAP in US security markets.

An obvious alternative explanation for my findings is that the performed tests lack the power to detect the differences in the proxies across IAS and US GAAP firms. Gauging the power of my tests, I find that a 10% (20%) difference in the bid-ask spread (share turnover) would be detectable. That is, even if measurement error is responsible for the insignificant results, the marginal effect of US GAAP reporting appears to be relatively small. Recall also that the tests detect significant differences in the spread and turnover when compared to firms using German GAAP.

Nevertheless, the results of this study should be viewed as preliminary and interpreted cautiously. In particular, my inferences are subject to the following caveats. First, note that firms choose their accounting standards. Thus, my results are only valid to the extent that I have appropriately controlled for selection bias. Second, it is not clear that findings for New Market firms can be extrapolated to firms in more mature industries and other market segments. For instance, it is conceivable that financial statements (of any kind) are not as important for the valuation of growth firms. On the other hand, New Market firms are dependent on equity markets as a source of capital which makes disclosure issues pertinent to them. Finally, many of the sample firms have a relatively short trading and financial reporting history. Thus, the market's current assessment of the quality of the standards may be based more on expectations than actual experience.

Despite these limitations, the paper provides novel evidence on the comparability of IAS and US GAAP that is in line with other recent findings. Harris and Muller (1999) examine Form 20-F reconciliations from IAS to US GAAP and conclude that based on the reconciliation amounts IAS are closer to US GAAP than other foreign GAAP. They also

find that the reconciliations are incrementally value relevant.³ Note, however, that prior research provides little evidence that investors actually use Form 20-F reconciliations (e.g., Amir, Harris and Venuti, 1993; Bandyopadhyay, Hanna and Richardson, 1994; Karamanou and Ready, 1999).

Furthermore, the evidence in Harris and Muller (1999) on the relative value relevance of IAS and US GAAP accounting measures is inconclusive; neither standard dominates the other in terms of a higher association with stock prices and returns.⁴ Ashbaugh and Olsson (1999) find that IAS and US GAAP are equally value relevant based on a sample of non-US firms quoted on SEAQ, but that the relative value relevance depends on the valuation model used.

Finally, note that all previous studies are based on firms that are traded in the US and generally subject to SEC enforcement. This makes it difficult to disentangle reporting, listing and enforcement effects.⁵ In contrast, this study provides evidence using firms that apply US GAAP or IAS, but do not trade on US markets and are not subject to SEC enforcement.

The remainder of the paper is organized as follows. Section 2 provides institutional details on the New Market at the Frankfurt Stock Exchange. Section 3 develops the hypothesis of the paper. Section 4 presents the results of the market-based comparison. Section 5 examines the determinants of the standard choice and addresses a potential self-selection bias. Section 6 concludes the paper.

³ See Saudagaran and Meek (1997) and Pownall and Schipper (1999) for extensive surveys of the literature on the value relevance of non-US GAAP compared to US GAAP accounting numbers as well as the value relevance of Form 20-F reconciliations from non-US GAAP to US GAAP.

⁴ See also Venkatachalam (1999). Davis-Friday and Rueschhoff (1999) provide complementary evidence on the association between IAS accounting numbers and US market prices.

⁵ This holds also for the study by Ashbaugh and Olsson (1999). Although they select firms quoted on SEAQ, the vast majority of their sample is also traded in the US and many are subject to SEC enforcement.

2. The "New Market" at the Frankfurt Stock Exchange

Launched in March 1997 as fourth German stock market segment, the "Neue Markt" has attracted more than 160 listings. In terms of market capitalization and number of listings, the New Market has become Europe's most successful stock market for growth firms (see *Financial Times*, 10/13/1999, p. 27). Its success is in part attributed to relatively strict disclosure and listing requirements (see *The Economist*, 1/9/1999, p. 69-71).

Following the example set by NASDAQ, the New Market is geared towards smaller and medium-size companies in innovative and fast growing industries. These firms are generally characterized by substantial uncertainty about the prospects of their business and about the expertise of their management. Hence, the disclosure and listing requirements have been designed to ensure transparency and investor protection.⁶ They are stricter than those in the more traditional market segments.

The rules and regulations of the New Market ("Regelwerk") stipulate that the market value of the initial public offering (IPO) has to exceed 10 mill. DEM, of which at least 50 percent have to be newly raised capital. The minimum free float at the IPO is 20 percent, but should generally exceed 25 percent. In addition, old shareholders are required to keep their position for six-month after the going public. There are extensive and detailed disclosure requirements for the IPO prospectus (see Regelwerk, § 4). In particular, firms have to provide financial statements in accordance with either IAS or US GAAP for the current year and comparative figures from the two previous fiscal years.⁷

Subsequently, firms have to prepare annual financial statements following either IAS or US GAAP, which have to be published at the latest four months after the fiscal year end

⁶ See <http://www.exchange.de/regelwerk/index.html>

⁷ If the firm has experienced major changes in its organizational structure (e.g., due to acquisitions) in the last three years, pro-forma statements for the previous two fiscal years have to be provided on the basis of the current organizational structure in order to ensure comparability (see Regelwerk § 4.1.8).

(see Regelwerk, § 7). Alternatively, firms may provide financial statements based on German GAAP together with a reconciliation to either IAS or US GAAP, similar to Item 18 of the Form 20-F filing for the SEC.⁸ But only a small number of firms use this option (see section 4.1). In addition, firms are required to publish quarterly reports two month after the end of the quarter and to hold an annual conference for financial analysts.

Annual financial statements have to be audited. But neither the exchange nor any other German institution monitors the proper application and interpretation of IAS or US GAAP. Moreover, the vast majority of firms is not listed in the US and hence not subject to SEC enforcement. For those firms, the enforcement of accounting standards is purely auditor-based and hence comparable across IAS and US GAAP firms in the sample. Note, however, that this may imply that US GAAP are not applied as rigorously as under the scrutiny of the SEC (see *Frankfurter Allgemeine Zeitung*, 10/4/1999, p. 33).

Shares in the New Market are traded simultaneously on the floor and on an electronic trading platform (Xetra), which allows all traders to post limit orders. Floor trading is organized as an auction system only. The "Skontroführer", who has exclusive access to the order book, determines the prices in and between three daily auctions and constantly provides price estimates ("Preistaxen") reflecting the total order flow. The electronic trading system is a hybrid between an auction and market-maker system. The market-maker function is performed by designated sponsors ("Betreuer"), who must be authorized dealers at the Frankfurt Stock Exchange.⁹ They provide binding bid and ask quotes for the three daily auctions and upon request by a market participant (with a maximum response

⁸ A reconciliation from non-German GAAP to either IAS or US GAAP firms, however, is not deemed acceptable by the stock exchange.

