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HISTORY VERSUS GEOGRAPHY: THE ROLE OF COLLEGE INTERACTION IN PORTFOLIO CHOICE AND STOCK MARKET PRICES

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ABSTRACT

History versus Geography: The Role of College Interaction in Portfolio Choice and Stock Market Prices*

We study the link between portfolio choice and different college-based interaction – defined as the one that relates the portfolio choice of an investor to that of the other investors who went to the same college. We explain it in terms of a common cultural imprinting and the development of long-term friendship and alumni network and we directly quantify this bonding effect. We use a new dataset with information on portfolio choice – broken down at the stock level – wealth, income and demographic characteristics of a big panel of investors as well as information on the college they attended and their family situation at the time.

We compare college-based interaction to other forms of social interaction, such as educational, professional and geographical interaction, properly controlling for all the standard motivations of portfolio theory, such as hedging of non-financial income risk, familiarity and information effects, wealth and income effect, a host of demographic, geographic and professional dummies, trend-chasing and momentum behaviour. All the different sources of social interaction significantly affect stock-picking as well as the choice between direct and delegated investment, both statistically and economically. College-based interaction is, however, the most important of them and the third single most important factor affecting stock picking.

The impact of college-based interaction aggregates at the market level and affects stock prices. For each company, we construct measures of the degree of strength of college-based interaction among shareholders. We show that an increase in the strength of interaction reduces stock return and volatility. This can be rationalized in terms of recent theories on the impact of dispersion of beliefs in the presence of short-sale constraints.

JEL Classification: G11 and G14
Keywords: asset pricing, education, portfolio choice and social interaction

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Introduction

One of the main tenets in finance is that portfolio choice is a function of the information of the investors. However, we know little about the process through which information is transmitted, elaborated and aggregated. Investors have access to different pieces of information and, even if they share the same information, may reach different conclusions, depending on either their prior beliefs (e.g., Kraus and Smith, 1989, DeTemple, 1994) or the way they elaborate information (e.g., Harris and Raviv, 1993). What can we say about the channel through which information is transmitted among investors and processed?

In general, the financial literature has been silent about this, even if the answer to this question is very important to understand why seemingly identical changes in information generate very different investor reactions. We argue that one of the main channels of information transmission is social interaction. Human beings, by interacting with one another, transmit information and influence the way this information is elaborated. This phenomenon has been extensively studied in social sciences and in economics (e.g., Ellison and Fudenberg, 1995, McFadden and Train, 1996, Akerlof, 1997, Bikchandani and Welch, 1998, Bala and Goyal, 1998, Betrand, Luttmer and Mullainathan, 1999). More recently, Hong, Kubik and Stein (2002) show how social interaction – defined as interaction between people belonging to the same geographical community – affects the decision of the investors to enter the stock market. However, no paper has hitherto empirically examined the process of social interaction in financial markets, identifying its many facets and linking it to portfolio choice. Nor has there been any attempt to study its effects on the stock market. We bridge this gap by identifying and studying the different sources of social interaction and showing their impact on investor portfolio choice and on stock market prices and volatility.

There are many ways through which individuals interact with one another. A source of (compelled) social interaction takes place at school. Then, people interact in the professional as well as extra-professional life. Interaction may be defined in terms of the group of people to which a person belongs and that affects his behavior. There are at least four main sources of interaction: college-based, educational, professional and geographical interaction. In the case of college-based interaction, the group is defined as the other investors who attended the same college. In the case of educational interaction, the group is made of the other investors who earned the same type of university degree. In the case of professional interaction, the group comprises the other investors in the same profession. Finally, in the case of geographical interaction, the group is defined as the other investors living close (e.g., in the same district/municipality).

Geographical and professional interactions are more related to the present. College-based interaction, instead, defines the way a person will think for the rest of his life. Unlike geographical and professional interaction, college-based interaction is mostly rooted in the past. It differs from educational interaction as this latter relates people who have in common just the type of degree and the program of study they attended, but not necessarily the same college experience. College-based interaction is made of two components: the common general imprinting due to the type and quality of education of the particular school and the additional effect due to the bonding with other people attending the same school that persists over time on friendship or alumni basis. We will define this second effect as "bonding-based interaction".

Given that this type of interaction is rooted in the past, the main question is how much of the educational interaction survives over time. That is, do people who attended the same college and received the same education have similar investment attitudes? Is the college experience providing investors with a pair of glasses thorough which they can look at the world and decide their investment? The answer to this question is very important as it may help to explain hitherto unexplained puzzles in the financial markets. Indeed, if college-based interaction matters and its impact is sizable, the behavior of financial markets may be more "predetermined" than we usually think of. That is, current market behavior may be related to the past school interaction of the investors. This implies that fads, bubbles and investment waves may be explained in terms of a new cohort of investors coming to the market with a different view of the world.

The purpose of this paper is to tackle these issues. In particular, we address three questions: first does social interaction in general affect portfolio choice? Second, what is the form of social interaction – college-based, educational, professional and geographical interaction - that is more relevant? Third, does the impact of the more relevant source of social interaction – i.e., college-based interaction – aggregate at the market level and affect stock prices?

We consider four sources of social interaction – college-based, geographical, professional and educational – and we relate them to portfolio choice. We construct proxies for all them and we study how they affect portfolio choice. We borrow from the economic literature on social interaction to construct our tests (Glaeser and Scheinkman, 2001, Glaeser, Scheinkman, 2002, Horst and Scheinkman, 2002, Glaeser, Scheinkman and Sacerdote, 2003).

Professional and geographical interactions are subject to the potential criticism of endogeneity. People with the same characteristics may tend to locate themselves closer (Bertrand, Luttmer and Mullainathan, 1999) or enter a similar profession. Therefore, the fact that they participate in the stock market and invest in similar stock may be due to the very same characteristics that induce them to be professionally or geographically closer. This can be hardly said in the case of educational and college-based interaction, as the choice of the type of education and college is more likely to be exogenous or affected by the characteristics of the parental family. However, also in this case, a potential endogeneity issue persists. We have available a full-fledged set of characteristics of the parental family (e.g., income, wealth) that allow us to construct identifying restrictions that properly control for the issue of endogeneity.

We show that investors in general are affected by all four sources of social interaction. We also show that the time spent at college affects the future financial decisions of the investors in two ways. First, it shapes the way of thinking of the investors. Second, it creates bonds and networks that survive over time. Both determine the investment behavior. Our findings hold even after controlling for all the standard motivations brought forward in portfolio theory, such as speculative motives, hedging of non-financial income risk, familiarity and information effects, wealth and income effect, a host of demographic, geographic and professional dummies, trend-chasing and momentum behavior.

