Gender Observations for European Financial Analysts

Where are Female Analysts and What do They do?

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Abstract

Financial analysts play an important role in the economy given their contribution to corporate information dissemination. However, gender observations among them are scare and limited within the United States. This study presents gender observations for financial analysts in European countries, which enjoy a wide cultural diversity. It shows that women represent 16.15% of all analysts in European countries from 2006 to 2013 with a remarkable country-level variation. The recommendations issued by female analysts represent 14.60% of all the recommendations. Moreover, female analysts intend to cover firms in specific industries. Finally, after grouping European countries into different cultural sub-regions according to national cultural patterns based on Hofstede (2001) and Schwartz (1999) classifications, we observe differences in women representation among the cultural sub-regions under consideration. The findings suggest that gender observations vary across countries with different national cultural pattern. This paper contributes to the extant literature by shedding light on the gender observations for female financial analysts in Europe.

1   Introduction

Diversity, including gender diversity, in workforce has been a heatedly discussed issue in both the academic and popular press. After decades of fights against gender discrimination and with women's increasing involvement in social activities, gender equality in the workplace tends to become the norm. Nonetheless, several job positions, notably the high-profiles jobs in the business world, including the job of financial analysts, continue to be dominated by males.

Financial analysts are assumed to be important intermediaries in the economy. By gathering relevant information, analyzing the collected information ,issuing recommendations and forecasts, and they provide market participants with crucial data for their investment decisions (Michaely et al., 1999). They interpret public information and collect useful private information by their own means so as to give an appropriate judgment about companies' future performance. Having long been seen as sophisticated processors of financial information, they are presumed to help investors to allocate their resource in a more efficient and rewarding way.

Given the importance and indispensability of financial analysts, an extensive body of research has been dedicated to this subject with different perspective and directions. Researchers have intended to define different roles of financial analysts, determine input that analysts work on, study different aspects of analyst's productions, analyze the potential bias, document market reactions to their different outputs and explore the impact of relevant regulations.

Company managers also realize financial analysts' importance in the financial market. According to the surveys and interviews conducted by Graham et al. (2005), financial executives rank financial analysts as one of the most important factors in terms of setting the stock price for their companies. Analyst consensus estimate is one important earnings benchmark that company executives do not want to miss. Managers are even willing to sacrifice some economic value so as to meet analyst's expectation because they are fully aware of analyst's influence on company stock price. In support of that, Sorescu and Subrahmanyam (2006) document significant greater price reactions to the recommendation with a dramatic nature issued by experienced analysts or analysts affiliated to a brokerage house with high reputation. Stock-level abnormal returns could be triggered by "influential" recommendations changes coming from leader, famous analysts or analysts who are previously influential (Loh and Stulz, 2011). According to prior literature, the market reactions to the outputs issued by financial analysts depends on 1) analyst's ability to process the information; 2) analyst's access to information; 3) analyst's credibility; 4) extent to which the outputs are anticipated, in terms of both timing and rating, as summarized by Bradley et al. (2008).

During the recent years, in response to the arising concerns about gender diversity in social activities, some research about financial analysts have studied the gender issues in this specific

workplace. Extant literature aims to depict a panorama for the situation of women financial analyst in the United States. Green et al. (2007) document a decrease in the proportion of women financial analysts from 16% in 1995 to 13% in 2005. More recently Kumar (2010), with a greater sample period (from 1983 to 2005) claims that 16.03% of financial analysts working in the United States are women. These studies provides interesting insights in the place of women in the financial analysts industry but, as far as our knowledge goes, no research has yet been conducted for gender observations of female financial analysts outside the U.S. How many female financial analysts are there outside the United States? Where do they work? In which industries are they specialized? In purpose to provide answers to all these questions and fulfill this vacuum of knowledge, our study aims to shed light on gender observation in the financial analysis industry for European countries. Unlike United States, European countries enjoy a wide cultural diversity, which is quite relevant for the gender issue. It is of interest to investigate whether gender observations among financial analysts vary across countries with different national cultural patterns.

Before any profound analytically-oriented research about the causes and consequences of female representation among financial analysts, studies of descriptive nature such as the census of women figures, their representation across years, their industrial preference, would be a priori an indispensable knowledge so as to depict a panorama of women representation in financial analysts. Therefore, our research aims to examine the temporal and spatial variation in gender composition of European financial analysts as well as female analysts' recommendation style.

The empirical evidence from our study indicates that women account for 16.15% of financial analysts in Europe during the sample period (from 2006 to 2013). The proportion of European female financial analysts increased from 14.99% in 2006 to 16.26% in 2012 with significant country-level variations. On average, male financial analysts issued more recommendations per capita than their female counterparts. Moreover, the latter followed less companies than the former.

Consistent with the common sense, female analysts are less extremist when issuing recommendations and seem to be more reluctant to issue extreme recommendations such as "Strong Buy" and "Sell" recommendations. As regards their industrial specialization, we find that female financial analysts are more inclined to work in specific industries such as "Apparel" and "Consumer goods", while keeping distance from "Automobile" and "Metal" market segments, though they are broadly distributed in all the recorded industries.

Following the trend of addressing the gender concerns in financial world by means of applying the fruit from psychology and sociology, we group all the Europeans countries under study into different cultural sub-regions according to each country's national cultural patterns, in light of the Hofstede (2001) and Schwartz (1999) classification. Results based on the Hofstede's cul-

tural model show that Latin countries record the highest proportion of women financial analysts, whereas Germanic countries exhibit the lowest. In light of the Schwartz cultural model, we observe the highest proportion of female financial analysts in Eastern Europe, so is the highest proportion of recommendations issued by female. Given the significant difference in gender observations among different cultural sub-regions, we examine whether the gender observations are also influenced by the cultural sub-regions to which a country belongs, after controlling for other relevant factors such as the importance of financial market and that of analysts. The results of time fixed-effect models suggest that: according to the Hofstede cultural model, Nordic countries tend to have the lowest female representation in financial analysts than other countries, while higher proportion of female analysts is associated with Latin countries. As regards the Schwartz cultural model, we find that in Eastern Europe, proportion of female analysts is more likely to be higher.

