The Influence of Culture on the Cross-country Gender Disparities in the European Financial Analysts Industry

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Abstract

This study documents a strong cross-sectional variation in female representation among financial analysts in Europe. It aims to analyze the factors that explain this variation. I specially examine the impact of national culture on gender diversity among financial analysts. I focus on two dimensions of national culture identified by Hofstede (2001): individualism/collectivism and uncertainty avoidance. I empirically show that countries with lower individualism and lower uncertainty avoidance enjoy higher female representation among financial analysts.

Keywords: financial analysts, gender, Europe, culture dimensions

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1 Introduction

This study aims to investigate the influence of national culture on gender diversity among European financial analysts, who are assumed to be important intermediaries in the economy. By gathering relevant information, analyzing the collected information, issuing recommendations and forecasts, financial analysts provide market participants with crucial data for their investment decisions (Michaely et al., 1999). Extensive prior research investigates the characteristics of financial analysts who produce more accurate forecasts (Clement, 1999; Jacob et al., 1999; Kini et al., 2009), and more influential recommendations (Bradley et al., 2008; Loh and Stulz, 2011; Sorescu and Subrahmanyam, 2006) than their peers. Difference in analysts' performance is partly determined by factors such as analysts' ability, available resources and portfolio complexity. Past research also documents the existence of an upward bias in the outputs of financial analysts and attribute its possible origin to analysts' temptation to favor company managers or to attract investment banking business (Agrawal and Chen, 2008; Cowen et al., 2006; Michaely et al., 1999). However, gender issues are barely discussed in the context of financial analysts. Studies dedicated to gender issues mainly clustered in the business field: the presence of women figures in the boardroom (Adams and Ferreira, 2009; Campbell and Mínguez-Vera, 2008; Krishnan and Parsons, 2008), performance of female loan managers (Beck et al., 2013), audit fees for female auditors (Ittonen and Peni, 2012). The studies of Kumar (2010) and Green et al. (2007) are, nonetheless, two remarkable exceptions. Using a sample from the United States, they show that women are constantly underrepresented in the world of financial analysts and that female analysts issue bolder and more influential recommendations than their male counterparts. I extend these studies by investigating the role of national culture in explaining cross-country differences in gender diversity among financial analysts in Europe.

The analysis of the influence of national culture is motivated mainly by Aggarwal and Goodell (2014), who emphasize the economic relevance of national culture and summarize the sparse use of cultural dimensions in accounting and finance scholarship. Extant arguments in the literature

suggest that national culture, which is very stable over time, is an important factor influencing financial activities as it shapes both the institutional environment within a country and the way human actors react to these institutions around them.

This study uses European recommendation data from *I/B/E/S* to examine the extent to which financial analysts' gender diversity in Europe is affected by the national culture that characterizing each European country. In particular, I examine whether female representation is higher in countries with certain cultural patterns. I concentrate on two cultural dimensions that Hofstede (2001) refers to as "individualism" and "uncertainty avoidance". The cultural dimension "individualism *versus* collectivism" focuses on inter-personal relation patterns. In individualistic countries, ties between individuals are loose and people are less motivated to reach out helping others. The relationship between employers and employees is highly based on mutual benefits. Collectivism countries, on the other hand, emphasize the importance of inter-personal links in the workplace. Once a female analyst is hired, her colleagues may be more prone to help her integrate into the professional milieu. Therefore, I expect that in a milieu dominated by males, such as the financial analysis industry, women are less likely to survive in individualistic countries. Our first hypothesis states that holding other factors constant, gender diversity among financial analysts is lower in individualistic countries.

Uncertainty avoidance is the other cultural dimension in which I are interested. Hofstede (2001) points out that uncertainty avoidance captures the extent to which members of a given society feel threatened by uncertain or unknown situations. Individuals in countries with high degree of uncertainty avoidance perceive exogenous members as threats and are more inclined to maintain the *status quo*. Given the fact that the financial analysis industry is traditionally a male-dominated industry, I expect that women are less able to survive as financial analyst in high uncertainty-avoiding countries. Therefore, our second hypothesis states that holding other factors constant, gender diversity among financial analysts is lower in countries with strong uncertainty avoidance.

The research sample consists of 125 908 recommendations issued by 3 579 European analysts over the 2006-2013 period. Consistent with prior research in the United States (Green et al., 2007;

Kumar, 2010), I document an under-representation of female financial analysts in Europe. The descriptive statistics indicate that women account for 16.15% of financial analysts in Europe during the period under study with significant country-level variations. Female representation among European financial analysts only enjoyed a moderate increase from 14.99% in 2006 to 16.26% in 2012. Female financial analysts represent 40.00% of all the financial analysts in Italy, however, in Denmark only 4.17% of them are female.Furthermore, though female analysts are broadly distributed in all the economic sectors, I find that they are more inclined to work in specific industries such as "Apparel" and "Restaurant", while keeping distance from "Rubber and Plastic Products" and "Electrical Equipment" market segments, . Differences in female representation are also remarkable among different cultural sub-regions identified by (Hofstede, 2001). The findings show that Anglo countries, *i.e.* Ireland and United Kingdom, enjoy the highest proportion of female financial analysts, but the highest proportion of recommendations issued by females are found among Latin countries, *i.e.* Belgium, France, Italy, Portugal and Spain. In Nordic countries, *i.e.* Denmark, Finland, Netherlands, Norway and Sweden, the proportion of female analysts and the proportion of recommendations issued by female analysts are significantly lower than in Anglo and Latin countries.

Consistent with two hypotheses, univariate tests provide strong evidence that individualistic and more uncertainty-avoiding countries have less gender diversity among financial analysts. The incremental influence of "individualism" and "uncertainty avoidance" persists when I control for variables that can plausibly be related to gender diversity, such as proxies for financial analysts' workload, the density of analysts' influential stock recommendations, the financial market size, *etc*.

By shedding light on the gender observations for financial analysts working in Europe, I expand the existing literature about gender concerns in the business area into the world of financial analysts in countries other than the United States. The findings contribute to the growing body of research in finance that addresses the gender issue in different area such as corporate boardroom directors (Adams and Ferreira, 2009; Burgess and Tharenou, 2002; Farrell and Hersch, 2005). Furthermore, I also complement the research about female financial analysts in United States by focusing on

European countries and their cultural specific features. Our implication of national culture on gender diversity adds to the culture and business literatures by introducing national culture as an important country-level factor in financial research in an international setting.

The remainder of the paper is organized as follows: Section 2 reviews the existing literature in the implication of national culture on the finance field. The data and research methodology are discussed in Section 3. Section 4 provides descriptive statistics for European financial analysts at both country and economic sector level. Section 5 displays the main results about the impacts of national culture on gender diversity in the European financial analysis industry. The final section contains conclusions and discussions.

2 Prior literature and hypothesis

Hofstede (2001) defines culture as the collective mental programming that leads to patterned ways of thinking, feeling and acting and that "distinguishes the members of one category of people from those of another". National culture influences economic activities by both conditioning formal institutions and by shaping human actors' incentives and subjective perceptions of the external world (Zheng et al., 2012). In addition, national culture can also shape the way human actors react to the institutions that are in place or are being shaped around them (Aggarwal and Goodell, 2014). The impact of cultural dimensions have been well recognized in research about business and management . In the field of accounting and finance, however, relatively few studies have investigated the role and impacts of cultural dimensions. Nonetheless, the economic relevance of national culture should be acknowledged in order to understand cross-country differences in an international setting. The incorporation of national cultural dimensions can provide additional perspective on financial and accounting research concerns (Aggarwal and Goodell, 2014). Hofstede (2001) defines five key dimensions to capture national culture, namely power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, and long-term/short-term orientation. These dimensions capture different attributes of national culture. In the appendix is listed the definition of each cultural dimension stated by Hofstede (2001). Power distance refers to the extent to which the less

powerful members of institutions and organizations within a country expect and accept that power is distributed unequally. Uncertainty avoidance measures the stress the members of a culture feel faced by uncertain or unknown situations. Individualism/Collectivism capture the patterns of interpersonal links shared by members of society. Masculinity/Femininity refers to the extent to which the emotional gender roles are distinct. Long-term/Short-term orientation stands for the preference of fostering virtues oriented towards future or towards past.

Using these cultural dimensions, Hofstede (2001) divides nations into sub-regions based on similarities in national cultural profiles. A hierarchical cluster analysis helped him define five country clusters in Europe labeled Anglo, Germanic, Latin, Near Eastern and Nordic. *Anglo* includes Ireland, United Kingdom; *Germanic* refers to Austria, Germany, and Switzerland; *Latin* stands for Belgium, France, Italy, Portugal, and Spain; *Near Eastern* includes Greece; *Nordic* represents Denmark, Finland, Netherlands, Norway, and Sweden. Nordic countries tend to have a lower power distance than other countries. Anglo and Nordic nations have a stronger attachment to individualism. Latin countries express a greater intolerance towards the changes and uncertainty. Furthermore, Nordic countries have the most feminist cultures opposed to Germanic countries.