Social interaction also affects the decision of the investors to hold mutual funds as opposed to stocks. Investors in general tend to choose the investment strategy – i.e., direct versus delegated investment – selected by the other investors they interact with. This suggests that the choice of the type of investment strategy is perceived as risky and word-of-mouth and social interaction reduce the perception of this risk. This may be because they provide more information and reduce informational uncertainty, or because "herding with the pack" generates a psychological sense of safety. Both in the case of stock-picking and in the case of the choice between direct and delegated investment, the impact of social interaction, in all its forms, is not only statistically significant, but also economically relevant.

Out of all the different sources of interaction, college-based interaction is the one with the highest explanatory power. Moreover, it ranks third as the single most important factor affecting portfolio choice, with an explanatory power higher than that of all standard determinants of portfolio choice, such as hedging non-financial income risk, information and familiarity and so on.

We therefore focus on college-based interaction and test whether its impact aggregates at the market level and affects stock prices. For each company, we measure the strength of interaction among its shareholders. We construct a proxy of intensity of interaction and a proxy of dispersion. Then, we use these variables to test two alternative hypotheses. The first hypothesis ("*differences of beliefs hypothesis*") is based on the theories relating differences of beliefs to stock prices (Miller, 1977, Morris, 1996, Chen, Hong and Stein, 2002, Diether, Malloy and Scherbina, 2002, Scheinkman and Xiong, 2002 and Hong, Scheinkman, and Xiong, 2003). An increase in differences of beliefs in the presence of short-sale constraints increases stock prices and volatility. In our set-up, this implies that an increase in social interaction, by raising the degree of “similarity” of the shareholders, should *reduce* stock prices and volatility.

The alternative hypothesis (“*cascade hypothesis*”) is based on the theories relating the intensity of interaction to the way information is acquired. The choice of the investor is based on the information derived by observing the actions of the other investors. Investors may end up ignoring their own information and generate a cascade in which the subsequent investors observe the uninformed choices of the previous investors (Welch, 1992, Bichandani, Hirsheliefer and Welch, 1992 and Bichandani and Welch, 1999). Social interaction affects the information channel. By making it easier for investors to observe the actions of their peers, it facilitates the birth of a cascade-type pattern. This implies that an increase in social interaction, by increasing the probability of a cascade, should *increase* stock prices and volatility. The data supports the differences of beliefs hypothesis. An increase in the intensity of interaction reduces stock volatility, while an increase in dispersion of interaction increases stock prices.

Our findings on interaction relate to the recent literature on “proximity investment”. Examples in which geography or profession play a role on portfolio choice come from the recent literature on "familiarity bias" based on professional and geographical proximity. We can consider examples of professional proximity the findings of Huberman (2001) who shows that workers in a Regional Bell Company tend to buy stock of the firm where they work but not of similar firms present in other regions. Also, Benartzi and Thaler (1995) and Benartzi (2001) show that investors choose the stocks of the company for which they work. The mere fact of working for a company induces them to optimistically extrapolate past returns. Example of geographical proximity is the evidence that investors invest in stocks of companies headquartered close to where they live (Coval and Moskowitz, 1999, 2001) or of the country they come from (Bhattacharya, 2001). In all these cases, proximity plays the role of “cheap” source of information. Our measures of social interactions not only are robust to the inclusion of proxies for proximity investment, but they dwarf them in terms of explanatory power. This shows that geography and profession are relevant in terms of defining the proximity not between the investors and the stock – as familiarity-based investment would require – but between the investors and other investors.

Our results have major implications. First, we are able to show how the different forms of social interaction affect portfolio choice. Our approach complements and brings to unity existing different pieces of literature dealing with the effects of familiarity on investment. Moreover, we are able to quantify the differential effects and show that the one related to interaction deep rooted back in the past has the strongest impact.

Second, we properly account for the issue of endogeneity by exploiting strictly exogenous identifying restrictions such as the characteristics of the parental family of the investor at the time he went to college.

Third, we make the additional step of testing how interaction affects the stock market, providing evidence on the impact of interaction on stock price and volatility. This has relevant implications. Indeed, if investors' choice is "hard-coded" in a mental imprinting that takes place during the college period, current stock market behavior may be explainable in terms of past behavior. This implies an explanation of the stock returns based on past interactions and new cohorts coming to the market.

A direct implication is that some "anomalies" may be explained in terms of the type of shareholder interaction. A stock (e.g., a growth stock) may have a price that appears to be inflated – i.e., too high if compared to the fundamentals – simply because of a higher dispersion and lower intensity of college-based interaction among its shareholders. This would also suggest that bubbles – i.e., the temporary divergence of stock prices from the fundamental – can be related to different cohorts of investors coming to the market, each characterized in terms of the type of interaction they had at school and the networks and friendship they developed there. The stronger this relationship and the more similar their investment behavior, the more stable and closer to the fundamentals the prices will be. However, the looser the relationship gets and the less investors share a common view of the world, the more dispersion affects stocks increasing prices and volatility. This implies that a bubble develops not in the case in which investors share the same (wrong) belief and their interaction is strong, but in the case in which they have different beliefs about the value of the asset and their interaction is weakest.

An important normative implication deals with the relationship between educational and college-based interaction. If education affects investors' choice in relation with what the investors learned at college – i.e., educational interaction - a change in the type of education may have profound implications in terms of future stock market behavior. If, however, what really affects investors' choice is the social interaction with the schoolmates – college-based interaction - then the type of education will matter less and the cross-interaction between students will make all the difference. In the former case, governmental policies for education may affect investor future behavior, while in the latter case will be mostly neutral.

Finally, the fact that social interaction - and especially college-based interaction - affects the choice of the investor provides a new insight on the role of delegated investment and its determinants. The choice of an investor between direct and delegated investment is influenced by the choice of the other investors he interacts with. This provides the intriguing suggestion that the cyclical swings between direct and indirect investment and the long run trend toward the latter can be related to the dynamics between college-based interaction and the other ones.

The analysis is empirical and is based on a new and unique dataset that allows us to inspect the individual components of the investor's overall portfolio and relate them to his non-financial income. This is, to our knowledge, the first paper to combine *detailed* individual portfolio holding data with comprehensive information on *all* the components of the non-financial wealth of the household as well as information about his college education. In particular, for each investor we have information about the college he went to, the socio-demographic and economic conditions of the family at the time he went to college, his current profession as well as his geographical location.

The dataset contains a representative sample of the Swedish population and has information on the wealth of the investors, broken down into their components (cash, equity holdings, mutual funds, real estate, loans, bonds and other assets). We also have available the income and the tax position of the investors as well as their demographic characteristics. We can therefore identify the returns of the separate components of the investor's portfolio, as well as all the other sources of income of the investor, including real estate. The data contain detailed information on demographic and employment characteristics of the investors. This allows us to analyze the different sources of heterogeneity in investor behavior. Moreover, the fact that we are able to observe the behavior of the same investor over time, confers to the data a complete panel dimension that allows us to control for past portfolio choices and returns.