⁹ See Designated Sponsor Guide, <http://www.exchange.de>

time of 120 seconds).¹⁰ The minimum quote volume is 20,000 EUR and quoted spreads cannot exceed 4%. The performance of the designated sponsors is monitored by the exchange. First empirical studies suggest that designated sponsors facilitate larger trades and that they have a stabilizing, but not dominating role in the New Market.¹¹

Each New Market firm has to name at least two designated sponsors. To ensure sponsoring, firms enter into private agreements with banks, typically those in the IPO consortium. Aside from providing liquidity, sponsors are expected to furnish regular research reports on the firms to which they designated. They may also advise these firms in future security offerings, support their investor relations activities and actively sell these stocks to institutional investors.¹² Note, however, that the designated sponsors have to comply with the rules on insider trading.

3. Hypothesis Development and Research Design

Economic theory suggests that information asymmetries among potential buyers and sellers of firm shares introduce adverse selection into secondary share markets and hence reduce their liquidity (e.g., Copeland and Galai, 1983; Kyle, 1985; Glosten and Milgrom, 1985). Information asymmetries are costly to firms as they have to compensate investors for holding shares in illiquid markets. Increasing the level and precision of disclosure reduces the likelihood of information asymmetries arising among potential buyers and sellers of firm shares and in turn should increase liquidity and decrease the firm's cost of capital (e.g., Diamond and Verrecchia, 1991).¹³

¹⁰ To be precise, the participation rules specify that over the course of a month the designated sponsor has to participate in at least 80% of the auctions and must answer at least 65% of the quote requests. See Designated Sponsor Guide.

¹¹ See Theissen (1998) and in particular Gerke and Bosch (1999).

¹² See Francioni (1997) and Designated Sponsor Guide.

¹³ See Welker (1995), Botosan (1997), and Leuz and Verrecchia (1999) for evidence supporting this line of reasoning.

Drawing on this logic, regulators have used disclosure requirements to "level the playing field" among investors and to "increase investor confidence", i.e., to reduce information asymmetries and increase liquidity (e.g., Sutton, 1997). In particular, exchange-listed firms have to provide financial statements on a regular basis. Although there are other requirements, financial statements are generally considered as one of the most important disclosure instruments (e.g., AMIR, 1993). The effectiveness of this disclosure instrument, however, depends critically on the quality of the accounting standards. For this reason, the SEC has always stressed the importance of high quality accounting standards for the capital markets (e.g., Sutton, 1997; Levitt, 1998).

Thus, information asymmetries and liquidity should reflect in part the quality of accounting standards. Previous studies have documented that proxies for information asymmetry and market liquidity capture cross-sectional differences in disclosure policy (e.g., Welker, 1995). This logic suggests a market-based assessment of the two competing standards. Higher quality accounting standards imply *ceteris paribus* less information asymmetry and more liquid markets. Thus, if US GAAP are in fact of higher quality than IAS, I expect firms employing US GAAP to exhibit less information asymmetry and higher liquidity than firms using IAS.

To test this hypothesis, I analyze whether IAS and US GAAP firms trading in the New Market exhibit cross-sectional differences in the bid-ask spread and share turnover, both of which are standard proxies for information asymmetry and market liquidity. A salient feature of this research design is that many institutional factors can be held constant. In particular, the sample can be chosen such that all firms trade only in the New Market, operate in the same legal environment, and that accounting standards are interpreted and enforced only by the auditor. Moreover, the choice of IAS or US GAAP has no immediate tax or dividend implications.

An obvious concern with the research design is that the choice between the two standards may give rise to selection bias. Presumably, firms trade off the costs and benefits of IAS and US GAAP. Unfortunately, the precise nature of these costs and benefits as well as the standard choice itself are not yet well understood.¹⁴ For this reason, I report results from simple OLS regressions as well as from two-stage procedures attempting to control for selection bias.

4. Information Asymmetry, Liquidity and Standard Choice

4.1 Descriptive Statistics and Univariate Analysis

Currently, more than 160 firms are listed in the "New Market". Many of them, however, are traded for a few months only. To have a reasonable trading history based on which I compute the proxies, the sample comprises only firms that are listed as of 4/30/1999. This requirement reduces the sample to 90 firms. Eleven of these firms are incorporated outside of Germany. Moreover, the sample comprises eleven firms that are listed at foreign exchanges, of which seven are trading on NASDAQ or the NYSE and hence are subject to Form 20-F filings with the SEC. Eliminating firms that are incorporated outside Germany or listed abroad ensure maximum comparability across firms, but it also reduces sample size to 74 firms. Hence, I estimate the regressions using both the full as well as the reduced sample. Table 1 presents descriptive information on place of incorporation, foreign listings as well as industry composition of the sample. Note that about a third of the sample firms belong to the software industry.

Table 2 reports the accounting choices of the New Market firms for the 1998 annual report, i.e., fiscal years ending between 5/1/98 and 4/30/99. Panel A shows that IAS and US GAAP are equally distributed across firms. Based on the full sample, each of the two

¹⁴ Peemöller et al. (1999) provide some evidence based on a survey of 28 New Market firms. See section 5

standards is chosen by 43 firms while 4 firms still provide German GAAP statements.¹⁵ The vast majority of firms provides full IAS or US GAAP statements. Only 4 firms use the option to prepare German GAAP statements together with a reconciliation to IAS (=2) or US GAAP (=2). In the reduced sample, the number of US GAAP firms decreases relative to the number of IAS firms because all eight firms trading in the US provide full US GAAP statements.

Panel B reports the accounting choices by industry. IAS and US GAAP firms are fairly evenly distributed within most industries. Only for Automotives and Merchandising there seems to be an "industry standard".

Following the literature, I use the bid-ask spread and share turnover as proxies for information asymmetry and market liquidity. For each sample firm, I compute the average bid-ask spread over two months from 05/31/99 to 07/30/99.¹⁶ During this time period, the financial statements, based on which the accounting choices in table 2 are recorded, were available to investors. In particular, the firms with fiscal year end in December have just published their 1998 annual report as well as the first 1999 quarterly report.¹⁷

Panel A of table 3 reports descriptive statistics for the bid-ask spreads for each reporting strategy. The mean (median) bid-ask spread of the US GAAP firms is somewhat lower than the mean (median) bid-ask spread of the IAS firms, but these differences are not statistically significant ($p_{t\text{-test}} = 0.129$ and $p_{MWW} = 0.130$) using a two-sided t-test (Mann-

for details.

¹⁵ Based on the rules and regulations of the New Market, the exchange may allow firms to provide German GAAP statements in the IPO prospectus as well as German GAAP annual reports for up to two years if they are temporarily unable to prepare IAS or US GAAP statements.

