The Relative Importance of Determinants of the Quality of Financial Analysts' Forecasts: *International Evidence*

Alain Coën*
Graduate School of Business, Université du Québec à Montréal (UQÀM)

Aurélie Desfleurs
School of Accounting, Université Laval

Jean-François L'Her
Caisse de dépôt et placement du Québec

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Alain Coën (corresponding author) is from l'École des sciences de la gestion, Université du Québec à Montréal (UQÀM), case postale 6192, succursale Centre-Ville, Montréal (Québec) Canada H3C 4R2, e-mail: coen.alain@uqam.ca; Aurélie Desfleurs is from Université Laval, Ste-Foy, PQ, G1K 7P4, e-mail: aurelie.desfleurs@fsa.ulaval.ca; Jean-François L'Her is from La Caisse de dépôt et placement du Québec, Investment Policy Research, e-mail: jlher@lacaisse.com.

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Abstract:

We analyse earnings forecasting errors made by financial analysts for 18 developed countries over the 1990-2004 period. We use the Heston-Rouwenhorst approach to unravel country-, industry-, and firm-specific effects as a source of variation in financial analysts' earnings forecast errors. We first estimate each effect with a dummy variable regression, and then decompose the variance of forecast errors into different effects. We provide evidence that the differences among countries, industrial sectors, or analyst following offer a weak explanation for differences in forecast errors. Country effects however largely dominate industry and analyst following effects. By contrast, the type of earnings – profits or losses – and variations in earnings – increases or decreases – play a significant role in the performance of financial analysts.

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1. Introduction

Much work has been dedicated to the accuracy and quality of financial analysts' forecasts (hereafter referred to as *FAFs*), with research in the field focusing largely on the U.S. market. Among the most documented determinants of the quality of *FAFs* are earnings type – profits vs. losses, increases vs. decreases – (Dowen, 1996; Ciccone, 2001), the business activities of the firm (Dunn and Nathan, 1998), the economic situation (Chopra, 1998), the forecast horizon (Richardson *et al*., 1999), the industrial sector (Brown, 1997), and the competence of analysts (Mikhail *et al*., 1997).

Most of these studies provide U.S. evidence of the accuracy and the quality of *FAFs,* and generally each focus on a single determinant. They do not allow a proper evaluation of the accuracy and quality of *FAFs* in different environments. Recently, some articles have taken an interest in *FAFs* around the world, and shown significant differences in their respective accuracy levels (Hope, 2003; Ang and Ciccone, 2001; Chang *et al.*, 2000; Capstaff *et al.*, 1998). They try to explain the reasons for the differences unmasked, underscoring worldwide determinants of the quality of *FAFs*. Beyond the type of earnings effect largely documented in the U.S., they highlight the importance of country and industry effects.

The accounting, legal, and institutional environments are the most obvious country-related determinants of the accuracy of *FAFs*: the most important determinant probably being the accounting dimension. According to numerous studies, differences in accounting systems lead to significant differences in the quality and in the quantity of information available, further complicating earnings forecasting (Basu *et al.*, 1998). Further, as pointed out by Bhattacharya *et al*. (2003) and Leuz *et al.* (2003), there are systematic differences in the way earnings are managed in different countries around the world.

Most international studies underscoring the differences in accounting systems do not take into consideration the significant differences existing between industrial structures. However, norms and accounting practices tend to vary from one sector to the next. For example, firms belonging to the natural resources sector may benefit from more choices to account for their costs, making their earnings more difficult to analyse and to forecast. In such cases, the presence of a high number of such firms in a country may lead to significant errors in earnings forecasting. Differences in accounting systems may be interpreted to a greater extent as a sector effect rather than a simple country effect in explaining variances in *FAF* errors. Further, with international harmonisation in accounting, sector differences should appear to be greater than country differences.

Moreover, studies stressing the accounting factor tend to neglect firm-specific effects, such as the type of earnings – profits vs. losses, or increases vs. decreases (Hope, 2003; Huang and Jan, 1998) – or analyst following. As mentioned by Ang and Ciccone (2001), it seems easier to forecast profits than it is to forecast losses, and to forecast earnings increases rather than decreases. The broader the analyst coverage of the firm, the more accurate the *FAFs* should be (Alford and Berger, 1999).

To our knowledge, no study has analysed the relative importance of country-, industry- or firm-specific effects in explaining the cross-sectional variance in *FAF* errors[1]. The question is nonetheless a fundamental one both for financial analysts and international investors. Cavaglia, Brightham, and Aked (2000), and Hopkins and Miller (2002) provide evidence that sector

[1] Recently, Beckers et al. (2004) have analyzed the bias in European analyst's earnings forecasts, shedding a new light on country- and industry effects, but they have ignored the analysis of the cross-sectional variance in *FAF* errors.

factors became more important determinants of the stock returns of developed countries in the late 1990s and early 2000s. The international portfolios of developed stock markets could be structured in the near future along the sector dimension rather than along the traditional country dimension.

Our contribution to the debate on the determinants of the accuracy of *FAFs* is threefold. First, we use a more powerful methodology to separate the relative importance of each class of determinants. This approach differs in many respects from previous studies carried out at the international level. The few previous studies that analyse country effects on the quality of forecasts compare the moments and the distribution of errors. This conventional and traditional approach is open to criticism insofar as it is unable to disentangle country-, accounting-, industry-, and firm-specific effects, and to estimate their relative importance. Secondly, we concentrate on a sample of 18 developed countries (excluding the U.S.)[2] over the 1990-2004 period. Our sample includes (1) countries from Europe, North America and Australasia, which have experienced significant international harmonization over the last decade, and (2) countries with sharply contrasted sectors (Energy in Canada, Finance and Banking in Singapore, Hong Kong and Switzerland). Thirdly, all these regions have implemented significant financial and legal reforms in order to restore trust among investors. This evolving financial context offers the opportunity to analyse the evolution of the factors influencing the performance of financial analysts.

Section 2 presents and justifies our conceptual framework for testing our hypotheses concerning the performance of analysts during the period. Section 3 describes the data source and forecast

[2] We voluntarily exclude the U.S. from our sample. The market capitalization of the U.S. stock market represents more than 40% of world market capitalization, and the number of firms followed by financial analysts is considerable as compared to other countries. These stylized facts could significantly influence our results, and so to avoid this statistical and methodological problem, we decided to restrict our sample to the developed countries mentioned.

error measures used in the analysis. We describe the methodology employed in section 4, and present results in section 5. In section 6, we summarise our main results.

2. Determinants of FAFs

We consider the quality of *FAF* results along four dimensions: 1) the relative facility of forecasting earnings, 2) the quantity of information available, 3) the quality of this information, and 4) the ability of financial analysts to analyse this information. Recent studies led by Allen *et al*. (1999), Chang *et al*. (2000), Ang and Ciccone (2001), Black and Carnes (2002), or Hope (2003) among others, document that accounting, legal and economic systems tend to have a relatively important impact on the quality of forecasts. These features hinge essentially on the second and third aforementioned determinants of *FAFs*. They may be included in the country effect, which is one, but by no means, the only determinant of *FAFs*.

We examine two hypotheses. First, we analyze the average relative importance of country-, industry-, and firm-specific effects (type of earnings, increase or decrease in earnings, analyst coverage) in explaining cross-sectional differences in *FAF* errors. Secondly, we scrutinize the evolution of the relative importance of each class of determinants in explaining variations across *FAF* errors.