Extant research in finance has particularly focused on the impact of two specific cultural dimensions: individualism and uncertainty avoidance. The individualism/collectivism dimension measures the extent to which nations are "individualistic" or "collectivist". Actors in the individualistic countries tend to view themselves as independent persons with high autonomy, while in collectivist countries, they consider themselves to be more connected to the social context and tend less to differentiate themselves from others. In the financial context, high individualism means self-orientation, overoptimism or overconfidence. Consistent with this argument, Chui et al. (2010) show that individualism is positively linked to overoptimism or overconfidence, which leads to higher trading volume and stock volatility and that momentum strategies are more profitable in individualistic countries. Moreover, in an individualistic country, such as the United States, the relationship between employers and employees are mostly based on mutual benefits. Consequently, in a workplace dominated by male such as financial analysis, female analysts need to perform bet-

ter than their male counterpart to survive (Kumar, 2010). In collectivist countries, the relationship between employers and employees are like that between family members. People attach more importance to maintaining the family link in the workplace. Thus, once a female analyst is recruited, it is not necessary for her to provide superior performance to survive. Moreover, her colleagues are more willing to help her integrate into her new professional milieu in a collectivism country. Given the above-mentioned reasoning, I hypothesize that female analysts are less likely to survive in a country with individualistic culture.

Hypothesis 1. *Ceteris paribus, female representation among financial analysts is lower in individualistic countries.*

The second cultural dimension with strong implication in the financial research is uncertainty avoidance. This cultural dimension captures people's attitude toward uncertain or unknown situations. Uncertainty is one of the key factors in asset pricing and plays a crucial role in financial market. Thus, several empirical studies used uncertainty avoidance scores as a proxy for risk tolerance. Aggarwal and Goodell (2009) find that national preferences for market financing over bank financing decreases with the degree of uncertainty avoidance. In the same vein, CEO in countries with high uncertainty avoidance score demonstrate lower levels of risk tolerance and engage less in cross country or cross industry takeovers (Frijns et al., 2013). Zheng et al. (2012) address the incremental influence of national culture on corporate debt maturity choice and find that firm's use of short-term debt is more prevailing in countries with high uncertainty avoidance and low individualism. Hofstede (2001) states that people in countries with high uncertainty avoidance prefer a more predictable environment with less ambiguity. Accordingly, countries with high uncertainty avoidance value the structure existing in their organizations and stick to the fact that company rules should not be broken. Given the fact that the world of financial analysts is *de facto* a masculine circle, less female analysts are likely to found in countries with high uncertainty avoidance. Thus, the hypothesis regarding the impact of uncertainty avoidance on female representation among European financial analysts is stated as follows:

Hypothesis 2. *Ceteris paribus, female representation among financial analysts is lower in coun-*

tries with strong uncertainty avoidance.

In addition to the two cultural dimensions mentioned above, other factors could also exert an influence on the female representation among financial analysts. These include market segments, role of stock markets and the importance of financial analysts. Kumar (2010) find that in the United States, female analysts have greater concentration in market segments such as clothing, tobacco and consumer industry categories. The proportion of female financial analysts could, therefore, be higher in countries with more companies operating in these market segments. Furthermore, the financial analysis industry is closely tied to the stock market. Accordingly, the size of stock market could affect the representation of woman figures in the world of financial analysts. In a country with more developed stock market, financial analysts are more in need to provide sophisticated investment advices, which likely leads to more female analysts. The quantity of financial analysts is only one side of the story: not all financial analysts are influential to the stock market. Loh and Stulz (2011) finds that only 12% of all the recommendation changes can be labeled as "influential", which triggered significant cumulative abnormal daily return. I, therefore, control for the impact of the percentage of influential financial analysts on the female representation among financial analysts.

3 Data and research design

Our study is based on recommendations issued by European analysts, *i.e.* analysts located in the 28 European countries; namely, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovenia, Spain, Sweden, Switzerland, and United Kingdom. Countries outside the European Union, such as Switzerland, Norway and Russia, have also been included in this research given that they belong to the same economic region. Furthermore, their inclusion in the sample increases the cultural variety at country level.

The data about analysts' recommendations are collected from the *I/B/E/S* database of *Thomson*

Financial. They are composed of 1) the International Securities Identification Number (hereafter, *ISIN*) code of targeted firms, 2) the date when the recommendations were issued (Recommendation date), 3) the level of recommendations[1], 4) the identification code of analysts and 5) the broker for which the analyst works.

The data cover a eight-year period from January 2006 to December 2013. The beginning of the sample period is coincident with the date when the European Union countries finished transposing the Market Abuse Directive (generally referred to as *MAD*) into their local legislation (Dubois et al., 2014). The Market Abuse Directive (Directive 2003/6/EC), hereafter MAD, adopted in 2003 by the European Commission to curb insider dealing and market manipulation states that

> "The identity of the producer of investment recommendations, his conduct of business rules and the identity of his competent authority should be disclosed, since it may be a valuable piece of information for investors to consider in relation to their investment decisions."

Since the implementation of MAD, analysts are therefore required to disclose their identification, *i.e.* first name and last name, when publishing their outputs, which makes our study feasible.

Due to the fact that *I/B/E/S* database does not mention the analyst's gender, the gender is identified by the analyst's first name. However the *I/B/E/S* database only provides a brief identity code for each analyst, which is composed of the analyst's last name and the initial letter of his/her first name. For example, an analyst named "Joe Black" is coded as "J Black" in the *I/B/E/S* database. Thus, complementary information about analysts' complete first name and their workplace (at the country level) is obtained from the official website of *Thomson One*[2]. *Thomson One* provides more detailed and thorougher information about analysts from whom it collects financial data. Analyst first name, last name, employer, workplace, contact coordinates could all be found in the website. After merging the recommendation data from *I/B/E/S* with data of analyst identities, I determine the

[1] A five-level recommendation scale is adopted by the *I/B/E/S* database: namely, Strong Buy, Buy, Hold, Underperform, and Sell.

[2] www.thomsonone.com

gender for each analysts in the database using a list of 22,345 unique first names[3]. Thus according to the outcome of gender identification, analysts are separated into three categories: male, female and undefined. Some analyst's gender is undefinable due to the following facts: 1) unisex first name, some first names, such as "Alex", could be used as a first name for both male and female; 2) duplicate last name and first initial, there are more than one analyst identification that could be matched with an analyst identity code, for example, "Julia Smith" and "John Smith" could both be abbreviated as "J Smith"; or 3) undisclosed analyst code: some analyst identity codes are deliberately veiled by the data provider and thus turn out to be "Undisclosed" during the data collection.

The final sample consists of 3 579 analysts from 28 European countries. They have issued a total of 125 908 recommendations for 10 676 companies around the world over the eight-year period under study (2006-2013).

4 Breakdown of female representation in Europe

Based on the above-mentioned sample, discussion about gender composition and recommendation style for European analysts is presented in detail in this section. Our results show that 78.35% of the 3 579 European analysts included in the sample period (2006-2013) are male analysts. On average, for the eight years under consideration, 16.15% of all the identified European analysts are female, which is comparable to the proportion documented in the United States: 15.6% for Green et al. (2007) from 1995 to 2005 and 16.03% for Kumar (2010) from 1983 to 2005). Between 2006 and 2013, 125 908 recommendations have been issued by these European analysts for 10 676 firms. However, among the 10 676 firms, only 2 501 of them have been covered by both male and female European analysts, representing roughly 23% of all the firms.

Table 2 suggests that the 2 804 male analysts from the European countries issued 101 442 recommendations for 9 217 firms, which reflects an average of 36.46 recommendations per male analyst. In contrast, the 578 female financial analysts issued 18 386 recommendations on 3 282

[3]The data mainly come from in the following sites: www.behindthename.com/, www.babynameindex.com/, en.wikipedia.org/wiki/Category:Masculine_given_names, and en.wikipedia.org/wiki/Category:Feminine_given_names

firms. On average, female analysts produced each 31.98 recommendations only. With a closer look at the stocks for which analysts provide recommendations, at the individual level, female analysts issued an average of 3.40 recommendations per firm, which is roughly the same as the recommendations per firm recorded for their male colleagues: 3.45 recommendations per firm. Finally, at the individual level, female analysts followed less firms than male analysts: on average, nine firms have been covered by each female analysts, which is lower than the number recorded for male: roughly ten stocks per male analyst.

⟨ Insert Table 2 about here ⟩

In order to clarify the country-level comparison, all countries with less than 1% of all financial analysts are grouped into one category: namely, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Ireland, Lithuania, Luxembourg, Portugal, Romania, and Slovenia. Table 3 provides summary statistics for analysts and analysts' recommendations across European countries. In terms of gender composition for European analysts, an average of 16.15% is observed for the percentage of women financial analysts across the 28 European countries with a remarkable country-level variation. The proportion of female analysts reaches 19% for France, which is double of the proportion in Germany (less than 10%), and is also considerably higher than that of United Kingdom (14.78%). Countries in Northern Europe do not report a higher proportion of women analysts: Denmark, Norway and Switzerland all have a proportion of female financial analysts lower than the average one, with the exception of Finland, where women financial analysts occupy more than one-fifth of the positions. As for the related recommendations issued by European analysts during the sample period, women analysts issued only 14.6% of total recommendations, still relatively less compared to their representation in all the European financial analysts (16.15%). This suggests that on average, female analysts issued fewer recommendations relative to their male counterparts. However, France is an interesting exception, where female analysts have on average issued more recommendations than male analysts. The standard deviation for both proportion of female analysts and proportion of recommendations issued by female analysts are high, 9.39% and 10.11% respectively, which suggests a high volatility in gender observation across countries.