¹⁶ Data has been provided by the Frankfurt Stock Exchange. The spread is expressed as a percentage, i.e., it is computed as the difference between the best ask and the best bid divided by the midpoint. The Exchange provides for each stock an average monthly spread using *all* spreads that existed in the XETRA trading system. That is, every new spread that results from a change of either the best bid or the best ask is equally weighted.

Whitney-Wilcoxon test). The finding that the p-values are relatively close to the 10% significance level is driven by US GAAP firms trading in the US. The spreads of these firms are considerably lower than the spreads of the other US GAAP firms trading only in Germany. The mean (median) spread of these two groups are statistically different at the 10% (5%) level. Eliminating firms trading in the US, the spreads of the US GAAP firms are still somewhat lower than those of IAS firms, but the mean and the median of the two groups become statistically indistinguishable ($p_{t\text{-test}} = 0.368$ and $p_{MWW} = 0.383$).

The average daily share turnover is computed over three months from 05/1/99 to 07/30/99.¹⁸ Panel A of table 3 reports descriptive statistics for the share turnover for each reporting strategy. I find only minor differences among IAS and US GAAP firms. While IAS firms appear to have a slightly higher turnover, the mean (median) turnover of the two groups is not statistically different using a two-sided t-test (Mann-Whitney-Wilcoxon test). Note that US GAAP firms trading in the US have a lower median turnover than those trading only in Germany. Although the medians are not statistically different, the lower turnover of firms trading in the US may reflect that the turnover computations do not include US trading volume.

In summary, the differences across US GAAP and IAS firms are small and insignificant. But these univariate comparisons do not control for firm characteristics across the two groups. Panel B of table 3 presents descriptive statistics on firm characteristics. There are considerable differences between IAS and US GAAP firms. Due the small number of observations, firms following German GAAP or providing a reconciliation are not further

¹⁷ The rules and regulations of the New Market require firms to publish their annual (quarterly) report at the latest 4 (2) months after the fiscal year end. The full sample contains only 13 firms whose fiscal year end is not in December. Dropping these firms from the sample does not materially alter my results.

¹⁸ Daily turnover is expressed as percentage and computed as the market value of daily volume divided by daily market value of equity. I use three months to have at least 60 trading days based on which the average is computed. Using the first seven months of 1999 to calculate the average turnover yields very similar results.

considered. Comparing the medians across the two groups, US GAAP firms are larger (in terms of market capitalization, sales and number of employees), more leveraged and slightly more profitable (in terms of the operating margin). IAS firms have less often a "Big Five" auditor, a higher free float and a higher book-to-market ratio. There are only minor differences in the number of days traded since the IPO, the number of designated sponsors and in share price volatility. Thus, it obvious that any comparison of the two groups needs to control for firm characteristics. In addition, it may be important to control for selection bias.

4.2 Regression Analysis

In this section, I study cross-sectional differences in the bid-ask spread and share turnover between IAS and US GAAP firms. After eliminating two outliers from the sample,¹⁹ the sample comprises 40 IAS and 40 US GAAP firms. The reduced sample, which excludes firms with foreign listing or foreign incorporation, comprises 38 IAS and 28 US GAAP firms.

Bid-Ask Spreads

In modeling the bid-ask spread regression, I follow the extant literature. Based on prior research, the relative spread is expected to be negatively associated with trading volume, market value, market-maker competition, and positively associated with share price volatility and the presence of insiders (e.g., Stoll, 1978; Chiang and Venkatesh, 1988; Glosten and Harris, 1988). In particular, I use the firm's share turnover, average market capitalization and share price volatility, computed from 5/1/99 to 7/31/99.²⁰ As proxy for

¹⁹ The two observations exhibit an extremely large bid-ask spread and share turnover, respectively. Including these firms in the regressions yields qualitatively similar results and does not change my conclusions.

²⁰ Note that turnover is used as opposed to trading volume to avoid multi-collinearity problems with market capitalization.

the presence of insiders, the firm's free float is included in the model.²¹ As the designated sponsors perform market-maker functions, I use their number to control for market-maker competition.

A binary variable indicates the firm's reporting strategy (US GAAP=1). Provided that the bid-ask spread is an appropriate proxy for the existence of information asymmetries, I expect to find a negative coefficient for the dummy variable, i.e., lower spreads for US GAAP firms, if in fact IAS are of lower quality than US GAAP. As most analytical models identify multiplicative relationships between the spread and its determinants (e.g., Stoll, 1978; Glosten and Milgrom, 1985), I estimate a log-linear specification.

The correlation statistics in panel A of table 4 and regression diagnostics suggested by Belsley et al. (1980) suggest that multi-collinearity among the independent variables is not a problem.²² Panel B of table 4 presents the coefficients and t-statistics using an OLS regression and White-corrected standard errors. Results are reported for the full and the reduced sample. Both models are highly significant and explain about 75% of the variation in the relative bid-ask spreads. In both cases, the coefficient of the reporting dummy is negative as predicted, but not significant. All other variables also have the expected signs and are highly significant, except the number of designated sponsors. The latter coefficient has the predicted sign, but is not significant at conventional levels.

In summary, OLS regressions produce no evidence that firms employing US GAAP have lower bid-ask spreads than firms using IAS. Furthermore, comparing the results for the full and the reduced sample, there is no evidence that US GAAP firms trading in the US experience lower bid-ask spreads after controlling for firm size, trading volume,

²¹ Using the percentage of shares held by management and family is a better proxy for the presence of insiders. Unfortunately, this data is not available for all firms. To check my results, I estimate the regressions for the subset of firms, for which the data is available (n=73). This produces very similar results.

volatility, and free float. Including a dummy variable indicating US trading in the full sample regression confirms this finding.

Share Turnover

The turnover model is also based on the extant literature. Prior studies suggest that share turnover is positively associated with volatility, institutional ownership, and negatively associated with firm size (e.g., Tkac, 1999).²³ Note, however, that the sign of firm size in a *turnover* regression is not a priori obvious as pointed out by Leuz and Verrecchia (1999). Moreover, as some of the New Market firms are too small for institutional investors, I expect size to proxy for institutional holdings, for which Tkac (1999) finds a positive association.

The firm's average market capitalization and share price volatility are computed from 5/1/99 to 7/31/99. I also include the firm's free float in the model to control for the fact that a positive association with share turnover follows almost by definition.²⁴ In addition, Gerke and Bosch (1999) find that the trading volume of New Market firms is inflated for some time after the IPO. As my sample includes a larger fraction of firms with a relatively short trading history, I control for this effect, which is expected to slowly fade over time. Therefore, I use the natural logarithm of the number of days since the firm's IPO.²⁵ Again, a binary variable indicates the firm's reporting strategy (US GAAP=1).