2.1 Country-, Industry-, and Firm-specific Effects

2.1.1 Country effects

Studies on many countries show sharp contrasts in the quality of *FAFs*. Chang *et al*. (2000) obtain an average absolute forecast error of 25.5% for the 47 countries in their sample: from 2.3% for the U.S. to 71.2% for Slovakia. Ang and Ciccone (2001), with a sample of 42 countries and covering the period of 1988 to 1997, give another illustration of this significant diversity of performance, with an average absolute forecast error of 60% and a dispersion of 31%. The results of Capstaff *et al*. (1996) and Higgings (1998), for Europe, and Allen *et al*. (1997), Black and Carnes (2002) and Coën and Desfleurs (2004), for Asia, and for different time horizons, demonstrate that the performance of financial analysts for countries of the same geographic region may be very contrasted.

These studies tend to confirm the existence and the preponderance of country effects. We may wonder what their sources are. As shown by Allen *et al*. (1999), and Ang and Ciccone (2001), the level of development, as convincing as it may seem, is not the most relevant explanation. In fact, the country effect has many origins we have to specify. Some of the factors related to the country effect are macroeconomic. In their study on Pacific Basin markets in the early '90s, Allen *et al*. (1999) observe that forecast errors are lower for countries with higher growth rates. Riahi-Belkaoui (1998), for a sample of 14 countries, shows that the level of forecast accuracy is positively related to the associated economic risk. Black and Carnes (2002), focusing on 12 Asian markets, denote that the level of forecast errors is directly correlated with the Global Competitiveness Index published in *The Global Competitiveness Report*. Forecast errors would be lower in high-competition countries. Moreover, they add that forecasts are all the more accurate since such countries show a significant openness to foreign business and foreign direct investments. On the contrary, forecasts tend to be less accurate in countries with a high level of governmental intervention, with a high level of corruption, and with a less competitive environment. Following Chopra (1998), we may add that financial analysts are more accurate in an environment characterised by stable growth than in one experiencing a sharply accelerating or decelerating business cycle.

The legal and institutional environments may also have a significant influence on *FAFs*. Chang *et al*. (2000) show that there are significantly fewer forecast errors are significantly smaller in countries with common and English legal systems, and which offer a high protection for minority shareholders.[3] Furthermore, the existing financing structure and its consequences on the disclosure of information may tend to influence the accuracy of financial analysts. The use of debt to finance operating activities decreases the number of players in the markets, and may stem the disclosure of information. In countries with high levels of intermediation, the circulation of information between the borrower and the lender is more encouraged, often to the detriment of shareholders and analysts.

According to a growing body of literature, accounting and fiscal system characteristics tend to be quite influential. Hope (2003) shows that there is a positive relation between the level of information disclosure and the level of the accuracy of *FAFs*. An improvement of information quality should decrease the dispersion of forecast errors. Basu *et al.* (1998) underscore the fact that forecast errors are smaller in an environment offering a vast range of accounting methods. Black and Carnes (2002) argue that the development of accounting systems is influenced by the idiosyncratic cultural features of different countries. *FAFs* are more accurate since the accounting system has been marked by a British inheritance (Australia, New Zealand, Hong Kong, and Singapore).

While it is true that country effects have many origins, and constitute major determinants of the quality of *FAFs*. It would however be a mistake to neglect other effects, such as industry-, or firm-specific effects.

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3 According to Ang and Ciccone (2001), the relative importance of these factors may be weak. They also demonstrate that the structure of financing is not a significant determinant.

2.1.2 Industry effects.

In most studies devoted to the accuracy of *FAFs* within a given country, the diversity of the industrial structure is taken into account as a control variable (see O'Brien (1998), and Sinha, Brown and Das (1997), among others). Paradoxically, many international studies neglect this feature (see Black and Carnes (2002) for Asia, or Ang and Ciccone (2001) for a larger sample of countries). The industrial structure sharply differs from one country to the next, with the contrast particularly striking in Asian markets. In Hong Kong and Singapore, financial services are preponderant while the natural resource sector is totally absent. Differences in the quality of *FAFs* attributable to country effects may therefore be due to differences in industrial structures, and it is therefore important to control for industry effects in explaining cross-sectional differences in quality.

There does indeed exist a large body of empirical evidence attesting to the importance of industry effects. For Europe during the period of 1987 to 1994, Capstaff *et al*. (2001) observe that forecasts for the public utilities and health care sectors are more accurate. By contrast, they are less accurate for the transportation and consumer durables sectors. Brown (1997) confirms these industry differences in the U.S., where analysts demonstrate a significant over-optimism in 11 out of 14 sectors. In Asia, the results of Jaggi and Jain (1998) show that there are smaller forecast errors in the public service sectors than in the private industrial sectors. They attribute this result to the low earnings volatility that exists in public service sectors.

The influence of the industrial sector on financial analysts' performance may be related to the stability of the firms in the sector. The earnings of firms evolving in stable sectors should tend to be easier to forecast, while sectors subject to external factors would tend to be difficult to analyse. This is the case of the natural resources sector, where earnings are sensitive to the variability of prices.[4] According to Luttman and Silhan (1995), the level of competitiveness may affect earnings and the characteristics of the information disclosed. To forecast earnings, analysts must consider a firm's strategy and its suitability with respect to the evolution of competitiveness. As suggested by Katz *et al*. (2000), these differences in competitive environments may have repercussions on the ability of financial analysts to forecast the earnings of firms in contrasted sectors.

Accounting factors, already mentioned to justify the country effect, may also be interpreted to constitute a sector or industry effect. As studied by DeFond and Hung (2003), the choice of accounting systems or methods available depends on the industry. For example, firms in the oil and mining sectors may use either the successful-effort method or the full-cost effort to account for exploration costs. Moreover, the level of information disclosure and transparency differs, and evolves differently as we go from one industry to the next. For a sample of countries, including emerging Asian countries, Patel *et al.* (2002) note a 15% improvement in the level of disclosure from 1998 to 2000 for the industrial sector, while the improvement reaches only 4% in the public service and information technology sectors. Such differences in evolution may explain the variations observed in the quality of *FAFs* by sectors.

2.1.3 Firm-specific effects

While many studies on the determinants of the quality of *FAFs* focus almost exclusively on the different aspects of the country factor, especially differences in accounting systems, industry

[4] In the oil and mining sectors, DeFond and Hung (2003) consider that earnings are not appropriate gauges for estimating firms' values. They suggest the use of cash flows from operations.

factors and firm-specific factors are neglected. We concentrate on two firm-specific factors: earnings-specific factors (profits/losses, and earnings increases/decreases) and analyst following.

Profits/Losses and Increases/Decreases Effects

In the absence of any other motivations, a rational analyst should be able to forecast increases as well as decreases in earnings. Nevertheless, financial analysts may be constrained by various motivations or reasons to not maximize the accuracy of their forecasts. Their accuracy tends to decrease as a result of agency costs. To maintain good relationships with firms disclosing information, financial analysts are often reluctant to forecast decreases in earnings. Conroy and Harris (1995) show that financial analysts who do not have to make buy recommendations tend to make more accurate forecasts, particularly for decreases in earnings. Their task is all the more complicated since firms are inclined to manipulate their financial statements (Hope, 2003) when earnings decline ('big baths'). The results reported by Loh and Mian (2002) indicate that firms in Singapore took advantage of the 1997 financial crisis to withdraw some assets from their balance sheets, leading to significant gaps between reported and forecast earnings.

Financial analysts are often over-optimistic when faced with earnings decreases. They indeed tend to under-react, and do not take into account all available negative information in making their forecasts. According to Daniel *et al.* (1998), agents are overconfident in their private information, and revise imperfectly their anticipations following the arrival of new information, more specifically bad news

Moreover, as mentioned by Ang and Ciccone (2001), the type of earnings (profits vs. losses) should be a major determinant of the accuracy of *FAFs*. The over-optimism of financial analysts is more significant when firms report losses, as it leads to significant forecast errors. This bias in accuracy may be the result of the behaviour of financial analysts and of information manipulations.