The remainder of the paper is organized as follows: Section 2 briefly reviews the methodology and data used in this research. The results are presented in the third section. Section 4 discusses the cultural sub-regions in Europe and the variation of gender composition across the sub-regions. The final section contains conclusions and discussions.

2   Methodology and Data

Our data are 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.

It should be noticed that the term of "European countries" does not necessarily refer to countries of the European Union. Countries outside the European Union, such as Norway and Russia, have also been included in our sample given that they belong to the same economic region. Their inclusion in the sample helps to increase 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

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

and 5) the broker for which the analyst works.

The data are designed to cover a eight-year period from January 2006 to December 2013. The beginning of the sample period is coincident with the date when European countries finished transposing the Market Abuse Directive (generally referred to as *MAD*) into their local legislation (Dubois and Dumontier, 2008). The Market Abuse Directive (Directive 2003/6/EC), hereafter MAD, was adopted in 2003 by the European Commission to curb the insider dealing and market manipulation. The Directive 2003/6/EC 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 names and informations about their previous research reports when publishing their outputs, which makes our study much more feasible.

Since the *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* 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 the 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, we determine the gender of associated analysts basing on 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.

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[2] www.thomsonone.com

[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

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. With a closer look at the statistics for each European country in the sample (see Table 1), we find that in terms of number of financial analysts as well as the number of recommendations, United Kingdom ranks the first during the sample period, followed by Germany and France. Moreover, for all firms covered by European analysts, we identified the country where the firm's headquarter is domiciled. On average, an European analyst covers three European firms during the sample period. Further, among all the European countries, firms covered by European analysts are most likely to be listed in the United Kingdom. European analysts also favor firms listed in Germany and France. In order to provide an overall view for each European country's economy scale, we collect the *GDP per capita* for each country. The data are available in the site of the World Bank and are in current U.S. dollars. 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 available in the *I/B/E/S* database. We 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. On average, companies listed in the Czech Republic and Spain have a much greater market capitalization than the others.

3   Breakdown of European Analysts by Gender

In this section, discussion about gender composition and recommendation style for European analysts is presented in detail. Based on the above-mentioned sample, 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 all the 10 676 firms, only 2 501 of them have been covered by both male

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[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.

and female European analysts, representing roughly 23% of all the firms.

Table 2 suggests that the 2 804 male analysts from the European countries made 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 firms. On average, female analysts produced each 31.98 recommendations only. With a closer look at the stocks for which analysts provide recommendations, at 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. Along with that, at individual level, female analysts followed less firms than male analysts: averagely, nine firms have been covered by each female analysts, which is lower than the number recorded for male: roughly ten stocks per male analyst.

In order to better depict the panorama, we reduce our sample by focusing only on firms that received at least 10 recommendations in a given year, and analysts who issued at least 10 recommendations in a given year. The restricted sample allows us to concentrate on active analysts and firms. Table 2 provides descriptive statistics for the *Restricted sample*. The data for the *Restricted sample* is presented on an annual basis rather than for the all sample period because the rotation of firms across year makes the pooling sample less appropriate. The average number of recommendations issued by each analyst for each firm included in the restricted sample is roughly the same as one observed in the full sample. In terms of full sample, we observed that male analysts followed significantly more firms than female did and they also issued significantly more recommendations per analyst. Such difference holds for the *Restricted sample* of 2007. However, in 2011, female analysts outperformed their male counterpart by issuing significantly more recommendations per analyst.

Apart from the above-mentioned summaries about European financial analysts, the following results conclude our gender observations in a more detailed way, which respectively concerns i) country-levels variations for gender observations in Europe, ii) distribution of female analysts across market segments, as well as iii) observed optimism in the distribution of recommendations.

3.1   Country-level Variations

In this part, we will discuss the country-level variations in the gender observations among financial analysts. 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 Euro-

pean 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 financial analysts that are female 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%). The countries of Scandinavia 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 an exception for 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 that a high volatility in gender observation across countries.

Further, we investigate the number of stocks followed per capita, the number of recommendation issued per capita, and the numbers of recommendations issued for each companies an analyst covered. Table 4 presents the gender comparison across different European countries. The difference between genders is largest in Belgium, where, on average, one male analyst followed 4.33 companies more than a female analyst does. 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. So is the difference observed in Netherlands. On the contrary, in France, we find that female analysts issued significantly more recommendations compared to their male counterpart, in consistent with the findings of Table 3 that in France, the proportion of recommendations issued by female analysts is higher that that of female 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 the results of t-test, the differences are all significant at 0.01 level. Nonetheless, in Germany, male analysts issued significantly less recommendations per stock than female. Also, female analysts in Italy have issued most recommendations for companies they followed, while it was in Finland where male analysts had the highest recommendations per stock ratio.

Table 5 describes the evolution of gender observations among European financial analysts across the sample period. First, from the full sample, we 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 worldwide 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.

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, we observe more analysts in 2013 than in 2006, however the test of proportion for the two years 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 has the most 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.

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, we find that there is a significant increase in the proportion of recommendation issued by female financial analysts at 0.01 level.