As dependent variable, I use the median daily turnover at the Frankfurt Stock Exchange from 5/1/99 to 7/31/99. The reason for this choice is that the median turnover is likely to be

²² That is, the condition number as well as variance inflation are well below the suggested critical values.

²³ Another determinant of turnover may be index inclusion. A New Market index was introduced for the first time on 7/1/99. Using a dummy for index membership does not have any material effect on the results of the spread and the turnover regressions.

²⁴ Including the number of designated sponsors in the model (as in the spread regression) leaves the results virtually unchanged. The coefficient is positive as expected, but has a p-value=0.607.

²⁵ Using this variable in the spread regression produces an insignificant coefficient and does not alter the results reported in table 4. Note, however, that this variable is important in the turnover regression.

a better proxy for the level of daily liquidity trading than the average turnover, which may be influenced by a few days of heavy trading around on some event.²⁶ Provided that median share turnover is an appropriate proxy for market liquidity, I expect to find a positive coefficient for the dummy variable, i.e., higher share turnover for US GAAP firms, if in fact IAS are of lower quality than US GAAP. As mentioned before, multi-collinearity among the independent variables does not appear to be a problem. Following the spread model, I estimate a log-linear specification. Note, however, that a linear specification yields similar results.

Panel C of table 4 reports the coefficients and t-statistics using an OLS regression and White-corrected standard errors. Results are reported for both the full and the reduced sample. Both models are highly significant. The R^2 s are lower than in the spread model, but comparable to those of similar turnover models reported in the literature (e.g., Tkac, 1999; Leuz and Verrecchia, 1999). In both regressions, the reporting dummy is insignificant. All other coefficients have the predicted signs and are highly significant, except the coefficient on share price volatility in the reduced sample regression that has a two-sided p-value = 0.125 only.

Although the coefficient on US GAAP reporting is insignificant, the regression on reduced sample suggests that share turnover is *negatively* associated with US GAAP reporting, which is in contrast to my research hypothesis. Note that this result is *not* driven by US GAAP firms that are trading abroad and hence may have a lower turnover at the Frankfurt Stock Exchange precisely because these firms are excluded in the reduced

Although the results are qualitatively unchanged, dropping this variable considerably reduces the R^2 of the regression.

²⁶ Using the average turnover produces very similar results except that the coefficient on US GAAP reporting is always negative (but insignificant).

sample.²⁷ Confirming this conclusion, a dummy variable indicating US trading is insignificant in the full sample. In summary, there is no evidence that US GAAP firms have a higher share turnover than IAS firms after controlling for firm size, volatility, free float and the number of days since the IPO.

Industry Effects

Table 3 shows that US GAAP and IAS firms exhibit substantial differences in firm characteristics (beyond those controlled for in the OLS regression).²⁸ One way to control for firm characteristics is to use industry dummies because firms in the same industry are likely to exhibit similar firm characteristics. I control for industry effects based on the classification in panel C of table 1.²⁹ Introducing seven industry dummies into the spread model leaves all coefficients and significance levels virtually unchanged. None of the industry dummies turns out to be significant. In the turnover model, there are weak industry effects for telecommunications and merchandising. However, the introduction of industry dummy does not materially affect the other coefficients and their significance levels as reported in table 4. Thus, industry effects do not seem to be responsible for the insignificance of US GAAP reporting in both the spread and the turnover model.

Assessment of the Test Power

One obvious concern about the results presented in table 4 is that my tests may lack sufficient power to detect differences in bid-ask spread or turnover across US GAAP and IAS firms, in particular as the sample is relatively small. However, the standard errors of the reporting coefficient in the spread (turnover) model suggest that I would be able to

²⁷ Note further that this result is not driven by collinearities among the independent variables. Eliminating variables in the model does not alter the sign of the reporting dummy.

²⁸ A related concern that firms choose their reporting strategy considering the costs and benefits of either standard and hence that the above OLS regressions may suffer from self-selection bias is addressed in the next section.

²⁹ To reduce the number of dummy variables, I have further aggregated electronics and computer hardware as well as special machinery and automotives.

reject the null hypothesis at the 5% level if the marginal effect of US GAAP reporting was larger than 10% (20%). Provided that the estimated coefficients are consistent, the regressions in table 4 suggest that the marginal effect of US GAAP reporting on the bid-ask spread and share turnover is much smaller. In contrast, Leuz and Verrecchia (1999) report that the marginal effect of IAS or US GAAP reporting compared to German GAAP reporting is much larger than 10% (20%) for the bid-ask spread (turnover). Thus, while there are substantial differences in the proxies across German GAAP firms and those following either IAS or US GAAP, the choice between IAS or US GAAP does not seem to have a measurable effect on information asymmetry and liquidity. This issue is further explored in the next section.

4.3 Comparison of New Market and German GAAP firms

Another way to gauge my results is to compare spreads and turnover in the New Market and in other German market segments. As described in section 2, New Market firms face stricter disclosure requirements as part of the listing agreement than firms in more traditional market segments. In particular, firms in the MDAX index do not have to follow international reporting and disclosure standards. Thus, a comparison across the two market segments is a way to check whether differences in the disclosure requirements can be detected in the spreads and share turnover.

To control for size differences, I match 42 New Market and 42 MDAX firms based on market capitalization as of 4/30/99.³⁰ All MDAX sample firms provide German GAAP financial statements. Note also that the market microstructure is very similar across the two market segments, which is another reason for choosing MDAX firms for this comparison.³¹ Panel A of table 5 provides descriptive statistics as well as univariate tests for the bid-ask

³⁰ The remaining New Market firms are too small to have counterpart in the MDAX.

spread and share turnover. I find that the mean and median bid-ask spread (share turnover) is significantly lower (higher) for the New Market firms compared to the MDAX firms.³² This comparison, however, does not control for the determinants of spreads and turnover. Panel A shows that New Market and MDAX firms also exhibit considerable differences in volatility and free float.

To control for these differences, I estimate regressions for the bid-ask spread and share turnover using a binary variable to indicate a New Market firm (=1). I use the same log-linear specification as in section 4. Panels B and C of table 5 report the coefficients and t-statistics using OLS and White-corrected standard errors. In the spread regression, the variable indicating New Market firms has a significantly negative coefficient as predicted by the univariate tests. The regression suggests that New Market firms have on average a 20% lower bid-ask spread than MDAX firms of similar size. In the turnover regression, the dummy variable for New Market firms has a significantly positive coefficient (albeit at the 10% level only using a two-sided test). Thus, the results confirm the univariate findings, but demonstrate that it is important to control for volatility and free float.³³ According to the regression, New Market firms have a share turnover that on average is 27% higher than the turnover of size-matched MDAX firms. Finally, to see whether these results may be driven by New Market firms trading in the US, I eliminate these observations (and the corresponding MDAX firm) from the sample. The regressions based on the reduced sample produce very similar results as the regressions based on all 84 firms.