⟨ Insert Table 3 about here ⟩

Further, I investigate the number of stocks followed per capita, the number of recommendation issued per capita, and the numbers of recommendations issued for each company an analyst covered. Table 4 presents the gender comparison across different European countries. The difference between genders is the largest in Belgium, where, on average, one male analyst followed 4 more companies than a female analyst did. The largest difference in the number of recommendations per capita is also observed in Belgium: male analysts in Belgium issued more than double of the recommendations issued by female. In contrast, in France, I find that female analysts issued significantly more recommendations compared to their male counterpart, consistent with the findings of Table 3 which states that the proportion of recommendations issued by French female analysts is higher that that of French male analysts. The findings also suggest that in countries such as Austria, Belgium, Denmark, Finland, Greece, Netherlands, Switzerland, and United Kingdom, female analysts issued less recommendations per stock than male analysts. According to the t-tests, the differences are all significant at the 0.01 level. Nonetheless, in Germany, male analysts issued significantly less recommendations per stock than female. Furthermore, female analysts in Italy have issued the most recommendations for companies they followed, compared to female analysts from other European countries. In Finland, male analysts had the highest recommendations per stock ratio.

⟨ Insert Table 4 about here ⟩

Table 5 describes the evolution of gender observations among European financial analysts across the sample period. First, from the full sample, I can see that despite the remarkable decline in the number of analysts after the peak observed in 2011, women representation reaped a steady increase from 14.66% in 2007 to 16.26% in 2012 after a slight decline observed in from 2006 to 2007. However, a setback to 15.65% was recorded for 2013. Meanwhile, as for recommendations issued by European female analysts, a dramatic breakdown in the total number of recommendations issued by all the European analysts was recorded from 2008 to 2009: a decline of more than

13%. This is probably linked to the 2008 financial crisis. Accordingly, the proportion of recommendations issued by female was also declined from 14.54% in 2008 to 13.53% in 2009. However, after then, the proportion has enjoyed a promising increase. In 2013, 15.47% of all the recommendations were issued by women, slightly lower than the proportion recorded in 2012 (15.71%). Data from the restricted sample with only active analysts and firms are given in Panel B of Table 5. The percentage of female analysts peaked in 2008 (16.15%), before a three-year decrease. Despite the recent rebound observed in 2011-2012, women representation declined again in 2013. In terms of percentage of recommendations issued by female analysts, a remarkable decline can be observed in 2013 subsequent to a peak in 2011 and 2012, when female analysts issued more than eighteen percent of all the recommendations.

⟨ Insert Table 5 about here ⟩

From a more detailed country-level comparison between 2006 and 2013 in terms of numbers of analysts and recommendations issued by European analysts, reported in Table 6, I observe more analysts in 2013 than in 2006, however the test of proportions indicates that there is no significant difference between the average number of European analysts between the two years, due to the limited observations available in the sample. The United Kingdom is the country with highest number of financial analysts for both 2006 and 2013, and a increase could also be observed in the proportion of female analysts from 2006 to 2013. For French and Germany, despite a decrease in the total number of analysts, the proportions of female analysts have still been improved. Norway, Spain as well as Sweden, on the other hand, are the opposite case where the proportion of female analysts declined along with the increasing number of analysts.

⟨ Insert Table 6 about here ⟩

With reference to the recommendations, the number of recommendations issued by European analysts in 2013 was less than the number of recommendations issued in 2006. The setback was, to a certain extent, due to the considerable decline of recommendations documented in countries

such as Germany, Belgium as well as Netherlands. However, the number of recommendations in Norway, Russia and Poland enjoyed a remarkable increase, contrary to the general trend of decline. Despite the decline in the total number of recommendations issued by European analysts, the percentage of recommendations issued by female financial analysts increased from 2006 to 2013. The most remarkable increase was documented in Austria, followed by France. Nevertheless, the dramatic decline in the percentage of all recommendations issued by female analysts for Finland and Spain sharply contrasts with the overall increase for the full sample, which to a great extent results from the shrink in the number of female analysts. Finally, the tests of proportion between 2006 and 2013 confirm that for both countries the differences in proportion of recommendations issued by female in the two years respectively are significant at 0.01 level. Moreover, taking into consideration all the European countries, I find that there is a significant increase in the proportion of recommendation issued by female financial analysts at 0.01 level.

Sector-specific factors have strong impacts on firms' performance. Because of the complexity in getting information and understanding benchmark for firms in different economic sectors, financial analysts are often specialized in some specific economic sectors. In accordance with analysts' industrial specialization, extant literature confirms a negative relationship between the number of industries followed by an analyst and analyst's performance as captured by earning forecast accuracy or recommendation profitability, *e.g.* Clement (1999); Salva and Sonney (2010). With regards to gender differences in industrial specialization, Kumar (2010) documents that the distribution of female analysts in different market segments is not random. Female analysts in the U.S. are concentrated in economic sectors such as retail and clothing, which implies an industrial preference of female analysts. Following his step, I analyze the gender composition of financial analysts working for each market segment to examine whether female analysts in Europe also have a preference for certain economic sectors. The classification is based on company's two-digit *SIC*s and I categorize companies according to the 48 Fama and French industry list (Fama and French, 1997). The p-values from chi-square tests suggest that neither male nor female analysts are equally distributed in the listed industries (see Table 7).

The results presented in Table 7 suggest that despite the fact that women analysts could be observed in all industries, they are concentrated in the industries categorized as "Apparel", "Restaurants, Hotels, Motels", "Food Products", where the percentages of female financial analysts covering the industry are more than one-fifth of all the analysts working in this field. In the field of "Rubber and Plastic Products" as well as "Electrical Equipment", women figures are relatively under-represented: less than 10% of analysts working in these market segments were female.

⟨ Insert Table 7 about here ⟩

Cultural sub-regions that differ in their cultural profiles also differ systematically in gender diversity among financial analysts. After grouping European countries into homogeneous cultural sub-regions based on Hofstede cultural model (see Table 8), I find that Latin countries, which include Belgium, France, Italy, Portugal and Spain, record the highest proportion of women financial analysts (24.31%), whereas the Germanic countries (i.e. Austria, Germany, and Switzerland), the lowest. Contrary to the common sense of highly achieved gender equality in Nordic countries, these nations have the second lowest percentage of female analysts.

⟨ Insert Table 8 about here ⟩

With regard to the proportion of female financial analysts, the results of Pearson's chi-squared test for the Hofstede's cultural sub-regions (See Panel A of Table 8) reveals that Latin countries have significantly more female financial analysts than Anglo, Germanic and Nordic countries as well. Further, as presented in Panel B of Table 8, within the Hofstede cultural sub-regions, although most recommendations are issued by analysts working in the Anglo countries (i.e. Ireland and United Kingdom), the highest proportion of recommendations issued by female analysts is recorded in Latin countries (26.27%), consistent with the results for the proportion of female analysts. Regarding the recommendations issued by female financial analysts (See Panel B in Table 8), the proportion of recommendations issued by female financial analysts in Latin countries is significantly higher than in countries classified in the other four cultural sub-regions: Anglo, Germanic, Near Eastern and Nordic countries, consistent with the results observed for the proportion

of female analysts among Hofstede cultural sub-regions. The Pearson's chi-squared test suggests that the difference among the five cultural sub-regions are highly significant.

Finally, I compare the situation of 2006 with that of 2013 in order to observe the variation across time. The comparison for analysts in Hofstede's cultural sub-regions between 2006 and 2013 is presented in the Panel A of Table 9. I observe an increase in the number of financial analysts from 2006 to 2013 only in Anglo and Nordic countries. In terms of proportion of female financial analysts, Anglo and Germanic countries show an increase while the proportion of female analysts has dramatically declined in Near Eastern countries and Nordic countries, from 26.92% to 4.76% and from 13.36% to 7.92%, respectively.

⟨ Insert Table 9 about here ⟩

In addition, by comparing the recommendations issued financial analysts between 2006 and 2013 (See Panel B in Table 9), I find that all cultural sub-regions, especially Germanic countries, have suffered from a decline in the number of recommendations issued by their analysts, except Nordic countries where the number of recommendations increased dramatically from 1 771 analysts in 2006 to 2 066 analysts in 2013. As for the proportion of recommendations issued by female financial analysts, Germanic and Latin countries were the ones that enjoyed a remarkable increase across the sample period. Anglo countries did not benefit from their increase in the proportion of female analysts from 2006 to 2013: the proportion of recommendations issued by female has reduced from 12.87% to 10.84% in 2013. For the remaining countries, a shrink in the proportion of recommendations issued by female has also been documented for both Near Eastern and Nordic countries, which is probably due to the sharp decline in female representation in the financial analysts.

