Financial Analysts' Performance: Sector Versus Country Specialization

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Brokerage houses normally structure their research activities along either country or sector lines. I investigate whether organizational structure affects the quality of financial analysts' earnings forecasts. Specifically, I compare the performance of country-specialized financial analysts with that of sector-specialized financial analysts. The former issue forecasts considerably more accurately than the latter. Country specialists benefit from an informational advantage over sector specialists. A superior knowledge of country-specific factors, as well as geographical proximity between analysts and the firms they cover, are significant determinants of this advantage. (*JEL* G15, G24, M41)

1. Introduction

Financial research departments are usually structured along either country or industry lines. At one extreme, brokerage houses organize their research activities along country lines. For instance, some analysts follow UK firms, while others are restricted to German firms. These country-specialized analysts may be required to follow firms from many different economic sectors. At the other extreme, brokerage houses ignore all national dimensions and rely on global sector structures. For instance, some analysts follow firms in the banking sector, while others specialize in the technology sector, irrespective of the nationality of the firms. These sector-specialized analysts may have to deal with firms headquartered in many different countries.

Research on US firms is mostly performed by sector specialists within the US market. Conversely, research on Japanese firms is almost exclusively performed by country specialists. While brokerage houses producing research on European firms once favored country-based structures, they have shown a clear tendency to switch to more sector-oriented structures over the last decade. In today's global environment, this issue has become

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of critical importance. Is it better to rely on the traditional country-based approach, placing analysts close to the firms' headquarters, thereby allowing them to build strong relationships with local firms and their managers? Or should research departments be organized with a global sector perspective, with analysts focusing on big-picture industry trends and competition among firms regardless of their location? This article focuses on European markets, where both country- and sector-based specializations coexist, and evaluates the impact of financial analysts' specialization on the accuracy of their earnings forecasts.

The results indicate that country specialists issue far more accurate earnings forecasts than their sector-specialized peers. Over the period 1994–2004, the average forecast error of sector specialists was approximately 6% larger than that of country-specialized analysts. This differential accuracy is not only statistically but also economically significant. For example, a sector-specialized analyst would have to follow a firm for more than 5 years to outperform an inexperienced country-specialized analyst by as much as 6%. This outperformance is robust across countries and sectors, and does not depend on firms' characteristics such as market capitalization or level of international activities. Country specialists owe their informational advantage to their superior knowledge of country-specific factors and their geographical proximity to the firms they follow.

These results have several implications. First, they add to the literature on the determinants of analysts' coverage. According to Kini et al. (2003), if analysts tend to specialize by countries (sectors) in markets (sectors) with relatively strong national (sector-specific) influences, it is because they aim to produce high quality research. The data does not support this assertion. Over the period 1994–2004, sector-specialized analysts did not noticeably outperform country specialists in any of the sectors or the countries considered in the sample.

Second, the number of countries and industries followed by analysts are classic proxies for the complexity of their portfolios. This article shows that specialization is more important than the mere fact that increasing the number of countries and/or industries renders their task more arduous. Hence specialization should be considered an important determinant of forecast accuracy.

Third, knowing which analysts are more likely to produce the most accurate earnings forecasts is obviously of interest to asset managers. But more importantly, it has strong implications for the overall portfolio allocation process. Academic research shows that country-specific factors remain at least as influential as industry-specific factors. Moreover, international diversification is still at least as important as industry diversification. This research further reveals that country-specialized analysts perform better than industry-specialized analysts. These three

findings, put together, really indicate that managers who adopt a sector-based approach at the expense of the traditional top-down international portfolio allocation could very well be on the wrong track.

Fourth, this research is of concern to the financial analysis profession itself. Obviously, forecast accuracy is not the only force that helps to shape the organization of financial research departments. For instance, small brokerage houses may not have the financial resources to maintain offices in a number of different locations. Also, marketing considerations may drive the choice of a particular structure. Financial analysis departments may be organized along sector lines if portfolio managers demand sector-based research. Nonetheless, results in this article suggest that decentralized research departments organized along country lines are better at producing accurate earnings forecasts.

The article is structured as follows. Section 2 reviews the relevant literature and presents testable hypotheses. Section 3 discusses the methodology and the data. Results are set out in Section 4. Section 5 concludes.

2. Background and Testable Hypotheses

2.1 Background

The relative performance of country- versus sector-specialized financial analysts is closely related to the issue of location. Financial analysts specializing by country can locate within the same country as the whole set of firms they follow, and even geographically close to them. Obviously, this cannot be true of sector-specialized analysts who follow firms headquartered in different countries.

Information asymmetries due to geography are real. They have been shown to explain, at least partially, the well-documented home bias puzzle; see, for example, Brennan and Cao (1997), Coval and Moskowitz (2001), Grinblatt and Keloharju (2001), Hau (2001), Ivkovic and Weisbenner (2005). Accordingly, local or geographically proximate market participants are assumed to be better informed than foreign or more distantly located ones.

This "Geographic Information Asymmetry Hypothesis" (GIAH) has been explored in the context of financial analysts' earnings forecasts. Orpurt (2003) makes a distinction between earnings forecasts issued by analysts located in the same country as the firm for which the forecast is issued (local analysts) and by analysts based abroad (foreign analysts). Although Orpurt's tests cannot be directly linked to the home bias puzzle, his cross-border distinction between local and foreign analysts produces results that support the GIAH. That is, local analysts tend to issue more accurate and timelier forecasts than foreign analysts. Bae et al. (2006) look at a large sample of 32 countries and again compare the performance of local and foreign analysts. Their results support the notion that local

analysts tend to issue more accurate earnings forecasts than their foreign peers. In addition, they propose a way to test whether this local advantage is due to information asymmetries between local and foreign analysts, or is simply driven by the demand for analyst services. Specifically, the local advantage should be higher in countries where foreign ownership and capital flows are lower, since the demand by foreign investors for analyst services, and therefore the resources allocated to foreign analysts, should be lower for such countries. Their results support the information-based explanation. Malloy (2005) also tests the GIAH, but with a different approach, using the geographical distance between US analysts and the firms they cover. His results are consistent with those of Orpurt (2003) and Bae et al. (2006). That is, geographically proximate analysts seem to benefit from an informational advantage, which translates into the production of more accurate earnings forecasts.

In some ways these results are in line with a couple of studies on other determinants of financial analysts' performance. Barker (1998) interviews UK analysts and reports that the source of information they consider most important is "direct contact with the company." Bolliger (2004) documents a decrease in the accuracy of analysts' forecasts as the international diversification of analysts' portfolios increases. He also provides evidence of a negative relationship between forecast accuracy and industry diversification, but concludes that the synergies gained by following only a few industries are "more than offset by the difficulty to produce forecasts with portfolios containing firms from several European countries."[1] He thinks this may be "partly due to a better knowledge of the various local institutional contexts." In light of the results presented above, it may also be a matter of proximity, as financial analysts who follow firms in several countries are, on average, located further away from the firms they track.

Clement (1999) reports a strong negative association between forecast accuracy and the number of industries followed by analysts. His results indicate that, all else being equal, the forecast error of an analyst who follows eight industries (the 90th percentile value of his sample) will be 2.9% larger than that of an analyst who concentrates on a single industry. Jacob et al. (1999) report similar results, whereas Mikhail et al. (1997) find very little evidence of a relationship between industry concentration and forecast accuracy. None of these has anything to say about the influence of the international dimension of analysts' portfolios.

In fact, the way analysts' organization affects their performance has received very little attention from academics. They rely rather on the relative importance of country and industry factors when advising how financial analysis departments should be organized. Magee (1974), among

[1] The "diversification" of country and industry portfolios is measured by the number of countries/industries for which analysts supply forecasts over a given fiscal year.

others, reports that industry-wide commonalities in earnings are large.[2] He remarks that "from the viewpoint of an investor or security analyst, such a result indicates that industry earnings outcomes have potential value for those who are able to forecast these outcomes accurately." Hence both academics and practitioners frequently argue that financial analysis should be organized along industry lines. Analysts specializing in a given industry should have superior knowledge of it, which should enable them to produce more accurate forecasts than otherwise diversified analysts.

However, the mere fact that industry membership can be shown to have a significant impact on earnings does not tell us whether structuring research departments according to this factor will enable information to be acquired and produced more efficiently, or financial analysts to issue more accurate forecasts. Therefore we cannot rely on the relative influence of country and industry factors on earnings when advocating how financial analysis should be performed. Instead, we must explicitly raise this question by examining the performance of financial analysts as a function of their specialization. In what follows, I study whether specializing in a sector gives analysts a comparative advantage enabling them to release more accurate forecasts than if they specialized in a country (and vice versa).

2.2 Testable hypotheses

Financial research departments producing research on European firms have historically been organized along country lines. Many banks and brokerage houses still follow this approach. Switzerland's Bank Julius Baer, for instance, has seven research centers in various European countries and clearly relies on country-by-country structures.[3] Other brokerage houses, though, now organize research along sector lines. This tendency to switch to sector-based structures casts some doubt on the ability of country-specialized analysts to outperform sector-specialized analysts. If, as Kini et al. (2003) suggest, analysts' coverage is driven by the concern to produce high quality research, the synergies gained by specializing in a sector might very well offset the synergies gained by specializing in a country. Nonetheless, country-specialized analysts potentially benefit from a strong informational advantage owing to their location close to the firms they follow and/or their good knowledge of the firm's country-specific factors. Provided that they have incentives to issue accurate earnings forecasts, this should lead country-specialized analysts to outperform sector-specialized analysts. Therefore, I state the first hypothesis as follows:

[2] See also Schmalensee (1985), Rumelt (1991), Powell (1996), McGahan and Porter (1997), and Hawawini et al. (2003).

[3] See John Rubino, "The New Global Industry Analysis", *CFA Magazine*, July–August 2003.

Hypothesis 1. *Country-specialized analysts produce on average more accurate forecasts than sector-specialized analysts.*

In Europe, Orpurt (2003) concludes that local financial analysts (i.e., analysts based in the same country as the firms they follow) tend to issue more accurate forecasts than foreign financial analysts (i.e., analysts based abroad). However, we cannot infer from the evidence that local analysts have an informational advantage over foreign analysts, whether the source of this advantage is being located close to the firm or a better knowledge of the country's institutional factors. In fact, if most local analysts specialized in firms headquartered within the same country, their superior performance might potentially result from informational advantages due to both proximity and their expertize in local institutional factors.

The next two hypotheses investigate whether the superior accuracy of country-specialized financial analysts is the consequence of one or both of these two potential advantages:

Hypothesis 2. *Proximity explains the superior accuracy of country-specialized analysts.*

Hypothesis 3. *A good knowledge of country-specific factors explains the superior accuracy of country-specialized analysts.*

In order to disentangle location and the knowledge of country-specific factors, I reason as follows. Both country and sector specialists, if they are located close to the firm for which they issue the forecast (hereafter "proximate analysts"), will obtain an informational advantage from this proximity. More distantly located analysts (hereafter "distant analysts"), whatever their specialization, do not have this particular advantage. Moreover, country-specialized analysts, whenever they are based close to or far away from the firms they follow, should profit from an informational advantage related to their superior knowledge of the country's institutional factors (assuming, of course, that they have such knowledge). Sector-specialized analysts, especially when based abroad, logically cannot enjoy this potential advantage. One might argue that locally based sector specialists may draw some advantage from their knowledge of country-specific factors. The descriptive analysis below indicates that most analysts' followings are biased towards domestic firms. Hence sector specialists may be quite well informed about their home country's fiscal policies, accounting rules, and other relevant country-specific factors. Therefore, the possibility that locally-based sector analysts may also benefit from an informational advantage due to their superior knowledge of country factors is allowed for. Table 1 summarizes the above discussion.

If geographical proximity is important, proximate country specialists ought to outperform more distant country specialists and proximate

Table 1

Analyst	Location	The analyst has an informational advantage due to	
		Proximity	Country factors
Country specialist	Proximate	Yes	Yes
	Distant	No	Yes
Sector specialist	Proximate	Yes	Yes/No
	Distant	No	No

sector specialists ought to outperform more distant sector specialists. If knowledge of country-specific factors is a source of informational advantage, distant country specialists ought to outperform distant sector specialists. Depending on the level of country expertize of proximate sector specialists, proximate country specialists may also outperform proximate sector specialists.

3. Methodology and Data

3.1 Measuring analysts' specializations

Kini et al. (2003) sort analysts according to their degree of sector and country specialization. According to their classification scheme, an analyst is considered a sector specialist if all the forecasts s/he issues during a given fiscal year relate to firms of different nationalities but in the same sector. Over the same fiscal year, analysts who issue forecasts for firms active in different sectors, but headquartered in the same country, are categorized as country specialists. ''Absolute'' specialists are analysts who issue earnings forecasts for firms in a single sector within a single country. ''Generalists'' are analysts who follow firms headquartered in various countries and are active in various industries.