³¹ In particular, the rules and regulations for designated sponsoring are *identical* for the 35 MDAX2 firms and very close for the others. See Designated Sponsor Guide (<http://www.exchange.de>).

³² In an earlier study, Theissen (1998) compares the bid-ask spread and share turnover for 5 firms in New Market and in MDAX stock index. He finds that the bid-ask spreads are comparable across the two market segments and that turnover is higher for New Market firms.

³³ The sign and insignificance of firm size is in contrast to the findings in table 4. Recall, however, that firms are matched based on size and that turnover is scaled by market capitalization.

These findings show that standard choice is not always irrelevant. Moreover, they are remarkable because one might expect that holding disclosure constant young growth firms, such as the firms in the New Market, are characterized by more information asymmetry and less liquidity than more traditional firms with a longer trading history. New Market firms, however, commit to an increased level of disclosure compared to a listing in other market segments. A higher disclosure level is ensured by the New Market regulation. Thus, taken together, the results in section 4 and section 5 suggest that a commitment to increased disclosure is associated with lower spreads and higher turnover, but that, given the disclosure regulation of the New Market, the choice between IAS and US GAAP is of second order importance in terms of proxies for information asymmetry and liquidity.

5. Determinants of Standard Choice and Self-Selection

In this section, I investigate the determinants of the standard choice and analyze whether previous results are affected by selection bias. To control for the fact that firms can choose between IAS and US GAAP, I estimate a so-called "treatment effects" model (see Maddala, 1983):

$$d_i^* = \gamma' z_i + \varepsilon_i \quad (1)$$

where $d_i = 1$ if $d_i^* > 0$ and $d_i = 0$ otherwise, and

$$y_i = \beta' x_i + \delta d_i + u_i \quad (2)$$

with d_i^* as *unobservable* net benefit (or loss) of US GAAP reporting, d_i as the firm's reporting choice (US GAAP=1), z_i as vector of explanatory variables, y_i as the firm's bid-ask spread (or turnover), x_i as vector of exogenous determinants of the spread (turnover), u_i and ε_i as normally distributed disturbances.

In the first stage, I analyze the firm's decision to adopt IAS or US GAAP using a probit model. In the second stage, I estimate the association between the bid-ask spread (turnover)

and the firm's reporting choice as well as other firm characteristics taking into account that the reporting variable is endogenous. That is, I include the inverse Mills ratio, which is obtained from the probit model, to account for self-selection. In addition, the standard errors are adjusted to account for the correlation between the equations (Maddala, 1983, pp. 252-256).

The key role of the first stage is to control for self-selection and endogeneity using proxies for the (expected) costs and benefits of US GAAP versus IAS accounting. Unfortunately, the precise nature of these costs and benefits are not yet well understood and there is not much analytical or empirical research on firms' choices between IAS and US GAAP.

Peemöller et al. (1999) survey 26 New Market firms with respect to their standard choice. About 25% of the respondents following IAS (8) cite comparability with competitors as a motive for their standard choice, while the competitors' standard choices play a role for more than 40% of the respondents following US GAAP (18). Half of the US GAAP firms also indicate that their decision is related to an existing or intended listing in the US. However, more than 60% of the IAS firms expect the SEC's acceptance of IAS for US listings. The latter would increase the likelihood of a future US listing for more than 40% of the IAS firms. In addition, 25% of the IAS firms value the discretion in the accounting standards and 37.5% state that IAS are closer to German GAAP. While such findings help understanding firms' standard choices and provide useful hints, they are based on a very small (and unbalanced) sample. Moreover, they are difficult to incorporate into an empirical study.

An alternative approach is to bring to bear the extant empirical literature on voluntary disclosures. These studies analyze firms' decisions to provide voluntarily more and higher quality information (e.g., Lang and Lundholm, 1993; Botosan and Frost, 1998). Thus,

under the hypothesis that US GAAP are higher quality accounting standards than IAS, the determinants identified in these studies may also explain the choice of US GAAP by New Market firms. In addition, studies analyzing accounting standard choices in some other context may provide valuable insights. For instance, Harris and Muller (1999) examine the decision of non-US firms to adopt IAS and list in the US. Leuz and Verrecchia (1999) analyze the decision of German firms to switch from German GAAP to either IAS or US GAAP.

Reviewing this literature, firm size, financing needs, and firm performance emerge as the main determinants of corporate disclosures. While the first two are expected and generally found to be positively associated with additional and higher quality disclosures, the sign of firm performance may depend on the context and the type of information (e.g., Lang and Lundholm, 1993). In addition, analyst following and foreign listings are in general positively associated with corporate disclosures.³⁴ But as 7 out of 8 sample firms trading in the US essentially have to follow US GAAP, I eliminate all firms with a foreign listing from the sample and hence do not need to control for this variable.

Thus, based on the hypothesis that US GAAP are of higher quality information than IAS, the choice of US GAAP is modeled as a function of firm size (+), financing needs (+), firm performance (?), and analyst following (+). I also use a binary variable indicating a Big Five auditor (+), and industry dummies because firms' choices may be affected by the standard choices of their competitors as reported by Peemöller et al. (1999).

An additional obstacle in finding proxies for the above determinants is that variables based on accounting numbers are influenced by firms' standard choices. For this reason, I refrain from using accounting-based variables wherever possible. Firm size is measured as the market capitalization as of 4/30/99. Financing needs are measured as the average sales

growth in the last two fiscal years. In addition, I include the firm's free float to control for the firm's ownership structure.³⁵ Performance is measured as the firm's return since its IPO.³⁶ To control for analyst following, I use the number of designated sponsors because they are expected to provide regular in-depth research reports on the firm (see section 2). The results are similar using the number of analysts following the firm. Industry dummies are based on the industry classification reported in panel C of table 1 (see also footnote 29).

Table 6 reports coefficients and z-statistics for the probit model. Firm size, sales growth, designated sponsors and Big five auditor have the predicted signs. Free float, however, exhibits a negative (albeit insignificant) sign. A possible explanation is that US GAAP firms intend to list in US in the future and therefore have retained a larger fraction of the firm. Note, however, that the z-statistics of most variables are relatively low. Firm size is the only significant variable and the return since the IPO is close to conventional significance levels (p-value=0.1026). However, the overall fit of the model is acceptable. Note that the industry dummies contribute substantially to the fit of the model.