5 Impact of cultural dimensions on female representation among financial analysts

5.1 Regression Model

Following prior research on the economic relevance of national culture, I investigate how national culture affects gender observation among financial analysts in European countries. The following model is estimated:

$$\begin{aligned} GenderObservation_{i,t} = {} & \alpha_0 + \alpha_1 dIndivualism_i + \alpha_2 dUncertaintyAvoidance_i \\ & + \alpha_3 (\frac{Rec}{Firm})_{i,t} + \alpha_4 InfluRec_{i,t} \\ & + \alpha_5 (\frac{MarketCap}{GDP})_{i,t} + \alpha_6 IndustryM_{i,t} + \alpha_7 IndustryF_{i,t} \\ & + \alpha_8 UndfAnalyst + \alpha_9 LocalBroker_{i,t} \\ & + \text{Sub-region Fixed Effects} + \text{Year Fixed Effects} + \varepsilon_{i,t} \end{aligned} \tag{1}$$

Dependent Variable The measure for gender diversity used as the dependent variable is either the proportion of female analysts in a given country ($FemAnalyst_{i,t}$) which is the percentage of female analysts in country i for year t or the proportion of recommendations issued by female analysts in a given country ($FemRec_{i,t}$) which is the percentage of recommendations issued by female in country i for year t.

Independent Variables I identify four sources of differences in gender observations among financial analysts across European countries.

Firstly, the national cultural patterns. The individualism and uncertainty avoidance indices of Hofstede (2001) are used to measure national cultural pattern. Based on the individualism scores of Hofstede (2001) for the 28 European countries under study, I split countries with individualism scores higher than the median score from those with score lower than the median score. Austria, Belgium, Germany, Greece, Italy, Poland, Switzerland, and United Kingdom are labelled as indi-

vidualistic countries, while Denmark, Finland, France, Netherlands, Norway, Russia, Spain, and Sweden are treated as collectivist countries. The dummy variable $dIndividualism_i$ is set to one for individualist nations, zero otherwise. The same approach is used with regard to Uncertainty avoidance: Belgium, France, Greece, Italy, Netherlands, Poland, Russia, and Spain are classified as countries with high uncertainty avoidance. Austria, Denmark, Finland, Germany, Norway, Sweden, Switzerland, and United Kingdom are labelled as countries with low uncertainty avoidance. Therefore, the dummy variable $dUncertaintyAvoidance_i$ is set to one for countries with Uncertainty avoidance score higher than the median value, and zero otherwise.

Secondly, importance of financial analysts in the financial market. Financial analysts' importance is measured by two proxies. First, the quantity of recommendations issued by financial analysts, $Rec/Firm_{i,t}$, which is the the number of recommendations issued by analysts in country i divided by the number of listed firms in that country during a given year t. Next, the quality of recommendations is also used to measure analysts' importance. $InfluRec_{i,t}$ measures the percentage of influential recommendations issued by financial analysts of country i in year t. For that, I use a standard event-study methodology. Daily stock prices were collected from *Thomson One*. The event window includes the day that an analyst issues a recommendation, as reported by *I/B/E/S*, and the day that follows. Following the study of Loh and Stulz (2011), a recommendation is classified as influential if it triggers a two-day cumulative abnormal return (CAR) in the event window that is in the correct direction and statistically significant. Following the existing literature, I define $CAR_i = \prod_{t=0}^{1}(1+AR_{it}) - 1$, where AR_{it} is the daily abnormal return estimated by the market model. The estimation period for the market model parameters covers the three months prior to the recommendation announcement date. I check whether the CAR accords with the direction of recommendation change, *i.e.* a positive (negative) CAR is associated with an upgrade (downgrade) in recommendation levels. Table 10 reports the descriptive statistics of two-day cumulative abnormal return around the recommendation date. The CAR is in percentage form. Based on the recommendation changes relative to the previous recommendation issued by the same analyst for the same company, recommendations are classified into three categories: downgrade, reiteration and

upgrade. The *initiation* recommendations refer to the first recommendation issued by an analyst for a given company.

⟨ Insert Table 10 about here ⟩

The average CAR is -0.129% for all the recommendations. The recommendations labelled as "downgrade" relative to its previous recommendation trigger on average a CAR of -1.248%. The CAR is modest when analysts just repeat their previous recommendation. When analysts upgrade their stock recommendation for a given company, the average CAR is positive and comes to 0.875%. Given the first recommendation issued by an analyst for a given company, the CAR is on average negative. I also check whether the absolute value of CAR statistically exceeds the idiosyncratic volatility, σ_ε, which is the standard deviation of residuals from a daily time-series regression of firm returns in the estimation period against market returns. The critical value is $1.96 \times \sqrt{2} \times \sigma_\varepsilon$. The $\sqrt{2}$ accounts for the fact that the CAR is a two-day CAR.

Thirdly, the importance of capital markets. The work of financial analysts are closely linked to stock markets, thus the size of capital market may affect the demand for financial analysis. The proxy used for the importance of capital market, $MarketCap/GDP_{i,t}$, is calculated as the ratio of total market capitalization of all the listed firms over GDP for country i in year t.I collect the *GDP per capita* for each country. The data are available in the website of the World Bank and are in current U.S. dollars (see Table 1). The average *GDP per capita*[4] from 2006 to 2013 for each European country has a mean value of 32 131 US dollars, with a standard deviation equal to 20 519. The distribution of the average *GDP per capita* also reveals a country-level variation in terms of national wealth: from 6 424 US dollars to 92 704 US dollars. Luxembourg enjoys the highest *GDP per capita*, while the lowest *GDP per capita* is recorded in Bulgaria. Countries in the Eastern Europe have a relatively lower *GDP per capita* compared to the remaining countries. Table 1 also presents the statistics of market capitalization for firms listed in each European countries except for Ireland and Lithuania because the information for firms listed in the these two countries are not

[4]For countries including Cyprus, Hungary, Lithuania, and Slovenia, the average of *GDP per capita* is based on data from 2006 to 2012 because the data about their *GDP per capita* for 2013 are not currently available.

available in the *I/B/E/S* database. I find that the country-level variation in the listed firms' market capitalization is quite wide. It ranges from 141.31 million US dollars to 6255.55 million US dollars per company. On average, companies whose headquarter is located in the Czech Republic and Spain have a much greater market capitalization than the others.

⟨ Insert Table 1 about here ⟩

Fourthly, industrial preferences of financial analysts. Constrained by information availability, financial analysts tend to cover firms that share certain commonalities. Thus they tend to be sector specialized (Kini et al., 2009; Ross et al., 2002; Salva and Sonney, 2010). Kumar (2010) suggested that female analysts concentrate in certain industries while keeping distance from others. Thus, countries with more major industries favored by female analysts would expect a higher female representation among financial analysts. The proxies I use are $IndustryF_{i,t}$, which measures the percentage of firms in the five industries where the female representation in financial analysts are the highest for country i in year t, and $IndustryM_{i,t}$, which refers to the percentage of firms in the five industries where the male representation in financial analysts are the highest for country i in year t.

I control for cultural sub-region and year fixed effects, the percentage of undefined analysts, $UndAnalyst_{i,t}$, which refers to the percentage of analysts whose gender cannot be determined for country i in year t, and the internationalization of brokerage houses, $LocalBroker_{i,t}$, which refers to the percentage of recommendations issued by analysts working in a local brokerage house for country i in year t. I exclude observations for countries with less than 1% of all financial analysts recorded in our sample. OLS method is used to estimate the coefficients.

5.2 Summary Statistics of Variables

Table 11 presents descriptive statistics for the dependent and independent variables for the regression model. The average proportion of female analysts is 17.6% and female analysts issued 16.3% of all recommendations in the regression sample. This observation is similar to the results obtained

by Green et al. (2007) and Kumar (2010) in the context of United States. The percentage of analysts for whom I did not manage to identify his/her gender remains modest for all the country-year observations: the average percentage of analysts with undefined gender is 2.7%. In all, 5.3% of firms belongs to the industries favoured by female analysts, while the firms in masculine industries account for 3.4% of all the firms in our sample. On average, 7.3% of all the recommendations are influential to the stock market, creating a statistically significant two-day cumulative abnormal return around the recommendation issue date. About 42.3% of brokerage houses have only local financial analysts. Financial analysts issued on average three recommendations per year for the firms they covered. The capital markets in European countries are equivalent to 64.7% of GDP. Finally, the mean values of individualism and uncertainty avoidance estimated by Hofstede (2001) for each country are 64.44 and 68.56, respectively.

⟨ Insert Table 11 about here ⟩

5.3 Regression Results

The association of cultural dimensions with female representation among European financial analysts is presented in Table 12. In the first specification, the dependent variable is the percentage of female analysts (FemAnalyst%) (columns 1 and 2). The percentage of recommendations issued by female analysts (FemRec%) is used as dependent variable for the second specification (columns 4 and 5). To study the incremental effect of cultural dimensions on the female representation in the world of financial analysts, I include two dummy variables to capture individualism and uncertainty avoidance in column 2 and 5, in addition to the variables presented in columns 1 and 4. The adjusted R^2 is higher for regression models with two cultural dimension variables (in columns 2 and 5).

Regarding the dummy variables for two cultural dimensions: *Individualism* and *Uncertainty Avoidance*, the model specification of column 2 shows that the regression coefficient on the dummy variable for individualism (*dIndividualism*) is -0.111, significant at the 0.01 level. The result indicates that countries with higher levels of individualism have less female representation among

financial analysts, consistent with our first hypothesis which predicts that, holding other factors constant, gender diversity among financial analysts is lower in individualistic countries. Our results suggest that in individualistic societies where the relationship between employers and employees are expected to be based on mutual benefits, female figures are less likely to enter into the industry of financial analysts.