This classification scheme is not entirely satisfactory. Analysts who spend most of their time following firms in a single country (sector) should also be included in the country (sector) specialist group even if they issue forecasts for firms in different countries (sectors). Yet the above criterion would not identify them as specialists. In consequence, I propose another measure. It is a concentration ratio based on the Herfindahl Index (HI), which is generally used as an indicator of the amount of competition among firms in an industry. For each analyst, I compute both a sector and a country HI. Each analyst's country (sector) HI is computed as the sum over all countries (sectors) of the ratios of the number of firms followed by the analyst within a given country (sector) to the total number of firms for which the analyst issued forecasts during the fiscal year. These are formally given as:

$$HI_{a,y}^{Country} = \sum_{c=1}^{C} \alpha_c^2 \text{ and } HI_{a,y}^{Sector} = \sum_{s=1}^{S} \alpha_s^2$$

where $\alpha_c = N_{c,a,y}/N_{a,y}$ and $\alpha_s = N_{s,a,y}/N_{a,y}.N_{c,a,y}$ ($N_{s,a,y}$) is the number of firms in country c (sector s) for which analyst a issued forecasts over fiscal year $y.N_{a,y}$ is the total number of firms followed by analyst a over fiscal year y. A country (sector) HI has a value of 1 (i.e., its maximum value) when the analyst follows firms that are all headquartered in a single country (active in a single sector). Analysts who follow more than one, but not many countries (sectors), but devote most of their attention to firms within a single country (sector), will have a country (sector) HI close to one. HI values go towards zero as analysts' portfolio diversification increases.

Analysts are classified as country (sector) specialists if their country (sector) HI is larger than 0.90 and their sector (country) HI is smaller than 0.90. Analysts whose country and sector HIs are both above 0.90 are classified as "absolute" specialists. Note that the specialization measure proposed by Kini et al. (2003) is a particular case of the HI measure, where the cutoff value is set to 1.[4]

Figure 1 provides an illustration of the way financial analysts organize their research. On this graph, each dot represents one analyst. Each is characterized by her country and sector HIs. Approximately 70% of the 2936 analysts lie either on the upper- or right-side lines of the graph. That is, more than two thirds of analysts are either absolute, country, or sector specialists in the sense that they follow firms in only one country or sector, or both. No other pattern emerges from this figure. This confirms the fact that, in Europe, analysts tend to specialize either in a country or in a sector.

3.2 Measure of financial analysts' performance

To gauge financial analysts' performance, I follow the classic accuracy measure based on analysts' forecast errors. Within each given fiscal year, the absolute value of the forecast error of every single earnings forecast ($AFE_{a,j,t,y}$) is given by:

$$AFE_{a,j,t,y} = |EPS_{j,y} - F_{a,j,t,y}|$$

$EPS_{j,y}$ is the actual earnings per share announced by firm j for fiscal year y, and $F_{a,j,t,y}$ is the latest 1-year forecast of fiscal year y earnings of firm j released by analyst a at date t.

Because forecasting difficulty may vary by firm and year, and also in an attempt to reduce heteroscedasticity, Clement (1999) computes the "percentage demeaned absolute forecast error" ($PDAFE$). For ease of interpretation, I multiply it by -1, so that it can be interpreted as an

[4] In what follows, I consider a 0.90 cutoff value. Results remain unchanged when computations are performed with thresholds set to 0.85, 0.90, or 1, and when the raw HI measures are used instead of imposing an arbitrary threshold.

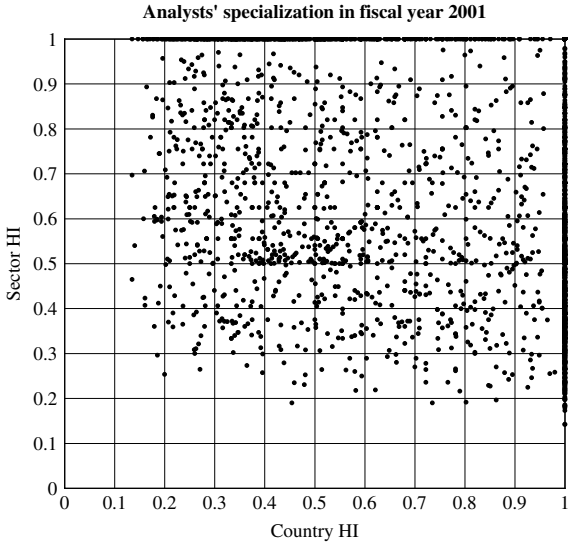

Figure 1
This figure gives a picture of financial analysts' organization based on my Herfindahl Index (*HI*) measure. Each dot represents one of the 2936 individual analysts who issued 1-year earnings forecasts for European firms during year 2001. The horizontal axis reports analysts' country *HI*s. The vertical axis reports analysts' sector *HI*s. A value close to 1 for the country (sector) *HI* indicates a strong concentration (specialization) of the analyst's portfolio in firms of a single country (sector). A value close to 0 for the country (sector) *HI* indicates a highly diversified portfolio in terms of countries (sectors).

accuracy measure. This variable, which I call *PDAFA*, is formally given as:[5,6]

$$PDAFA_{a,j,t,y} = -\frac{DAFE_{a,j,t,y}}{\overline{AFE_{j,y}}}$$

[5] *PDAFA* stands for "percentage demeaned absolute forecast accuracy." Forecast accuracy alone is not a sufficient statistic for measuring analysts' performance, as some analysts may herd on forecasts released by skilled analysts. Below another measure is introduced, namely the timeliness of earnings forecasts developed by Cooper et al. (2001). This timeliness measure makes it possible to check the robustness of the conclusions.

[6] As an additional robustness check, I also performed all the tests using two other measures of analyst earnings forecast accuracy: *PDAFAP* and *RangeAFEP;* see, e.g., Malloy (2005) and Bae et al. (2006). The former is constructed similarly to *PDAF*A except that absolute forecast errors are divided by the last month end stock price. *RangeAFEP* is computed as:

$$RangeAFEP_{a,j,y} = \frac{MaxAFEP_{j,y} - AFEP_{a,j,y}}{MaxAFEP_{j,y} - MinAFEP_{j,y}}$$

where $AFEP_{a,j,y}$ is the absolute forecast error of analyst a on firm j in year y scaled by firm j's last month stock price. *MaxAFEP* and *MinAFEP* are respectively the maximum and minimum price scaled absolute forecast error for firm j in year y. Both of these alternative measures of forecast accuracy yield results consistent with those from the *PDAFA* measure. These results are available from the author on request.

$\overline{AFE_{j,y}}$ is the mean absolute forecast error calculated over all analysts' forecasts of firm j's earnings in fiscal year y. $DAFE_{a,j,t,y} = AFE_{a,j,t,y} - \overline{AFE_{j,y}}$ is the demeaned absolute forecast error. A positive value of $PDAFA$ indicates a better than average performance. A negative value of $PDAFA$ indicates a worse than average performance.

3.3 Regression model and control variables

The following pooled regression model is estimated to test whether it is advantageous for individual financial analysts to specialize by country rather than by sector:

$$\begin{aligned} PDAFA_{a,j,t,y} &= \alpha_{j,y} + \beta_{ABS} ABS_{a,y} + \beta_{COS} COS_{a,y} \\ &\quad + \beta_{SES} SES_{a,y} + \sum_{l=1}^{L} \gamma_l z_{a,j,l,t,y} + \varepsilon_{a,j,t,y} \end{aligned} \tag{1}$$

$PDAFA_{a,j,t,y}$ is the proportional demeaned absolute forecast accuracy measure defined above. $\alpha_{j,y}$ is a firm-year fixed effect.[7] $COS_{a,y}$ is a dummy variable that is equal to one if analyst a is a country-specialized analyst over fiscal year y and zero otherwise. $SES_{a,y}$ is a dummy variable that is equal to one if analyst a is a sector-specialized analyst and zero otherwise. $ABS_{a,y}$ is a dummy variable that is equal to one if analyst a is an "absolute" specialist and zero otherwise. The L control variables are represented by the z's. These variables control for ability and/or skills. Indeed, it is important to make sure that the potential superiority of one analyst's specialization to another is not due to more skilled analysts concentrating in this type of specialization. The considered control variables are defined below. They are those that have been shown to explain financial analysts' forecast accuracy; see, e.g., O'Brien (1990), Stickel (1992), Mikhail et al. (1997), Clement (1999), Jacob et al. (1999), and Bolliger (2004). Two additional control variables may have an impact on the performance of country- and sector-specialized individual analysts. First, specialization change (*SPCHG*) is a dummy variable that equals one if the analyst was in another specialization group over the preceding fiscal year, and zero otherwise. It allows taking account of the fact that an analyst who switched from one specialization to another may need some time to adapt to his or her new position. Second, specialization experience (*SPEXP*) is the number of successive years the analyst has been in his or her current specialization. Analysts may benefit from a learning effect in the particular country or sector they are specialized in.

[7] Firm-year demeaning all variables is equivalent to estimating the model with a firm-year fixed effect (see Greene (2003), pp. 287–293). Owing to the huge amounts of data, I follow this approach.

As mentioned above, the concern of not picking out fixed effects such as analysts' skills or ability when measuring the difference in performance between country and sector specialists is central. Perhaps the most important of the L control variables is $AvPercRank$. It is the measure of analysts' past accuracy proposed by Hong et al. (2000) and Hong and Kubik (2003). For each year and each firm for which a given analyst issues a forecast, the analyst is ranked according to her forecast accuracy relative to other analysts who issued forecasts on the same firm over the same fiscal year. Percentile ranks are constructed in order to account for differences in coverage across firms and years. Formally, the measure is given by:

$$PercRank_{a,j,y} = 100 - \left(\frac{Rank_{a,j,y} - 1}{FirmCoverage_{j,y}} \right) \times 100$$

where $Rank_{a,j,y}$ is analyst a's forecast accuracy ranking for firm j over year y, and $FirmCoverage_{j,y}$ is the number of analysts who issued forecasts on firm j over year y. For each analyst in each year, $PercRank_{a,j,y}$ is then averaged across all firms covered by the analyst to provide an average measure of the analyst's forecast accuracy as follows:

$$AvPercRank_{a,y} = \frac{1}{N_{a,y}} \sum_{j=1}^{N_{a,y}} PercRank_{a,j,y}$$

where $N_{a,y}$ is the number of firms followed by analyst a during fiscal year y. The summation term is taken over these $N_{a,y}$ firms. More generally, the L control variables are given by:

- *NBCO* (number of countries) is the number of countries followed by the analyst.
- *NBSE* (number of sectors) is the number of sectors followed by the analyst.
- *AGE* (forecast age) is the number of days between the date at which analyst a's last forecast for firm j's earnings was issued and the date at which actual EPS were announced.
- *FEXP* (firm experience) is the number of years the analyst has been issuing forecasts of a particular firm's earnings.
- *GEXP* (general experience) is the number of years the analyst has been in the database.
- *SPEXP* is the number of successive years the analyst has been classified in her current specialization.
- *SPCHG* is a dummy variable that equals one if the analyst was in another specialization group during the previous fiscal year.
- *BSIZE* (broker size) is a dummy variable that equals one if the analyst works for one of the brokerage houses in the top size decile. The size of

the brokerage house is computed as the number of analysts employed during the fiscal year.

- *FREQ* (frequency) is the number of forecasts released by the analyst over the fiscal year.
- *AvPercRank* (Average Percentile Rank) is the measure of the analyst's past accuracy, as defined by Hong et al. (2000) and Hong and Kubik (2003).

3.4 Data

One year EPS forecasts are taken from the I/B/E/S International Historical Detail File database. The period studied is from 1994 to 2004. The sample includes the fifteen major European markets: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the UK. The decision to confine to European markets was dictated by the following considerations. First, the reorganization of financial research departments already referred to is mainly a European phenomenon. Second, keeping within Europe provides us with a large cross-section of country- and sector-specialized analysts. Conversely, most analysts following Japanese firms are country-specialized.[8] In the US market, analysts tend to specialize by sectors within the US.

The I/B/E/S Identification File is used to ascertain the country of origin of each firm. The industry sector in which each firm is active is given by the two-digit code provided by I/B/E/S. Eleven sectors are defined: Finance, Health Care, Consumer Nondurables, Consumer Services, Consumer Durables, Energy, Transportation, Technology, Basic Industries, Capital Goods, and Public Utilities. Firms for which I/B/E/S does not define a country or an industry are excluded from the sample. In the whole world sample, 166 firms are given two countries by I/B/E/S. I manually checked the location of their headquarters on www.Business.com or on their home websites. Fifty-three of them are headquartered in one of the fifteen European countries considered here and are therefore included in the sample.

I/B/E/S reports earnings forecasts released by both individual analysts and teams of analysts. As there is no additional information about how teams are structured, how many analysts they include, and what the analysts' specializations are, they are discarded from the sample. Only forecasts released by individual analysts are considered.[9] Also deleted are analysts for whom I/B/E/S does not provide a code or a name and analysts who had issued forecasts for fewer than three firms over the relevant fiscal year.