The paper is structured as follows. In the next section we describe the data. In Section 3, we present some preliminary evidence of college-based heterogeneity. In Section 4, we study the impact of college-based interaction on stock market on portfolio choice. In Section 5, we relate interaction to stock market prices. A brief conclusion follows.

2 Data and construction of the variables

2.1 Data sources

We use different sources. For each investor we have detailed information of his individual holdings of stocks (broken down at the stock level), mutual funds, bank accounts, real estate and other types of wealth. Fiscal authorities provide us with information on the different forms of investor income, as well as demographic and family characteristics. This information is matched at the individual level, so as to construct a time series of investment and income for each investor. For each stock we have detailed information on the company and the price, volume and volatility at which it trades. We also use aggregated data on Swedish macro-economic conditions and on the indexes of the real estate market. We now explain the data sources more in detail.

Individual stockholding

We use the data on individual shareholders collected by Vardepappererscentralen (VPC), the Security Register Center. The data contain both stockholding held directly and on the street name, including holdings of US-listed ADRs. In addition, SIS Ägarservice AB collects information on ultimate owners of shares held via trusts, foreign holding companies and alike (for details see Sundin and Sundquist, 2002). Our data cover the period 1995-2000. Overall, the records provide information about the owners of 98% of the market capitalization of publicly traded Swedish companies. For the median company, we have information about 97.9% of the equity, and in the worst case we have information on 81.6% of market capitalization of the company. The data provided by SIS Ägarservice AB were linked by Statistics Sweden with the LINDA dataset described below.

LINDA

LINDA (Longitudinal INdividual DAtaset for Sweden) is a register-based longitudinal data set and is a joint endeavor between the Department of Economics at Uppsala University, The National Social Insurance Board (RFV), Statistics Sweden, and the Ministries of Finance and Labor. It consists of a large, representative panel of households for the population over the period 1960 to 2000. For each year, information on all family members of the sampled individuals is added to the data set. The sampling procedure ensures that the data are representative for each year. Moreover, the same family is traced over time. This provides a real time series dimension which, in general, is lacking in surveys based on different cohorts polled over time.

The variables include individual characteristics (gender, age, marital status, country of birth, citizenship, year of immigration, place of residence detailed at the parish level, education, profession, employment status), housing information (type and size of housing, owner, rental and occupation status, one-family or several-family dwelling, year of construction, housing taxation value) and tax and wealth information. In particular, the income and wealth tax registers include information on labor income, capital gains and losses, business income and losses, pension contributions, taxes paid and taxable wealth. A detailed description of the dataset is provided by Edin and Fredriksson, (2000) and is available on the web site http://linda.nek.uu.se/.

The tax aspect deserves more detailed discussion. In Sweden, in addition to income taxation, there exists an additional wealth tax, which is paid by every investor with net worth in excess of 900,000 SEK (about US$90,000). The taxable wealth includes the tax-assessed value of real estate, market value of publicly listed securities, balance of bank accounts and fair value of valuable possessions (including jewelry, cars, antiques, etc.).

For the purpose of this paper, we compute the current market value of housing using the tax-assessed value provided by LINDA. We evaluate it at current prices by using the average ratio of market value to tax-assessed value that is provided for each year and county by the Swedish Office of Statistics. There is no estimate of the market value of privately held companies. However, the data contains an indicator variable for owners of privately held companies and entrepreneurs who file their business tax return along with their personal tax return. For the privately held unlimited liability companies the value of the assets is included in the tax return. For the privately held unlimited liability companies that are not listed, the value of assets held is generally missing. However, the size of the group is rather small (1.74%-1.91% of the sample depending on a year) and is unlikely to affect our estimates in a significant way. Moreover, for the members of the wealthiest 5,000 families, we have been able to reconstruct their values and to correctly impute it by using information from SIS Ägarservice AB (Sundin and Sundquist, 2002).

The combined LINDA/Shareholding dataset covers the period 1995-2000. The overall sample we use contains 1,757,406 observations. In addition, we also use 1990-1994 data from LINDA in the implementation of the Carroll and Samwick (1996) procedure to construct the moments of conditional non-financial income we describe below. In Table 1 we report some descriptive statistics. In particular, Panel A contains the general demographic characteristics (number of households for each year, members in household, adults in household, age of the oldest member of household, percent of the sample with secondary and higher education, percent of immigrants), while Panels B and C report, respectively, the age and gender distribution of the sample and their wealth and income characteristics.

College data

For each investor in the sample, we have information about the college he attended. Moreover, for each college we have information about the enrollment, average GPA, location and ranking on a nation-wide basis. Moreover, for each student at the time he attended the college we have background information about the parental family (“heritage variables”), such as the size, wealth and income.

Firm-level information and other data

For individual security returns (including dividends) and the overall market index (SIX market index), we use the SIX Trust Database. For information on firm-level characteristics we use the Market Manager Partners Databases. These two databases are the equivalent of, respectively, CRSP and COMPUSTAT for the US. In addition, Market Manager Partners Databases contain information at the plant level, including municipality location of the plant. The consumer confidence index is provided by Statistics Sweden. Geographical coordinates are supplied by the Swedish Postal Service and contain latitude and longitude of Swedish Postal Offices.

2.2 Construction of the main variables

The analysis of the impact of social interaction on portfolio choice requires us to control for all the other factors that may affect investor choice. Moreover, the need to use instrumental variable estimation requires us to have a proper set of control variables. In particular, we need variables that account for the main alternative motives affecting portfolio choice: hedging non-financial income risk, information/familiarity, demographic and other variables, and heritage variables.

Non-financial risk variables.

A first measure of non-financial income exposure is related to the investor's level of income, its volatility and its correlation with his financial and real estate income. We consider non-financial income as the sum of labor income and entrepreneurial income of the investor. We construct measures of the permanent (expected) non-financial income following the approach of Carrol and Samwick (1997) and Vissing-Jorgensen (2001). In the Appendix, we provide a brief description of the methodology. As an additional measure of uncertainty, we also construct a measure of unemployment risk that proxies for the probability of being unemployed in the following year. It is the one year-ahead forecast of a linear probability model in which the unemployment status (i.e., 1 if unemployed and zero otherwise) is regressed on demographic variables, measures of income and wealth and regional, geographic and professional dummies.

Finally, we also include variables that account for the investor speculative motive. Given that this is based on the expected stock return and variance, we use as a proxy for them the return and volatility of the stock in the previous 12 months. These variables also control for the possibility that the portfolio choice is due to momentum, that is, changes to the variation in the value of the stock market or in the value of the portfolio holdings.