3.2   Industrial Preference for Each Gender

Extant research about market segments concludes that female analysts in the U.S. are concentrated in certain industries belonging to retail, and clothing industry categories Kumar (2010). To examine whether European analysts also have a preference for certain market segments, we analyze the gender composition of financial analysts working for each industry categorized in 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", "Consumer Goods", "Alcoholic Beverages", "Restaurants, Hotel and Motel", "Food Product"s, "Tobacco Products" and "Shipping Containers", 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 constructions, metals, trading as well as transportation, women figures are relatively underrepresented: less than 14% of analysts working in these market segments were female. The lowest proportion of female analysts was recorded in the industry of "Automobiles and Trucks", where only 3.33% of all the analysts were female. The scenario for the recommendations issued by female analysts were basically the same as the one for female analysts. In the industries such as "Apparel", "Printing and Publishing", "Food Products", "Shipping Containers", "Consumer Goods", "Alcoholic Beverages" as well as "Utilities", the proportion of recommendations issued by female analysts were the highest. Consistent with the lowest proportion of female analysts recorded in the "Automobiles and Trucks" industry, female analysts working in this market segment also issued the lowest proportion of recommendations. Women working in the "Agriculture", "Banking", "Construction", "Entertainment", "Food Products", "Personal Services", "Printing and Publishing", "Retail", "Shipping Containers", and "Utilities", they tended to issue more recommendations relative to male analysts.

3.3   *Recommendation Distribution and Potential Optimism*

Apart from recommendation ratings, researchers are also intrigued by the distribution of recommendations. The interest to study the distribution of stock ratings is mainly due to its link with the potential future return of brokerage firm's recommendations. Theoretically, this relationship will exist as long as: 1) stock ratings have investment value; 2) market cannot fully and immediately react to the information contained in the recommendations and rating distributions; 3) different ratings criteria are used by different analysts, due to either the implicit differences (deliberate mis-ranking of covered stocks) or the explicit differences (different definition of recommendation ratings), as summarized by Barber et al. (2006). Using the data collected from Thomson Financial's First Call database, they confirm the presence of persistence for the different proclivity to issue favorable recommendations among different brokers, despite a limited reversion to the mean value. Even if the investors could not immediately recognize the information contained in the nature of ratings distribution at the date of recommendation announcement, the buy recommendations issued by those brokers who are less likely to issue buys are still proved to outperform those who are more intended to do so, and the contrary situation is documented regarding the sell recommendations.

Existing literature asserts that financial analysts tend to cover firms for which they have optimistic views and deliberately drop the firms by stopping updating the predictions once they receive unfavorable news about the firm's future performance (McNichols and O'Brien, 1997). Such behavioral pattern of analysts results in over-optimism in analyst's overall outputs subsequent to censoring pessimist errors. The distribution of recommendations suggest that after controlling for sudden change in focus, analysts assign a higher rating for newly-added stocks than for stocks that analysts have already covered. Conversely, the distribution of recommendations for stocks dropped by analysts is skewed to "Strong Sell" compared to those whose coverage continues. Further, the McNichols and O'Brien (1997) find evidence that stocks for which analysts discontinue to rate underperform those that remain in the list of analyst's coverage, while newly-added stocks enjoy a better performance than those with previous coverage. All these findings indicate that the ubiquitous and persistent over-optimism in analysts' recommendation and forecast is at least partially due to the unintentional cognitive bias stemming from analyst's self-selection.

Extant studies for the U.S. indicate that buy recommendation enjoyed an overwhelming preponderance over the other ratings, peaking at 74% of the total in the second quarter of 2000 (Barber et al., 2006). However, the economic recession and new regulations in the following years brought about a significant change to the distribution of recommendations issued by financial analysts in the brokerage firms. Barber et al. (2006) consent that a pronounced reduction

of buy recommendations was observed in the last six months of 2002, during which the buy recommendations decreased from 60% to 45%. Similarly, in Europe, following the adoption of MAD, the proportion of favorable recommendations i.e. "Strong Buy" and "Strong Buy" recommendations, significantly decreased, while the proportion of unfavorable recommendations increased (Dubois and Dumontier, 2008).

Regarding the distribution of recommendation levels for European analysts in our sample, Table 8 indicates that female analysts are less extremist than male analysts. They issued less recommendations labeled as "Sell" and "Strong Buy" than males: 4.95% (20.18%) of all the recommendations issued by female were "Sell" ("Strong Buy"), while 5.89% (21.99%) of those issued by male analysts were "Sell" ("Strong Buy"). On the other hand, the percentages of recommendations labeled as "Buy" and "Underperform" issued by females were both higher than those for male analysts. Further, consistent with the previous studies, e.g. Dubois and Dumontier (2008), Loh and Stulz (2011), we attribute values to each of the recommendation levels:

$$StrongBuy = 5$$
$$Buy = 4$$
$$Hold = 3$$
$$Underperform = 2$$
$$Sell = 1$$

Based on the five-point scale, our results show that female analysts have a standard deviation slightly higher than male analysts (0.56 v.s 0.51), suggesting more dispersion in the recommendation levels for female. Meanwhile, difference for the mean value between the two genders is not quite large. Female analysts slightly more intend to issued optimized recommendations such as "Strong Buy" and "Buy".

4   Variations across Different Cultural Sub-Regions

Finally, this study for female financial analysts also adds a cultural dimension to the gender issues in this specific field by focusing on European countries that share similarity in the social structure yet maintain remarkably different in their national culture.