[8] On a yearly basis over the period 1994–2001, the I/B/E/S database contained on average 206 country-specialized analysts reporting forecasts of Japanese firms' earnings, but only two sector-specialized analysts.

[9] For this purpose, all records for which the analyst's name did not include a first name initial are deleted. So are all names that included "/" or "&" characters.

In addition, the sample is restricted to 1-year EPS forecasts issued before the actual earnings announcement date. Forecasts for which there is no data about actual earnings or for which the currency is unknown are also eliminated from the sample. Finally, only forecasts issued for firms followed by at least three analysts are considered. Table 2 summarizes the resulting dataset.

4. Results

4.1 Financial analysts: location and average characteristics

The first panel of Table 3 offers some interesting insights into the geographical location of financial analysts. It reports analysts' location with respect to the firms they follow. Depending on specialization, the percentage of analysts based in the home country of the firms they cover varies from 34.3 to 93.1%. That is, approximately one third of the firms for which sector-specialized analysts report earnings forecasts are headquartered in the same country as the analyst. The high percentage of domestic firms covered by country specialists indicates that country-specialized analysts tend to be located within their country of expertize. Also, analysts tend to be located geographically close to the firms they follow. For instance, almost all firms followed by sector specialists that are headquartered within analysts' home countries are also located less than 100 kilometers away from the analyst; country specialists are based less than 100 kilometers away from the headquarters of nearly 60% of the firms they cover. On average, the distance between analysts and firms is far lower for country than for sector specialists. The former are on average based 185 kilometers away from the firms they cover, whereas 676 kilometers separate sector specialists from the firms they follow.

The maximum distance of 17,704 kilometers between analysts and the firms they cover reminds us that European firms are also followed by some overseas analysts. Nevertheless, panel B of Table 3 reveals that they are in fact very few. Only 1.8% of analysts following European firms are located in the US. An additional 0.7% are located outside the fifteen European countries included in the sample. In fact, research on European firms is mainly centered in the UK, where almost half of the analysts are located. Research is also extensively performed in France and Germany. These two countries house respectively 12.6% and 9.8% of analysts following European firms. A significant amount of research is also performed in Sweden and the Netherlands, where a total of almost 10% of analysts is located. The rest of the research is divided between the ten remaining European countries, with smaller markets having fewer analysts.

Table 2
Summary statistics

	No. of firms followed by					No. of forecasts issued by					No. of analysts				
	Absolute special	Country special	Sector special	General	Total no. firms	Absolute special	Country special	Sector special	General	Total no. forecasts	Absolute special	Country special	Sector special	General	Total no. analysts
Panel A: Summary statistics by country															
Austria	8	41	20	33	42	11	382	187	429	1009	5	49	122	204	328
Belgium	26	99	34	77	100	89	2680	723	1169	4661	18	152	332	383	747
Denmark	68	121	64	107	128	416	1853	774	1810	4853	56	130	268	386	673
Finland	66	135	45	97	135	224	4132	782	2028	7166	34	197	240	490	829
France	278	520	235	386	521	2996	21,991	4520	9475	38,982	277	783	1036	1587	2836
Germany	187	395	178	338	406	1644	10,452	3225	7182	22,503	251	643	791	1311	2370
Ireland	34	64	27	58	65	317	714	322	649	2002	37	73	128	154	306
Italy	92	177	73	108	181	1547	4351	1449	1758	9105	125	250	434	641	1258
Netherlands	93	203	98	168	204	642	11,191	2211	3667	17,711	99	404	695	889	1706
Norway	79	136	56	111	139	560	3010	701	1338	5609	69	208	254	325	712
Portugal	16	57	22	39	57	115	973	371	550	2009	19	104	138	196	376
Spain	90	139	76	122	140	622	5329	1416	3093	10,460	99	261	421	691	1199
Sweden	131	224	105	207	227	679	4422	1753	4138	10,992	110	320	460	775	1357
Switzerland	101	179	75	137	181	861	6070	1859	2151	10,941	85	280	554	649	1297
UK	724	1042	505	714	1074	8774	17,751	6404	9335	42,264	689	837	1033	1358	2857
Panel B: Summary statistics by sector															
Basic Ind.	137	291	141	220	292	788	9140	3089	5175	18,192	139	1926	266	984	2786
Cap. Goods	347	669	241	493	670	1564	23,436	1870	9659	36,529	248	2693	214	1450	3733
Cons. Discr.	17	88	16	57	88	96	3373	256	2156	5881	27	878	41	438	1205
Cons. Non-D.	203	352	145	255	354	1427	10,648	2054	4351	18,480	175	1685	164	755	2280
Cons. Serv.	381	706	297	551	714	4152	20,047	3579	9252	37,030	405	2735	348	1507	3948

Table 2
(Continued)

	No. of firms followed by					No. of forecasts issued by					No. of analysts				
	Absolute special	Country special	Sector special	General	Total no. firms	Absolute special	Country special	Sector special	General	Total no. forecasts	Absolute special	Country special	Sector special	General	Total no. analysts
Energy	43	88	54	79	89	234	2697	1060	2422	6413	39	635	108	411	1015
Finance	461	516	372	349	551	9240	7914	10,961	2490	30,605	696	1257	580	525	2456
Health Care	129	176	131	161	188	773	4113	1835	3414	10,135	120	929	227	533	1456
Public Util.	61	127	81	115	127	418	3806	1456	3943	9623	77	1044	233	758	1739
Technology	156	416	94	334	426	441	7212	240	4133	12,026	99	1399	97	966	2129
Transport.	59	105	45	93	107	380	2926	313	1802	5421	52	764	41	332	1026
Panel C: Summary statistics by year															
1994	167	650	215	352	672	317	3797	453	850	5417	57	393	61	98	609
1995	384	1070	301	648	1105	869	7219	751	1830	10,669	152	743	112	238	1245
1996	590	1505	371	798	1558	1607	10,462	1109	2246	15,424	253	1064	150	265	1732
1997	710	1772	496	898	1831	2301	12,862	1629	2350	19,142	349	1338	206	283	2176
1998	768	1922	548	1001	1982	2406	13,271	1877	2733	20,287	391	1416	264	344	2415
1999	837	1886	659	1178	1962	2437	11,155	2441	4291	20,324	422	1348	374	572	2716
2000	752	1742	735	1221	1843	2146	8854	2724	4776	18,500	403	1232	487	686	2808
2001	767	1646	818	1328	1780	2094	7139	3603	6153	18,989	386	1085	582	883	2936
2002	709	1625	758	1422	1778	1950	6991	4319	8274	21,534	369	1016	729	1154	3268
2003	641	1501	754	1346	1679	1817	6891	4109	8283	21,100	324	923	670	1118	3035
2004	615	1475	686	1264	1643	1653	7027	3809	7250	19,739	281	906	619	967	2773
Total	2027	3617	1652	2773	3701	19,597	95,668	26,824	49,036	191,125	1892	4371	2043	2979	8101

This table reports the number of firms, forecasts, and analysts included in my sample. These numbers are split according to whether they have been issued by an absolute, country, or sector specialist, or a generalist. In panel A, the statistics are reported country by country, based on the location of the firm's headquarters. In panel B they are reported sector by sector, according to the sector firms are active in. Year-by-year statistics appear in panel C. The total number of analysts in my sample is the sum of the number of analysts in each of the four specialization groups. The sum of firms followed by absolute specialists, country specialists, sector specialists, and generalists does not equal the total number of firms, since a given firm is usually followed by more than one type of specialist.

Panel C of Table 3 reports statistics on the average characteristics of analysts from different specialization groups. It shows that the average number of countries (sectors) followed by country (sector) specialists does not equal 1. It is respectively 1.07 and 1.18. This feature comes from the use of the Herfindahl-based measure for analyst specialization, which allows analysts to be considered as country (sector) specialists as long as they spend most of their time following firms headquartered (active) in a single country (sector).

An interesting output from Panel C relates to the organizational structures of brokerage houses of different sizes. Large brokerage houses rely more on sector-by-sector organizational structures. The reverse is true for small- and medium-sized brokerage houses. Only 39.7% of country specialists, but more than 75% of sector specialists, worked for large brokerage houses on average over the sample period.

4.2 Tests of H1

4.2.1 Main results. Tests of analysts' forecast accuracy are based on Equation (1). More precisely, the following model is estimated, with all or subsets of the control variables:

$$\begin{aligned} PDAFA_{a,j,t,y} = {} & \alpha_{j,y} + \beta_{ABS} ABS_{a,y} + \beta_{COS} COS_{a,y} \\ & + \beta_{SES} SES_{a,y} + \gamma_1 NBCO_{a,y} \\ & + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} \\ & + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} \\ & + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} \\ & + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y} \end{aligned} \quad (2)$$

Table 4a reports the results. Whatever the specification, the coefficient on the country specialists' dummy is positive and highly statistically significant, which implies that the accuracy of financial analysts specialized by countries is superior. Financial analysts specializing by sectors are less accurate on average, as their related coefficient is negative and statistically significant in every specification. The difference in accuracy between country and sector specialists ranges from 5.80 to 7.33%. In the most comprehensive model, the difference is 5.84%. It is highly statistically significant, as indicated by the zero p-value reported in the last row but three of the table. This underlines the superiority of country-specialized analysts over sector-specialized analysts.

All significant control variables are of the expected sign. *FREQ* does not significantly impact the accuracy of analysts' earnings forecasts, while the *AGE* of the forecast is by far the most influential variable. As previously documented in the literature, the number of countries and sectors followed

Table 3
Summary statistics—analysts and analysts' location

	Absolute spec.	Country spec.	Sector spec.	General.	All analysts
Total number of analysts	1892	4371	2043	2979	8101
Panel A: Analyst-firm characteristics					
Perc. of within country (local)	91.2%	93.1%	34.3%	47.2%	66.8%
Av. distance	211	185	676	530	393
Min. distance	0	0	0	0	0
Max. distance	9440	17,074	17,040	17,704	17,704
Perc. of <100 km	60.0%	57.4%	25.2%	31.4%	43.1%
Panel B: Analyst location (%)					
UK	52.5	30.0	65.9	49.4	46.5
France	9.2	14.6	9.8	13.8	12.6
Germany	9.2	12.0	6.3	10.0	9.8
Sweden	4.4	6.3	3.1	4.9	4.9
Netherlands	4.5	6.7	2.5	3.9	4.7
Spain	3.4	5.1	1.9	3.7	3.8
Switzerland	3.7	6.1	0.7	2.1	3.5
Italy	4.6	4.2	0.3	0.8	2.5
Norway	2.3	4.1	0.9	1.0	2.2
Belgium	0.6	2.6	0.6	2.1	1.7
Denmark	1.8	1.7	1.4	1.8	1.7
Finland	0.7	3.1	0.2	0.9	1.5
Ireland	1.0	1.3	0.3	1.4	1.1
Portugal	0.5	1.1	0.4	0.9	0.8
Austria	0.0	0.5	0.1	0.2	0.2
USA	1.0	0.5	4.1	2.1	1.8
Others	0.5	0.2	1.4	1.0	0.7
Panel C: Analyst average characteristics					
No. of countries followed	1.07	1.07	4.09	3.80	2.20
No. of sectors followed	1.16	4.20	1.18	3.16	3.20
No. of firms followed	8.59	13.26	9.04	10.40	11.45
Forecast age (days)	109.8	105.3	104.0	103.7	105.2
Firm experience (years)	2.31	2.31	2.54	2.46	2.38
General experience (years)	3.27	3.56	4.06	4.12	3.74
Specialization experience (years)	1.89	2.70	2.15	2.17	2.40
Perc. of anal. in large brok.	57.3%	39.7%	75.9%	60.1%	51.8%
Perc. of anal. in small/med. brok.	42.7%	60.3%	24.1%	39.9%	48.2%

This table reports summary statistics on financial analysts' locations and characteristics, split according to analyst specialization. The very first row indicates the total number of analysts in each specialization group. Panel A reports measures of analysts' locations relative to the firms they follow. The first row indicates the percentage of analysts located in the same country as the firms they follow. The second to fourth rows respectively report the average, minimum, and maximum distance between analysts and the firms they follow. The last row in this panel gives the percentage of analysts located less than 100 km away from the firms they follow. Panel B reports the percentage of analysts based in each of the fifteen countries in my sample. As research on European firms is also done outside Europe, the two last rows indicate the percentages of analysts following European firms from the US and other countries worldwide. Panel C reports average characteristics of financial analyst earnings forecasts. The last two rows in this panel add up to 100%. They reveal how the different analyst specializations are distributed across large and small/medium brokerage houses.