Therefore, I use the probit model including the industry dummies to generate an inverse Mills ratios. The latter term is then introduced into the spread and turnover regressions to account for self-selection. In both regressions (unreported), the estimated coefficients for the inverse Mills ratio are insignificant (t-statistics = -0.671 and 0.893, respectively). In the bid-ask spread regression, the coefficients for US GAAP reporting is now positive, but has a very low t-statistic. In the turnover regression, the coefficient is negative and slightly larger than before, but again does not attain conventional significance levels. The

³⁴ See Lang and Lundholm (1996) and Saudagaran and Meek (1997), respectively.

³⁵ Another candidate is leverage. Botosan and Frost (1998) and Harris and Muller (1999) provide evidence that highly leveraged firms disclose more. In my model, however, leverage is insignificant and controlling for it does not materially alter the results reported below. the book-to-market ratio to control for financing needs does not affect my results. Note also that both variables are influenced by the accounting standard chosen.

coefficients of all other control variables are virtually unchanged in both regressions. Thus, self-selection does not appear to have an impact on my results reported in table 4.³⁷

Obviously, this conclusion hinges on how well the probit model controls for self-selection. Given the relatively low significance levels of many variables, the tests should mitigate, but not eliminate all concerns about self-selection. Thus, until we improve our understanding of firms' standard choices, this issue remains unresolved. Note, however, that low significance levels are consistent with my findings in sections 4 and 5. If in fact IAS and US GAAP are relatively close in terms of proxies for information asymmetry and liquidity and hence the standard choice is of second-order importance to firms, as my results suggest, then I would *not* expect to find high significance levels for proxies that are chosen based on the hypothesis that US GAAP are of higher quality than IAS.

6. Conclusions and Caveats

In recent years, there has been much discussion about the quality of IAS and its comparability to US GAAP. The policy debate has frequently focused on differences between the accounting standards. However, there is little market-based research examining whether these differences in the accounting standards matter in financial markets.

This study contributes to this debate in providing a market-based comparison of IAS and US GAAP. I investigate whether New Market firms employing IAS or US GAAP exhibit measurable differences with respect to proxies for information asymmetry and market liquidity. The paper exploits the fact that firms trading in the "New Market" of the

³⁶ Alternative, but accounting-based measures are the operating margin or return on assets. These variables produce similar results, albeit at lower significance levels.

³⁷ To check whether endogeneity of spreads and turnover affects my results, I estimate the bid-ask spread and the turnover regressions simultaneously, including spread on the right hand side of the turnover regression. The results, however, are qualitatively similar to those reported above – in particular, the reporting coefficient remains insignificant.

Frankfurt Stock Exchange have to provide financial statements in accordance with either IAS or US GAAP as part of the listing agreement. This requirement yields a sample of firms, for which many institutional factors, in particular disclosure requirements and enforcement of the accounting standards, are held constant. In this setting, I find no evidence that US GAAP reporting is associated with lower bid-ask spreads or higher share turnover when controlling for other determinants. The results are inconsistent with the hypothesis that US GAAP are of higher quality than IAS and hence reduce information asymmetry and increase liquidity in equity markets compared to IAS.

Previous studies find that expanded (voluntary) disclosure are associated with lower bid-ask spreads and higher turnover. Taken together, my findings suggest that given the New Market regulation stipulating timely annual and quarterly reports, annual analyst conferences, and ad-hoc disclosures, the choice between IAS and US GAAP is of second order importance. Consistent with this interpretation, I find that firms trading in less-regulated market segments and following German GAAP exhibit significantly higher spreads and lower turnover than size-matched New Market firms.

However, any market-based comparison of accounting standards is plagued by methodological difficulties and data limitations. This study is no exception. In particular, my inferences are subject to the following caveats. While confining attention to the New Market is one of the advantages of this study, it is also one of its limitations. New Market firms are young and innovative growth firms. Hence, it is not clear that the results extend to firms in more mature industries and trading in other market segments.

Another concern is that financial statements are not the only disclosure instrument. It is conceivable that IAS firms compensate deficiencies in the accounting standards by improved investor relations. Leuz and Verrecchia (1999) report, however, that for German DAX 100 firms the two disclosure instruments are more likely to be complements than

substitutes. Moreover, the regulation of the New Market stipulates that all companies have to entertain an annual analyst conference, leveling the playing field to some extent. Note further that the spread regression controls for the number of designated sponsors, which are expected to support firms in their investor relations.

Finally, firms choose their accounting standards. Thus, my results are only valid to the extent that I have appropriately controlled for self-selection. Two-stage regressions suggest that self-selection does not influence the results and inferences in a major way, but this conclusion hinges on the disclosure model used to explain firms' standard choices.

In summary, the results of this study should be viewed as preliminary and as suggesting further market-based research. In this regard, the role of enforcement seems to be a particularly important issue to explore. In this study, the enforcement is solely auditor-based and comparable across the two standards. Thus, it is conceivable that differences between IAS and US GAAP found in other empirical studies are mainly due to stricter enforcement of US GAAP by the SEC. More research is necessary to answer this question.

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Table 1
Sample Description

Panel A: Place of Incorporation	Number of Firms
Germany	79
Netherlands	4
USA	4
Switzerland	2
Israel	1
Panel B: Foreign Listings	
NYSE	1
NASDAQ	6
US OTC	1
Swiss Exchange	2
EASDAQ	1
Panel C: Industry Composition	
Software	34
Media & Publishing	11
Electronics	8
Computer Hardware	6
Health	6
Telecommunication	6
Merchandising	5
Special Machinery	5
Automotives	3
Others	6

As of 4/30/99, 90 firms were listed in the New Market. The industry classification is based on two-digit industry codes.

Table 2**Panel A: Accounting Standard Choices in New Market**

Financial Statement in 1998	Full sample (n=90)	Reduced sample (n=74)
German GAAP only ¹	4	4
German GAAP with Reconciliation	IAS: 2 US GAAP: 2	IAS: 2 US GAAP: 2
IAS	41	38
US GAAP	41	28

The full sample comprises all 90 firms listed in the New Market as of 4/30/99. The reduced sample excludes firms with a foreign listing or incorporated outside of Germany.

¹ Based on the rules and regulations for the New Market, the exchange may allow a firm to provide German GAAP statements in the IPO prospectus as well as German GAAP annual reports for up to two years if the firm is temporarily unable to prepare IAS or US GAAP statements.