Measures of familiarity/information

We consider three measures that proxy for the degree of familiarity of the investor with a stock. Familiarity has been identified as a key factor affecting the investor decision to hold a stock (Coval and Moskowitz, 1999, 2001, Hau, 2001). This may be due to a behavioral bias (Huberman, 2001) as well as to limited information (Merton, 1987, Shapiro, 2002).

The first measure is related to "professional proximity". It is a dummy taking the value 1 if the investor's profession is in the same area of activity as the company whose stock is under consideration, and zero otherwise. We use the one-digit SNI92 codes (similar to SIC codes) to identify the areas of activities. For example, in the case of an investor working in the mining sector holding a stock of a mining company, the dummy would be equal to 1.

The second measure is a measure of geographical proximity, that is, the proximity between the residence of the investor and the place where the company is located. We consider two different measures: the first one is the logarithm of the inverse of the distance between the ZIP code of the investor and the ZIP code of the closest branch/subsidiary of the company whose stock we consider. As an alternative measure, we use the logarithm of the inverse of the distance between the ZIP code of the investor and the ZIP code of the company headquarter. Given that the results do not differ and the variables are highly collinear, we report only the first specification. These measures are analogous to those proposed by Coval and Moskowitz (1999, 2001) in a study of geographical preferences in mutual fund investment. The greater the value of the variable, the closer the investor is to the stock. These measures are constructed at the stock level and then aggregated at the investor level, across all the stocks of his portfolio, weighting them by their share in the portfolio. This procedure delivers three measures of familiarity for each investor and time.

The third measure is related to the holding period, under the assumption that the investor is more informed about a stock the longer he has held it. This may be due to the fact that he is tracking it more closely, paying attention to the earning announcements and actively purchasing information about it. We therefore construct a variable that proxies for "holding period", based on the time a stock entered the investor's portfolio.

Measures of wealth and other control variables

The measures of wealth include the financial and real estate wealth. We also use the ratio of investor debt to total assets as a proxy for borrowing constraints. The demographic variables include: the age of the oldest member of the family of the investor and its value squared. This latter variable is consistent with standard results (Guiso and Jappelli, 2002, Vissing-Jorgensen, 2002) which find a non-linear relationship between age and the degree of stock market participation. To control for the effect of the local economy, we also include a Stockholm dummy. This takes the value of 1 if the investor lives in the capital and 0 otherwise. Furthermore, we construct a variable to proxy for the ability of the investor in his occupation. This is based on the difference between his income and the average income of his profession. The assumption is that the higher the income of the investor relative to the average income of the other investors in the same area, the higher his ability should be.

3 Preliminary evidence

The first question we want to address is whether educational interaction does indeed generate differential investment behavior. We construct portfolios that replicate the average portfolio composition of investors who attended the same college and then we test whether there is any statistical difference between them. In particular, for each individual *i*, stock *j* and college *c*, we proceed as follows. First, for each college, we trace the investors who attended it and are present in our dataset in 1995. For each of them, we identify their portfolio holdings and the fraction of their portfolios represented by each stock. This gives us the percentage investment (defined as fraction of the portfolio of the investor) of the *ith* investor who attended the *cth* college and invested in the *jth* stock. Second, we group the stocks into classes based on book-to-market and size. Then, for each classification we consider three sub-groups: low, medium and high (i.e., bottom 33%, intermediate 33% and top 33%). Finally, for each college we calculate the average percentage investment in each sub-group of stocks of the investors who attended the college. This is done for each pair stock/college. For example, we determine the average percentage investment in low book-to-market stocks of the University of Upsala by aggregating the percentage investment in low book-to-market stocks of all the investors who went to the University of Uppsala. The same procedure is repeated for the years 1996, 1997, 1998, 1990, 2000 and 2001. This generates, for each college, 6 yearly time series of average percentage investments. These represent the "college portfolios", that is, they mimic the "investment behavior" of the colleges. We then test whether these time series differ. We apply the Kruskal Wallis Test, the Median One Way Test, the Van der Waerden One Way Test and the Savage One-Way Test.

The results are reported in Table 2. All the tests agree and provide very strong statistical evidence supporting the existence of college investment styles. This analysis, though suggestive, is still partial, as it does not control for other factors affecting the investment behavior. Moreover, college style may represent two things: program-specific characteristics or interaction characteristics. For example, it is possible that students attending MIT have more similar investment patterns because they received a more technical education if compared to investors attending a local liberal art college. This would imply that college style proxies for the technical characteristics of the school. We will define the interaction related to the type of degree as educational interaction. Alternatively, investors who attended MIT may differ from the ones who attended a liberal art college simply because the specific type of interaction that took place at the time they attended college shaped their way of thinking, regardless of the type of education they received. This impact would be stronger, for example, in the case of colleges run by religious organization (i.e., Notre Dame). In this case, college style may proxy for the type of social interaction that takes place at that college. We will define this interaction, more specifically related to the type of college, as college-based interaction.

Distinguishing these two types of interaction is complicated by the confounding effect of other factors, such as wealth, status, family characteristics and so on. For example, it is possible that students who attended MIT have similar patterns of investment behavior, simply because come from wealthier families than students attending a local liberal art college. Moreover, even if they came from families with analogous economic characteristics, still, the task of identifying college specific effects could be thwarted by the difference in wealth, income, profession and status of the investors at the time (e.g., 1998) when their investment does actually takes place. These considerations induce us to a more structured analysis where we separately identify these different sources of interaction by properly accounting for the alternative factors affecting investor behavior.

4 College-based interaction and portfolio choice

We now directly test how college-based interaction affects portfolio choice, distinguishing it from the other sources of social interaction – i.e., educational, professional and geographical interaction – and properly controlling for the other determinants of portfolio choice – i.e., speculative motives, hedging non financial income risk, familiarity/information-based motives. We start by running a horse-race between college-based interaction and the other sources of social interaction. Then, we quantify the explanatory power of each of them, and study the incremental one of college-based. Finally, we focus more in detail on college-based interaction and study its two components: the overall one and the "bonding-based interaction". We consider two aspects of the portfolio choice: stock pricking and choice between direct and delegated investment.

4.1 A test of college-based interaction

We start by defining the test of social interaction and its econometric specification. Let us assume there are i = 1:v:I investors, who belong to c = 1:g:C groups and may invest in j = 1:J stocks. The standard literature (Glaeser and Scheinkman, 2001, Glaeser, Scheinkman, 2002, Horst and Scheinkman, 2002, Glaeser, Scheinkman and Sacerdote, 2003) models the impact of social interaction in decision making as:

$$a_{ijc} = X_{ijc} + N_{ijc} = \sum_k \left(\delta_{jk} A_{ijc,k} + \varepsilon_{ijc} \right) + \frac{\eta}{I-1} \sum_{v \in c(i), v \neq i} a_{jv,c} , \qquad 1)$$

where a_{ijc} is the action of the *ith* individual, belonging to the *cth* group, on the *jth* choice. The action is affected by the action-specific characteristics (X_{ijc}) and by the actions of all the other individuals regarding the *jth* choice with whom the *ith* individual belonging to the *cth* group interacts (N_{ijc}). The term X_{ijc} reflects the role of the exogenous determinants of the level of action. It can be decomposed into the *k* specific attributes of the decision (i.e., for K = 2, these are the payoff related to the outcome of the decision and its cost) ($A_{ijc,k}$) and an individual specific random effect (ε_{ijc}). The impact of the action of the other investors that belong to the same group (i.e., for each investor $v \in c(i)$, different from *i*) is $\sum_{v \in c(i), v \neq i} a_{jv,c}$. This action is proportional (through the coefficient η) and negatively related to the size of the group (*I*). The term *c(i)* refers to the group of which the *ith* person is member.