Table 4a
Forecast accuracy regressions

	(1)	(2)	(3)	(4)	(6)
ABS	2.5**	4.01***	2.06*	1.52	1.63
	(2.51)	(4.09)	(1.82)	(1.33)	(1.43)
COS	4.69***	4.86***	4.19***	3.25***	3.45***
	(7.59)	(7.99)	(5.25)	(3.94)	(4.19)
SES	−2.64***	−2.25**	−3.1***	−2.55***	−2.39***
	(−2.93)	(−2.53)	(−3.36)	(−2.74)	(−2.58)
NBCO			−0.38**	−0.25	−0.38**
			(−2.06)	(−1.29)	(−1.97)
NBSE			−0.53***	−0.74***	−0.58***
			(−3.64)	(−4.13)	(−3.21)
AGE		−0.18***	−0.19***	−0.19***	−0.19***
		(−60.76)	(−60.88)	(−60.87)	(−60.86)
FEXP				1.08***	1.04***
				(6.45)	(6.24)
GEXP				−0.59***	−0.56***
				(−4.39)	(−4.16)
SPEXP				0.31*	0.33*
				(1.65)	(1.78)
SPCHG				0.91	1.08
				(1.27)	(1.5)
BSIZE				−4.46***	−4.46***
				(−9.62)	(−9.63)
FREQ				0.02	0.02
				(0.58)	(0.62)
AvPercRank				0.28***	
					(18.34)
Diff. Cou.-Sec.	7.33	7.11	7.29	5.80	5.84
p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Adj-R^2	0.00	0.03	0.03	0.04	0.04
Nb obs.	142,178	142,178	142,178	142,178	142,178

Each column reports the coefficients estimated from a specific subset of the regression equation:

$$PDAFA_{a,j,t,y} = \alpha_{j,y} + \beta_{ABS}ABS_{a,y} + \beta_{COS}COS_{a,y} + \beta_{SES}SES_{a,y} + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y}$$

PDAFA is the proportional demeaned absolute forecast accuracy defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed-effect. *ABS, COS*, and *SES* are dummy variables that take the value 1 if analyst a is respectively an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year $(y-1)$. *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the top size decile. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year $(y-1)$. All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1%, 5%, and 10% levels is marked ***, ** and * respectively. In the last four rows of the table, "Diff. Cou.-Sec." reports the difference between the coefficients on country and sector specialization. The statistical significance of this difference is given by the p-value reported just below. The adjusted-R^2 and the number of observations are indicated in the last two rows.

by financial analysts is negatively related to forecast accuracy. It should be emphasized that the coefficient on country specialization is statistically significant above and beyond the simple fact that the analysts' task is rendered more complex when they follow a large number of countries. Indeed, the coefficient on country specialization is significantly positive even when the number of countries is included as a control variable. This highlights how important it is for analysts to concentrate on a single country. It is also consistent with the existence of informational advantages due to proximity or to a good knowledge of country-specific factors.

Forecast accuracy increases with FEXP. The coefficient on this control variable allows a meaningful comparison. It will be recalled that FEXP is defined as the number of years the analyst has been issuing earnings forecasts for a particular firm. It is a surrogate for the "learning-by-doing" effect. It may also proxy for analysts having easier access to private information through the relationships they may have forged with the firm's management over the years. The coefficient on *FEXP* is 1.04%. This means that every additional year of "firm experience" produces a 1.04% reduction in average forecast error. By comparison, the difference in accuracy between country and sector specialists is 5.84%. That is, more than 5 years (i.e., 5.84/1.04) of "firm experience" are needed to achieve a differential comparable to the superiority of country- over sector-specialized analysts.

The negative coefficient on the brokerage size variable (*BSIZE*) may appear surprising at first sight. Analysts working for large brokerage houses should be in a position to produce more accurate earnings forecasts since they have wider access to resources. Also, large brokers have the financial resources to attract and hire the most skilled analysts. However, this astonishing negative relationship is a recurrent outcome in the literature on the accuracy of financial analysts' earnings forecasts in Europe. Bolliger (2004) investigates two potential explanations. First, analysts working for large brokerage houses may be at a disadvantage relative to their peers working for small brokerage houses because the latter have a local advantage. Another possible explanation is conflicts of interest from the involvement of large brokers in investment banking. Bolliger (2004) results indicate that the local disadvantage explains part of the bad performance of large brokerage houses, while conflicts of interest are irrelevant.

AvPercRank is highly significant, with a t-statistic of 18.34. It indicates a strong persistence in the performance of financial analysts in Europe. More importantly, the inclusion of this variable in the model does not impact the coefficient estimates on analyst specializations. This suggests that the difference in performance between country and sector specialists is not a result of skilled analysts' being concentrated in the country specialization group. Endogeneity due to a possible causal relationship between analysts'

past performance and organizational design is indeed a concern. This issue is considered in Section 4.3.3.

4.2.2 Country-by-country and sector-by-sector estimates. According to Kini et al. (2003), the structure of financial research departments is related to the strength of country- and sector-specific factors. In an attempt to gain synergies and produce high quality forecasts, financial analysts tend to specialize by countries in markets with strong national influences. Similarly, the likelihood of analysts' specializing by sector increases with the strength of industry factors. Thus, results so far may very well depend on each particular country or sector. If Kini et al. (2003) are correct, sector specialists should outperform country specialists in sectors with strong industry-specific influences. We should also find that country specialists perform better than average only in countries with relatively strong national factors.

Therefore, I re-estimate regression Equation (2) independently for each country and each sector. Table 4b reports country-by-country regression results. Country specialists tend to issue more accurate forecasts than sector specialists in all countries except one. The exception is Austria, where the coefficient on the sector specialist dummy is higher than for country specialists. This difference is not statistically significant, however, as indicated by the p-value of 0.4845. In the fourteen countries where country specialists show higher forecast accuracy, the difference between the two types of analysts is statistically significant in six countries: Belgium, France, Italy, the Netherlands (marginally significant), Norway, and Spain. In these countries, the difference in accuracy between country and sector specialists ranges from 6.77% (Netherlands) to a high of 16.49% (Belgium).

Overall, these results show a general comparative advantage for country specialists.[10] Table 4c reports sector-by-sector results. Country-specialized analysts perform better in nine out of eleven sectors. This superior performance is statistically significant in five sectors: basic industries, consumer nondiscretionary, consumer services, finance, and health care. In the two industries in which sector specialists have a coefficient larger than country-specialized analysts (viz., consumer discretionary and technology) the difference is not statistically significant.

[10] If one assumes that this advantage is mostly due to country specialists being located in the same country as the firms they follow, this result contradicts Bae et al. (2006), who find no local advantage for most of the countries investigated here. However, they focus on a very specific time-period. I re-estimated the model in Table 4b over their restricted sample period (2001–2003) and found no significant superiority among country specialists in any of the 15 European countries. While consistent with Bae et al. (2006), this result shows that the absence of local advantages reported by Bae et al. (2006) for these countries is sample-specific. Results are available from the author on request.

Table 4b
Country-by-country forecast accuracy regressions

	ABS	COS	SES	NBCO	NBSE	AGE	FEXP	GEXP	SPEXP	SPCHG
Austria	73.36**	0.62	11.74	0.99	3.16	−0.22***	1.31	−2.29	−6.24	−24.6*
	(2.07)	(0.06)	(0.96)	(0.45)	(1.04)	(−3.93)	(0.46)	(−1.01)	(−1.63)	(−1.93)
Belgium	−4.24	7.31	−9.18	−1.74	−1.19	−0.11***	0.39	0.2	1.01	−3.27
	(−0.37)	(1.39)	(−1.59)	(−1.5)	(−1.13)	(−5.92)	(0.32)	(0.23)	(0.71)	(−0.67)
Denmark	−4.2	−2.61	−2.75	−1.2	−1.18	−0.21***	2.32**	−1.93**	−0.53	−2.72
	(−0.71)	(−0.7)	(−0.51)	(−1.06)	(−1.14)	(−11.6)	(2.13)	(−1.97)	(−0.43)	(−0.66)
Finland	23.42***	11.88***	9.81**	0.01	1.51*	−0.32***	0.8	−0.11	0.96	−0.07
	(2.79)	(3.3)	(2.13)	(0.01)	(1.76)	(−20.78)	(0.94)	(−0.15)	(0.99)	(−0.02)
France	5.91**	7.82***	−2.32	0.22	−0.74*	−0.13***	0.76**	−1.13***	1.68***	4.97***
	(2.24)	(3.83)	(−0.98)	(0.44)	(−1.94)	(−20.91)	(2.19)	(−3.79)	(4.41)	(2.95)
Germany	−12.67***	−2.33	−3.04	−0.78	0.24	−0.2***	0.79*	−0.44	0.49	2.22
	(−3.13)	(−1.05)	(−1.14)	(−1.46)	(0.41)	(−20.34)	(1.65)	(−1.13)	(0.88)	(1.11)
Ireland	−8.32	−9.54*	−16.49**	0.03	0.27	−0.16***	2.58*	−2.33**	0.98	3.22
	(−0.94)	(−1.72)	(−2)	(0.01)	(0.16)	(−5.82)	(1.77)	(−2.19)	(0.62)	(0.57)
Italy	21.69***	12.08**	−1.5	0.66	−0.99	−0.11***	−0.82	0.17	1.08	3.48
	(3.71)	(2.33)	(−0.33)	(0.7)	(−1.25)	(−7.97)	(−0.98)	(0.26)	(1.27)	(0.82)
Netherland	14.87***	−0.15	−6.92**	−0.39	0.3	−0.2***	1.83***	−1.16**	−0.9	−1.19
	(3.13)	(−0.05)	(−2.13)	(−0.55)	(0.58)	(−19.12)	(2.94)	(−2.22)	(−1.27)	(−0.44)
Norway	4.23	11.97***	−1.09	0.42	−1.55	−0.31***	0.6	0.76	−1.04	−7.03*
	(0.65)	(2.75)	(−0.23)	(0.46)	(−1.36)	(−17.51)	(0.63)	(0.89)	(−0.93)	(−1.72)
Portugal	−11.29	1.77	−2.19	1.85	−7.17**	−0.1***	4.07	−1.05	−10.32**	−12.65
	(−0.65)	(0.22)	(−0.22)	(1)	(−2.51)	(−2.85)	(1.57)	(−0.47)	(−2.53)	(−1.42)
Spain	−3.19	3.85	−8.65*	−1.22	−1.96**	−0.11***	1.71*	−1.81**	2.09**	9.37***
	(−0.56)	(0.98)	(−1.86)	(−1.58)	(−1.97)	(−8.58)	(1.93)	(−2.06)	(2.08)	(2.59)
Sweden	−11.67**	3.54	2.49	−1.65**	−1.56*	−0.29***	0.41	−0.63	−0.85	−4.33
	(−2.18)	(1.28)	(0.63)	(−2)	(−1.68)	(−21.91)	(0.51)	(−1.12)	(−0.96)	(−1.49)
Switz.	4.52	4.03	−1.36	0.2	−1.83*	−0.23***	0.88	−0.47	0.01	−0.38
	(0.83)	(0.99)	(−0.34)	(0.19)	(−1.8)	(−16.61)	(1.19)	(−0.78)	(0.01)	(−0.12)
UK	0.91	1.15	−1.37	0.36	−0.52	−0.17***	1.08***	0.15	−0.11	0.74
	(0.44)	(0.65)	(−0.79)	(0.92)	(−1.25)	(−29.31)	(3.5)	(0.6)	(−0.3)	(0.55)

Table 4b
(Continued)

	BSIZE	FREQ	AvPerc Rank	Diff. Cou.-Sec.	*p*-value	Adj-R^2	Nb. obs.
Austria	−9.05	0.2	0.11	−11.12	0.4845	0.04	717
	(−1.1)	(0.22)	(0.58)				
Belgium	−2.52	0.18	0.08	16.49	0.0210	0.02	3460
	(−0.81)	(0.79)	(0.92)				
Denmark	−3.01	0.1	0.26***	0.14	0.9820	0.05	3579
	(−1.11)	(0.38)	(3.09)				
Finland	−4.93**	−0.61**	0.15**	2.07	0.6919	0.13	5296
	(−2.1)	(−2.25)	(2.09)				
France	−1.19	−0.09	0.37***	10.14	0.0004	0.03	29,622
	(−1.32)	(−1.02)	(11.43)				
Germany	−7.25***	−0.19	0.19***	0.71	0.8202	0.04	16,531
	(−5.08)	(−1.63)	(4.6)				
Ireland	−16.83***	−0.71	0.12	6.95	0.4005	0.05	1620
	(−3.09)	(−1.6)	(0.79)				
Italy	−10.39***	0.6***	0.31***	13.58	0.0318	0.03	6257
	(−4.79)	(3.29)	(4.64)				
Netherland	−3.4**	−0.07	0.15***	6.77	0.0984	0.04	13,028
	(−2.17)	(−0.91)	(2.77)				
Norway	−3.06	0.54*	0.36***	13.06	0.0153	0.11	4404
	(−1.13)	(1.77)	(4.73)				
Portugal	−38.56***	−0.82	0.41***	3.96	0.7431	0.07	1285
	(−5.67)	(−0.9)	(2.67)				
Spain	−10.65***	0.14	0.94***	12.5	0.0262	0.04	7458
	(−5.17)	(0.73)	(9.97)				
Sweden	−3.05	0.39	0.2***	1.05	0.8197	0.09	7767
	(−1.47)	(1.57)	(3.41)				
Switzerland	−10.9***	0.23	0.19***	5.39	0.2667	0.05	8291
	(−4.77)	(0.88)	(2.82)				
UK	0.47	0.18***	0.12***	2.52	0.2291	0.03	32,863
	(0.44)	(2.72)	(4.26)				

Each row reports the coefficients estimated from the following regression equation estimated on a country-by-country basis:

$$\begin{aligned} PDAFA_{a,j,t,y} &= \alpha_{j,y} + \beta_{ABS} ABS_{a,y} + \beta_{COS} COS_{a,y} \\ &+ \beta_{SES} SES_{a,y} + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} \\ &+ \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} \\ &+ \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y} \end{aligned}$$

PDAFA is the proportional demeaned absolute forecast accuracy defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed-effect. *ABS, COS*, and *SES* are dummy variables that take the value 1 if analyst a is respectively an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year $(y-1)$. *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the top size decile. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year $(y-1)$. All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1, 5, and 10% levels is marked ***, ** and * respectively. In the last four columns of the table, "Diff. Cou.-Sec." reports the difference between the coefficients on country and sector specialization. The statistical significance of this difference is given by the p-value reported in the next column. The adjusted-R^2 and the number of observations are indicated in the last two columns.