Analyst Following Effect

Alford and Berger (1999) suggest that a significant number of analysts following a firm should induce an increase in competitiveness and an improvement in the accuracy of *FAFs*. They document a strong positive relation between the size effect and the analyst following. Brown (1998) shows that *FAFs* are more accurate and rational in the U.S. for large cap firms. Allen *et al*. (1997) also observe a negative relation between the firm size and forecast errors in Pacific Asian markets from 1989 to 1991. We expect to see a positive relation between the performance of analysts and the number of analysts following a given firm.

Although the results of Hope (2003), Ang and Ciccone (2001) and Chang *et al*. (2000) may lead to the conclusion that earnings-specific factors (profits vs. losses or increases vs. decreases) are the most important in explaining the characteristics of *FAFs*, studies on the determinants of forecast errors focus almost exclusively on the different aspects of the country effect (on the differences in accounting systems).

3. Sample selection and variable definitions

3.1 Measures of errors

We define an *FAF* error as the difference between forecast earnings and the actual reported earnings, standardized by the absolute value of actual reported earnings. We examine two types of forecast error across countries. The first metric used is the absolute forecast error, $|FERE|$, which does not consider the direction, but only the magnitude of the error. The mean of the absolute forecast error provides summary information on accuracy. The second metric, *FERE*, considers the direction of the error. The mean of this metric provides information on the bias of *FAFs*. For each firm *i* and each fiscal year *t* (*t=1 to 15*), we compute the forecast error at various points in time, from 1 to *h (h = 1 to 9)* months prior the earnings report date. The nine-month horizon ensures that analysts know the previous year's earnings when making their forecasts. We therefore obtain *9×15 FAF* errors per firm. The definitions of |*FERE*| and *FERE* are shown in equations (1) and (2) below.

$$\left|FERE_{i,h,t}\right| = \left|\frac{F_{i,h,t} - RE_{i,t}}{RE_{i,t}}\right| \qquad \textbf{(1)}$$

$$FERE_{i,h,t} = \frac{F_{i,h,t} - RE_{i,t}}{\left|RE_{i,t}\right|} \qquad \textbf{(2)}$$

where $RE_{i,t}$ and $F_{i,h,t}$ are respectively the actual earnings of firm *i* for fiscal year *t* and the consensus analysts' forecast of the firm's year *t* earnings made *h* months before the earnings report date.

3.2 Data

We obtain analysts' earnings forecasts from the international Institutional Brokers Estimate System (I/B/E/S) database. We select 18 countries in our sample: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Netherlands, Norway, Singapore, Spain, Sweden, Switzerland and the United Kingdom. The sample period covers fiscal years 1990 to 2004. All forecasts are earnings per share forecasts for the current fiscal year, with I/B/E/S continuing to provide forecasts until a firm's annual financial results are announced. We select earnings forecasts made from nine months to one month prior to the earnings report date. This horizon ensures that analysts have the past year's annual report, and thus the previous year's earnings figures, available to them when making their forecasts. We use the mean forecast as the consensus forecast, but impose the condition that *at least three* analysts follow the firm (Chang *et al.*, 2000). We obtain a sample of 403,360 observations. All conclusions are similar if median forecasts are used instead of mean forecasts. The number of firms covered by analysts varies during the 15-year period examined, and differs from one country to the next and from one industry to the next.

Data are then adjusted to eliminate potential biased and/or extreme situations. Extreme values in forecast errors may be caused by data errors or by transitory factors specific to a firm (for example takeovers, mergers and acquisitions or important restructurings). Following Capstaff *et al.* (1998), to prevent the results from becoming contaminated by outliers, all absolute forecast errors exceeding 100% are removed. After eliminating extreme data, our final sample includes 380,807 forecasts.

Table 1 reports descriptive statistics on */FEREs/* and *FEREs* for each country and for each industry. The average absolute error */FERE/* is large, standing at 27.99%, for the world ex U.S. This level of error is high and casts doubts on the effective accuracy of financial analysts. The forecast bias, that is the average *FERE*, is positive, and equal to 13.61%, which is consistent with the documented over-optimism bias of financial analysts' forecasts.

Table 1, Panel A illustrates the differences in the accuracy and in the forecast biases for the countries considered. The forecast bias is lowest in the United Kingdom (average: 7.4%; median: -0.6%), followed by the Netherlands (average: 8%; median: 0.0%), and Belgium (average: 9.7%; median: 1.3%). By contrast, the forecast bias is highest in Japan (average: 19.8%; median: 5.7%), followed by Italy (average: 18%; median: 4.3%) and Hong Kong (average: 17.6%; median: 3.6%). Panel B sheds light on the differences that exist among industries. The forecast bias is lower for Public Utilities (average: 5.3%; median: 0%), Transportation (average: 10%; median: 1%) and Finance (average: 10.4%; median: 0.0%), whereas it is higher in Technology (average: 21.1%; median: 4.1%) and Basic Industries (average: 17.3%; median: 4.5%). These results are consistent with previous evidence in the literature.

[Please insert table 1]

Figures 1/A and 1/B show the evolution of country forecast biases per country and industry. For the sake of clarity, we only present five of the 18 countries and five of the ten industries, respectively. We observe sharp differences among countries. The forecast bias is continuously lowest in the U.K. By contrast, the forecast bias is very volatile in Japan. While the evolution of the forecast bias in Canada shows a relatively smooth trend, it is more volatile in France, but parallels the evolution observed in Switzerland or other countries from Continental Europe. Significant disparities also exist among industries. Public Utilities are characterized by the lowest average forecast bias among all the industries; however, its forecast bias reaches 16.5% in 2001. The forecast bias for the Technology sector peaks at 34.1% in 2001, whereas it was three times lower in 1997. The forecast bias for the Energy sector is volatile, witnessing the shocks of the period.

[Please insert figures 1/A and 1/B]

4. Methodology

To test both aforementioned hypotheses, we use a methodology initially developed by Heston and Rouwenhorst (1994) and Griffin and Karolyi (1998) to decompose financial returns in industry and country components. This two-step procedure allows us to analyse the relative importance of country- (accounting), industry- and firm-specific effects in explaining the cross-sectional variations in *FAF* errors. In the first step, we estimate the model, and in the second, we decompose the variance to identify and measure the relative importance of each effect.

4.1 Step 1: Estimation of country-, industry-, and firm-specific effects

We first define $FAFE_{i,h,,t}$ as financial analysts' forecast error on reported earnings for firm *i* for horizon *h* and fiscal year *t*. Then, we regress the *FAFE*s on dummy variables standing for countries, industries, profits or losses, increases or decreases in earnings, and analyst following. Since our sample comprises 18 countries and 11 industries, we define the following dummies: S_{ij} and C_{ik}. S_{ij} is equal to 1 if security *i* belongs to industry *j* ($j = 1,\ldots,11$) and is 0 otherwise. C_{ik} is equal to 1 if security *i* belongs to country *k* ($k = 1,\ldots,18$) and is 0 otherwise. We introduce the dummy, RE_{ig}, for the type of reported earnings to be forecast. RE_{i1} is equal to 1 if the reported earnings for security *i* are positive, and is 0 otherwise. RE_{i2} is equal to 1 if the reported earnings for security *i* are negative, and is 0 otherwise. We add another series of dummies to take into account the direction of the variations of the earnings to be forecast, V_{if}. V_{i1} is equal to 1 if there is there is an increase in earnings, and is 0 otherwise; V_{i2} is equal to 1 if there is a decrease in earnings, and is 0 otherwise. We also introduce a dummy to take into account the size effect or number of analysts effect, N_{iy} ($y = 1, ..., 4$). N_{iy} is equal to 1 if security *i* is included in category *y*. We define four categories for all the securities in our sample: securities followed by three to five analysts, securities followed by six to nine analysts, securities followed by ten to fifteen analysts, and securities followed by sixteen or more analysts.