In the field of sociology, the word "Culture" is defined as "collective programming of the mind" by Hofstede (2001). It refers to "the complex of meanings, symbols, and assumptions about what is good or bad, legitimate or illegitimate that underlie the prevailing practices and

norms in a society" (Licht et al., 2005). Each country has its unique national culture which is "extremely stable over time" (Hofstede, 2001). Under the common postulate that the regulation of human activity afflicts all the societies with similar basic problems, cross-cultural psychologists, who are specialized in cross-national comparisons of culture, have always intended to find out the similarity and differences in national cultural patterns by means of different cultural dimensions. Thus by measuring the values of cultural dimensions for each country, researchers could define the cultural characteristics for all the societies, which helps to group countries into different cultural categories according to country's cultural similarity.

4.1 *Theoretical Background*

Famously, both Hofstede (2001) and Schwartz (1999) have conducted research with multinational and large-scale samples so as to conduct the cultural comparison at country level (Desender et al., 2001). Firstly, based on two surveys conducted on the IBM employees across 53 countries and three regions in 1968 and 1972 respectively, Hofstede (2001) formulated five key cultural dimensions to measure national culture, labeled as power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, and long-term/short-term orientation (see Table 9 on page 32 for the definition). Later, from his original research on teachers and students coming from 49 countries all over the world during the sample period between 1988 and 1993, Schwartz (1999) also derived his framework of seven types of values, which deal with three major issues commonly confronted by all the societies: 1) the desirable relationship between the individual and the group; 2) guarantee of responsible behavior that will preserve the social fabric; 3) the relation of humankind to the nature and social world (see Table 9 on page 32 for detailed explanation).

Some relevant connotations related to each cultural dimension could also be derived from these two cultural models: for example, according to Hofstede's culture dimension theory, In the low PDI (power distance index) countries, people believe that "inequality in society should be minimized". In contrast, in countries with high PDI, people are comfortable with the fact that there are disparity and every one has his/her "rightful place". Moreover, a high uncertainty avoidance would suggest a "lower tolerance of diversity" and less acceptance to the foreign things (Hofstede, 2001). In terms of individualism/collectivism, in countries commonly regarded as individualistic, gender accounts less for people's identity. Also, feminine cultures strength less on the gender difference on individual values, contrary to masculine cultures. Similarly, in Schwartz's dimensions, nations labeled by Intellectual/Affective Autonomy, Egalitarianism, and Mastery could be more likely to achieve gender parity in the social activities than those labeled by Conservatism, Hierarchy, and Harmony.

Consequently, both researchers managed to group countries into distinctive cultural groups after calculating values of cultural dimensions for each country in their samples. Six cultural sub-regions have been identified in the Hofstede cultural model: Anglo, Asian, Germanic, Less-developed Latin, More-developed Latin, Near Eastern and Nordic countries. As regards the Schwartz cultural sub-regions, there are also six different ones: African, Eastern Europe, English Speaking, Far East, Latin America, as well as Western Europe. In the light of these two cultural models, European countries concerned in this research are also categorized into different cultural sub-groups (see Table 10). For instance, Austria is labeled as "Western Europe" country according the Schwartz's cultural model, while in the Hofstede's model, it belongs to the category of "Germanic" countries. Countries that have not been grouped into a specific cultural sub-regions are labeled as "Unclassified".

In light of Hofstede (2001), Nordic countries tend to have a lower power distance than other countries; Anglo and Nordic nations have a stronger attachment to individualism while Latin countries express a greater intolerance towards the changes and uncertainty. Also, Nordic countries have the most feminist cultures opposed to Germanic countries. On the other hand, according to the conclusions drawn by Schwartz (1999), "Mastery" and "Affective Autonomy" values are more cherished by English-speaking countries, in contrast with the East European nations emphasize "Conservatism" and "Harmony" values. As for the Western Europe, they attach more importance to Intellectual autonomy and Egalitarianism values (Licht et al., 2005).

4.2   Descriptive Statistics

After grouping European countries into different cultural sub-regions (see Table 11), we find that based on the Hofstede cultural model, 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, for which their masculine cultures should be able to account. Contrary to the common senses of highly achieved gender equality in Nordic countries, these nations have the second lowest percentage of analysts that are women, which is also contradicted to the Hofstede's connotation that gender diversity is more encouraged within feminine cultures. With respect to the standards established by Schwartz, English-speaking countries are found to have less female analysts than others among which Eastern European countries enjoys the highest women involvement in this workplace of financial analysts.

With regard to the proportion of female financial analysts, the results of Pearson's chi-squared test for Hofstede's cultural sub-regions (See Panel A of Table 11) reveals that despite that Latin countries have significantly more female financial analysts than Anglo, Germanic and

Nordic countries as well. In light of the Schwartz model, the proportion of female financial analysts in Eastern Europe is significantly higher than that in English speaking countries and Western Europe.

Further, as presented in Panel B of Table 11, 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 proportion of female analysts. With regard to Schwartz cultural sub-regions, this proportion is highest in the Eastern Europe. As regards the recommendations issued by female financial analysts, the results of Hofstede model (See Panel B in Table 11) confirm that proportion of recommendations issued by female financial analysts in Latin countries is significantly higher than that 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. Regarding the Schwartz model, the Peason's chi-squared test suggests that the difference among the three cultural sub-regions are highly significant.

Finally, we compare the scenario 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 12 on page 38. Only in Anglo and Nordic countries could we observe an increase in the number of financial analysts from 2006 to 2013. In terms of proportion of female financial analysts, Anglo and Germanic countries enjoy an increase while in Near Eastern countries and Nordic countries the proportion has dramatically declined, from 26.92% to 4.76% and from 13.36% to 7.92%, respectively. The results for analysts in Schwartz's cultural sub-regions between 2006 and 2013 suggest that more analysts could be observed in both Eastern Europe and English speaking countries, although number of analysts in Western Europe has declined. An increase in the proportion of female financial analysts is recorded for Eastern Europe and English speaking countries as well. However, Western Europe have suffered from a decline in the proportion.