Table 4c
Sector-by-sector forecast accuracy regressions

	ABS	COS	SES	NBCO	NBSE	AGE	FEXP	GEXP	SPEXP	SPCHG
Basic ind.	6.92	6.61**	−3.73	0.7	−0.03	−0.27***	0.86	−1.04**	1.07*	−0.67
	(1.3)	(2.5)	(−1.37)	(1.2)	(−0.05)	(−25.82)	(1.58)	(−2.22)	(1.69)	(−0.27)
Cap. goods	3.52	−0.91	−2.11	−2.19***	0.13	−0.18***	0.72*	−0.72**	0.42	−0.84
	(1.07)	(−0.46)	(−0.77)	(−3.95)	(0.33)	(−26.78)	(1.83)	(−2.21)	(1)	(−0.5)
Cons. D.	−31.77	−7.47	1.9	−2.84*	1.16	−0.22***	1.45*	−0.76	0.92	−2.87
	(−1.48)	(−1.51)	(0.26)	(−1.77)	(1.24)	(−13.47)	(1.79)	(−1.05)	(0.99)	(−0.6)
Cons. N.D.	4.63	5.13*	−1.48	−0.14	−1.16**	−0.16***	1.47***	−0.5	1.08*	8.62***
	(1.24)	(1.89)	(−0.51)	(−0.18)	(−2.07)	(−16.91)	(2.86)	(−1.31)	(1.88)	(3.82)
Cons. serv.	−2.72	1.48	−6.89***	−1.6***	−0.73*	−0.14***	0.71*	−0.37	0.55	3.41**
	(−1.13)	(0.76)	(−2.93)	(−3.25)	(−1.94)	(−21.19)	(1.94)	(−1.28)	(1.38)	(2.13)
Energy	−11.98	2.48	−2.88	0.17	−2.02*	−0.23***	0.07	0.37	0.02	−0.67
	(−1.14)	(0.53)	(−0.67)	(0.24)	(−1.95)	(−13.87)	(0.08)	(0.55)	(0.02)	(−0.16)
Finance	4.86*	9.41***	0.32	−0.16	−1.87***	−0.18***	1.63***	−0.6	−1.32***	−3.74**
	(1.69)	(3.41)	(0.12)	(−0.39)	(−3.31)	(−24.01)	(3.79)	(−1.53)	(−2.61)	(−2.12)
Health care	−2.27	6.95*	−2.13	1.7*	−1.11	−0.18***	1.08	−0.29	0.96	−1.09
	(−0.4)	(1.75)	(−0.64)	(1.66)	(−1.2)	(−12.58)	(1.46)	(−0.51)	(0.96)	(−0.35)
Public util.	8.44	6.58*	5.72	0.62	1.75*	−0.12***	1.07	−0.9	1.04	5.05
	(1.35)	(1.84)	(1.52)	(0.87)	(1.94)	(−9.26)	(1.3)	(−1.43)	(1.23)	(1.62)
Techno.	−3.81	−0.52	3.14	−1.46	−0.47	−0.26***	1.44**	−0.16	0.3	4.08
	(−0.62)	(−0.17)	(0.34)	(−1.37)	(−0.71)	(−20)	(2.02)	(−0.29)	(0.38)	(1.51)
Transport.	0.02	−2.22	−9.71	−0.25	0.35	−0.21***	1.21	−0.39	−0.85	−6.13
	(0)	(−0.56)	(−1.48)	(−0.26)	(0.36)	(−11.72)	(1.39)	(−0.55)	(−0.75)	(−1.45)

Table 4c
(Continued)

	BSIZE	FREQ	AvPerc Rank	Diff. Cou.-Sec.	p-value	Adj-R^2	Nb. Obs.
Basic Ind.	−2.07	−0.12	0.26***	10.34	0.0030	0.07	13,264
	(−1.28)	(−1.03)	(5.17)				
Cap. goods	−4.46***	−0.16**	0.36***	1.2	0.7018	0.04	27,360
	(−4.35)	(−2.01)	(9.6)				
Cons. D.	−2.06	−0.47**	0.34***	−9.37	0.2768	0.06	4488
	(−0.89)	(−2.45)	(4.45)				
Cons. N.D.	−4.32***	0.16	0.21***	6.61	0.0650	0.03	14,356
	(−3.02)	(1.63)	(4.4)				
Cons. Serv.	−5.58***	0.08	0.31***	8.37	0.0019	0.03	28,163
	(−5.42)	(1.19)	(9.17)				
Energy	−7.29***	0.18	0.4***	5.36	0.3592	0.05	4870
	(−2.75)	(0.83)	(4.12)				
Finance	−5.84***	0.27***	0.2***	9.09	0.0002	0.04	22,210
	(−4.91)	(2.88)	(5.59)				
Health care	−3.59	0.02	0.13*	9.08	0.0524	0.03	7447
	(−1.61)	(0.1)	(1.95)				
Public util.	−6.72***	−0.44**	0.32***	0.86	0.8652	0.02	6856
	(−3.04)	(−2.33)	(4.63)				
Techno.	0.13	0.03	0.23***	−3.66	0.7005	0.07	9067
	(0.08)	(0.17)	(4.53)				
Transport.	1.3	0.06	0.25***	7.49	0.2935	0.05	4097
	(0.48)	(0.32)	(2.97)				

Each row reports the coefficients estimated from the following regression equation estimated on a sector-by-sector basis:

$$PDAFA_{a,j,t,y} = \alpha_{j,y} + \beta_{ABS}ABS_{a,y} + \beta_{COS}COS_{a,y} + \beta_{SES}SES_{a,y} + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y}$$

PDAFA is the proportional demeaned absolute forecast accuracy defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed-effect. *ABS, COS*, and *SES* are dummy variables that take the value 1 if analyst a is respectively an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year $(y-1)$. *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the top size decile. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year $(y-1)$. All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1, 5, and 10% levels is marked ***, ** and * respectively. In the last four columns of the table, "Diff. Cou.-Sec." reports the difference between the coefficients on country and sector specialization. The statistical significance of this difference is given by the p-value reported in the next column. The adjusted-R^2 and the number of observations are indicated in the last two columns.

Overall, even though the superiority of country over sector specialists may be concentrated in a subset of countries and sectors, sector specialists are never significantly more accurate than country specialists. In none of the investigated countries or sectors is the coefficient on sector specialists significantly higher than the coefficient on country specialists. Country specialists, on the other hand, perform statistically significantly better in almost half of the countries and sectors. This makes it impossible to confirm Kini et al. (2003) conjecture that the choice between country and sector specialization is made with the aim of enhancing forecast accuracy.

4.2.3 Firms' characteristics. It is often argued that multinational firms are likely to be insensitive—or at least less sensitive than domestic firms—to their home-country-specific factors. Nokia, for instance, would not be considered as a Finnish entity. As a consequence, such firms are better followed by global sector-specialized analysts. If this is correct, the superior performance of country specialists should be concentrated in firms with low levels of foreign activity. I rely on foreign sales and assets, and to a lesser extent market capitalizations, as proxies for the level of firms' international activities. This information is extracted from the Worldscope database and the following model is estimated:

$$\begin{aligned} PDAFA_{a,j,t,y} = {} & \alpha_{j,y} + \beta_{ABS} ABS_{a,y} + \beta_{COS} COS_{a,y} + \beta_{SES} SES_{a,y} \\ & + \beta_{ABS,Q_1} ABS_{a,y} \times Q_1 + \beta_{ABS,Q_4} ABS_{a,y} \times Q_4 \\ & + \beta_{COS,Q_1} COS_{a,y} \times Q_1 + \beta_{COS,Q_4} COS_{a,y} \times Q_4 \\ & + \beta_{SES,Q_1} SES_{a,y} \times Q_1 + \beta_{SES,Q_4} SES_{a,y} \times Q_4 \\ & + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} \\ & + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} \\ & + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} \\ & + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y} \end{aligned} \tag{3}$$

where Q_1 (Q_4) is a dummy variable that equals 1 if the firm belongs to the highest (lowest) firm-level variable quartile and 0 otherwise. I estimate the model independently for each of the three firm-level variables.

Results are reported in Table 5. The first column reports results relative to estimations based on quartiles constructed from market capitalizations. It shows that, if we control for firms' market capitalization, country specialists outperform sector specialists. Moreover, this result contradicts the hypothesis that the superiority of country specialists should be concentrated in small capitalization firms. In fact the reverse is true. Country specialists perform significantly worse when they issue earnings forecasts on small rather than medium or large capitalization firms.

Table 5
Forecast accuracy regressions—market cap, foreign sales, and foreign assets

	Market cap.	Foreign sales	Foreign assets
ABS	3.61**	1.68	2.04
	(2.19)	(0.71)	(0.66)
COS	4.24***	1.58	1.24
	(3.81)	(1.24)	(0.61)
SES	0.75	−4.17**	−3.36
	(0.55)	(−2.5)	(−1.47)
ABS × Q1 (high)	−2.8	−1.62	−6.02
	(−1.05)	(−0.4)	(−1.01)
ABS × Q4 (low)	−7.33***	4.06	−0.51
	(−2.62)	(1.28)	(−0.12)
COS × Q1 (high)	−1.53	2.53	−1.35
	(−0.9)	(1.4)	(−0.46)
COS × Q4 (low)	−4.14***	0.67	−3.84
	(−2.63)	(0.35)	(−1.33)
SES × Q1 (high)	−4.93**	5.06*	−8.11**
	(−2.36)	(1.87)	(−2.04)
SES × Q4 (low)	−9.16***	4.15	2.44
	(−2.83)	(1.45)	(0.63)
NBCO	−0.35	−0.35	−0.02
	(−1.58)	(−1.36)	(−0.05)
NBSE	−0.74***	−0.29	−0.82*
	(−3.61)	(−1.23)	(−1.96)
AGE	−0.19***	−0.19***	−0.19***
	(−55.22)	(−47.39)	(−31.16)
FEXP	0.99***	1.11***	1.6***
	(5.51)	(5.36)	(5.15)
GEXP	−0.55***	−0.72***	−0.87***
	(−3.82)	(−4.29)	(−3.48)
SPEXP	0.42**	0.58**	0.32
	(2.11)	(2.48)	(0.85)
SPCHG	1.54**	1.47	1.69
	(1.96)	(1.58)	(1.2)
BSIZE	−4.78***	−4.26***	−3.71***
	(−9.2)	(−6.96)	(−3.55)
FREQ	0.06	−0.02	0.1
	(1.52)	(−0.36)	(1.16)
AvPercRank	0.28***	0.29***	0.22***
	(16.89)	(14.61)	(6.95)

Overall, this first column reveals no obvious relationship between firms' market capitalizations and the relative performance of country- and sector-specialized analysts. Taking market capitalization as an indicator of the multinationality of a firm, one would expect country-specialized analysts to perform better with regard to low market cap firms. There is however no evidence for this. Therefore, the general premise that financial analysts should concentrate on sectors rather than countries because of the increasing level of cross-border activities appears to be incorrect.