Panel B: Distribution of Accounting Standards by Industry

	German GAAP only	German GAAP with Reconciliation	IAS	US GAAP
Software	1	-	16	17
Media & Publishing	-	1 (IAS)	6	4
Electronics	2	1 (US)	2	3
Computer Hardware	1	-	2	3
Health	-	-	3	3
Telecommunication	-	-	3	3
Merchandising	-	-	5	0
Special Machinery	-	-	2	3
Automotives	-	1 (US)	0	2
Others	-	1 (IAS)	2	3

Based on all 90 firms listed in the New Market as of 4/30/99 and two-digit industry codes.

Table 3**Panel A: Descriptive Statistics for the Dependent Variables and Univariate Tests**

Variable	Standard	Number	Mean	Median	Std. Dev.
Bid-ask spread	All	89 ¹	2.194	2.209	0.774
	G GAAP only	4	2.771	2.192	1.646
	G GAAP & Reconciliation	4	2.176	2.186	0.783
	IAS	41	2.287	2.266	0.770
	US GAAP	40 ¹	2.044	2.138	0.648
	US GAAP w/o US listing	32	2.133	2.203	0.648
	US GAAP with US listing ²	8	1.685*	1.616**	0.549
Share turnover	All	89 ³	1.055	0.963	0.539
	German GAAP only	4	0.567	0.623	0.216
	German GAAP & Reconciliation	4	1.060	1.060	0.261
	IAS	40 ³	1.167	1.021	0.655
	US GAAP	41	0.992	0.952	0.414
	US GAAP w/o US listing	33	0.985	0.962	0.416
	US GAAP with US listing	8	1.025	0.872	0.430

Spread data has been provided by the Deutsche Börse AG. The spread is expressed as a percentage, i.e., it is computed as the difference between the best ask and the best bid divided by the midpoint. The exchange provides an average monthly spread for each stock using *all* spreads that existed in the XETRA trading system. I compute the average percentage bid-ask spread from 5/31/99 to 7/30/99. Daily turnover is expressed as percentage and computed from 5/1/99 to 7/30/99 as the market value of daily volume divided by daily market value of equity. Turnover has been obtained from Datastream.

¹ I eliminated one outlier with an average spread of more than 7%.

² The asterisks indicate that the mean (median) bid-ask spread of US GAAP firms trading in the US is statistically different at the 5% (10%) level from those trading only in Germany based on a t-test (Mann-Whitney-Wilcoxon test).

³ I eliminated one outlier with an average turnover above 4%.

Table 3 continued**Panel B: Descriptive Statistics of Firm Characteristics**

Variable	Reporting	Number	Mean	Median	Std. Dev.
Market capitalization	IAS	40	474.21	235.98	792.40
	US GAAP	40	624.17	389.75	705.84
	ALL	80	549.19	268.75	749.41
Sales	IAS	38	89.04	31.48	154.98
	US GAAP	40	61.02	47.25	53.72
	ALL	78	74.67	39.09	116.09
Employees	IAS	38	363	220	534
	US GAAP	40	446	302	422
	ALL	78	406	238	480
Days listed in the New Market	IAS	40	305	287	216
	US GAAP	40	288	270	196
	ALL	80	296	270	205
Leverage	IAS	40	0.107	0.064	0.121
	US GAAP	40	0.205	0.095	0.260
	ALL	80	0.156	0.073	0.208
Operating margin	IAS	38	0.063	0.061	0.095
	US GAAP	40	-0.220	0.070	0.781
	ALL	78	-0.082	0.064	0.571
Big five auditor	IAS	40	0.475	0.000	0.506
	US GAAP	40	0.625	1.000	0.490
	ALL	80	0.550	1.000	0.501
No. designated sponsors	IAS	40	2.300	2.000	0.564
	US GAAP	40	2.650	2.000	1.027
	ALL	80	2.475	2.000	0.842
Free float	IAS	40	0.416	0.383	0.185
	US GAAP	40	0.383	0.299	0.182
	ALL	80	0.399	0.354	0.183
Book-to-market ratio	IAS	40	0.170	0.081	0.262
	US GAAP	40	0.124	0.063	0.164
	ALL	80	0.147	0.072	0.219
Share price volatility	IAS	40	0.036	0.035	0.010
	US GAAP	40	0.034	0.035	0.009
	ALL	80	0.035	0.035	0.009

The differences in sample size across the variables arise due to missing data. As in Panel A, two outliers are eliminated from the sample. The market capitalization (in mill. Euro), the number of days listed in the New Market since the IPO, and the number of designated sponsors are measured as of 4/30/99. Sales (in mill. Euro), the number of employees, leverage (=noncurrent assets divided by total assets), operating margin (=operating income divided by sales), big five auditor (=1 and zero otherwise), and free float are measured as of the fiscal year end between 5/1/98 and 4/30/99. The book-to-market ratio is the book value as of the fiscal year end divided by the market capitalization as of 4/30/99. Share price volatility is computed as the standard deviation of daily returns from 5/1/99 to 7/31/99. Share price data has been obtained from Datastream. All other financial data has been obtained from annual reports, the Bloomberg database and the New Market webpage of the Deutsche Börse AG (<http://www.exchange.de>).

Table 4**Panel A: Pearson Correlations of the Regression Variables**

	US GAAP	Mkt. Cap.	Share turnover	Volatility	Free Float	Designated sponsors
Mkt. Cap.	0.051	1.000				
Share turnover	-0.158	0.004	1.000			
Volatility	-0.085	-0.091	0.415	1.000		
Free float	-0.092	-0.032	0.189	-0.346	1.000	
Desig. sponsors	0.209	0.192	-0.149	-0.304	0.243	1.000
Days traded in NM	-0.042	0.239	-0.281	-0.376	0.341	0.366

Based on the full sample (=80 firms). Correlations based on the reduced sample and/or the natural logarithms of the variables are very similar.

Panel B: Bid-Ask Spread Model

$$\log(\text{percentage spread}) = \gamma_1 + \gamma_2 \text{US GAAP} + \gamma_3 \log(\text{size}) + \gamma_4 \log(\text{turnover}) + \gamma_5 \log(\text{volatility}) \\ + \gamma_6 \log(\text{free float}) + \gamma_7 \log(\text{no. design. sponsors}) + \varepsilon$$

	Full sample		Reduced sample	
	Coefficients	t-statistics	Coefficients	t-statistics
Constant	2.9099 ***	8.5648	3.0145 ***	8.1867
US GAAP (-)	-0.0203	-0.4667	-0.0227	-0.4919
Firm size (-)	-0.2612 ***	-13.1042	-0.2645 ***	-11.6067
Share turnover (-)	-0.1917 ***	-3.7203	-0.1945 ***	-3.4577
Volatility (+)	0.2420 ***	2.9084	0.2679 ***	2.8123
Free float (-)	-0.1497 ***	-2.7862	-0.1950 ***	-3.0778
Designated sponsors(-)	-0.0581	-0.7737	-0.1119	-1.0257
Adj. R squared	0.7547		0.7410	
F-statistic	41.5077 ***		31.9973 ***	

*** indicates a p-value < 0.01 based on a two-sided test. Expected signs are in parentheses. The full sample comprises 80 firms listed in the New Market as of 4/30/99 and providing IAS or US GAAP financial statements. The reduced sample comprises 66 observations and excludes firms that are traded abroad or incorporated outside of Germany. For the definitions of the variables see table 3.