We can customize equation 1 to represent a portfolio decision. Let us define h_{ijc} as the fraction of the portfolio of the *ith* investor, belonging to the *cth* group, that is invested in the *jth* stock in excess of the market portfolio. This represents the excess with respect to the allocation each investor would be holding according to CAPM. This way of defining the dependent variable partially controls for the speculative motive or the "Merton proportion" in a dynamic setting.[2] The decision to invest in the *jth* stock is a function of the characteristics related to the objective characteristics of the investment in the *jth* asset evaluated from the perspective of the investor's goals (i.e., speculative motive, desire to hedge the investor's non-financial income risk) and constraints (amount of information available, financial and borrowing constraints) as well as of the interaction of the investor with all the other investors belonging to the same group. Therefore, for each investor *I* who belongs to group *c* and stock *j*, we can estimate:

$$h_{ijc} = \alpha + \beta X_{ijc} + \gamma N_{ijc} + \varepsilon_{ijc}, \qquad 2)$$

where X_{ijc} is a vector of variables that control for the standard determinants of portfolio choice and N_{jc} is the proxy for social interaction or "network effect".

We study the determinants of both stock-picking and mutual fund investing. In the first case, h_{ijc} is the fraction of the equity portfolio invested in the *jth* stock in excess of the market portfolio, while in the second case, it is the fraction of the overall risky portfolio (stocks and mutual funds) invested in mutual funds. Specification 2) also suggests how to construct the proxy for social interaction. It is the mean characteristics of the social group within which we assume the social interaction to take place (Jencks and Mayer, 1990, Glaeser and Scheinkman, 2001, Glaeser, Scheinkman, 2002). That is, it is the average value of the fraction of the risky portfolio invested in the *jth* stock in excess of the market

[2] The inclusion among the explanatory variables of past stock returns and volatility provide further control for momentum on trend-chasing strategies.

portfolio by all the other investors (excluding the *ith* investor) who belong to the same *cth* group to which the *ith* investor belongs.[3]

We consider four alternative dimensions of interaction: professional, geographical, educational and college-based. They differ in terms of the social group (i.e., *c*) the investors belong to. In the case of professional interaction, the group is represented by the profession of the investor. For example, we expect that lawyers are more likely to interact with other lawyers. In the case of geographical interaction, the group is represented by the municipality where the investor lives. In this case, it is the physical proximity to other investors that matters. In the case of educational interaction, instead, the group is represented by all the other investors who received the same type of education. For example, a physicist is more likely to have a view of the world similar to the one of another physicist than to someone who graduated in theological studies. Finally, in the case of college-based interaction, the group is represented by the investors who ever attended the same college.

It is worth noting that we have two "contemporaneous measures of interactions" (i.e., geographical and professional interaction) and two "historical measures" (i.e., educational and college-based). We will consider all the four measures, running a horse race among them, to identify the one that has the stronger impact on investor behavior.

Ideally, X_{ijc} is independent within the group and independent of the social interaction term N_{ijc}. In this case, the estimation of equation 2) would only require simple OLS. However, there is a major problem of omitted variables: omitted personal/groups-specific characteristics may be correlated with $N_{ijc.}$. Let us, for instance, consider college interaction. The bias may be due to the fact that investors who attended a particular school tend to invest more in the *jth* stock for their own specific and - not properly controlled for - reasons. For example, Harvard graduates are less likely to be affected in their portfolio choice by financial constraints than the graduates of a poor community college. This would induce a spurious correlation between portfolio choice and investor specific characteristics. This problem is compounded by the endogeneity of group membership. Given that the choice of college, the choice of education, as well as the choice of the profession and the physical location of the investors are all endogenous in the long run, a significant value of γ may just be due to spurious correlations.

To address these issues we use a two-pronged approach. First, we include an extensive number of control variables that account for the other factors affecting investor demand that may potentially aggregate at the group level and induce correlation within groups and between group average

[3] In the case the dependent variable is the fraction of the overall risky portfolio invested in mutual funds, the proxy for social interaction is constructed as the average value of the fraction of the overall risky portfolio invested in mutual funds by all the other investors (excluding the *ith* investor) who belong to the same *cth* group to which the *ith* investor belongs.

characteristics and individual behavior. These factors are related to the other determinants of portfolio choice, such as hedging, information, borrowing constraints, individual specific characteristics.

Second, we employ an instrumental variable methodology. We argue that the decision to attend a particular school, select a particular type of education or a particular professions are affected by the fundamental characteristics of the investor (gender) as well by the specific characteristics of his parental family (family size, income and wealth). Recent evidence in this direction (Shore and White, 2002) suggests that these variables are indeed good instruments. We also include the characteristics of the college such as the decile of labor and capital income of the students who attended the college, their gender composition and the geographical distribution of the places they were coming from.

The control variables (X_{ijc}) proxy for other investment motives, such as hedging, speculation and information constrains/familiarity. They also proxy for borrowing constraints as well as other demographic, geographic and professional factors affecting investor behavior. We consider five specifications. The base specification contains, on top of the proxies for social interaction, a constant, the level of wealth of the investor (aggregate financial and real estate wealth), the expected level of income, unemployment risk, the return and volatility of the stock in the prior 12 months and a Stockholm dummy, that takes the value 1 if the household lives in Stockholm and zero otherwise. A second specification also contains demographic variables, such as a variable that proxies for the individual abilities of the members of the household (ability), the number of adults in the household (18 year and older), the size of the family (i.e., the number of members in the household), the age and the square of the age of oldest member of the household. A third specification adds the hedging variables. These are the mean and volatility of the non-financial income and its correlation to the stock returns and to investor's real estate income. The different moments of non-financial income (i.e., aggregate labor and entrepreneurial income) have been constructed according to the Carrol and Samwick (1997) and Vissing-Jorgenson (2002) methodology as defined above and in the Appendix. A fourth specification also adds the familiarity variables (geographical, professional and holding period-based proximity). A fifth specification includes also the heritage variables, that is the variables that proxy for the economic situation of the investor when he went to College.