Of course, firms' market capitalization is not a perfect measure of a firm's international activity. Therefore, I consider foreign sales in proportion to total sales and foreign assets in proportion to total assets as proxies for firms' multinational dimensions. Results are reported in the

Table 5
(Continued)

	Market cap.	Foreign sales	Foreign assets
Diff. Cou.-Sec.	3.49	5.75	4.60
p-value	0.0205	0.0021	0.0789
Adj-R^2	0.04	0.04	0.04
Nb obs.	115,722	83,256	35,083

This table reports the coefficients estimated from the following regression:

$$\begin{aligned} PDAFA_{a,j,t,y} = {} & \alpha_{j,y} + \beta_{ABS} ABS_{a,y} + \beta_{COS} COS_{a,y} + \beta_{SES} SES_{a,y} + \beta_{ABS,Q_1} ABS_{a,y} \times Q_1 \\ & + \beta_{ABS,Q_4} ABS_{a,y} \times Q_4 + \beta_{COS,Q_1} COS_{a,y} \times Q_1 + \beta_{COS,Q_4} COS_{a,y} \times Q_4 \\ & + \beta_{SES,Q_1} SES_{a,y} \times Q_1 + \beta_{SES,Q_4} SES_{a,y} \times Q_4 + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} \\ & + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} \\ & + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y} \end{aligned}$$

Q_1 (Q_4) is a dummy variable that equals 1 if the firm belongs to the highest (lowest) firm-level variable quartile and 0 otherwise. Three firm-level variables are considered: the firm's market capitalization, the ratio of foreign sales to total sales, and the ratio of foreign assets to total assets. The model was estimated independently for each of these three firm-level variables. The results reported in the first column refer to quartiles constructed from market capitalizations. The second column refers to the ratio of foreign sales to total sales. The third column refers to the ratio of foreign assets to total assets. *PDAFA* is the proportional demeaned absolute forecast accuracy defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed effect. *ABS, COS*, and *SES* are dummy variables that have the value 1 if analyst a is respectively an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year ($y-1$). *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the top size deciles. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year ($y-1$). All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1, 5, and 10% levels is marked ***, ** and * respectively In the last four rows of the table, "Diff. Cou.-Sec." reports the difference between the coefficients on country and sector specializations. The statistical significance of this difference is given by the p-value reported just below. The adjusted-R^2 and the number of observations are indicated in the last two rows.

second and third columns of Table 5. Here again, coefficients on country specialization are higher than coefficients on sector specialization for both measures of foreign activity. The difference between the performances of the two types of analysts also remains statistically significant. Moreover, no relationship is apparent between the level of firms' foreign activity and the relative performance of country and sector specialists. This again confirms the superiority of country-specialized analysts, whatever the level of international activity of the firms they follow.

Results in this section also reveal a very important feature of my general conclusions. Just as analysts' specialization may be endogenously determined, so may location. Bae et al. (2006) hypothesize that the

local advantage could be higher in countries where foreign ownership and capital flows are lower, since the demand by foreign investors for analyst services, and therefore the resources allocated to foreign analysts, should be lower for such countries. As a consequence, country specialists would outperform sector specialists not because they benefit from an informational advantage, but simply because of lower demand for analyst services in some countries because investors are home biased. The results in Table 5 tell against this hypothesis. Because the firms with the highest levels of foreign activities should garner the most foreign interest, one would expect large foreign resources to be expended on covering them, and this should prevent country specialists from significantly outperforming sector specialists with regard to these firms. This is not what I observe, however. Rather, my results are a further indication that location may provide analysts with a strong comparative advantage. Bae et al. (2006) come to the same conclusion. Thus, while our methodological approaches are different, the results from the two studies are perfectly consistent, reinforcing the idea that local advantage can confidently be interpreted as an information asymmetry explanation.[11]

Overall, results indicate that specializing by country rather than sector brings considerable benefits in terms of forecast accuracy. Individual country-specialized analysts tend to issue more accurate forecasts than sector-specialized ones. This result is highly significant in approximately half of the countries and sectors considered in the sample. Moreover, in no country or sector is the accuracy of sector-specialized analysts superior to that of country specialists. This marked superiority of country specialists can be interpreted as an informational advantage. Potential sources of this informational advantage are investigated below.

4.3 Robustness checks

4.3.1 Analysts' following. Country-specialized financial analysts may concentrate on firms whose earnings are, for some reason, easier to forecast than the earnings of firms mainly followed by sector-specialized analysts. As a first check, I re-estimate Equation (2), restricting the sample to firms followed by at least one country- and one sector-specialized analyst. If the former really outperform the latter, there should be no difference between the results reported above and the results from this restricted sample. Nor should there be any difference if firm-year differences were accurately controlled for. Results, reported in Table 6, are indeed extremely similar to those in Table 4a. Here again, the *p*-values indicate that the difference between country and sector specialist coefficients is highly significant in all cases.

[11] I am grateful to an anonymous referee for this suggestion.

Table 6
Accuracy regressions—firms followed by both country and sector specialists

	(1)	(2)	(3)	(4)	(5)
ABS	2.91**	4.73***	3.77**	2.68*	2.78*
	(2.08)	(3.43)	(2.35)	(1.65)	(1.71)
COS	5.04***	5.67***	6.56***	4.91***	5.26***
	(5.39)	(6.16)	(5.48)	(3.99)	(4.28)
SES	−3.09***	−2.49**	−3.74***	−3.2***	−3.05***
	(−2.93)	(−2.39)	(−3.35)	(−2.84)	(−2.71)
NBCO			0.08	0.17	0.03
			(0.36)	(0.71)	(0.14)
NBSE			−0.73***	−1.13***	−0.96***
			(−2.99)	(−3.76)	(−3.2)
AGE		−0.18***	−0.18***	−0.18***	−0.18***
		(−40.26)	(−40.27)	(−40.27)	(−40.22)
FEXP				1.18***	1.1***
				(4.87)	(4.58)
GEXP				−0.76***	−0.69***
				(−3.94)	(−3.56)
SPEXP				0.46	0.46
				(1.61)	(1.63)
SPCHG				1.12	1.31
				(1.07)	(1.25)
BSIZE				−5.75***	−5.51***
				(−7.94)	(−7.62)
FREQ				0.05	0.07
				(0.91)	(1.27)
AvPercRank					0.31***
					(13.09)
Diff. Cou.-Sec.	8.13	8.16	10.30	8.11	8.31
p-value	0.0000	0.0000	0.0000	0.0000	0.0000
Adj-R^2	0.00	0.03	0.03	0.03	0.04
Nb obs.	63,843	63,843	63,843	63,843	63,843

The sample is restricted to firms followed by at least one country and one sector specialist. Each column reports the coefficients estimated from a specific subset of the regression equation:

$$PDAFA_{a,j,t,y} = \alpha_{j,y} + \beta_{ABS}ABS_{a,y} + \beta_{COS}COS_{a,y} + \beta_{SES}SES_{a,y} + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y}$$

PDAFA is the proportional demeaned absolute forecast accuracy as defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed-effect. *ABS, COS*, and *SES* are dummy variables that take the value 1 if analyst a was respectively an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year $(y-1)$. *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the top size deciles. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year $(y-1)$. All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1, 5, and 10 levels is marked ***, ** and * respectively. In the last four rows of the table, "Diff. Cou.-Sec." reports the difference between the coefficients on country and sector specialization. The statistical significance of this difference is given by the p-value reported just below. The adjusted-R^2 and the number of observations are indicated in the last two rows.

4.3.2 Timeliness. The forecast accuracy measure considered up to this point cannot be used in isolation to appraise financial analysts' performance. It could easily give an impression of skill in inferior analysts who herd on the forecasts released by their accurate peers. I therefore employ the timeliness measure, called "Leader-to-Follower ratio" (LFR), developed by Cooper et al. (2001). This allows me to verify that the superiority of country-specialized analysts, as so far documented, is not in fact due to herding behavior among analysts.

High values of the LFR statistics are indicative of skilled analysts. Follower analysts have lower LFR values.[12] Cooper et al. (2001) consider analysts who have a LFR ratio statistically greater than 1 to be "leader analysts" and others "follower analysts." I choose not to impose this arbitrary threshold. Instead, I compare the median LFR levels across analysts' specializations. Moreover, as LFR distributions are highly skewed, a rank sum test is performed. Table 7 reports the results.

The LFR difference between country-specialized and sector-specialized analysts produces reassuring results. Neither the median nor the mean LFR for country and sector specialists is statistically different. Interestingly, the LFR difference appears significantly related to one type of analyst only. Indeed, both the median and mean LFR on generalists are in all cases significantly smaller than for other types of analysts. Herding behavior may therefore exist among the European financial analyst community, but applies only to generalists, who follow firms in different countries and sectors. It does not explain the difference in accuracy between country and sector specialists documented above.

4.3.3 Endogeneity. Endogeneity is potentially a serious concern in this context. It may arise from a potential causal relationship between analyst performance and specialization. For instance, the most skilled analysts may be given their choice of specialization. As nobody wants to travel further than they have to, these analysts may choose to specialize by country so they can cover their home country's firms. Inferior analysts would then have no choice other than to follow firms scattered over many different places or countries.[13] If this is the case, the superiority of country specialists would not be due to informational advantages, but simply to their superior skill. I investigate this issue in three different respects.

First, while the control variable for analysts' past accuracy (*AvPercRank*) can be seen as a measure of their skills, it also implicitly controls for this potential endogeneity problem. As the results in Table 4a indicate,

[12] Interested readers may refer to the Appendix for a presentation of the timeliness measure.

[13] I am grateful to the editor for this suggestion, and for showing me a way of testing its validity.

Table 7
Forecast timeliness—leader-to-follower ratios

	Wilcoxon–Mann–Whitney				Normal mean difference			
	Median (1)	Median (2)	(1)–(2)	Prob.	Mean (1)	Mean (2)	(1)–(2)	Prob.
Absolute Sp. - Country Sp.	0.99	0.98	0.0124	0.2028	1.26	1.21	0.0496	0.1415
Absolute Sp. - Sector Sp.	0.99	0.99	0.0071	0.2303	1.26	1.23	0.0311	0.1475
Absolute Sp. - Generalist	0.99	0.96	0.0344	0.0259	1.26	1.21	0.0503	0.0239
Country Sp. - Sector Sp.	0.98	0.99	−0.0052	0.4606	1.21	1.23	−0.0185	0.5001
Country Sp. - Generalist	0.98	0.96	0.0221	0.0461	1.21	1.21	0.0007	0.0827
Sector Sp. - Generalist	0.99	0.96	0.0273	0.0406	1.23	1.21	0.0192	0.0870

This table reports nonparametric Wilcoxon–Mann–Whitney tests for the difference in forecast timeliness measures across different specialization groups. For each analyst a, who releases a forecast on firm j's earnings over fiscal year y, timeliness is measured by the LFR (Leader-to-Follower Ratio), which is computed as $LFR_{a,j,y} = \frac{T^0_{a,j,y}}{T^1_{a,j,y}}$, with $T^0_{a,j,y} = \sum_{k=1}^{K} \sum_{m=1}^{M} t^0_{a,j,m,k,y}$ and $T^1_{a,j,y} = \sum_{k=1}^{K} \sum_{m=1}^{M} t^1_{a,j,m,k,y}$. T^0 and T^1 are respectively the cumulative lead- and follow-times for the K forecasts made by analyst a for firm j over fiscal year y. $t^0_{a,j,m,k,y}$ ($t^1_{a,j,m,k,y}$) denotes the number of days by which forecast m precedes (follows) the k-th forecast made by analyst a for firm j. K is the number of forecasts made by analyst a for firm j over fiscal year y. M is the number of forecasts made by other analysts that preceded or followed the release of the k-th forecast by analyst a. LFR ratios are computed for each analyst and each firm for which they issue forecasts. They are therefore firm-analyst specific measures. Mean and Median LFRs of the first (1) and second (2) mentioned specializations are given in columns 3, 4, 7 and 8. The difference and the p-value for the statistical significance of this difference appear in columns 5, 6, 9 and 10.

AvPercRank is highly significant, but it does not affect the coefficient estimates.[14]

Second, in order to explicitly take endogeneity into account, I build on the methodology developed by Heckman (1979). I compute the inverse Mills' ratio from the estimate of a probit model where the probability of being a country specialist is modeled as a function of the analyst's past accuracy, the size of the brokerage house, the average total capitalization weight of the countries followed by the analyst, and the number of firms followed by the analyst. This Mills' ratio is then included as an additional control variable in all of the tests. Unreported results confirm that this does not change the coefficient estimates, nor does it change their statistical significance. Moreover, the Mills' ratio is never significantly different from zero.[15]

Third, based on the idea that analysts do not want to travel further than they have to, I compute the total distance between each analyst and the set of firms she follows and form deciles from this measure. The model is then estimated separately for each decile. If skilled analysts do indeed concentrate in the country specialization group, there should be no difference between the performance of country and sector specialists once total distance is controlled for. Unreported results contradict this hypothesis as country specialists outperform sector specialists in most deciles.