We use ordinary least squares (OLS) to estimate the following model[5]:

$$FAFE_i = \alpha + \sum_{i=1}^{11} s_j S_{i,j} + \sum_{c=1}^{18} c_k C_{i,k} + \sum_{g=1}^{2} r_g RE_{i,g} + \sum_{f=1}^{2} v_f V_{i,f} + \sum_{y=1}^{4} \eta_y \mathrm{N}_{i,y} + e_i \qquad \textbf{(3)}$$

Because of perfect multicollinearity between the regressors, we cannot directly estimate equation (3). Following the method initiated by Heston and Rouwenhorst (1994), we impose, for each fiscal year *t* and each horizon *h*, restrictions to solve this over-identification problem.

$$\sum_{j=1}^{11} n_j s_j = 0 \; ; \; \sum_{k=1}^{18} m_k c_k = 0 \; ; \; \sum_{g=1}^{2} l_g r_g = 0 \; ; \; \sum_{f=1}^{2} w_f v_f = 0 \; ; \; \sum_{y=1}^{4} z_y \eta_y = 0 \qquad \textbf{(4,a,b,c,d,e)}$$

where n_j, m_k, l_g, w_f, and z_y stand respectively for the number of firms in industry *j* and in country *k*, the number of firms for which the type of reported earnings *g* (positive or negative) has encountered a variation *f* (increase or decrease), and the number of firms followed by a number of analysts belonging to category *y*.

These constraints make it easier to interpret the coefficients. Instead of arbitrarily choosing a country-, industry-, or firm-specific benchmark, the intercept $\hat{\alpha}$, stands as the average forecast error of our sample of developed countries, and each country-,industry-, or firm-specific coefficient ($\hat{c}_k$, $\hat{s}_j$, $\hat{r}_g$, $\hat{v}_f$, and $\hat{\eta}_y$) is the deviation relative to the benchmark. The pure industry forecast error $\hat{\alpha} + \hat{s}_j$ is the ordinary least-squares estimate of the forecast error on a geographically-diversified group of firms in the j^{th} industry. This forecast error is free of country- and firm-specific effects. Similarly, $\hat{\alpha} + \hat{c}_k$ is an estimate of the pure country forecast

5 To simplify the notation subscripts related to forecast horizon *h* and fiscal year *t* have been neglected in this equation.

error on an industrially-diversified group of firms in the country, *k.* As before, this forecast error is free of industry- or firm-specific effects.

4.2 Step 2: Analysis of variance

We decompose the cross-sectional variance (*VT*) of forecast errors for our sample of developed countries to analyse the relative importance of the error determinants on the developed markets. Through the decomposition of (*VT*), we shed light on the proportion of variance caused by country factors (*VC/VT*), by industry factors (*VS/VT*), by the type of earnings – profits or losses - and variations in earnings – increases or decreases –, by the number of analysts following a security (*VN/VT*), and by the idiosyncratic features (*VE/VT*), where $VT_{h,t} = VC_{h,t} + VS_{h,t} + VRE_{h,t} + VV_{h,t} + VN_{h,t} + VE_{h,t}$ is the total effect for fiscal year *t* and horizon *h*.[6]

First, to assess the relative importance of each effect over the whole 15-year period, we decompose the total variance using panel data analysis over the 15 years, nine forecast horizons and number of firms analysed. Secondly, we examine the evolution of the relative importance of each effect on a year-by-year basis, using panel data analysis over the nine forecast horizons and number of firms considered.

5. Empirical results and analysis

The analysis of the distribution of *FAF* errors shows significant differences among countries and industries. What are the origins of these differences? The decomposition of the cross-

[6] For example, the contribution of country effects to the total variance, for each fiscal year *t* and horizon *h*, is measured as follows: $VC_{h,t} / VT_{h,t} = Var(\sum_{k=1}^{18} \hat{c}_{k,h,t} C_k) / VT_{h,t}$. The model offers an incomplete decomposition of the variance. As acknowledged in the literature, the covariance terms between country-, industry- and firm-specific effects are very small, and can be reasonably neglected (Heston and Rouwenhorst, 1994 and 1995; Griffin and Karolyi, 1998). We proceed in a similar manner for the other components. Observations are equally-weighted.

sectional variance of forecast errors into country effects, industry effects, earnings-specific effects, and analyst following effects sheds light on the influence of each effect on the level of error and on the level of financial analysts' bias.

5.1 Step 1: estimation of effects

Tables 2A and 2B show the results of the first step of our methodology: the results of the regression of forecast errors, |*FERE*| and *FERE,* on dummies to capture the different effects, using equation (3) and constraints (4a) to (4e).

|***FEREs***|: Results from table 2A on the relative importance of countries and industries are in line with those previously reported. As mentioned earlier, the intercept, $\hat{\alpha}$, stands as the average forecast error of our sample of 18 developed countries. The adjusted R squared is 22.04%, and is much higher than the one reported by other studies in the existing literature. Thus, we focus on the types of earnings effects and on the analyst coverage effects. Estimated coefficients reported in table 2A show that |*FEREs*| are much more important when companies report losses than when they report profits (38.65% vs. -4.98%). Consistently also, financial analysts tend to make more errors when earnings decrease than when earnings increase: +11.63% vs. -7.24%. As expected, the more significant the analyst firm coverage, the smaller the absolute forecasting errors. For firms followed by more than 15 analysts, the estimated coefficient is -4.39%, whereas it is 3.87% for firms followed by less than 5 analysts.

[Please insert table 2A]

FEREs: Results from table 2B on the relative importance of countries and industries are in line with those reported in Table 1. The adjusted R squared is 29.41% which is much higher than the one reported in other studies. We concentrate on earnings-specific effects, and on the analyst coverage effects.[7] Estimated coefficients reported in table 2 show that when we control for countries and industries, the forecast bias is low, and even negative (-5.81%) for companies reporting profits, whereas average forecasts suffer from over-optimism (13.91% for the intercept). By contrast, the forecast bias is very large and positive for companies reporting losses (39.56%). When we control for country and industry differences, we also observe this asymmetry in forecast biases for companies posting increases or decreases in earnings. For companies reporting increases in earnings, the forecast bias is negative (-12.79%), while for those reporting decreases in earnings, the forecast bias is positive (20.55%), and almost twice as large in absolute value. The forecast bias is negative for companies followed by more than five financial analysts, and is statistically significant for the four categories, confirming the theory that more information should improve forecasts

[Please insert table 2B]

5.2 Step 2: Decomposition of variances in forecast errors

An analysis of the decomposition of variances in forecast errors sheds light on the relative importance of each class of determinants. The variances of the different effects are reported in **tables 3A and 3B**.

|*FEREs*|: We show in table 3A that the sign (profits or losses) and the variation (increases or decreases) of reported earnings respectively account for 55.68% and 26.02% of the explained cross-sectional variance of absolute forecasting errors. The third determinant, at 10.45%, is the country incorporation. Country effects largely dominate industry effects, (4.14%) and the

[7] We have also analysed the forecast horizon effects. Results not reported here are available upon request. As expected, we observe a decreasing and monotonic relation between the average absolute error and the forecast horizon. We observe the same relation between the forecast bias and the forecast horizon.

number of analysts' effect (3.68%). These results have significant consequences on the analysis and understanding of the behaviour of financial analysts. They tend to prove that earnings-specific factors represent much more important factors in explaining the magnitude of forecasting errors than the country or industry effects. Financial analysts make more accurate forecasts when earnings increase and are positive, and have difficulties forecasting earnings decreases and losses.