In addition, by comparing the recommendations issued financial analysts between 2006 and 2013 (See Panel B in Table 12), we find that in Hofstede's cultural sub-regions, all the sub-regions, especially Germanic countries, have suffered from a decline in the numbers of recommendation 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. With regard to the Schwartz model, the number of recommendations issued by analysts in Eastern Europe have tripled from 2006 to 2013 while the number declined in the rest two cultural sub-regions. As regards the proportion of recommendations issued by female, in Eastern Europe, the proportion almost doubled across the sample years. Nonetheless, in English speaking countries, significant lower proportion of recommendations issued by female was observed for 2013 relative to 2006.

4.3   Research Design and Results

Given the significant difference in gender observations across different cultural sub-regions, I examine the relation between gender observations of financial analysts and the cultural sub-regions to which a country belongs using time-fixed regressions. European countries where analysts represent less than 1% of all the analysts in the sample are exclude from the regression. In these regression, the dependent variable is either the percentage of female analysts or the percentage of recommendations issued by female analysts. The *FemAnalyst%* refers to the proportion of female analysts in a European country during a given year, while the *FemRec%* stands for the proportion of recommendations issued by female analysts in a European country during a given year.

Model 1

$$
\begin{aligned}
FemAnalyst\%_{i,t} = \alpha_0 &+ \alpha_1 \left(\frac{MarketCap}{GDP}\right)_{i,t} + \alpha_2 \ln(Nb.listed.firm)_{i,t} \\
&+ \alpha_3 UndAnalyst\%_{i,t} + \alpha_4 \left(\frac{NbRec}{Nb.listed.firm}\right)_{i,t} \\
&+ \beta_1 Hofstede.Anlgo_{i,t} + \beta_2 Hofstede.Germanic_{i,t} \\
&+ \beta_3 Hofstede.Latin_{i,t} + \beta_4 Hofstede.Near.Eastern_{i,t} \\
&+ \beta_5 Hofstede.Nordic_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{1}
$$

Model 2

$$
\begin{aligned}
FemRec\%_{i,t} = {} & \alpha_0 + \alpha_1 \left(\frac{MarketCap}{GDP}\right)_{i,t} + \alpha_2 \ln(Nb.listed.firm)_{i,t} \\
& + \alpha_3 UndAnalyst\%_{i,t} + \alpha_4 \left(\frac{NbRec}{Nb.listed.firm}\right)_{i,t} \\
& + \beta_1 Hofstede.Anlgo_{i,t} + \beta_2 Hofstede.Germanic_{i,t} \\
& + \beta_3 Hofstede.Latin_{i,t} + \beta_4 Hofstede.Near.Eastern_{i,t} \\
& + \beta_5 Hofstede.Nordic_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{2}
$$

Model 3

$$
\begin{aligned}
FemAnalyst\%_{i,t} = {} & \alpha_0 + \alpha_1 \left(\frac{MarketCap}{GDP}\right)_{i,t} + \alpha_2 \ln(Nb.listed.firm)_{i,t} \\
& + \alpha_3 UndAnalyst\%_{i,t} + \alpha_4 \left(\frac{NbRec}{Nb.listed.firm}\right)_{i,t} \\
& + \gamma_1 Schwartz.Eastern.Europe_{i,t} + \gamma_2 Schwartz.English.speaking_{i,t} \\
& + \gamma_3 Schwartz.Western.Europe_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{3}
$$

Model 4

$$
\begin{aligned}
FemRec\%_{i,t} = {} & \alpha_0 + \alpha_1 \left(\frac{MarketCap}{GDP}\right)_{i,t} + \alpha_2 \ln(Nb.listed.firm)_{i,t} \\
& + \alpha_3 UndAnalyst\%_{i,t} + \alpha_4 \left(\frac{NbRec}{Nb.listed.firm}\right)_{i,t} \\
& + \gamma_1 Schwartz.Eastern.Europe_{i,t} + \gamma_2 Schwartz.English.speaking_{i,t} \\
& + \gamma_3 Schwartz.Western.Europe_{i,t} + \varepsilon_{i,t}
\end{aligned}
\tag{4}
$$

The set of independent variables includes: variables which measure the importance of financial market in the economy (*MarketCap/GDP* and *ln(Nb.listed.firm)*), variables that represent the importance of financial analysts (*NbRec/Nb.listed.firm*), and also, socio-cultural variables based on the cultural models created by Hofstede (2001) and (Schwartz, 1999), respectively. For country *i*, and year *t*, *MarketCap/GDP* is the ratio of total market capitalization of all the listed firms in a country over the country's GDP. *ln(Nb.listed.firm)* is the number of the firms listed in a country for a given year. *UndAnalyst%* refers to the percentage of analysts whose gender cannot be determined. *NbRec/Nb.listed.firm* is the number of all the recommendations issued by analysts in a given country divided by the number of firms listed in that country during a given year. *Hofstede.Anglo*, *Hofstede.Germanic*, *Hofstede.Latin*, *Hofstede.Near Eastern*,

Nordic are dummy variables which are set to one for countries that belong to the given Hofstede cultural sub-regions. Similarly, *Schwartz.Eastern.Europe*, *Schwartz.English.speaking*, and *Schwartz.Western.Europe* are dummy variables which are set to one for countries that belong to the given cultural sub-regions according to Schwartz (1999).

The regression estimates are presented in Panel A of Table 13. In order to test the coefficient equality for cultural dummy variables, I conduct the Wald test. The comparison results of Wald test are presented in Table 13, Panel B. The results indicate that according to the Hofstede cultural model, Nordic countries tend to have the lowest female representation in financial analysts than other countries, while higher proportion of female analysts is associated with Latin countries. As regards the Schwartz cultural model, we find that in Eastern Europe, proportion of female analysts is more likely to be higher.