Overall, these three tests confirm that the documented superiority of country over sector specialists is not due to skilled analysts specializing by country. This further reinforces the idea that country specialists issue more accurate earnings forecasts because they benefit from a strong informational advantage. The following section investigates potential sources of this advantage.

4.4 Proximity and institutional factors

This section conducts tests of $H2$ and $H3$. Two potential sources of financial analysts' informational advantage are examined. First, "proximity"—whether or not analysts are located close to the firms they follow. Analysts are classified in one of two groups, depending on whether they are located fewer or more than 100 kilometers away from

[14] Note that the persistence of financial analysts' earnings forecast accuracy is highly significant in the countries studied here. Researchers working in this field should be aware of this important feature of the European market for financial analysis.

[15] As robustness checks, I also consider the probability of following a single (or restricted) number of countries against that of being a country specialist. Specifically, the left-hand side variable of the probit model is Prob (Absolute or Country specialist) instead of Prob(Country specialist). I also estimate the probit model on a year-to-year basis, including as control variables as many Mills' ratios as there are years in the sample; see Wooldridge (1995). In all cases, results remain unchanged. The consideration of endogeneity through the inclusion of Mills' ratios in the model never affects the coefficient estimates.

the firms for which they issue earnings forecasts.[16] Second, "country-specific factors"—whether analysts are benefiting from an informational advantage due to a better than average knowledge of country-specific factors. As previously argued, country-specialized analysts ought logically to benefit from this particular advantage.

Data on the geographical location of financial analysts is taken from successive editions—from 1994 to 2004—of Nelson Information's *Directory of Investment Research*. This is a yearly reference book containing the addresses and phone numbers of financial analysts worldwide. Data on the geographical location of each firms' headquarters is taken from the Worldscope database. The latitudes and longitudes needed to compute the distance between analysts and the firms they follow are extracted manually from the website www.heavens-above.com. For each forecast reported in the I/B/E/S database, I compute the distance between the analyst who issued the forecast and the firm for which the forecast was issued.[17]

The following regression model is estimated:

$$\begin{aligned} PDAFA_{a,j,t,y} = {} & \alpha_{j,y} + \beta^{P}_{ABS} ABS^{P}_{a,j,y} + \beta^{D}_{ABS} ABS^{D}_{a,j,y} \\ & + \beta^{P}_{COS} COS^{P}_{a,j,y} + \beta^{D}_{COS} COS^{D}_{a,j,y} + \beta^{P}_{SES} SES^{P}_{a,j,y} \\ & + \beta^{D}_{SES} SES^{D}_{a,j,y} + \sum_{l=1}^{L} \gamma_l z_{a,j,l,t,y} + \varepsilon_{a,j,t,y} \end{aligned} \tag{4}$$

The P (D) superscript stands for proximate (distant) analysts. Thus $COS^{P}_{a,j,y}$ is a dummy variable that equals one if analyst a is a country-specialized analyst located close to (i.e., less than 100 km away from) firm j.$COS^{D}_{a,j,y}$ is a dummy variable that equals one if the analyst is a country-specialized analyst located more than 100 km away (distant) from firm j.$SES^{P}_{a,j,y}$, $SES^{D}_{a,j,y}$, $ABS^{P}_{a,j,y}$, and $ABS^{D}_{a,j,y}$ are similarly defined for "proximate" and "distant" sector and absolute specialists. The L control variables (z's) are the same as in previous tests.

Results are presented in Table 8. The coefficients in the first column show that, consistent with the previous results, sector-specialized analysts tend to issue less accurate forecasts than country-specialized analysts. The difference is statistically significant, as indicated by the zero p-value.

Results from Equation (4) are consistent with hypothesis $H2$. That is, proximity is a source of informational advantage. Indeed, country

[16] Other thresholds, such as 50, 150, and 200 kilometers were implemented, but do not change any of the conclusions.

[17] The formula used to compute the distance (*Dist*) between to cities A and B is:

$$Dist = R \cdot \arccos[\sin(latitude_A)\sin(latitude_B) + \cos(latitude_A)\cos(longitude_B - longitude_A)]$$

where $R = 6378$ km is the radius of the earth.

Table 8
Forecast accuracy regressions—proximity and country institutional factors

	Pooled 94–04		*p*-value			
	Equation(2)	Equation(4)	Prox. C. special.	Dist. C. special.	Prox. S. special.	Dist. S. special.
Country special.	4.49*** (4.02)					
Prox. C. special.		6.12*** (4.92)	—	0.0123	0.2733	0.0000
Dist. C. special.		3.04** (2.32)	0.0123	—	0.6664	0.0000
Sector special.	−2.7** (−2.23)					
Prox. S. special.		3.95** (2.2)	0.2733	0.6664	—	0.0000
Dist. S. special.		−5.14*** (−3.8)	0.0000	0.0000	0.0000	—
p-value	0.0000					
Adj-R^2	0.04	0.04				
Nb obs.	71,569	71,569				

The first column reports the coefficients estimated from the standard regression Equation (2):

$$PDAFA_{a,j,t,y} = \alpha_{j,y} + \beta_{ABS}ABS_{a,y} + \beta_{COS}COS_{a,y} + \beta_{SES}SES_{a,y} + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y}$$

The second column reports the coefficients estimated from Equation (4):

Table 8
(Continued)

$$
\begin{aligned}
PDAFA_{a,j,t,y} = {} & \alpha_{j,y} + \beta^{P}_{ABS} ABS^{P}_{a,j,y} + \beta^{D}_{ABS} ABS^{D}_{a,j,y} \\
& + \beta^{P}_{COS} COS^{P}_{a,j,y} + \beta^{D}_{COS} COS^{D}_{a,j,y} + \beta^{P}_{SES} SES^{P}_{a,j,y} + \beta^{D}_{SES} SES^{D}_{a,j,y} \\
& + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} \\
& + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y}
\end{aligned}
$$

PDAFA is the proportional demeaned absolute forecast accuracy defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed-effect. ABS^P, COS^P, and SES^P are dummy variables that take the value 1 if analyst a is located less than 100 kilometers away from firm j (i.e. is a proximate analyst) and is respectively an absolute, a country, or a sector specialist in year y. ABS^D, COS^D, and SES^D are dummy variables that take the value 1 if analyst a is located more than 100 kilometers away from firm j (i.e. is a distant analyst) and is respectively an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year $(y-1)$. *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the brokerage houses in the top size decile. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year $(y-1)$. All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1, 5, and 10% levels is marked ***, ** and * respectively. Coefficients and t-statistics from the first equation are reported in the first column. The p-value reported below indicates the statistical significance of the difference between *COS* and *SES*. Coefficients and t-statistics from the second equation are reported in the second column. The p-values of the difference between coefficients of interest in this second model estimate are reported at the right-hand side of the table. The coefficients on the control variables are not reported but are of the same order of magnitude as in previous estimations.

specialists who are located close to the firms tend to issue more accurate forecasts than those who are not. Proximate sector specialists tend to issue more accurate forecasts than more distant sector specialists. The two differentials amount to 3.08% and 9.09% respectively. Both are statistically significant with p-values of 0.0123 and 0.

The country-specific factors explanation is convincing as well. As stated in hypothesis $H3$, if knowledge of country-specific factors is a source of informational advantage, one would expect distant country specialists to significantly outperform distant sector specialists and, to some extent, proximate country specialists to significantly outperform proximate sector specialists. The results support $H3$. The two coefficients on proximate and distant country specialists are both larger than their respective counterparts (i.e., proximate and distant sector specialists). When distant country specialists are compared to distant sector specialists, the difference is highly significant. For the differential accuracy between proximate country and proximate sector specialists, the p-value (0.2733) indicates that, while the coefficient on proximate country specialists is higher than that on proximate sector specialists, this difference is not statistically significant. As previously discussed, local and proximate sector specialists can be expected to have a reasonably good knowledge of their home country. Proximate country specialists issue statistically significantly more accurate forecasts than more distant sector specialists (p-value: 0), whereas the reverse is not true (p-value: 0.6664). Overall, these results indicate that proximity and a better knowledge of each country's specific factors provide convincing explanations for the superiority of country specialists over sector specialists.

4.5 Evolution through time

4.5.1 Organization of research departments. Over the last decade, financial analysis departments have been refocused from country- to industry-based structures. Indeed, more and more brokerage houses now seem to favor sector-based approaches to financial research. This is apparent from Figure 2, which shows the percentage of country- relative to sector-specialized analysts for each of the 15 countries at two different points in time.

Figure 2 shows that, for every single European country, the number of country-specialized analysts decreased relative to the number of sector-specialized analysts between 1995 and 2004. This effect is more pronounced for some countries than for others. In 1995, French, Portuguese, and German firms were mainly followed by country specialists. There were respectively 77.6, 75, and 73.5% of country- relative to sector-specialized analysts. These percentage values dropped to respectively 25.4, 27.1, and 30.5% in 2004. In other countries, such as the UK and Belgium, there were, even in 1995, approximately as many sector as country specialists, or even

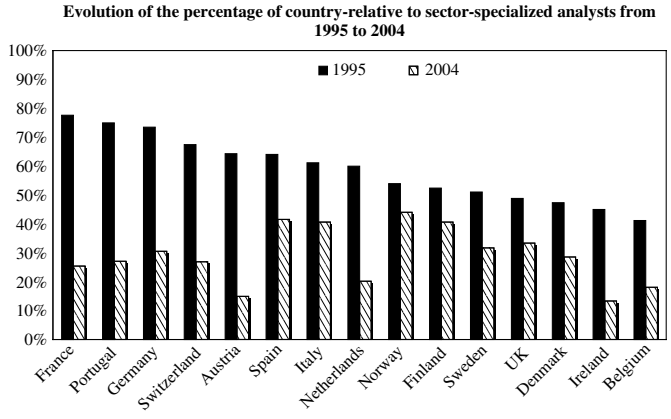

Figure 2
For each of the 15 European countries in the sample, the figure shows the proportion of country- relative to sector-specialized analysts. This proportion is indicated on the vertical axis. The solid bars correspond to the proportion computed in 1995. The dashed bars correspond to the proportion computed in 2004.

more: the respective ratios were 48.8% and 41.2%. In these countries that were already dominated by more sector-oriented structures, the respective ratios decreased to 33.3% and 18.1% in 2004.[18]

4.5.2 Forecast accuracy. Country factors are important determinants of the comparative advantage of country- over sector-specialized analysts. Thus, the relative decrease in the strength of country factors compared to sector factors, documented in the literature, may explain the observed tendency to reorganize research on sector lines.[19] Indeed, brokerage houses may have been trying to take advantage of economies of scale in the acquisition and production of information offered by the growing importance of commonalities among firms in the same economic sector.

If this is so the relative advantage of country- over sector-specialized financial analysts should tend to decrease over time, as a consequence of the decrease in the importance of country factors relative to sector factors. To test this hypothesis, I re-estimate Equation (2) on a year-by-year basis from 1995 to 2004. However, if the difference in performance

[18] Unreported results show that the trend towards more sector-oriented organizations is highly significant in most European countries. Specifically, the following yearly time-series regression was estimated for each individual country:

$$PCS_{c,t} = \alpha_c + \beta_c \cdot t + \varepsilon_{c,t}\ t = 1, \ldots, 10$$

where $PCS_{c,t}$ is the percentage of country- relative to sector-specialized analysts in country c over fiscal year t. These estimations returned highly significant negative slope coefficients in 13 of the 15 countries. Slope coefficients were also negative, though statistically not significant, in Norway and Finland. Rank regressions delivered similar results. Results are available on request.

[19] See, for example, Cavaglia et al. (2000) and Baca et al. (2000).

between country and sector specialists has indeed decreased, such a test would not tell us why. Generalist analysts were used as the reference group in previous estimations. If the performance of this group of analysts was not constant over the sample period, we would be unable to decide whether it was the performance of country specialists that deteriorated or the performance of sector specialists that improved. Hence, following Suits (1984) and Kennedy (1986), a constraint is imposed on the set of specialization coefficient estimates. This constraint is formally defined as:

$$\sum_{s} \frac{N_{s,y}}{N_y} \beta_{s,y} = 0$$

where s refers to the analyst's specialization (i.e., absolute, country, sector, or generalist), $N_{s,y}$ is the total number of earnings forecasts released by analysts of particular specialization s over year y, and N_y is the overall number of earnings forecasts issued over fiscal year y. Essentially, this approach makes it possible to alter the coefficients so that they can be interpreted as deviations from the overall mean instead as deviations from the "generalist" reference group.

The results in Table 9 support the view that the difference between the performances of country and sector specialists has decreased over time. The difference in accuracy is large and highly significant in all years up to and including 2000, but decreases subsequently. While the difference continues to favor country specialists in all years—except 2001, when sector specialists outperformed country specialists—it drops to insignificance after 2001. Moreover, this decline in the differential performance is mostly due to sector specialists' becoming more accurate, while the performance of country specialists remained the same.