[Please insert table 3/A]

FEREs: We show in table 3B that, as in table 3A, the reported earnings variation effect (earnings increases or earnings decreases) and the type of reported earnings (profits or losses) are the most important determinant of the variation across forecasting errors. They account for 49.9% and 40.23% of the explained variance of forecast errors respectively. We observe that the country effect accounts only for a small portion of the total variance (6.18%). However, country effects largely dominate industry effects (3.16%) and the analyst following effect (0.50%). These results have significant consequences on the analysis and understanding of the behaviour of financial analysts. They tend to prove that forecast errors are not primarily related to the country, industry and analysts following effects. Rather, earnings-specific factors are the main and preponderant effects when analysing forecast errors. Financial analysts tend to incorrectly anticipate earnings losses and earnings decreases. They are then systematically over-optimistic.

[Please insert table 3/B]

In **tables 4/A and 4/B**, we scrutinize the annual evolution of the decomposition of the variance of *FAFEs* over the 15-year period covered. For absolute forecast errors, |*FEREs*|, the type of earnings – profits vs. losses – is always the main driver in explaining the cross-sectional variation of earnings forecast errors, while the earnings variation – profits vs. losses – is the second driver. By contrast, for forecast errors, *FEREs,* the earnings variation effect is generally the main driver, peaking at almost twice the value of the type of earnings effect in 2000. However, this hierarchy is not always respected – the type of earnings effect dominates the earnings variation effect in 1992, 1993, 2003 and 2004.

Country and industry effects are much lower. For absolute forecast errors, |*FEREs*|, country effects always dominate industry effects. Country effects represent 1.96% of the cross-sectional variance in earnings forecasts errors in 1990 and 2.04% in 2004. For forecast errors, *FEREs,* country effects represent 1.96% of the cross-sectional variance in earnings forecasts errors in 1990 and 2.04% in 2004. They peak at 3.05% in 2003. Industry effects are always lower than country effects, except in 2000 and 2001, where they dominate country effects – 1.09% vs. 0.81% in 2000 and 1.25% and 1.08% in 2001. This change in hierarchy at the peak of the high tech bubble echoes the important empirical literature devoted to the analysis of stock returns (Cavaglia *et al*. (2000), Griffin and Karolyi (1998), Hargis and Mei (2006), Fereira and Fereira (2006), among others). This phenomenon was not persistent. In 2002, the country effect recovered its predominance. Another stylized fact for this long period of observation to be mentioned would be the constant increase in the idiosyncratic effect, from 66.89% in 1990 to 82.36% in 2004 for absolute forecast errors, and from 65.54% in 1990 to 78.02% in 2004 for the forecast errors. Despite our significant improvements in the understanding of the cross-sectional variance in earnings forecast errors, these last observations confirm that the accuracy bias and the forecast bias are still puzzling, and will be the subject of future challenging research.

[Please insert tables 4/A and 4/B]

[Please insert figures 2/A and 2/B]

6. Conclusion

We examine two hypotheses. First, we analyse the relative importance of country, industry and firm-specific factors in explaining the performance of *FAFs* on 18 developed markets during the 1990-2004 period. These markets present different levels of development and sharp contrasts in industrial structures, while the last decade was marked by an unprecedented financial bubble, and its subsequent burst. These events induced a major volatility in earnings, making the analysis of the cross-sectional variance in *FAF* errors more interesting and challenging.

We first document the importance of the differences in countries and industries in explaining the variance in *FAF* errors. We then indicate the importance of the type of earnings – profits vs. losses; increases vs. decreases – and analysts' following as determinants of the quality of *FAFs*. Following a methodology initiated by Heston and Rouwenhorst (1994) for decomposing financial returns into country and industry effects, we adapt it to the analysis of *FAF* errors. This framework allows us to propose a hierarchy of the determinants of the quality of *FAFs*, and to provide a better understanding of the differences existing among countries, industries, and firm characteristics as determinants of the performance of *FAFs*.

We document that the differences between countries, industries, or coverage by analysts hardly account for the differences seen in forecast errors. The type of earnings – increases vs. decreases in earnings, and profits vs. losses – are the main effects to consider in understanding the performance of *FAFs*. Financial analysts face difficulties in forecasting losses and decreases in earnings. However, the different effects we examine account for only 26 to 29% of the explained variance in forecast errors. Other effects must thus be considered. *FAF* errors in these developed markets may be related to idiosyncratic features.

Secondly, we explore the dynamic of country vs. industry effects over the 15-year period– and underline sharp contrasts among the 18 countries and 11 industries our sample. Industry effects are always lower than country effects, except in 2000 and 2001, where they surpass country effects in explaining the variation across earnings forecasts errors. The heightened importance of industry effects seems transitory, and an artefact of the tech bubble, and not evidence of a structural shift. In 2002, country effects are again more influential than industry effects. Another stylized fact for this long period of observation to be mentioned is the constant increase in the idiosyncratic effect, from 66.89% in 1990 to 82.36% in 2004 for absolute forecast errors, and from 65.54% in 1990 to 78.02% in 2004 for the forecast errors.

The main conclusions we can draw from our results are that the debate between country and industry effects must be revised and reconsidered. Idiosyncratic features remain very important. Firm-specific effects provide the most convincing explanation for *FAF* errors. We have restricted our approach to three firm-specific effects: variation of forecast earnings effect, type of forecast earnings effect, and number of analysts' effect. The first two play an important role in explaining financial forecasts errors.

Nevertheless, all results cast doubt on the real economic efficiency of financial analysts: their errors and the forecasts biases are still high. Despite the significant improvements we have made to the debate, we have to acknowledge that the accuracy and quality of financial analysts' forecasts still remain a puzzle. We leave this open question to future research.

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Table 1: Descriptive statistics of absolute forecast errors (|*FEREs*|) and signed forecast errors (*FEREs*) by country (panel A) and industry (Panel B). Period 1990-2004.

Panel A: COUNTRIES	Number of observations		Mean		Median		Standard deviation		T-test, H0: mean=0	
	/FEREs/	*FEREs*	*/FEREs/*	*FEREs*	*/FEREs/*	*FEREs*	*/FEREs/*	*FEREs*	*/FEREs/*	*FEREs*
Australia	22,983	22,983	0.211	0.102	0.082	0.005	0.338	0.385	94.94**	40.32**
Austria	5,296	5,296	0.309	0.119	0.149	0.004	0.398	0.490	56.56**	17.73**
Belgium	6,382	6,382	0.264	0.097	0.124	0.013	0.361	0.437	58.55**	17.68**
Canada	39,369	39,369	0.314	0.160	0.143	0.028	0.403	0.485	154.52**	65.39**
Denmark	8,771	8,771	0.306	0.109	0.160	0.005	0.382	0.477	75.00**	21.43**
Finland	6,771	6,771	0.349	0.105	0.197	0.000	0.405	0.524	70.93**	16.40**
France	27,574	27,574	0.274	0.133	0.117	0.023	0.381	0.450	119.76**	49.05**
Germany	24,320	24,320	0.332	0.171	0.158	0.027	0.412	0.500	125.78**	53.15**
Hong Kong	17,288	17,288	0.286	0.176	0.118	0.036	0.394	0.454	95.49**	50.97**
Italy	13,180	13,180	0.357	0.180	0.192	0.043	0.416	0.517	98.59**	39.87**
Japan	69,764	69,764	0.347	0.198	0.175	0.057	0.415	0.504	220.84**	103.65**
Netherlands	15,599	15,599	0.213	0.080	0.072	0.000	0.345	0.397	77.14**	25.28**
Norway	6,476	6,476	0.396	0.161	0.217	0.040	0.448	0.575	71.11**	22.57**
Singapore	12,498	12,498	0.290	0.151	0.139	0.027	0.386	0.459	84.00**	36.83**
Spain	11,619	11,619	0.237	0.112	0.100	0.017	0.344	0.403	74.25**	29.90**
Sweden	10,552	10,552	0.317	0.112	0.164	0.011	0.388	0.489	84.00**	23.59**
Switzerland	14,002	14,002	0.262	0.106	0.124	0.012	0.356	0.429	87.23**	29.27**
United Kingdom	68,363	68,363	0.179	0.074	0.068	-0.005	0.299	0.340	156.44**	57.09**
18 countries	380,807	380,807	0.280	0.136	0.122	0.015	0.382	0.454	452.18**	185.07**