5 Conclusion and Discussion

Over the last two decades, gender issues have attracted increasing attention among financial researchers. A considerable amount of research has been documented shedding light on the notable women figures in the corporate arena and their influence. However, few studies have yet been conducted in the field of financial analysts, especially for countries outside of the United States. Hence, this research aims to fulfill this gap by studying the female financial analysts in the context of European countries. Statistical information obtained from the sample confirms 16.15% of all the European analysts that are female from 2006 to 2013, an average value which varies across time and across countries as well. Strikingly contrary to the common senses, the countries of Scandinavia do not report a higher proportion of women analysts: Denmark, Norway and Switzerland all have a proportion lower than the average one, with an exception for Finland, where women financial analysts occupy more than one-fifth of the positions. As for the related recommendations issued by European analysts during the seven year sample period, women analysts issued only 14.6% of total recommendations, still relatively less compared to their proportion in the number of analysts, which suggests that at the individual level, female analysts issued fewer recommendations relative to their male counterparts. However, France is an interesting exception, where female analysts were able to issue more recommendations than male analysts.

Furthermore, our results suggest an industrial preference for female financial analysts: they intend to cluster in the industries of apparel, consumer goods, while keeping distance from others such as chemistry and automobile. With regard to distribution of recommendations, we find that female analysts are less likely to issue extreme recommendations such as "Strong Buy" and "Sell", and generally speaking. They are also slightly more optimist than male analysts.

Differences in female representation are remarkable among different cultural sub-regions. According to the Hofstede cultural model, we document that Latin countries (Belgium, France, Italy, Portugal and Spain), enjoy the highest proportion of female financial analysts and the highest proportion of recommendations issued by females. The proportion of female analysts (proportion of recommendations issued by female analysts) in Nordic countries is significantly lower than in Anglo and Latin countries. The results appear to be quite striking in that gender equality is often shown to be better achieved in Northern Europe. In light of Schwartz cultural model, we observe that the highest proportion of female financial analysts and the highest proportion of recommendations issued by females is recorded in Eastern Europe. These conclusions are also confirmed by the fixed-effect cultural regressions.

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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	41437
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
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

Continued on next page

Table 1 – *Continued from previous page*

Country	Analysts	Rec	Firm1	Firm2	MarketCap (Million US$)	GDP per capita (US$)
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.We 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
Restricted Sample						
2006						
Male	272	265	2192	3.22	8.06	2.55
Female	35	85	256	2.89	7.31	2.75
Diff	237	180	1936	0.33	0.74	-0.02
2007						
Male	394	405	3463	3.48	8.79	2.58
Female	78	198	700	3.56	8.97	2.46
Diff	316	207	2763	−0.08	−0.19	0.03
2008						
Male	492	541	5493	4.02	11.16	2.91
Female	91	264	1053	4.10	11.57	2.81
Diff	401	277	4440	−0.08	−0.41	-0.08
2009						
Male	401	444	3938	3.97	9.82	2.55

Continued on next page

Table 2 – *Continued from previous page*

	Analysts	Stocks	Recommendations	Stocks /Analyst	Rec /Analyst	Rec/Stock /Analyst
Female	69	191	572	3.74	8.29	2.30
Diff	332	253	3366	0.23	1.53**	0.53
2010						
Male	269	269	1815	3.14	6.75	2.24
Female	42	90	293	2.60	6.98	2.82
Diff	227	179	1522	0.55**	-0.23	-1.04
2011						
Male	316	338	2599	3.87	8.22	2.18
Female	56	185	603	4.55	10.77	2.51
Diff	260	153	1996	-0.68	-2.54**	-0.47
2012						
Male	302	284	2356	3.27	7.80	2.41
Female	57	138	525	3.53	9.21	2.57
Diff	245	146	1831	-0.26	-1.41	-0.43
2013						
Male	255	237	1727	3.16	6.77	2.18
Female	39	119	293	4.23	7.51	2.27
Diff	216	118	1434	-1.07	-0.74	0.75

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. We 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. We 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	125	16.80%	0.51%	19.47%
Alcoholic Beverages	131	22.90%	0.92%	21.16%
Apparel	177	30.51%	0.83%	29.71%
Automobiles and Trucks	30	3.33%	0.07%	1.11%
Banking	407	16.95%	5.24%	17.66%
Business Services	1106	14.47%	9.38%	12.36%
Business Supplies	1734	15.05%	23.87%	12.93%
Candy and Soda	136	16.18%	0.49%	16.01%
Chemicals	441	14.51%	2.73%	14.06%
Coal	96	14.58%	0.42%	13.19%
Computers	214	14.95%	1.23%	10.65%
Construction	517	14.12%	3.33%	15.31%
Construction Materials	219	13.70%	1.00%	8.76%
Consumer Goods	160	23.12%	0.69%	21.72%
Entertainment	236	16.95%	0.98%	18.47%
Food Products	306	21.90%	1.85%	22.48%
Insurance	222	18.02%	2.43%	11.02%
Miscellaneous	11	18.18%	0.02%	15.00%
Non-Metallic Mining	291	13.75%	1.94%	10.44%
Personal Services	107	14.02%	0.40%	14.03%
Petroleum and Natrual Gas	455	16.70%	5.72%	13.83%
Pharmacetical Products	314	19.75%	2.32%	17.29%
Precious Metals	115	12.17%	1.28%	8.90%
Printing and Publishing	249	16.87%	1.70%	25.81%
Real Estate	368	16.30%	4.07%	13.13%
Recreational Products	16	18.75%	0.03%	17.65%
Restaurants, Hotel and Motel	188	22.87%	1.40%	19.48%