As pointed out by Barber et al. (2003), 2000 and 2001 were "disasters" for the financial analyst profession. Focusing on stock recommendations, they show that analysts were unduly optimistic about stocks that turned out to perform extremely badly and vice versa. Barber et al. argue this was chiefly due to analysts' favoring small capitalization growth stocks. Extrapolating this evidence to earnings forecasts emphasizes the need to interpret results over this 2-year period with great care. Nonetheless, it remains true that even after this atypical period, earnings forecasts issued by country and sector specialists were not as different as they had been in 1994–1999.

The sample period used in the present study does not indicate whether this decline in the superior accuracy of country specialists is permanent or only temporary. The conclusions presumably are related to those in the literature on the relative importance of country and sector factors in stock returns. The consensus of this stream of research is that both the nationality and the industry in which firms are active are important

Table 9
Accuracy regressions—year-by-year analysis

	COS	SES	Diff. Cou.-Sec.	*p*-value	Adj-R^2
1995	2.87**	−11.90	14.76**	0.0129	0.05
	(2.21)	(−1.16)			
1996	3.31***	−13.75	17.06***	0.0012	0.06
	(3.14)	(−1.5)			
1997	0.74	−4.94**	5.68	0.1073	0.02
	(0.29)	(−2.24)			
1998	1.52	−6.21	7.73**	0.0397	0.03
	(1.04)	(−1.45)			
1999	3.63***	−9.07	12.70***	0.0000	0.04
	(5.92)	(−1.22)			
2000	2.51	−6.82	9.33**	0.0296	0.05
	(1.56)	(−1.11)			
2001	−1.70	2.06	−3.76**	0.0291	0.07
	(−1.58)	(1.21)			
2002	0.98	−3.64	4.62	0.3260	0.05
	(0.01)	(−1.19)			
2003	1.17	−0.43	1.59	0.8785	0.04
	(0.04)	(−0.15)			
2004	1.59	−2.68	4.27	0.1762	0.04
	(0.48)	(−1.28)			
Pooled	1.97***	−4.57***	6.54***	0.0000	0.04
	(3.89)	(−2.72)			

Each row reports the coefficients on *COS* and *SES* from the following regression equation estimated on a year-by-year basis:

$$\begin{aligned} PDAFA_{a,j,t,y} = {} & \alpha_{j,y} + \beta_{ABS} ABS_{a,y} + \beta_{COS} COS_{a,y} + \beta_{SES} SES_{a,y} \\ & + \gamma_1 NBCO_{a,y} + \gamma_2 NBSE_{a,y} + \gamma_3 AGE_{a,j,t} + \gamma_4 FEXP_{a,j,y} \\ & + \gamma_5 GEXP_{a,y} + \gamma_6 SPEXP_{a,y} + \gamma_7 SPCHG_{a,y} + \gamma_8 BSIZE_{a,y} \\ & + \gamma_9 FREQ_{a,y} + \gamma_{10} AvPercRank_{a,y} + \varepsilon_{a,j,t,y} \\ & s.t. \sum_s \frac{N_{s,y}}{N_y} \beta_{s,y} = 0 \end{aligned}$$

where s is analyst type (i.e., absolute, country, sector, generalist), $N_{s,y}$ is the total number of earnings forecasts released by analysts with a particular specialization s over year y, and N_y is the overall number of earnings forecasts issued over fiscal year y. *PDAFA* is the proportional demeaned absolute forecast accuracy as defined in Section 3.2. It measures the accuracy of analyst a's earnings forecast on firm j released at date t of fiscal year y.$\alpha_{j,y}$ is a firm-year fixed effect. *ABS, COS*, and *SES* are dummy variables that have the value 1 if analyst a was, respectively, an absolute, a country, or a sector specialist in year y. *NBCO* is the number of countries followed by analyst a over year y. *NBSE* is the number of sectors followed by analyst a over year y. AGE is the number of days between the date t at which analyst a released her forecast on firm j and the date at which actual earnings were released. *FEXP* is the number of years analyst a has been following firm j. *GEXP* is the number of years analyst a has been in the I/B/E/S database. *SPEXP* is the number of successive years analyst a has been classified in her current specialization group. *SPCHG* is a dummy variable that equals 1 if analyst a was in another specialization group over the preceding year $(y-1)$. *BSIZE* is a dummy variable that equals 1 if analyst a works for one of the brokerage houses in the top size decile. *FREQ* is the number of forecasts issued by analyst a over fiscal year y. *AvPercRank* is as defined in Section 3.3. It is a measure of analyst a's past accuracy computed over the previous fiscal year $(y-1)$. All coefficients have been multiplied by 100. Heteroscedastic consistent White t-statistics appear below their related coefficient. Statistical significance at the 1, 5, and 10% levels is marked ***, ** and * respectively. The coefficients on the control variables are not reported but are of the same order of magnitude as in previous estimates. The first column reports the coefficient on *COS*. The second column reports the coefficient on *SES*. The third column computes the difference between *COS* and *SES*. The fourth column indicates the *p*-value for the statistical significance of this difference. The last column reports the adjusted-R^2 of the regression.

determinants of stock returns; see, for example, Heston and Rouwenhorst (1994, 1995), Beckers et al. (1996), and Griffin and Karolyi (1998). A more recent result, first reported by Cavaglia et al. (2000) and Baca et al. (2000), is that industry factors are becoming more significant owing to global sector convergence rather than a weakening of country factors.

A few points are worth mentioning here. First, even if industry factors grew to be as important as country factors in the late 1990s, it is hard to tell whether this change is permanent or not. Brooks and Del Negro (2004) show that it is probably mainly due to the impact of the Information Technology "bubble". Adjaouté and Danthine (2003) show that the strength of both industry and country factors follows cycles;[20] see also Catao and Timmermann (2003). Bekaert et al. (2005) show that this growing influence of industry relative to country factors mainly results from an increase in underlying factor volatilities: globalization has not altered the domination of country factors over sector factors. All these results suggest that the decrease in the relative importance of country over sector factors is only temporary.

If the comparative advantage of country-specialized financial analysts is mainly due to their ability to take advantage of economies of scale linked to the relative strength of these factors, research organized along country lines should continue to outperform sector-based research in the future. Moreover, even if country-specific influences continue to diminish, my view is that financial research organized along country lines should still be beneficial. Accounting standards have still not been fully harmonized, even at the European level. There also remain significant differences among European countries' regulations. Moreover, proximity is an important determinant of financial analysts' performance. This is confirmed by analysts' behavior. Sector specialists, who should by definition hold internationally diversified portfolios, tend to bias their research efforts towards firms headquartered within their home countries. Country specialists should therefore still be able to take advantage of the comparative advantages provided by country-specific institutional factors and geographical location.

The relative decline in the superiority of country specialists may owe something to the evolution of research departments into more sector-oriented organizational structures. It may be that analysts who left the country specialization group were, on the whole, the most skilled of the country specialists, perhaps because it was the larger and more attractive brokerage houses that reorganized their research departments into more sector-oriented structures. Assuming that only the most talented analysts get jobs in such institutions, it may have been only skilled country specialists who gradually changed specialization over time. This would have left only

[20] See Adjaouté and Danthine (2003), figure 4.15, p. 45.

inferior analysts in the country specialists' group, which could explain why its performance as a group has declined.

However, additional unreported tests do not support this view.[21] First, the re-organization from country- towards more sector-oriented structures is not specific to large brokers. This evolution has been similar for both large and smaller brokerage houses. What makes these two groups different is that the former have always had relatively more sector specialists, while the latter had almost exclusively country specialists and still rely heavily on country-by-country structures. Second, if my hypothesis is valid, country specialists who have never changed specialization (i.e., analysts who remained country specialists from the very beginning to the very end of their presence in the database) should not be performing well, since good performers should be concentrated among country specialists who changed specialization at some point in time. Estimating the model on a restricted sample, retaining as country specialists only those who remained such throughout their presence in the database, returns results that contradict the hypothesis. These "all-time" country specialists behave very like the overall sample of country specialists in terms of forecast accuracy. Unreported results suggest that "all-time" country specialists may even perform better than their peers who changed specialization. This conclusion is further reinforced by the fact that I failed to find any cross-sectional relationship between the declining superiority of country specialists and the declining proportion of country relative to sector specialists.[22]

5. Conclusion

Financial research is usually performed either by countries or by sectors. In Europe, both specializations co-exist. In today's environment, in which firms compete on an international basis, the issue of how financial research departments should be structured has become of critical importance. While there has been a general tendency over the last decade to switch from country-based to more sector-oriented structures, there is no consensus about which approach is best.

This article compares the accuracy of earnings forecasts issued by country-specialized and sector-specialized financial analysts. The results show that country specialists issue far more accurate earnings forecasts than sector-specialized financial analysts. Moreover, sector specialists did not significantly outperform country specialists in any of the eleven sectors

[21] Results are available from the author on request.

[22] I performed different tests in order to check for the existence of such a relationship. Most notably, I ran cross-sectional regressions of the differential performance of country and sector specialists (evaluated country-by-country on a year-to-year basis) on the proportion of country and sector specialists in each country (also evaluated on a year-to-year basis). Results are unreported but are available from the author on request.

or the fifteen European countries considered over the period 1994–2004. This last result invalidates the conjecture that organizational structures are decided upon with the aim of producing high quality research.

Large multinational companies have to be evaluated in a global context. As a consequence, it is often argued that such firms should be followed by sector- rather than country-specialized financial analysts. Results reported in this article refute this assertion. Indeed, no relationship is apparent between the relative accuracy of country and sector specialists and firms' characteristics such as the firms' market capitalizations or their level of international activities. Finally, this article brings evidence that country specialists' informational advantage is drawn from both geographical proximity and a good knowledge of country-specific factors, such as language, culture, and accounting rules.

Overall, these results suggest that the reorganization of financial analysis departments towards more sector-oriented structures may have been driven by other objectives than the desire to boost the accuracy of earnings forecasts. Other explanations are possible. First of all, an organization structured along sector lines is likely to make the acquisition and production of information less costly, since it enables financial analysis to be centralized in a single location. Marketing considerations may have induced brokerage houses to specialize by sectors in order to meet the needs of portfolio managers, who now seem to care more about industry than international diversification; see Galati and Tsatsaronis (2001).

Whatever the underlying reason, one may wonder why brokerage houses continue to organize research in a way that reduces earnings forecast accuracy. The results indicate a diminution in the relative outperformance of country specialists over time. If this change were to be permanent, brokerage houses would simply be slightly ahead of the curve in their research reorganization efforts.[23] Conversely, several influences, like differences in cultural and institutional factors, or the advantage brought by proximity, suggest that this change may only be temporary. If this is so, country specialists will continue to outperform sector specialists in the future. These competing hypotheses call for further exploration.

Appendix Timeliness Measure

Cooper et al. (2001) argue that forecast revisions by skilled analysts, whom they refer to as leader analysts, should be followed closely by forecasts made by other analysts, called follower analysts. There are mainly two reasons for this. First, skilled analysts have an incentive to release forecasts before competing analysts since part of their revenue is based on the trading volume generated by their research. Second, analysts' compensation is also based on the

[23] This hypothesis was suggested by an anonymous referee.

accuracy of their forecasts.[24] Less skilled or less informed analysts may therefore wait for the release of forecasts made by skilled analysts in order to exploit the superior information of the latter and so increase the accuracy of their own forecasts. On the other hand, skilled analysts have no incentive to issue forecast revisions in response to forecasts released by other analysts. Therefore, Cooper et al. (2001) proposed a measure of the timeliness of analysts' earnings forecasts. They developed the "LFR" test statistics (which they call *LFR*)

$$LFR_{a,j,y} = \frac{T^0_{a,j,y}}{T^1_{a,j,y}}$$

for analyst a, who releases forecasts on firm j's earnings over fiscal year y. This ratio is therefore firm-analyst specific. T^0 and T^1 are respectively the cumulative lead- and follow-times for the K forecasts made by analyst a on firm j over fiscal year y. They are formally defined by:

$$T^0_{a,j,y} = \sum_{k=1}^{K} \sum_{m=1}^{M} t^0_{a,j,m,k,y} \; T^1_{a,j,y} = \sum_{k=1}^{K} \sum_{m=1}^{M} t^1_{a,j,m,k,y}$$

$t^0_{a,j,m,k,y}(t^1_{a,j,m,k,y})$ denotes the number of days by which forecast m precedes (follows) the k-th forecast made by analyst a for firm j.K is the number of forecasts made by analyst a for firm j over fiscal year y.M is the number of forecasts made by other analysts that precede and follow the release of the k-th forecast by analyst a. LFR ratios are computed for each analyst and each firm for which they issue forecasts. Cooper et al. (2001) compute the average ratio across all the firms followed by a particular analyst. They consider analysts with a ratio statistically significantly larger than 1 as leader analysts and others as follower analysts.

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[24] Note that while this assumption holds for the US market, it is not necessarily true of Europe.

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