Panel C: Turnover Model

$$\log(\text{median turnover}) = \gamma_1 + \gamma_2 \text{ US GAAP} + \gamma_3 \log(\text{size}) + \gamma_4 \log(\text{volatility}) + \gamma_5 \log(\text{free float}) \\ + \gamma_6 \log(\text{no. days listed}) + \varepsilon$$

	Full sample		Reduced Sample	
	Coefficients	t-statistics	Coefficients	t-statistics
Constant	3.5598 ***	3.7250	2.4280 ***	2.6291
US GAAP (+)	0.0206	0.2153	-0.0570	-0.6436
Firm size (+)	0.1260 ***	2.9989	0.1738 ***	4.2116
Volatility (+)	0.6452 ***	4.2715	0.8571	5.3346
Free float (+)	0.8411 ***	3.0089	0.3917 ***	1.5541
No. days listed in NM (-)	-0.2114 ***	-3.8644	-0.2792 ***	-5.1503
Adj. R squared	0.4168		0.5012	
F-statistic	12.3925 ***		14.0647 ***	

*** indicates a p-value < 0.01 based on a two-sided test. Expected signs are in parentheses. The full sample comprises 80 firms listed in the New Market as of 4/30/99 and providing IAS or US GAAP financial statements. The reduced sample comprises 66 observations and excludes firms that are traded abroad or incorporated outside of Germany. For the definitions of the variables see table 3.

Table 5
Comparison of Bid-Ask Spreads and Share Turnover of New Market and MDAX firms

Panel A: Descriptive Statistics and Univariate Tests

	New Market (IAS or US GAAP)		MDAX (German GAAP)	
	Mean	Median	Mean	Median
Bid-Ask Spread (%)	1.764	1.684**	2.399	2.019
Share Turnover (%)	7.204	6.750***	3.979	3.472
Size	912.37	587.76	891.78	626.04
Volatility	0.559	0.543	0.322	0.304
Free Float	0.402	0.330	0.523	0.493

** (***) indicates the median spread (turnover) of the New Market firms is significantly different from the spread (turnover) of the MDAX firms using a two-sided Mann-Whitney-Wilcoxon test at the 5% (1%) level. The comparison is based on a sample of 42 New Market and 42 MDAX firms matched based on market capitalization as of 4/30/99. New Market firms follow IAS or US GAAP while the MDAX sample firms provide German GAAP financial statements. The bid-ask spread is the average percentage spread from June to July 1999. Share turnover is the percentage of trading volume on all German exchanges in June and July relative to the market capitalization as of 4/30/99. Volatility is the average 30-day volatility in June and July 1999. All data has been obtained from the Frankfurt Stock Exchange, except free float for the MDAX firms, which has been obtained from Worldscope.

Panel B: Bid-Ask Spread Regression

	Full sample		Firms w/o US listing	
	Coefficients	t-statistics	Coefficients	t-statistics
Constant	1.6150 ***	3.2371	1.5721 ***	2.8993
New Market	-0.2085 **	-2.5979	-0.2267 **	-2.4822
Firm size (-)	-0.2849 ***	-4.4060	-0.2770 ***	-3.8742
Share turnover (-)	-0.3699 ***	-5.1546	-0.3759 ***	-4.7012
Volatility (+)	0.3566 ***	2.5355	0.4636 ***	3.3175
Free float (-)	-0.1591	-1.4772	-0.2122	-1.5539
Adj. R squared	0.4980		0.5247	
F-statistic	17.4653 ***		16.2385 ***	

*** (**) indicates a p-value < 0.01 (<0.05) based on a two-sided test. The t-statistics are computed based on White-corrected standard errors. Expected signs are in parentheses. The full sample comprises 42 New Market and 42 MDAX firms. The reduced sample comprises 70 firms and excludes pairs where the New Market firm is traded in the US. New Market is a binary variable indicating that a firm is listed in the New Market. For details on the variables see panel A of this table.

Panel C: Turnover Regression

	Full sample		Firms w/o US listing	
	Coefficients	t-statistics	Coefficients	t-statistics
Constant	-1.6894 ***	-2.9092	-1.7584 ***	-2.7948
New Market	0.2750 *	1.7335	0.3074 *	1.6846
Firm size (+)	-0.0416	-0.5328	-0.0285	-0.3361
Volatility (+)	0.9732 ***	4.7540	0.9264 ***	3.8854
Free float (+)	0.4575 ***	3.3853	0.5035 ***	3.1663
Adj. R squared	0.4221		0.3740	
F-statistic	16.1610 ***		11.3068 ***	

*** (*) indicates a p-value < 0.01 (<0.10) based on a two-sided test. The t-statistics are computed based on White-corrected standard errors. Expected signs are in parentheses. The full sample comprises 42 New Market and 42 MDAX firms. The reduced sample comprises 70 firms and excludes pairs where the New Market firm is traded in the US. New Market is a binary variable indicating that a firm is listed in the New Market (=1). For details on the variables see panel A of this table.

Table 6
Determinants of Standard Choice (Probit Model)

	US GAAP (=1)		US GAAP (=1)	
	Coefficients	z-statistics	Coefficients	z-statistics
Constant	-3.0693 *	-1.835	-2.9836 **	-2.0372
Firm size (+)	0.5458 **	2.102	0.3709 *	1.7810
Sales growth (+)	0.1274	0.981	0.1555	1.2673
Free float (+)	-1.9317	-1.328	-1.3401	-1.0594
Return since IPO (?)	-0.0020	-1.632	-0.0018 *	-1.7759
Designated sponsors (+)	0.3834	1.187	0.4533	1.5655
Big Five auditor (+)	0.4901	1.314	0.3452	1.0513
Industry dummies	included		not included	
Mc Fadden R squared	0.250		0.1377	
Likelihood-ratio statistic	23.736 **		13.0777 *	

* (***) indicates a p-value < 0.10 (<0.05) based on a two-sided test. Expected signs are in parentheses. The regressions are based on 69 New Market firms after excluding observations with foreign listing. US GAAP is a binary variable indicating the accounting standard choice. There are 31 firms following US GAAP (=1) and 38 firms following IAS (=0).