Our second hypothesis states that holding other factors constant, gender diversity among financial analysts is lower in countries with strong uncertainty avoidance. Column 2 of table 12 reports that the coefficient on the dummy variable for *Uncertainty Avoidance*(dUncertaintyAvoidance) is -0.180 and statistically significant at the 0.01 level, which indicates that countries with higher levels of uncertainty avoidance tend to have lower proportion of female financial analysts. In a traditionally male-dominated industry such as the financial analysis industry, women are less likely to enter the milieu in countries that show more hostility to exogenous members that are supposed to increase the uncertainty of situation.

The coefficient on the variable "industryF" is positive and statistically significant in regression models without dummy variables for cultural dimensions, which suggests that female representation is higher in countries where more companies are operating in economic sectors favored by female analysts. Meanwhile, the coefficient on the percentage of firms in masculine industry (industryF) is constantly negative and statistically significant. Note that female analysts are also documented to be not randomly distributed in economic sectors in the United States (Kumar, 2010). The results indicate that female representation increases with the percentage of firms in the feminine industries, such as "Apparel", "Restaurant" and "Food products", and decreases with the percentage of firms in industries most favoured by male analysts such as "Rubber and Plastic Products", "Electrical Equipment". Countries with more developed feminine industries tend to have higher female representation in the world of financial analysts.

The coefficient estimates of the percentage of influential recommendations (InfluRec) is also significantly negative. The cumulative abnormal rate of return around the recommendation issue date is commonly used to proxy for the influence of financial analysts on the investors. Given

the fact that the variable "InfluRec" measures the proportion of recommendations that triggered a statistically significant two-day cumulative abnormal return, this result suggests that more female analysts could be found in countries where investors generally attach less importance to analysts' opinion. Countries where financial analysts exert less influence on capital market have more female figures among financial analysts.

The coefficient on the percentage of recommendations issued by analysts working in a local brokerage house *LocalBroker* is negative, however, it is not significant at conventional levels, suggesting that the internationalization of brokerage house exerts no influence on the female representation among financial analysts.

The results reported in Table 12 indicate that analysts' workload is also an important characteristic in European countries. The coefficients on the numbers of recommendations issued per listed firms (*Rec/Firm*) are constantly positive at conventional levels of significance. A significantly positive coefficient suggests that female representation among financial analysts is higher in countries where financial analysts are more active in issuing stock recommendations.

With respect to the influence of market capitalization, the results are mixed and not statistically significant for the proxy that I used to capture the influence of capital markets. Column 1 and 2 show that the marginal effect of *MarketCap/GDP* is negative for the proportion of female analysts. Column 4 and 5 show that the marginal effect of *MarketCap/GDP* is positive for the proportion of recommendations issued female analysts. However, it is not statistically significant.

⟨ Insert Table 12 about here ⟩

Column 4 and 5 present regression results using an alternative measurement of gender diversity, *i.e.* the percentage of recommendations issued by female analysts (*FemRec*). Column 4 shows that the regression coefficients on *dIndividualism* and *dUncertaintyAvoidance* are -0.124 and -0.141, respectively. The coefficients have the signs that are consistent with our hypotheses and are significant at the 0.01 level. Collectively, the country-level regression results of Table 12 suggest that national culture has a significant effect on female representation in financial analysts. In particular,

I find strong evidence that gender diversity among financial analysts is higher in countries with collectivist and less uncertainty-avoiding culture.

5.4 Sensibility Tests

I examine the robustness of our results by conducting several sensitivity tests. As argued by Gow et al. (2010), two-way cluster-robust standard errors correction is necessary to produce valid inferences in the OLS regression. Our first sensitivity test consists of re-estimating results presented in Table 12 after correcting for cross-sectional and time-series dependence. The standard errors of variables are clustered by both Hofstede cultural sub-regions and year. The results, which are not reported in the paper, show that the coefficients for the dummy variables of two cultural dimensions: individualism and uncertainty avoidance remain significantly negative (p-value < 0.01). The effect of influential recommendations on female representation also remains significantly negative. However, the coefficient for the proxy of analysts' workload, *Rec/Firm* is no longer significantly positive for the regressions when two cultural dummy variables (*dIndividualism* and *dUncertaintyAvoidance*) are excluded from the regression model.

Secondly, I replace the dummy variables for the two cultural dimensions: *dIndividualism* and *dUncertaintyAvoidance* with the scores for each cultural dimensions (Columns 3 and 6 in Table 12). The marginal effect of one additional score in individualism dimension is -0.6% on the proportion of female analysts and -0.5% on the proportion of recommendations issued by female financial analysts. However, the effect of uncertainty avoidance is no longer significantly negative.

6 Conclusions and Discussions

The empirical studies about female financial analysts are limited in the U.S. context: Green et al. (2007) document a female representation of 15.6% across United States among the financial analysts. They also find that earning forecasts issued by women are less accurate than those issued by their male counterparts. The later work of Kumar (2010); Li et al. (2013) confirm such female under-representation in the milieu of U.S. financial analysts. However, the gender issues for finan-

cial analysts outside United States remain an unexplored research field. Motivated by the work of Aggarwal and Goodell (2014), I investigate the influence of national culture on female representation among financial analysts in European countries.

By using a cross-country European sample, I examine in this paper the descriptive statistics about female representation among financial analysts and the extent to which national culture influence the gender diversity among financial analysts as well. I first provide portray for female financial analysts working in European countries. I provide evidence suggesting that female analysts are constantly under-represented across Europe and during the sample period, their representation only enjoyed a moderate increase. Meanwhile, female financial analysts are more likely to cover companies in economic sectors such as "Apparel", "Restaurants, Hotels, Motels", "Food Products". In these feminine industries, women enjoy a higher representation among financial analysts.

I examine whether national culture has an incremental influence on female representation among financial analysts, after controlling for the impact of the industrial preference of female analysts, the scale of stock market and the analysts' influence. I measure the national culture profiles by employing the country-level scores for individualism/collectivism and uncertainty avoidance formulated by Hofstede (2001). I argue that these cultural dimensions are related to female representation in financial analysts. Hofstede (2001) states that in an individualistic country, ties between individuals are loose and one is expected to look after one's own benefits. Thus, I hypothesize that holding other factors constant, gender diversity among financial analysts is lower in individualistic countries. According to Hofstede (2001), people in countries with high uncertainty avoidance are more likely to feel threatened by unknown situations. Our second hypothesis, thus, predicts that holding other factors constant, gender diversity among financial analysts is lower in countries with strong uncertainty avoidance.

The regression analysis at the country level shows that both individualism and uncertainty avoidance are negatively related to the proportion of female analysts and proportion of recommendations issued by female analysts. The findings support our hypotheses that less gender diversity in financial analysts is achieved in countries with high individualism and high uncertainty-avoiding

culture. The findings also reveal that in countries where analysts' recommendations incur higher stock price reaction, there are less female financial analysts, suggesting that more female analysts work in countries whre investors generally attach less importance to analysts' opinion. As expected, countries with more firms in feminine economic sectors enjoy a higher female representation in financial analysts.

The study contributes to an emerging academic literature on the gender issues among financial analysts. Research to date focus on financial analysts based in United States only. Evidence provided in the U.S. literature suggests that female figures are constantly under-represented in the world of financial analysts (Green et al., 2007; Kumar, 2010). Our findings in the context of European countries contribute to the literature about gender concerns in the world of financial analysts by shedding light on the gender observation in other countries. Furthermore, in addition to confirming the results of concurrent studies that have been performed in the U.S. about female financial analysts, I find that national culture has a significant impact on the female representation among financial analysts. Our findings therefore contribute to the finance and culture literature by adding new evidence of the economic relevance of national culture, especially when the research is designed at international scale. This study is the first to document the observation for gender diversity in financial analysts in European cross-country setting. Future research could examine whether market perceives female financial analysts as more credible than their male counterpart.

Appendix

Definitions for Five Cultural Dimensions Hofstede (2001)

Culture dimension	Definition
Power distance	The extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.
Uncertainty avoidance	The extent to which the members of a culture feel threatened by uncertain or unknown situations.
Individualism/Collectivism	Individualism stands for a society in which the ties between individuals are loose: everyone is expected to look after himself/herself and his/her immediate family only. Collectivism, stands for a society in which people are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty.
Masculinity/Femininity	Masculinity stands for a society in which emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success; women are supposed to be more modest, tender, and concerned with the quality of life. Its opposite, femininity, stands for a society in which emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life.
Long-term/Short-term orientation	Long-term orientation stands for the fostering of virtues oriented towards future rewards and adapting to changing circumstances. Short-term orientation, stands for the fostering of virtues related to the past and present, in particular respect for tradition, preservation of 'face', and fulfilling social obligations.

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Table 1: Statistics for Sample Countries

The table includes descriptive statistics for all the European countries under study. *Analysts* stands for the number of analysts in a given country. *Rec* refers to the number of recommendations issued during the sample period (from 2006 to 2013). *Firm1* stands for the number of firms domiciled in the country under consideration. *Firm2* represents the number of firms domiciled in the country under consideration and also followed by at least one European analyst during the sample period. *MarketCap* refers to the mean market capitalization for firms whose headquarter is located in the European country under consideration The data in this column are in million U.S. dollars. *GDP per capita* presents the mean value of *GDP per capita* for each country from 2006 to 2013, except for Cyprus, Hungary, Lithuania, and Slovenia. For these countries, the average of *GDP per capita* is based on data from 2006 to 2012 because the data about their *GDP per capita* for 2013 are not currently available.