4.2 Main findings

The results are reported in Table 2. Panel A reports the estimates of the fraction of stock portfolio of individual investors (in excess of the market portfolio weights) as a function of four measures of social interaction (college-based, geographical, professional and educational interaction) and control variables. We consider 5 alternative specifications. Additional details are provided in the caption of Table 3. Panel B reports the estimates of the fraction of the risky portfolio (i.e., stocks and mutual funds) invested in mutual funds as a function of four measures of social interaction (college-based, geographical, professional and educational interaction) and control variables. Panel C reports the fraction of the explained variance of stock choice and fund choice explained by each variable.[4]

The results show some important points. First, the portfolio choice is related to social interaction. Indeed, three out of four measures of interaction are strongly statistically significant. In particular, geographical and college-based interactions are positively related to stock picking. Investors tend to hold the stocks in which invest people located close to them or people who went to the same school. However, investors are not affected by the choices of the other people who exercise the same profession. Interestingly, investors are negatively affected by the choice of the other investors who have the same type of high education. These results hold across different specifications. More importantly, the results are robust to the inclusion of variables proxying for geographic, professional and holding-based proximity. That is, social interaction is not a mere proxy for the standard familiarity biases identified in the literature.

Second, if we look at the percentage of the explained variance attributable to the various measures of interaction, we see that they affect the investors differently (Panel C, first column). College-based interaction has the strongest impact, contributing to approximately 16.31% of the explained variance of the stock picking choice. Geographical interaction has the second strongest impact (1.18%), while educational and professional interactions have the lowest impact. Among the other most significant variables are investor's wealth (49.58%) and the size of the household (16.41%). Geographical, professional and holding-based proximity have a way lower explanatory power (on average less than 0.5%) than that of our proxies for social interaction. This not only confirms the fact that social interaction is not a function of the standard familiarity biases identified in the literature, but it also suggests that it is way more relevant than them. Social interaction – and college based interaction in particular – is by far the most potent "behavioral" driver of portfolio choice. Properly accounting for it may explain many puzzled stylized facts in finance.

Third, not only does social interaction affect stock-picking, but it also shapes the choice between direct investment and delegated investment. The findings show that all four measures of interaction have a strong statistical impact. In particular, geographical, professional and educational interactions all favor the investment in mutual funds as opposed to direct stock investing. That is, investors tend to invest in funds if people located close to them or people who exercise the same

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[4] This effectively corresponds to the Partial R^2 normalized by Total R^2.

profession or have the same type of education invest in funds. This suggests that the choice of the type of investment strategy – i.e., direct or delegated – is perceived as risky and word-of-mouth and social interaction reduce the perception of this risk. This may be because they provide more information and reduce informational uncertainty, or because "herding with the pack" generates a psychological sense of safety. However, it is interesting to notice that the opposite is true in the case of college-based interaction: the higher the degree of interaction, the less likely the investors are to hold mutual funds as opposed to stocks.

Fourth, if we look at which factor has most power to explain the direct/indirect investment choice, we again see a wide dispersion among the four types of interaction (Panel C, second column). In this case, educational interaction has the strongest impact, contributing to approximately 11.06% of the explained variance of the choice to invest in mutual funds. Again, geographical interaction has the second strongest impact (6.09%), college-based interaction has a lower impact (1.62%), while professional interaction has almost no power. Among the other most significant variables are the size of the household (44%) and investor's age (10%). Wealth is not very significant any longer (just 0.62%).

These results show that social interaction plays an important role in portfolio choice. Among the different forms of interaction, college-based interaction seems to be the most relevant one, with the highest explanatory power in the case of stock picking. However, college-based interaction is made of two components: the common general imprinting due to the type and quality of education of the school and the additional effect due to the bonding with other people attending the same school that persists over time on a friendship- or alumni-based relationship. We will now investigate whether this "Bonding-based interaction" also plays a separate role in portfolio choice.

4.3 Bonding-based interaction

We re-estimate specification 2), including a variable that proxy for the degree of bonding-based interaction. For each investor *i* and stock *j*, this variable is constructed as the difference between the average value of the fraction of the risky portfolio invested in the *jth* stock (in excess of the market portfolio) of all the investors who went to the same school of the *ith* investor *at the same time*[5] *he went* and the average value of the fraction of the risky portfolio invested in the *jth* stock (in excess of the market portfolio) of all the investors who *ever* went to the same school of the *ith* investor (i.e., college-based interaction).

[5] For each investor, we consider a window of +3 years and -3 years around the time the *ith* investor attended college.

The results are reported in Table 3, Panel D. They show that bonding-based interaction has an additional explanatory power. It is positive and strongly statistically significant. This suggests that investors tend to invest in stocks in which their former classmates invest. This finding holds across different specifications and, as before, is robust to the inclusion of variables proxying for geographic, professional and holding-based proximity.

If interaction affects investor behavior, its impact may aggregate at the market level and affect stock prices and volatility. This is the topic of the next section.

5 College-based interaction and asset prices

5.1 A testing framework

Our guess is that, given that college interaction affects portfolio choice, its impact does not average out, but aggregates at the market level, impacting stock prices. There are two main intuitions that may help us to rationalize the impact of interaction on stock prices and volatility. On the one hand, we may stress the fact that attendance of different colleges merely represents *differences in beliefs*. On the other hand, we may stress the fact that attendance of the same school improves the *strength of the communication channel* between alumni and their ability to observe each other's actions.

The first hypothesis ("*differences of beliefs hypothesis*") links dispersion of beliefs to stock prices. In the presence of short-sales constraints (Miller, 1977, Morris, 1996, Chen, Hong and Stein, 2002, Diether, Malloy and Scherbina, 2002), given that the investors with pessimistic view are constrained not to participate in the stock market, the price is a function of the view of the relatively more optimistic investors. This implies that the higher the dispersion of opinions across investors, the higher the price should be. A more recent version of this theory (Scheinkman and Xiong, 2002 and Hong, Scheinkman, and Xiong, 2003) has also direct implications for volatility. Scheinkman and Xiong (2002), in line with Harrison and Kreps (1978), show that stock prices incorporate a speculative component when investors have heterogeneous beliefs about the fundamental value of the stock and short sales are costly. If investors are overconfident about the precision of their signal, heterogeneity of beliefs induces excessive volatility.

Therefore, given the *differences of beliefs hypothesis* posits a *negative correlation between the strength of college-based interaction and both prices and volatility*.[6] Indeed, the stronger the

[6] An alternative theory assumes that dispersion of beliefs proxies for uncertainty. In this case, given that it is a component of risk, we expect it to increase the volatility and the required rate of return of the stock and to reduce its price (Merton, 1973, Kraus and Smith, 1989, DeTemple and Murthy, 1994). Also in this case, this implies a *negative* correlation between the

interaction, the lower the dispersion of beliefs should be. This implies that an increase in college-based interaction, by raising the degree of "similarity" of the shareholders, should lower dispersion of beliefs and therefore *reduce* stock prices and volatility.