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Table 7 – *Continued from previous page*

Industry	NbAnalysts	FemAnalysts	PerTotRec	FemRec
Retail	584	19.18%	5.23%	19.45%
Shipping Containers	70	20.00%	0.22%	22.46%
Telecommunications	481	14.97%	4.46%	14.96%
Textiles	57	14.04%	0.18%	14.04%
Tobacco Products	56	21.43%	0.20%	17.79%
Trading	533	13.70%	3.47%	10.63%
Transportation	515	14.95%	4.66%	9.57%
Utilities	420	17.62%	3.93%	20.56%
Wholesale	618	15.86%	2.81%	14.35%

Table 8: Distribution of Recommendations Levels by Gender

The table reports the percentage of recommendations belonging to each recommendation level (namely, Strong Buy, Buy, Hold, Underperform, and Sell) issued by both genders, respectively. We attribute values to each of the recommendation levels: $StrongBuy = 5, Buy = 4, Hold = 3, Underperform = 2, Sell = 1$. The mean value, along with the standard deviation for recommendations issued by each gender are presented in this table. We use the test of proportion to test for the significance of difference for each level of recommendations. The t-test is used to test the significance of difference in mean value. *** difference significant at 0.01 level. ** difference significant at 0.05 level. * difference significant at 0.10 level.

	Female	Male	Difference
Recommendation Levels			
Strong Buy	20.18%	21.99%	$-1.82\%***$
Buy	30.52%	26.67%	$3.85\%***$
Hold	32.32%	34.73%	$-2.40\%***$
Underperform	12.02%	10.72%	$1.30\%***$
Sell	4.95%	5.89%	$-0.93\%***$
Statistics			
Mean	3.56	3.52	$-0.04*$
SD	0.56	0.51	$-$

Table 9: Definitions for Cultural Dimension Models

The table reports all the cultural dimensions and their definitions derived from Hofstede (2001) in Panel A. Definitions for the cultural dimensions derived from Schwartz (1999) are presented in Panel B.

Panel A: Hofstede Cultural Dimension Model

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 from birth onwards 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, in particular perseverance, thrift, 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.

Panel B: Schwartz Cultural Dimension Model

Type of Issues	Values	Description
Issue 1: How to define the nature of the relation between the individual and the group?	Conservatism	A cultural emphasis on maintenance of the status quo, propriety, and restraint of actions or inclinations that might disrupt the group or the traditional order.
	Autonomy	A culture in which the person is viewed as an autonomous, seeking to express his or her own internal attributes of ideas and thoughts (Intellectual autonomy) as well as emotions and feelings (Affective autonomy).
Issue 2: How to guarantee responsible behavior that will preserve the social fabric?	Hierarchy	A cultural emphasis on the legitimacy of an unequal distribution of power, roles and resources.
	Egalitarianism	A cultural emphasis on transcendence of selfish interests in favor of voluntary commitment to promoting the welfare of others.
Issue 3: How to deal with the relation of humankind to the natural and social world?	Mastery	A cultural emphasis on getting ahead through active self-assertion.
	Harmony	A cultural emphasis on fitting harmoniously into the environment.

Table 10: European Countries' Cultural Sub-Regions

 The table reports nation groups for 28 European countries based on Hofstede (2001) and Schwartz (1999), respectively.

Country	Schwartz's regions	Hofstede's regions
Austria	Western Europe	Germanic
Belgium	Unclassified	Latin
Bulgaria	Unclassified	Unclassified
Croatia	Unclassified	Unclassified
Cyprus	Eastern Europe	Unclassified
Czech Republic	Eastern Europe	Unclassified
Denmark	Western Europe	Nordic
Estonia	Eastern Europe	Unclassified
Finland	Western Europe	Nordic
France	Western Europe	Latin
Germany	Western Europe	Germanic
Greece	Western Europe	Near Eastern
Hungary	Eastern Europe	Unclassified
Ireland	English speaking	Anglo
Italy	Western Europe	Latin
Lithuania	Unclassified	Unclassified
Luxembourg	Unclassified	Unclassified
Netherlands	Western Europe	Nordic
Norway	Western Europe	Nordic
Poland	Eastern Europe	Unclassified
Portugal	Western Europe	Latin
Romania	Eastern Europe	Unclassified
Russia	Eastern Europe	Unclassified
Slovenia	Eastern Europe	Unclassified
Spain	Western Europe	Latin
Sweden	Western Europe	Nordic
Switzerland	Western Europe	Germanic
United Kingdom	English speaking	Anglo

Table 11: 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*. For the Schwartz's culture model, *Eastern Europe* refers to Cyprus, Czech Republic, Estonia, Hungary, Poland, Romania, Russia, and Slovenia, whereas Ireland and United Kingdom are labeled as *English speaking*. *Western Europe* includes Austria, Denmark, Finland, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. The remaining ones (Belgium, Bulgaria, Croatia, Lithuania, and Luxembourg) are categorized in *Unclassified*. We 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%
Schwartz	Eastern Europe	312	23.72%
	English speaking	1577	14.77%
	Western Europe	1631	16.19%
	Unclassified	59	11.86%

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 A: Comparison among cultural sub-regions of the Schwartz cultural model

	English speaking	Western Europe
Eastern Europe	8.94%***	7.53%***
	(14.66)	(9.82)
English speaking		−1.41%
		(1.11)

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%
Schwartz	Eastern Europe	7121	20.4%
	English speaking	52538	12.29%
	Western Europe	64012	16.18%
	Unclassified	2237	5.23%

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)

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

	English speaking	Western Europe
Eastern Europe	8.12%∗∗∗	4.22%∗∗∗
	(0.00)	(0.00)
English speaking		−3.90%∗∗∗
		(0.00)