* T-test significant at 5%, ** T-test significant at 1%.

|*FEREs*| are absolute forecast errors = $|(F_{i,h,t} - RE_{i,h,t}) / RE_{i,h,t}|$ and *FERE*s are signed forecast errors = $(F_{i,h,t} - RE_{i,h,t}) / |RE_{i,h,t}|$. $RE_{i,t}$ is reported earnings per share of firm *i* for fiscal year *t*. $F_{i,h,t}$ = consensus forecast earning per share of firm *i* for fiscal year *t*, with a forecast horizon of *h* months before earnings report. We use forecasts made from 1 to 9 months before earnings report date.

Panel B: INDUSTRIES	Number of observations	Mean		Median		Standard deviation		T-test	
		/FEREs/	*FEREs*	*/FEREs/*	*FEREs*	*/FEREs/*	*FEREs*	*/FEREs/*	*FEREs*
Basic Industries	44,714	0.330	0.173	0.164	0.045	0.407	0.495	171.21**	73.75**
Capital goods	74,332	0.288	0.147	0.130	0.019	0.386	0.459	203.42**	87.12**
Consumer durables	11,654	0.278	0.119	0.127	0.009	0.371	0.448	80.93**	28.60**
Consumer non-durables	38,834	0.248	0.140	0.102	0.022	0.364	0.418	134.12**	65.84**
Consumer services	68,915	0.257	0.134	0.104	0.014	0.369	0.429	182.35**	82.01**
Energy	15,836	0.315	0.145	0.155	0.017	0.391	0.480	101.43**	37.93**
Finance	57,629	0.254	0.104	0.110	0.000	0.362	0.430	168.38**	57.88**
Health care	16,108	0.216	0.078	0.091	0.007	0.326	0.383	83.90**	25.92**
Public utilities	12,897	0.187	0.053	0.073	0.000	0.295	0.345	72.03**	17.29**
Technology	26,694	0.380	0.211	0.184	0.041	0.450	0.550	138.11**	62.80**
Transportation	13,194	0.323	0.100	0.161	0.010	0.392	0.498	94.84**	23.01**

* T-test significant at 5%, ** T-test significant at 1%.

|*FEREs*| are absolute forecast errors = $|(F_{i,h,t} – RE_{i,h,t}) / RE_{i,h,t}|$ and *FERE*s are signed forecast errors = $(F_{i,h,t} – RE_{i,h,t}) / |RE_{i,h,t}|$. $RE_{i,t}$ is reported earnings per share of firm *i* for fiscal year *t*. $F_{i,h,t}$ = consensus forecast earning per share of firm *i* for fiscal year *t*, with a forecast horizon of *h* months before earnings report. We use forecasts made from 1 to 9 months before earnings report date.

Figure 1/A: Evolution of the forecast bias by country: 1990-2004

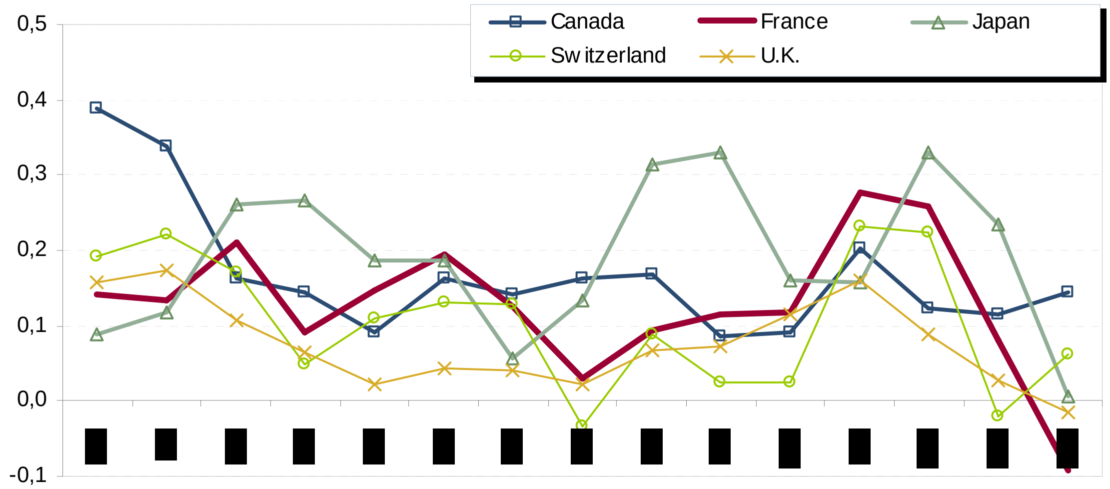
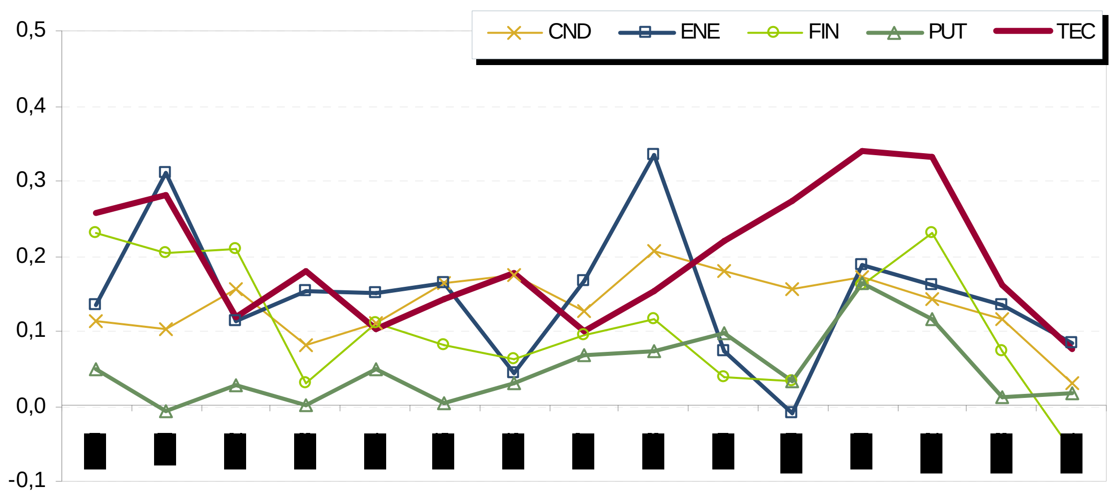


Figure 1/B: Evolution of the forecast bias by industry: 1990-2004



CND: Consumer Non-Durables; ENE: Energy; FIN: Finance; PUT: Public utilities; TEC: Technology

Table 2A: OLS regressions of absolute forecast errors (|*FEREs*|) on country-, industry-, and firm-specific factors using equation (3) and constraints (4a) to (4e). Period: 1990-2004