Country	**Analysts**	**Rec**	**Firm1**	**Firm2**	**MarketCap** (Million US$)	**GDP per capita** (US$)
Austria	52	1538	73	68	2005.43	46298
Belgium	46	2075	127	119	2169.28	43848
Bulgaria	5	48	27	26	159.77	6424
Croatia	5	68	14	12	141.31	12069
Cyprus	4	31	30	26	662.03	24493
Czech Republic	23	697	5	5	6255.55	14477
Denmark	48	1512	97	82	1886.90	50611
Estonia	5	157	16	15	220.30	15981
Finland	78	4752	115	107	1498.47	45968
France	298	12546	515	471	3521.63	40436
Germany	389	16507	608	550	2993.82	37031
Greece	48	1132	91	66	831.11	20424
Hungary	12	366	15	11	2176.51	9861

Continued on next page

Table 1 – *Continued from previous page*

Country	**Analysts**	**Rec**	**Firm1**	**Firm2**	**MarketCap** (Million US$)	**GDP per capita** (US$)
Ireland	34	778	76	63	NA	45168
Italy	110	5714	242	217	2715.69	30952
Lithuania	2	28	17	9	NA	12540
Luxembourg	1	18	59	52	4451.07	92704
Netherlands	90	2986	142	129	4268.31	47574
Norway	143	4888	176	163	1935.42	70559
Poland	86	3283	178	154	952.52	12142
Portugal	28	915	35	29	2201.38	21570
Romania	15	357	30	29	738.91	7470
Russia	163	2134	265	251	5249.94	8490
Slovenia	4	96	17	16	760.68	23335
Spain	94	2945	131	119	6116.61	30501
Sweden	132	5146	241	215	2058.60	46363
Switzerland	121	3431	202	194	4857.62	47271
United Kingdom	1543	51760	1289	1015	2303.20	39980

Table 2: Stock Coverage and Recommendations Issued by Each Gender

The table summarizes the number of European analysts, firms followed by European analysts and recommendations issued by them during the sample period (from 2006 to 2013). All recommendations issued gy European analysts and provided by the *I/B/E/S* database are included in *Full sample*. The *Restricted sample* consists only the recommendations issued by analysts who have issued at least 10 recommendations in a given year, for firms that have received at least 10 recommendations in a given year. *Analysts* refers to the number of analysts; *stocks* stands for the number of stocks followed by analysts; *Recommendations* is the number of recommendations issued by analysts; the number of stocks followed per analyst is recorded in *Stocks/Analyst*; the number of recommendations issued per analyst is recorded in *Rec/Analyst*; finally, *Rec/Stock/Analyst* refers to recommendations made by each analyst per firm.I test the significant of the difference between male and female for each country by using the t-test: *** refers to differences significant at 0.01 level.; ** differences significant at 0.05 level; * differences significant at 0.10 level.

	Analysts	**Stocks**	**Recommendations**	**Stocks** /Analyst	**Rec** /Analyst	**Rec/Stock** /Analyst
Full Sample						
Male	2804	9217	101442	10.56	36.46	3.45
Female	578	3282	18386	9.39	31.98	3.40
Diff	2226	5935	83056	1.17***	4.49**	0.05

Table 3: Breakdown of Analysts and Recommendations by Country and Gender

For all the European countries included in the sample, the table reports the number of analysts working or having worked in each country during the 2006 to 2013 sample period (*Analysts*), the proportion of analysts who are female (*FemAnalysts*), who are male (*MalAnalysts*) and the number of recommendations issued by analysts in each European countries during the 2006 to 2013 time span (*Rec*), the proportion of recommendations issued by female analysts (*FemRec*), issued by male analysts (*MalRec*). *Others* refers to all the countries with less than 1% of all financial analysts: namely Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Ireland, Lithuania, Luxembourg,, Portugal, Romania, and Slovenia.

Country	**Analysts**	**FemAnalysts**	**MalAnalysts**	**Rec**	**FemRec**	**MalRec**
Austria	52	19.23%	73.08%	1538	10.99%	84.01%
Belgium	46	8.70%	84.78%	2075	4.00%	90.31%
Denmark	48	4.17%	89.58%	1512	1.06%	97.35%
Finland	78	21.79%	76.92%	4752	18.41%	80.81%
France	298	18.79%	74.50%	12546	24.54%	69.36%
Germany	389	9.51%	84.06%	16507	8.63%	87.11%
Greece	48	20.83%	79.17%	1132	17.58%	82.42%
Italy	110	40.00%	60.00%	5714	35.65%	64.35%
Netherlands	90	7.78%	85.56%	2986	3.25%	94.61%
Norway	143	10.49%	88.81%	4888	9.62%	88.52%
Poland	86	26.74%	73.26%	3283	23.58%	76.42%
Russia	163	23.93%	75.46%	2134	21.42%	77.88%
Spain	94	31.91%	63.83%	2945	34.57%	64.48%
Sweden	132	12.12%	87.88%	5146	9.50%	90.50%
Switzerland	121	11.57%	85.95%	3431	10.14%	89.22%
United Kingdom	1543	14.78%	77.32%	51760	12.29%	79.77%
Others	138	18.84%	78.26%	3559	13.71%	85.53%
Total	3579	16.15%	78.35%	125908	14.60%	80.57%
Mean	211	17.72%	78.73%	7406	15.23%	82.51%
SD	355	9.39%	8.43%	12118	10.11%	9.69%

Table 4: Country-level Comparisons of Recommendations Issued and Stocks Followed by European Analysts

The table reports the gender comparison at country level in terms of the number of stocks followed by each gender, the number of recommendations issued by each gender, as well as the number of recommendations per stock issued by European financial analysts. *Others* refers to all the countries with less than 1% of all financial analysts: namely Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Ireland, Lithuania, Luxembourg, Portugal, Romania, Slovenia. I test the difference between male and female for each country by using the t-test: *** difference significant at 0.01 level, ** difference significant at 0.05 level., * difference significant at 0.10 level.

Country	**Stocks**			**Recommendations**			**Rec per Stock**		
	Female	Male	Difference	Female	Male	Difference	Female	Male	Difference
Austria	8.00	10.58	2.58	18.78	35.89	17.11**	2.35	3.39	1.04***
Belgium	7.75	12.08	4.33**	20.75	52.06	31.31***	2.68	4.31	1.63***
Denmark	3.50	9.10	5.60	8.00	35.90	27.90*	2.29	3.95	1.66***
Finland	11.82	12.03	0.21	51.47	65.08	13.61	4.35	5.41	1.06***
France	15.04	11.15	−3.89	57.02	40.47	−16.54*	3.79	3.63	−0.16
Germany	9.38	11.89	2.51**	38.51	44.24	5.73	4.11	3.72	−0.39*
Greece	7.80	7.32	−0.48	19.90	24.55	4.65	2.55	3.36	0.8***
Italy	10.25	12.53	2.28*	46.30	55.71	9.42	4.52	4.45	−0.07
Netherlands	7.14	11.65	4.51*	13.86	36.69	22.83***	1.94	3.15	1.21***
Norway	9.73	9.41	−0.32	31.33	34.07	2.74	3.22	3.62	0.40
Poland	8.65	10.78	2.13*	33.65	39.83	6.17	3.89	3.70	−0.19
Russia	5.82	7.20	1.37	11.72	13.51	1.79	2.01	1.88	−0.14
Spain	9.00	9.40	0.40	33.93	31.65	−2.28	3.77	3.37	−0.4*
Sweden	8.62	9.29	0.67	30.56	40.15	9.58	3.54	4.32	0.78***
Switzerland	7.71	9.39	1.67	24.86	29.72	4.86	3.22	3.17	−0.06
United Kingdom	9.33	10.92	1.58**	27.90	34.73	6.82**	2.99	3.18	0.19***
Others	5.19	7.95	2.76***	18.77	28.19	9.42*	3.61	3.54	−0.07

Table 5: Statistics across the Sample Period for European Analysts

The table reports the statistics for analysts data from the 2006 to 2013 period. All recommendations for stocks with available information in the *I/B/E/S* database are included in *Full sample*. *Restricted sample* consists only the recommendations issued by analysts who have issued at least 10 recommendations in a given year, for firms that have received at least 10 recommendations in a given year. *NbStocks* refers to the total number of stocks followed by European analysts. *NbAnalysts* is the total number of analysts in office during the given time period, and *NbRec* stands for the total number of recommendations issued by these analysts. Finally, the proportion of all analysts that are female (*FemAnalysts*) and the proportion of all recommendations issued by them (*FemRec*) are also reported in the table.