Table 12: 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

Panel A.1: Hofstede Cultural Model

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 A.2: Schwartz Cultural Model

Sub-Regions	2006		2013		Δ Fem
	NbAnalysts	FemAnalysts	NbAnalysts	FemAnalysts	
Eastern Europe	45	24.44%	166	26.51%	2.06%
English speaking	663	12.52%	723	14.11%	1.59%
Western Europe	894	16.44%	783	14.94%	−1.50%

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

Panel B.1: Hofstede Cultural Model

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%∗∗∗

Panel B.2: Schwartz Cultural Model

Sub-Regions	2006		2013		Δ Fem
	NbRec	FemRec	NbRec	FemRec	
Eastern Europe	342	12.87%	1284	22.59%	9.72%∗∗∗
English speaking	5430	12.87%	5229	10.84%	−2.03%∗∗∗
Western Europe	7159	14.43%	6546	17.98%	3.55%∗∗∗

Table 13: Fixed Effect Cultural Model

The table reports the time fixed effect model based on cultural models proposed by Hofstede (2001) and Schwartz (1999), respectively. Panel A report the estimates for the model with data from all the countries with more than 1% of all financial analysts recorded in our sample. The dependent variable is either the proportion of female analysts (*FemAnalyst%*) that is the yearly percentage of female analysts for each country within the same cultural sub-region or the proportion of recommendations issued by female analysts (*FemRec%*) that is the yearly percentage of recommendations issued by female for each country within the same cultural sub-region. The set of independent variables includes: *MarketCap/GDP*, which is the ratio of total market capitalization of all the listed firms in a country over the country's GDP; *ln(Nb.listed.firm)* is the number of the firms listed in a country for a given year; *UndAnalyst%* refers to the percentage of analysts whose gender cannot be determined; *NbRec/Nb.listed.firm* is the number of all the recommendations issued by analysts in a given country divided by the number of firms listed in that country during a given year; *Hofstede.Anglo*, *Hofstede.Germanic*, *Hofstede.Latin*, *Hofstede.Near Eastern*, *Nordic* are dummy variables which are set to one for countries that belong to the given Hofstede cultural sub-regions; similarly, *Schwartz.Eastern.Europe*, *Schwartz.English.speaking*, and *Schwartz.Western.Europe* are dummy variables which are set to one for countries that belong to the given cultural sub-regions according to Schwartz (1999). The *t*-statistics for the coefficient estimates are shown in the parentheses below the estimates. The sample period spans from 2006 to 2013. Panel B reports the results of Wald test to compare the coefficient equality. The difference equals to the coefficients of variables in the first column minus the coefficients of variables in the first line.

Panel A: Coefficient Estimates

Independent variables	**Model 1** FemAnalyst%	**Model 2** FemRec%	**Model 3** FemAnalyst%	**Model 4** FemRec%
(Intercept)	0.31***	0.16**	0.11	−0.00
	(4.86)	(2.27)	(1.39)	(−0.04)
MarketCap/GDP	0.01	0.01	−0.01	−0.00
	(0.45)	(1.15)	(−0.48)	(−0.20)
ln(Nb.listed.firm)	−0.02*	0.00	−0.00	0.02
	(−1.81)	(0.10)	(−0.12)	(1.08)
UndAnalyst%	−1.54***	−1.35***	−0.58	−0.54
	(−5.24)	(−4.30)	(−1.48)	(−1.25)
NbRec/Nb.listed.firm	0.03***	0.02***	0.01	0.00
	(3.84)	(2.91)	(1.00)	(0.49)
Hofstede.Anglo	0.05	−0.12		
	(0.43)	(−0.91)		
Hofstede.Germanic	−0.04	−0.07**		

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Table 13 – *Continued from previous page*

Independent variables	Model 1 FemAnalyst%	Model 2 FemRec%	Model 3 FemAnalyst%	Model 4 FemRec%
	(-1.32)	(-2.06)		
Hofstede.Latin	0.07^{***}	0.07^{**}		
	(2.64)	(2.58)		
Hofstede.Near.Eastern	-0.09^{**}	-0.06		
	(-2.62)	(-1.60)		
Hofstede.Nordic	-0.12^{***}	-0.12^{***}		
	(-5.01)	(-4.88)		
Schwartz.Eastern.Europe			0.15^{***}	0.14^{**}
			(3.03)	(2.52)
Schwartz.English.speaking			0.17	0.06
			(1.13)	(0.38)
Schwartz.Western.Europe			0.10^{**}	0.09^{*}
			(2.31)	(1.85)
R^2	0.56	0.54	0.22	0.15
Adj. R^2	0.49	0.47	0.11	0.04
Num. obs.	120	120	120	120

$^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.1$

Panel B: Test of Coefficient Equality

(a) Model 1

	Germanic	Latin	NearEastern	Nordic
Anglo	0.09	−0.02	0.14	0.17
Germanic		−0.11∗∗∗	0.05	0.08∗∗∗
Latin			0.16∗∗∗	0.19∗∗∗
Near Eastern				0.03

(b) Model 2

	Germanic	Latin	NearEastern	Nordic
Anglo	−0.06	−0.19	−0.06	0
Germanic		−0.14∗∗∗	−0.01	0.06∗∗
Latin			0.13∗∗∗	0.2∗∗∗
Near Eastern				0.07∗

(c) Model 3

	EnglishSpeaking	WesternEurope
Eastern Europe	−0.01	0.05∗
English Speaking		0.07

(d) Model 4

	EnglishSpeaking	WesternEurope
Eastern Europe	0.08	0.05
English Speaking		−0.03

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$