Coefficients		**Estim. Param.**	**Std. Error**	**T-test H0: Coef. =0**	**ChiSq.**
World ex U.S.	α	0.2799	0.0005	533.18**	284312.54**
Australia	c1	-0.0516	0.0021	-24.42**	764.64**
Austria	c2	0.0292	0.0044	6.57**	36.69**
Belgium	c3	0.0102	0.0040	2.53**	6.84**
Canada	c4	-0.0129	0.0016	-7.88**	52.18**
Denmark	c5	0.0084	0.0034	2.45**	5.62**
Finland	c6	0.0565	0.0039	14.46**	156.13**
France	c7	0.0115	0.0019	6.08**	36.68**
Germany	c8	0.0345	0.0020	16.85**	244.09**
Hong Kong	c9	0.0512	0.0025	20.84**	441.67**
Italy	c10	0.0704	0.0028	25.17**	525.31**
Japan	c11	0.0303	0.0011	26.42**	592.05**
Netherlands	c12	-0.0299	0.0026	-11.66**	166.28**
Norway	c13	0.0655	0.0040	16.21**	177.44**
Singapore	c14	0.0453	0.0029	15.69**	247.35**
Spain	c15	0.0017	0.0030	0.56	0.37
Sweden	c16	0.0172	0.0031	5.51**	28.01**
Switzerland	c17	0.0056	0.0027	2.07*	4.53**
United Kingdom	c18	-0.0712	0.0011	-62.67**	5684.69**
Basic industries	s1	0.0269	0.0015	18.27**	280.33**
Capital goods	s2	0.0019	0.0011	1.79	3.21
Consumer durables	s3	-0.0026	0.0030	-0.87	0.82
Consumer non-durables	s4	-0.0134	0.0016	-8.53**	83.84**
Consumer services	s5	-0.0014	0.0011	-1.20	1.56
Energy	s6	0.0501	0.0026	19.05**	330.45**
Finance	s7	-0.0017	0.0013	-1.31	1.86
Health care	s8	-0.0868	0.0025	-34.50**	1273.43**
Public utilities	s9	-0.0711	0.0028	-25.07	893.42**
Technology	s10	0.0290	0.0019	14.98**	164.75**
Transportation	s11	0.0107	0.0028	3.80**	12.82**
Positive Earnings: Profits	r1	-0.0498	0.0002	-248.82**	27770.56**
Negative Earnings: Losses	r2	0.3865	0.0016	248.82**	27770.56**
Increase in earnings	v1	-0.0724	0.0004	-167.55**	22038.44**
Decrease in earnings	v2	0.1163	0.0007	167.55**	22038.44**
Stocks followed by 3 to 5 analysts	η1	0.0387	0.0008	51.23**	2350.78**
Stocks followed by 6 to 9 analysts	η2	0.0000	0.0009	0.04	0.00
Stocks followed by 10 to 15 analysts	η3	-0.0205	0.0010	-20.13**	445.16**
Stocks followed by more than 15 analysts	η4	-0.0439	0.0011	-38.70**	1803.65**
Number of observations: 380,807					
Adjusted R^2: 0.2809					

|*FEREs*| are absolute forecast errors = $|(F_{i,h,t} - RE_{i,h,t}) / RE_{i,h,t}|$. $RE_{i,t}$ is reported earnings per share of firm *i* for fiscal year *t*. $F_{i,h,t}$ = consensus forecast earning per share of firm *i* for fiscal year *t*, with a forecast horizon of *h* months before earnings report. We use forecasts made from 1 to 9 months before earnings report date.

Table 2B: OLS regressions of signed forecast errors (*FEREs*) on country-, industry-, and firm-specific factors using equation (3) and constraints (4a) to (4e). Period: 1990-2004

Coefficients		Estim. Param.	Std. Error	T-test H0: coef. =0	ChiSq
World ex U.S.	α	0.1361	0.0006	220.24**	48512.10**
Australia	c1	-0.0083	0.0025	-3.35**	15.15**
Austria	c2	-0.0077	0.0052	-1.47	1.73
Belgium	c3	-0.0054	0.0047	-1.14	1.31
Canada	c4	-0.0098	0.0019	-5.09**	21.22**
Denmark	c5	-0.0402	0.0040	-9.93**	86.48**
Finland	c6	-0.0408	0.0046	-8.87**	55.58**
France	c7	0.0059	0.0022	2.65**	7.17**
Germany	c8	0.0013	0.0024	0.55	0.26
Hong Kong	c9	0.0720	0.0029	24.92**	689.35**
Italy	c10	0.0255	0.0033	7.73**	48.05**
Japan	c11	0.0240	0.0013	17.83**	269.29**
Netherlands	c12	-0.0223	0.0030	-7.40**	67.09**
Norway	c13	-0.0086	0.0048	-1.80	2.01
Singapore	c14	0.0386	0.0034	11.38**	136.32**
Spain	c15	0.0104	0.0035	2.96**	10.89**
Sweden	c16	-0.0425	0.0037	-11.58**	117.43**
Switzerland	c17	-0.0121	0.0032	-3.81**	15.79**
United Kingdom	c18	-0.0257	0.0013	-19.21**	552.93**
Basic industries	s1	0.0017	0.0017	1.00	0.83
Capital goods	s2	0.0079	0.0013	6.21**	38.73**
Consumer durables	s3	-0.0108	0.0035	-3.09**	10.14**
Consumer non-durables	s4	0.0230	0.0018	12.44**	190.28**
Consumer services	s5	0.0154	0.0013	11.61**	152.47**
Energy	s6	0.0178	0.0031	5.77**	29.51**
Finance	s7	-0.0048	0.0015	-3.19**	11.43**
Health care	s8	-0.0710	0.0030	-23.97**	571.10**
Public utilities	s9	-0.0646	0.0033	-19.37**	505.62**
Technology	s10	0.0112	0.0023	4.93**	16.95
Transportation	s11	-0.0625	0.0033	-18.88**	288.24**
Positive Earnings: Profits	r1	-0.0510	0.0002	-216.47**	19649.03**
Negative Earnings: Losses	r2	0.3956	0.0018	216.47**	19649.03**
Increase in earnings	v1	-0.1279	0.0005	-251.61**	50246.48**
Decrease in earnings	v2	0.2055	0.0008	251.61**	50246.48**
Stocks followed by 3 to 5 analysts	η1	0.0097	0.0009	10.94**	105.90**
Stocks followed by 6 to 9 analysts	η2	-0.0046	0.0011	-4.22**	17.69**
Stocks followed by 10 to 15 analysts	η3	-0.0060	0.0012	-5.03**	28.02**
Stocks followed by more than 15 analysts	η4	-0.0044	0.0013	-3.29**	13.24**
Number of observations: 380,807					
Adjusted R^2: 0.2941					

FEREs are signed forecast errors = $(F_{i,h,t} - RE_{i,h,t}) / | RE_{i,h,t} |$. $RE_{i,t}$ is reported earnings per share of firm *i* for fiscal year *t*. $F_{i,h,t}$ = consensus forecast earning per share of firm *i* for fiscal year *t*, with a forecast horizon of *h* months before earnings report. We use forecasts made from 1 to 9 months before earnings report date.