Year	NbStocks	NbAnalysts	NbRec	FemAnalysts	FemRec
Full Sample					
2006	4041	1634	13307	14.99%	13.66%
2007	4626	1733	17553	14.66%	14.56%
2008	4641	1727	20083	14.88%	14.51%
2009	4723	1742	17408	14.93%	13.38%
2010	4657	1861	14332	15.26%	14.50%
2011	4675	1893	15542	15.74%	15.27%
2012	4532	1753	14441	16.26%	15.71%
2013	4440	1700	13242	15.65%	15.47%
Restricted Sample					
2006	267	317	2538	11.04%	10.09%
2007	410	483	4284	16.15%	16.34%
2008	547	595	6699	15.29%	15.72%
2009	444	481	4626	14.35%	12.36%
2010	275	320	2178	13.12%	13.45%
2011	345	385	3282	14.55%	18.37%
2012	294	365	2899	15.62%	18.11%
2013	237	299	2043	13.04%	14.34%

Table 6: Country-level Comparison of the Proportion of Female Analysts and Recommendations Issued by Females between 2006 and 2013

The table reports the comparison between 2006 and 2013. *NbAnalysts* is the number of analysts in office during the given time period, and *FemAnalysts* refers to the proportion of all analysts that are female. *NbRec* is the total number of recommendations issued by European analysts in office during the given time period, and *FemRec* refers to the proportion of recommendations issued by female analysts. Δ *Fem* equals to the proportion in 2013 minus the one recorded in 2006 for each country. *Others* refers to all the countries with less than 1% of all financial analysts: namely Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Ireland, Lithuania, Luxembourg, Portugal, Romania, Slovenia. I ran the test of proportion for each country's changes in proportions from 2006 to 2013. *** difference significant at 0.01 level., ** difference significant at 0.05 level, * difference significant at 0.10 level.

Country	**NbAnalysts**		**FemAnalysts**		**Δ Fem**	**NbRec**		**FemRec**		**Δ Fem**
	2006	2013	2006	2013		2006	2013	2006	2013	
Austria	28	27	17.86%	22.22%	4.37%	208	198	8.65%	22.73%	14.07%***
Belgium	31	20	9.68%	5.00%	-4.68%	374	149	10.70%	5.37%	−5.33%*
Denmark	29	23	3.45%	0.00%	-3.45%	235	114	4.26%	0.00%	−4.26%*
Finland	44	44	25.00%	15.91%	-9.09%	373	570	32.71%	12.81%	−19.90%***
France	165	136	15.15%	19.85%	4.70%	1346	1395	21.25%	35.05%	13.81%***
Germany	244	179	7.38%	10.06%	2.68%	2324	1509	6.07%	8.15%	2.08%**
Greece	26	21	26.92%	4.76%	-22.16%	157	68	17.20%	5.88%	−11.32%**
Italy	72	59	41.67%	38.98%	-2.68%	500	525	33.80%	30.48%	−3.32%
Netherlands	52	42	7.69%	0.00%	-7.69%	442	256	2.94%	0.00%	−2.94%**
Norway	40	84	17.50%	9.52%	-7.98%	298	589	13.76%	8.83%	−4.93%**
Others	40	70	12.50%	24.29%	11.79%	269	394	4.46%	19.04%	14.57%***
Poland	12	59	33.33%	25.42%	-7.91%	103	607	19.42%	23.56%	4.14%
Russia	18	73	33.33%	27.40%	-5.94%	119	504	18.49%	23.41%	4.93%
Spain	44	45	43.18%	28.89%	-14.29%	292	335	37.67%	27.16%	−10.51%***
Sweden	67	72	11.94%	8.33%	-3.61%	423	537	8.51%	11.55%	3.03%
Switzerland	74	40	13.51%	15.00%	1.49%	497	316	11.27%	17.72%	6.45%**
United Kingdom	648	706	12.65%	13.88%	1.23%	5347	5176	13.00%	10.63%	−2.37%***
Total	1634	1700	14.99%	15.65%	0.65%	13307	13242	13.66%	15.47%	1.81%***

Table 7: Industry Segments for European Analysts

The table reports European analysts' industrial preference during the sample period. *NbAnalysts* is the number of analysts for each market segment, *FemAnalysts* refers to the proportion of female analysts in the given industry. *PerTotRec* is the percentage of all recommendations issued for the related industry, and *FemRec* refers to the proportion of recommendations issued by female analysts within a given industry. The industrial segments are based on the Fama and French industry classification (Fama and French, 1997).

Industry	**NbAnalysts**	**FemAnalysts**	**PerTotRec**	**FemRec**
Agriculture	188	16.489	0.726	21.335
Aircraft	113	15.044	0.596	16.511
Almost Nothing	82	15.854	0.230	24.138
Apparel	235	30.638	1.223	30.844
Automobiles and Trucks	383	12.533	2.591	9.565
Banking	468	17.735	5.226	17.660
Beer and Liquor	143	20.979	0.916	21.162
Business Services	1,261	13.957	9.470	12.311
Business Supplies	202	17.327	1.141	15.449
Candy and Soda	151	14.570	0.486	16.013
Chemicals	494	13.563	2.717	14.060
Coal	103	13.592	0.415	13.193
Communication	536	14.552	4.449	14.959
Computers	391	13.299	1.940	11.789
Construction	557	12.926	3.229	14.736
Construction Materials	483	14.907	2.375	11.371
Consumer Goods	382	20.157	1.568	23.860
Defense	19	15.789	0.044	12.500

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Table 7 – *Continued from previous page*

Industry	**NbAnalysts**	**FemAnalysts**	**PerTotRec**	**FemRec**
Electrical Equipment	279	9.319	0.907	9.632
Electronic Equipment	578	12.457	3.907	8.498
Entertainment	249	17.269	0.961	18.760
Fabricated Products	78	12.821	0.218	12.774
Food Products	333	21.622	1.848	22.475
Healthcare	146	13.699	0.672	9.693
Insurance	247	17.409	2.422	11.016
Machinery	693	13.276	4.463	11.621
Measuring and Control Equipment	229	10.044	0.709	12.878
Medical Equipment	222	18.468	1.355	15.123
Non-Metallic and Industrial Metal Mining	326	12.883	1.933	10.435
Personal Services	117	13.675	0.406	15.068
Petroleum and Natural Gas	542	16.790	5.751	13.714
Pharmaceutical Products	355	20	2.321	17.248
Precious Metals	134	12.687	1.276	8.899
Printing and Publishing	256	17.188	1.642	26.367
Real Estate	407	16.462	4.059	13.129
Recreation	132	20.455	0.621	23.018
Restaraunts, Hotels, Motels	206	22.816	1.399	19.478
Retail	653	19.449	5.218	19.452
Rubber and Plastic Products	147	8.844	0.518	7.209
Shipbuilding, Railroad Equipment	98	11.224	0.298	8.800
Shipping Containers	69	20.290	0.191	23.237

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Table 7 – *Continued from previous page*

Industry	**NbAnalysts**	**FemAnalysts**	**PerTotRec**	**FemRec**
Steel Works Etc	448	12.277	2.454	15.210
Textiles	62	12.903	0.181	14.035
Tobacco Products	58	17.241	0.195	17.551
Trading	587	13.969	3.460	10.629
Transportation	545	14.679	4.529	9.644
Unclassified	80	11.250	0.206	11.583
Utilities	440	16.136	3.736	20.153
Wholesale	691	14.906	2.800	14.351

Table 8: Scenario for Cultural Sub-Regions

The table reports differences between cultural sub-regions respectively based on Hofstede's and Schwartz's cultural model. *NbAnalysts* (*NbRec*) is the total number of analysts (recommendations issued by analysts) working in the given cultural sub-regions during the sample period, and *FemAnalysts%* (*FemRec%*) refers to the proportion of all analysts (recommendations issued by analysts) that are female. According Hofstede's culture model, *Anglo* includes Ireland, United Kingdom; *Germanic* refers to Austria, Germany, and Switzerland; *Latin* stands for Belgium, France, Italy, Portugal, and Spain; *Near Eastern* includes Greece; *Nordic* represents Denmark, Finland, Netherlands, Norway, and Sweden; and all the remaining countries (Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Luxembourg, Poland, Romania, Russia, and Slovenia) are grouped into *Unclassified*. I conduct Pearson's chi-squared test to compare the proportion recorded in different cultural sub-regions. Values in the first line and first column stands for the difference between the proportion of female analysts in Anglo countries and one documented in Germanic countries (the former minus the latter). χ^2 values of the chi-squared test are in parentheses. The *,**,*** means the difference is significant at the 0.10, 0.05, 0.01 level respectively, using a two-tailed test.

Panel A: Analysts

Cultural Model	**Sub-Regions**	**NbAnalysts**	**FemAnalysts%**
Hofstede	Anglo	1577	14.77%
	Germanic	562	10.85%
	Latin	576	24.31%
	Near Eastern	48	20.83%
	Nordic	491	11.61%
	Unclassified	325	23.69%

Panel A: Comparison among cultural sub-regions of the Hofstede cultural model

	Germanic	Latin	Near Eastern	Nordic
Anglo	3.92%**	−9.53%***	−6.06%	3.17%*
	(5.05)	(26.09)	(0.91)	(2.86)
Germanic		−13.45%***	−9.98%*	−0.75%
		(34.47)	(3.37)	(0.08)
Latin			3.47%	12.70%***
			(0.13)	(27.55)
Near Eastern				9.22%
				(2.62)

Panel B: Recommendations

Cultural Model	**Sub-Regions**	**NbRec**	**FemRec%**
Hofstede	Anglo	52538	12.29%
	Germanic	21476	9.04%
	Latin	24195	26.27%
	Near Eastern	1132	17.58%
	Nordic	19284	10.1%
	Unclassified	7283	20.42%

Panel B: Comparison among cultural sub-regions of the Hofstede cultural model

	Germanic	Latin	Near Eastern	Nordic
Anglo	3.25%***	−13.98%***	−5.29%***	2.19%***
	(159.32)	(2326.05)	(28.08)	(65.38)
Germanic		−17.22%***	−8.54%***	−1.05%***
		(2268.98)	(90.42)	(12.95)
Latin			8.69%***	16.17%***
			(42.09)	(1815.07)
Near Eastern				7.48%***
				(62.86)

Table 9: Comparison for Different Cultural Sub-Regions between 2006 and 2013

The table reports the comparison for European analysts in Hofstede's (Schwartz's) cultural sub-regions between 2006 and 2013. *NbAnalysts* is the total number of analysts in office during the given time period, and *FemAnalysts* refers to the proportion of all analysts that are female. *NbRec* is the total number of recommendations issued by European analysts in office during the given time period, and *FemRec* refers to the proportion of recommendations issued by female analysts. Δ *Fem* stands for the difference between 2006 and 2013, the latter minus the former. The *,**,*** means the difference is significant at the 0.10, 0.05, 0.01 level respectively, using a two-tailed Pearson's chi-squared test.