The alternative hypothesis, ("*cascade hypothesis*") is based on the theories relating the intensity of interaction to the way information is acquired. Welch (1992), Bichandani, Hisrheliefer and Welch (1992) and Bichandani and Welch (1999) show that, if investors react not only to their private information, but also to the information they infer from the *actions* of other agents, a cascade may appear. In particular, if investors make sequential decisions and base their action on the information derived by observing the actions of their predecessors, end up ignoring their own information and entirely relying on the information conveyed by the actions of others. This makes their actions less informative to the other investors in the market and generates a cascade in which the subsequent investors observe the uninformed choices of the previous investors. In a cascade, information stops accumulating, prices do not reflect all the available information, and bubbles may arise. The crucial assumption behind a cascade is the fact that investors can observe the actions of other investors.[7]

Social interaction by making it easier for investors to observe the actions of their peers, it facilitates the birth of a cascade-type pattern. Therefore, the "*cascade hypothesis*" posits a *positive correlation between the strength of college-based interaction and both returns and volatility*. This implies that an increase in college-based interaction, by increasing the probability of a cascade, should *increase* stock prices and volatility.[8]

To test the two hypotheses, we need a proxy for the strength of college-based interaction. Its impact should be a function of both *"intensity"* and *"dispersion"* of interaction. Let us first focus on the former aspect, the *intensity* of college-based interaction. This is represented by the number of people who, attending the same college, ended up sharing a common view. The higher the fraction of the shareholding structure of a company represented by the same school, the stronger the impact of the school should be. This implies that a proxy for the degree of intensity of college-based interaction for a company is the representation of the different colleges among the shareholders of the company. That is,

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intensity of college-based interaction and both returns and volatility and a *positive* correlation between the dispersion of college-based interaction and both returns and volatility.

[7] If however, investors could observe each other's signals or communicate to each other, word-of-mouth learning would overcome the imperfect information/noise that generates a cascade (Ellison and Fudenberg, 1993, 1995, Banerjee and Fudenberg, 1999). In the limit, "if conversation perfectly conveyed all information, we would know as much as the wisest person in the world" (Cao and Hishleifer, 2000). In reality there are many barriers that "clog the information pipeline" (Shiller, 1995).

[8] This would also be consistent with recent theories (Boot, and Thakor, 2002) suggesting that the firm's stock price is also increasing in shareholders' propensity to agree with management.

for each company j we may construct an index of "concentration" of the colleges in the company. The intensity of interaction for the *jth* company is:

$$Intensity_j = \sum_{c=1}^{C} \left(\sum_{i=1}^{I} \frac{N_{ijc}}{\sum_{c=1}^{C} \sum_{i=1}^{I} N_{ijc}} \right)^2 ,$$

where N_{ijc} is the number of shares that individual i who graduated from college c holds in company j. This measure of intensity can be interpreted as a Herfindhal index, in which the "market share" of college c in company j is given by the number of shares of the *jth* company that the investors who attended the *cth* college hold. The intuition is that the impact of college interaction should be stronger for companies in which most of the stocks are held by investors who went to the same college. The measure of the *dispersion* of college-based interaction is:

$$Dispersion_j = \sum_{c=1}^{C} w_{jc} \sum_{g \neq c}^{C-1} w_{jg} \left(f_{jg} - f_{jc} \right),$$

where, for college c, f_{jc} (f_{jg}) is the average fraction of the portfolio invested in the *jth* stock for all the investors who went to the *cth* (*gth*) college. The weight w_{jc} (w_{jg}) represents the fraction of company's j equity represented in our sample that is held by the investors went to the *cth* (*gth*) college.

In summary, the *dispersion of beliefs hypothesis* posits that an increase in the intensity of interaction should reduce prices and volatility, while an increase in the dispersion of interaction should increase them. The *cascade hypothesis*, instead, posits that an increase in the intensity of interaction should increase prices and volatility, while an increase in the dispersion of interaction should reduce them.

5.2 The main test

To test the previous restrictions, we regress stock return and volatility on the change in intensity and dispersion of college-based interaction, as defined before, and a set of control variables. For consistency and comparability with the literature, we adopt a methodology analogous to the one employed by Gompers *et al.* (2003) and by Coval and Moskowitz (2000 and 2002). We estimate:

$$S_{jt} = \alpha + \beta \Delta I_{jt} + \gamma \Delta D_{jt} + \delta C_{jt} + \varepsilon_{jt}, \qquad 3)$$

where S_{jt} is the stock characteristic (alternatively return or volatility) of the *jth* stock at time *t*, I_{jt} and D_{jt} are, respectively, our proxies for intensity and dispersion of interaction for the *jth* stock at time *t*. The operator represents the change in value of the variable between *t* and *t-1*. C_{jt} is a vector of control variables for the *jth* stock at time *t*. They defined exactly the same way as Gompers *et al.* (2003).

The control variables include: the *Market-to-Book Ratio*, measured as the ratio of the market value of the company (as of end of previous calendar year) to the book value of common equity (previous fiscal year), *Size*, measured as the logarithm of market value of the company as of the end of previous calendar year, *Leverage*, measured as the ratio of debt to sum of equity and debt as of end of previous fiscal year, *Employees*, measured as the number of employees, *Bid-Ask Spread*, defined as the bid-ask spread as of month t-2, the *Price*, defined as the price (in SEK) of a share as of *t-2*, the *Turnover*, defined as the logarithm of the ratio of shares traded to shares outstanding at month t-2 , the *Volume*, (defined by using the number of shares traded times price, in SEK) at month t-2, and the dividend yield (*DIVY*), defined as the ratio of the dividends paid in the previous fiscal year divided by the share price at year end. Following Gompers *et al.* (2003), we also include measures of past stock returns. *Return 23* is the compounded gross return for the period between months t-2 and t-3, *Return 46* the compounded gross return for the period between months t-4 and t-6, *Return 712* is the compounded gross return for the period between months t-7 and t-12. *High Tech Dummy* is a dummy equal to 1 if the company belongs to high-tech industries. Finally, we include a dummy (*A-list*) equal to 1 if the company is listed in A list at time *t*. The frequency is monthly.

We consider different econometric methodologies and specifications. In particular, we use both a heteroscedastic- and time-series consistent Pooled Panel Estimation implemented with and without time fixed effects and a standard Fama-MacBeth Estimation. We estimate alternative specifications that differ either in terms of the control variables that are used or in terms of the variable that proxies for changes in intensity and dispersion of interaction. In the latter case, we use either the actual change in our measure of intensity and dispersion, defined as in the previous sections, or a dummy that proxies for the period of high change. This variable is a dummy that takes the value 1 if the observation belongs to 40% of the companies with largest changes in dispersion and intensity and zero otherwise. This specification mirrors the analogous one used by Gompers *et al.* (2003). Finally, we separately consider college-based interactions and bonding-based interaction.