Table 3A: Decomposition of absolute forecast error (|*FEREs*|) variance

/FEREs/	1990-2004	
	Variance	**%**
Pure country effect	0.0037	2.78
Pure industry effect	0.0015	1.10
"Type of earnings" effect	0.0197	14.81
"Earnings variation" effect	0.0092	6.92
"Number of analysts" effect	0.0013	0.98
Idiosyncratic effects	0.0975	73.40
Total variance of forecast errors in absolute mean	0.1329	100.00

Table 3B: Decomposition of signed forecast error (*FEREs*) variance

FEREs	1990-2004	
	Variance	**%**
Pure country effect	0.0034	1.78
Pure industry effect	0.0017	0.91
"Type of earnings" effect	0.0219	11.59
"Earnings variation" effect	0.0272	14.37
"Number of analysts" effect	0.0003	0.16
Idiosyncratic effects	0.1348	71.19
Total variance of forecast errors in absolute mean	0.1893	100.00

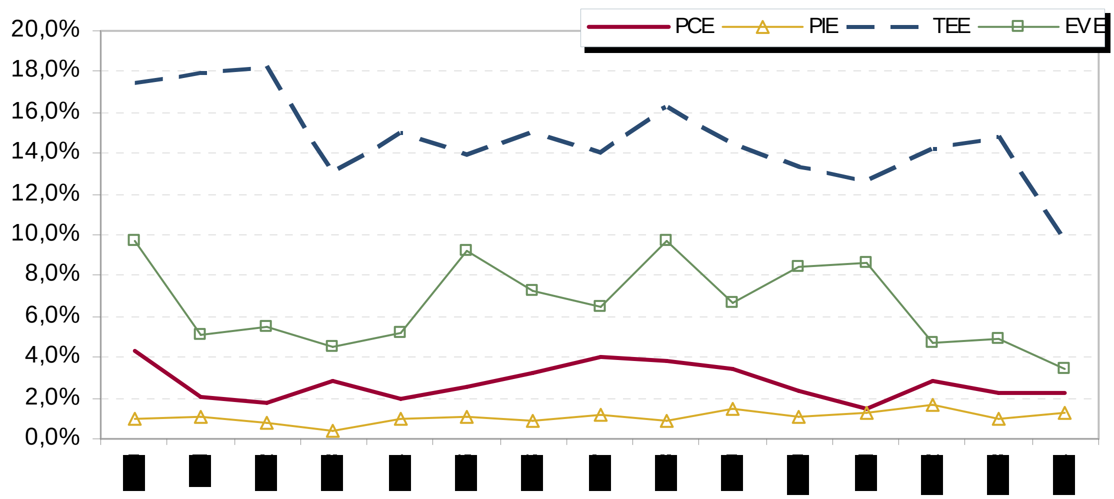
Table 4A: Decomposition of absolute forecast error (|*FEREs*|) variance by year

|*FEREs*|	Pure country effect	Pure industry effect	Type of earnings" effect	"Earnings variation" effect	"Number of analysts" effect	Idio-syncratic effects
1990	4.28%	1.00%	17.43%	9.68%	0.72%	66.89%
1991	2.04%	1.10%	17.94%	5.12%	0.54%	73.27%
1992	1.76%	0.80%	18.22%	5.50%	0.44%	73.28%
1993	2.84%	0.44%	13.01%	4.55%	0.91%	78.25%
1994	1.93%	0.96%	14.99%	5.22%	0.73%	76.17%
1995	2.59%	1.09%	13.92%	9.22%	0.67%	72.50%
1996	3.26%	0.87%	15.03%	7.23%	1.58%	72.02%
1997	4.03%	1.14%	14.06%	6.51%	1.45%	72.82%
1998	3.87%	0.89%	16.24%	9.66%	0.61%	68.73%
1999	3.44%	1.44%	14.43%	6.66%	1.42%	72.60%
2000	2.40%	1.05%	13.30%	8.41%	1.28%	73.57%
2001	1.51%	1.32%	12.69%	8.63%	0.69%	75.17%
2002	2.87%	1.63%	14.22%	4.69%	1.19%	75.41%
2003	2.25%	0.99%	14.79%	4.94%	1.17%	75.86%
2004	2.29%	1.32%	9.71%	3.48%	0.84%	82.36%
1990-2004	2.78%	1.10%	14.81%	6.92%	0.98%	73.40%

Table 4B: Decomposition of forecast error (*FEREs*) variance by year

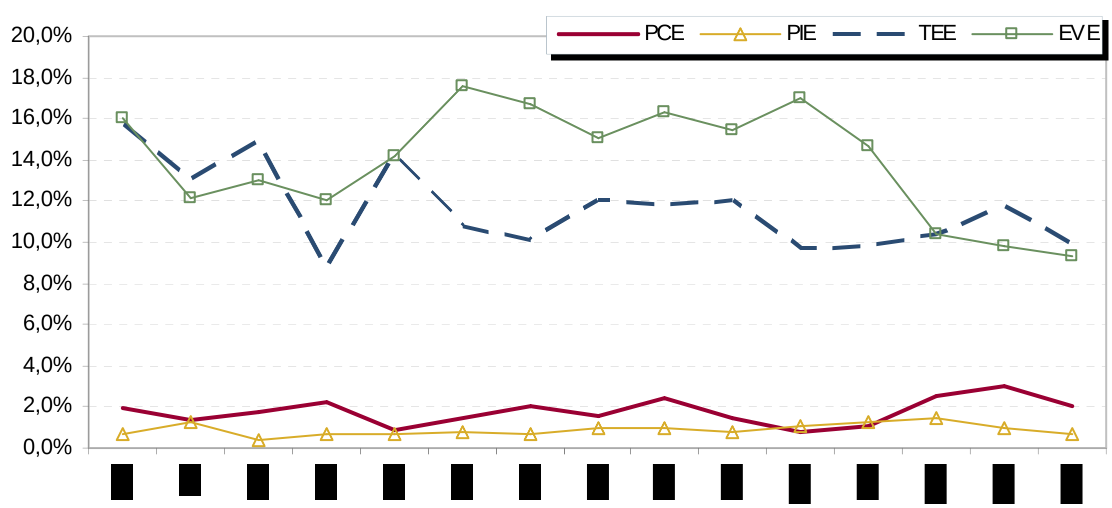
FEREs	Pure country effect	Pure industry effect	"Type of earnings" effect	"Earnings variation" effect	"Number of analysts" effect	Idiosyncratic effects
1990	1.96%	0.68%	15.77%	16.00%	0.05%	65.54%
1991	1.35%	1.28%	13.13%	12.12%	0.12%	72.00%
1992	1.78%	0.35%	14.85%	13.00%	0.19%	69.84%
1993	2.21%	0.65%	8.71%	12.08%	0.06%	76.30%
1994	0.84%	0.65%	14.16%	14.14%	0.05%	70.17%
1995	1.43%	0.82%	10.82%	17.61%	0.08%	69.24%
1996	2.04%	0.67%	10.09%	16.74%	0.22%	70.24%
1997	1.60%	0.98%	12.00%	15.01%	0.14%	70.28%
1998	2.47%	0.96%	11.85%	16.28%	0.09%	68.35%
1999	1.47%	0.76%	12.02%	15.41%	0.24%	70.10%
2000	0.81%	1.09%	9.67%	17.00%	0.14%	71.28%
2001	1.08%	1.25%	9.82%	14.67%	0.12%	73.06%
2002	2.54%	1.42%	10.43%	10.41%	0.38%	74.82%
2003	3.05%	0.93%	11.78%	9.77%	0.27%	74.20%
2004	2.04%	0.65%	9.87%	9.29%	0.12%	78.02%
1990-2004	1.78%	0.91%	11.59%	14.37%	0.16%	71.19%

Figure 2/A: The evolution of the decomposition of absolute forecast error variance: 1990-2004



PCE: Pure Country Effect; PIE: Pure Industry Effect; TEE: Type of Earnings Effect; EVE: Earnings Variation Effect

Figure 2/B: The evolution of the decomposition of forecast error variance: 1990-2004



PCE: Pure Country Effect; PIE: Pure Industry Effect; TEE: Type of Earnings Effect; EVE: Earnings Variation Effect