Panel A: Comparison for Analysts in Different Cultural Sub-Regions between 2006 and 2013

Sub-Regions	**2006**		**2013**		**Δ Fem**
	NbAnalysts	FemAnalysts	NbAnalysts	FemAnalysts	
Anglo	663	12.52%	723	14.11%	1.59%
Germanic	346	9.54%	246	12.20%	2.66%
Latin	321	24.61%	271	24.35%	−0.26%
Near Eastern	26	26.92%	21	4.76%	−22.16%
Nordic	232	13.36%	265	7.92%	−5.44%*

Panel B: Comparison for Recommendations in Different Cultural Sub-Regions between 2006 and 2013

Sub-Regions	**2006**		**2013**		**Δ Fem**
	NbRec	FemRec	NbRec	FemRec	
Anglo	5430	12.87%	5229	10.84%	−2.03%***
Germanic	3029	7.10%	2023	11.07%	3.97%***
Latin	2576	23.64%	2538	30.34%	6.70%***
Near Eastern	157	17.20%	68	5.88%	−11.32%**
Nordic	1771	12.54%	2066	9.05%	−3.48%***

Table 10: Cumulative Abnormal Returns for Different Recommendation Changes

This table reports the descriptive statistics of two-day cumulative abnormal return around the recommendation date. The CAR is in percentage form. The recommendations are classified into three categories, based on the recommendation changes relative to the previous recommendation issued by the same analyst for the same company. *initiation* recommendations refer to the first recommendation issued by an analyst for a given company.

	mean	SD	p25	median	p75
all	−0.129	4.715	−1.713	−0.152	1.478
downgrade	−1.248	6.029	−2.739	−0.728	0.793
reiteration	−0.006	4.198	−1.598	−0.128	1.522
upgrade	0.875	4.747	−1.158	0.365	2.327
initiation	−0.115	3.888	−1.565	−0.137	1.308

Table 11: Sample Descriptive Statistics

The table reports descriptive statistics for the variables in regression models. I use data from European countries with more than 1% of all financial analysts recorded in our sample from 2006 to 2013. $FemAnalyst_{i,t}$ refers to the proportion of female analysts, while $FemRec_{i,t}$ the proportion of recommendations issued by female analysts. $UndAnalyst_{i,t}$ refers to the percentage of analysts whose gender cannot be determined; $IndustryF_{i,t}$ measures the percentage of firms in five industries where the female representation in financial analysts are the highest; $IndustryM_{i,t}$ measures the percentage of firms in five industries where the male representation in financial analysts are the highest; $InfluRec_{i,t}$ is the percentage of recommendations that trigger a significant two-day cumulative abnormal returns; $LocalBroker_{i,t}$ refers to the percentage of recommendations issued by analysts working in a local brokerage house; $Rec/Firm_{i,t}$ is the number of all the recommendations issued by analysts in a given country divided by the number of listed firms in that country during a given year; $MarketCap/GDP_{i,t}$, stands for the ratio of total market capitalization of all the listed firms in a country over the country's GDP. *Individualism* and *Uncertainty Avoidance* refer to the respective scores given by Hofstede (2001) to each country based on its national cultural pattern.

Variable	*Mean*	*SD*	*p*25	*Median*	*p*75
FemAnalyst	0.176	0.101	0.100	0.151	0.226
FemRec	0.163	0.106	0.085	0.130	0.229
UndAnalyst	0.027	0.031	0	0.018	0.045
industryF	0.053	0.021	0.034	0.045	0.069
industryM	0.034	0.017	0.020	0.028	0.052
InfluRec	0.073	0.081	0	0.067	0.104
LocalBroker	0.423	0.233	0.258	0.410	0.571
Rec/Firm	3.128	1.203	2.272	2.920	3.595
MarketCap/GDP	0.647	0.452	0.368	0.516	0.807
Individualism	64.442	14.113	55	68	74
UncertaintyAvoidance	68.525	23.109	53	70	93

Table 12: Cultural Dimension Impacts

The table reports the results of fixed effect cultural models. The dependent variable is either the proportion of female analysts ($FemAnalyst_{i,t}$) (in column 1, 2 and 3) or the proportion of recommendations issued by female analysts ($FemRec_{i,t}$)(in column 4, 5 and 6). I use data from European countries with more than 1% of all financial analysts recorded in our sample from 2006 to 2013. $FemAnalyst_{i,t}$ refers to the proportion of female analysts, while $FemRec_{i,t}$the proportion of recommendations issued by female analysts. $UndAnalyst_{i,t}$ refers to the percentage of analysts whose gender cannot be determined; $IndustryF_{i,t}$ measures the percentage of firms in five industries where the female representation in financial analysts are the highest; $IndustryM_{i,t}$ measures the percentage of firms in five industries where the male representation in financial analysts are the highest; $InfluRec_{i,t}$ is the percentage of recommendations that trigger a significant two-day cumulative abnormal returns; $LocalBroker_{i,t}$ refers to the percentage of recommendations issued by analysts working in a local brokerage house; $Rec/Firm_{i,t}$ is the number of all the recommendations issued by analysts in a given country divided by the number of listed firms in that country during a given year; $MarketCap/GDP_{i,t}$, stands for the ratio of total market capitalization of all the listed firms in a country over the country's GDP. Based on the individualism scores of Hofstede (2001) for the 28 European countries, I classify countries with individualism score higher than the median score as having an individualist culture, and those with score lower than the median score as having a collectivist culture. $Individualism_i$ and $UncertaintyAvoidance_i$ refer to the scores of individualism and uncertainty avoidance respectively. The dummy variable $dIndividualism_i$ is set to one for individualist nations, zero otherwise. In the same vein, with regard to Uncertainty avoidance, the dummy variable $dUncertaintyAvoidance_i$ is set to one for countries with Uncertainty avoidance score higher than the median value, and zero otherwise. ***, **, * stand for p-value less than 0.01, 0.05, and 0.1 respectively.

	Dependent variable:					
	FemAnalyst%			FemRec%		
	(1)	(2)	(3)	(4)	(5)	(6)
UndAnalyst	-1.705^{***}	-1.047^{***}	-1.610^{***}	-1.350^{***}	-0.902^{***}	-1.434^{***}

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Table 12 – *Continued from previous page*

	Dependent variable:					
	FemAnalyst			FemRec		
	(1)	(2)	(3)	(4)	(5)	(6)
	(0.271)	(0.305)	(0.225)	(0.299)	(0.342)	(0.285)
industryF	0.738**	0.110	1.775***	0.701*	0.370	1.489***
	(0.363)	(0.396)	(0.298)	(0.401)	(0.443)	(0.378)
industryM	−1.219**	−0.351	−1.504**	−1.626***	−0.893	−2.720***
	(0.545)	(0.516)	(0.681)	(0.602)	(0.577)	(0.863)
InfluRec	−0.188**	−0.147**	−0.059	−0.263***	−0.206**	−0.141*
	(0.080)	(0.072)	(0.059)	(0.088)	(0.080)	(0.075)
LocalBroker	−0.011	−0.060	0.066**	0.001	−0.030	0.081**
	(0.040)	(0.038)	(0.031)	(0.044)	(0.043)	(0.039)
Rec/Firm	0.019***	0.023***	0.017***	0.015**	0.020***	0.008
	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)
MarketCap/GDP	−0.018	−0.025	0.021	0.034	0.025	0.081***
	(0.021)	(0.018)	(0.018)	(0.023)	(0.020)	(0.022)
dIndividualism		−0.111***			−0.124***	
		(0.022)			(0.025)	
dUncertaintyAvoidance		−0.180***			−0.141***	

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Table 12 – *Continued from previous page*

	Dependent variable:					
	FemAnalyst			FemRec		
	(1)	(2)	(3)	(4)	(5)	(6)
		(0.044)			(0.049)	
Individualism			−0.006***			−0.005***
			(0.001)			(0.001)
UncertaintyAvoidance			−0.0001			0.002
			(0.001)			(0.001)
Constant	0.247***	0.503***	0.507***	0.219***	0.427***	0.302**
	(0.041)	(0.069)	(0.106)	(0.045)	(0.077)	(0.135)
Observations	111	111	111	111	111	111
Adjusted R^2	0.613	0.701	0.799	0.588	0.673	0.719
Fixed effect	Region, Year	Region, Year	Region, Year	Region, Year	Region, Year	Region, Year