The results are reported in Tables 4-6. In Tables 4 and 5, we report the estimates when the stock return is the dependent variable, while in Table 6 we report the estimates when the stock volatility is the dependent variable. In Table 4 and Table 6, Panel A, we report the results of the pooled estimations, while in Table 5 and Table 6, Panel B, we report the results of the Fama-MacBeth estimations. In Table

4, Panels A and B are based on measures of intensity/dispersion of college-based interaction, while Panels C and D are based on measures of intensity/dispersion of bonding-based interaction

The results show that returns are positively and significantly related to an increase in dispersion of interaction and not correlated to a change of intensity. Volatility, instead, is negatively and significantly related to an increase in the intensity of interaction and not related to a change of dispersion. These results hold across all the specifications. The results are also robust to the use of alternative econometric specifications, pooled regression or Fama-MacBeth. Moreover, they hold both in the case we use our measures of changes in intensity and dispersion and in the case in which we use dummies to proxy for them.

These findings suggest that in general, an increase in the strength of interaction (i.e., either a reduction of dispersion or an increase in intensity) reduces prices and volatility. This supports the *dispersion of beliefs hypothesis*, while it is inconsistent with the *cascade hypothesis*.

The findings on bonding-based interaction are consistent with the ones on college-based interaction. They show that an increase in the strength of interaction – i.e., the more a firm is owned by schoolmates – is negatively related to the return and volatility of its stocks. This is important as it suggests that not only is bonding a determinant of portfolio choice, separate from and additional to the generic interaction that took place during school time, but its effect also aggregates at the market level and affect stock prices and volatility.

Overall, these results provide an intriguing perspective. Bubbles – i.e., the temporary divergence of stock prices from the fundamental – can be explained in terms of different cohorts of investors coming to the market. Each cohort can be characterized in terms of the type of interaction they had at school and the networks and friendship they developed there. The stronger this relationship and the more similar their investment behavior, the more stable and closer to the fundamentals the prices will be. However, the looser the relationship gets and the less investors share a common view of the world, the more dispersion affects stocks increasing prices and volatility. This analysis suggests that a bubble develops not in the case in which investors share the same (wrong) belief and their interaction is strong, but in the case in which they have different beliefs about the value of the asset and their interaction is weakest.

Conclusion

We investigate the link between college-based interaction and portfolio choice. We compare it to other forms of social interaction, such as educational, professional and geographical interaction. We show that the impact of social interaction, in all its forms, is not only statistically significant, but also economically relevant. This holds even after controlling for all the standard motivations brought forward in portfolio theory, such as hedging of non-financial income risk, familiarity and information effects, wealth and income effect, a host of demographic, geographic and professional dummies, trend-chasing and momentum behavior. Moreover, social interaction has a higher explanatory power than the classic measures of familiarity-based measures of interaction such as professional and geographical proximity to the stock.

In particular, college-based interaction has the strongest explanatory power out of all the sources of interaction and is the third single most important factor affecting portfolio choice, with an explanatory power higher than that of all the standard determinants of portfolio choice, such as hedging non-financial income risk, information and familiarity. We also separately identify the part of college-based interaction related to the bonding with other people attending the same school that persists over time on a friendship- or alumni-based relationship. We show that this “Bonding-based interaction” affects portfolio choice and has an explanatory power in itself. We also provide evidence that social interaction not only affects stock-picking, but also shapes the decision between direct and delegated investment. Investors tend to choose the form of investment – selected by the other investors they interact with.

College-based interaction aggregates at the market level and affects stock prices. For each company, we construct measures of the strength of interaction based intensity and dispersion of interaction among the shareholders of the company. We show that an increase in the degree of “similarity” between investors reduces prices and volatility.

Our analysis directly focuses on the role of schools as providers of both education and bonding experience for the people attending them. Both of them seem to play critical role. Our findings are a first step towards the understanding of the way different forms of social interaction affect portfolio choice and the stock market. In particular, if college-based interaction plays a dominant role among the different sources of social interaction, this suggests a more "long run" view of the stock market. If investor's choice is highly affected by the college years and especially by the type of interaction and bonding developed at the time, current stock prices may be explainable in terms of different cohorts of people coming to the market with different view of the world and information channel defined at an early stage of their life. Stock market bubbles and price anomalies can then be rationalized in terms of the type of generation coming to the market and the type of stocks IPOed or sold at the time.

Appendix: Construction of income-related variables

Here, we briefly describe the methodology we follow to construct proxies for permanent non-financial income, its volatility and its correlation to financial and real estate income. We follow the approach of Carroll and Samwick (1997) and Vissing-Jørgensen (2001). We consider as non-financial income: labor income and entrepreneurial income. In particular, we define the relevant moments of long term investor's non-financial income:

$$E(\omega_{it}|\omega_{it-1}, X_{it-1}),\ Var(\omega_{it}|\omega_{it-1}, X_{it-1}) \text{ and } \rho_{it},$$

where ω_{it} is the non-financial income of investor i at time t, X_{it-1} are the variables that can be used to predict income next period and ρ_{it} is the conditional correlation between shocks to log non-financial income and the log stock return. We assume that non-financial income follows:

$$ln\omega_{it} = p_{it} + \varepsilon_{it},$$

where:

$$p_{it} = g_{it} + p_{it-1} + \eta_{it},\ \varepsilon_{it} \sim N(0,\sigma_{\varepsilon t}^2),\ \eta_{it} \sim N(0,\sigma_{\eta i}^2),$$

and

$$cov(\varepsilon_{it}, \varepsilon_{is}) = 0,\ cov(\eta_{it}, \eta_{is}) = 0,\ cov(\varepsilon_{it}, \eta_{is}) = 0 \text{ for each t, s.}$$

The variable p_{it} represents the permanent income component of non-financial income. It has a drift term (g_{it}) that is known and based on the information available at t-1. This allows us to write:

$$ln\omega_{it} - ln\omega_{it-1} = p_{it} - p_{it-1} + \varepsilon_{it} - \varepsilon_{it-1} = g_{it} + \varepsilon_{it} - \varepsilon_{it-1} + \eta_{it},$$

or

$$ln\omega_{it} = ln\omega_{it-1} + g_{it} + \eta_{it} + \varepsilon_{it} - \varepsilon_{it-1}$$

This implies:

$$E(\omega_{it}|\omega_{it-1}, X_{it-1}) = ln\omega_{it-1} + g_{it} = \omega_{i,t-1}\, G_{it}\, exp\{J_{it}/2\}$$

$$Var(\omega_{it}|\omega_{it-1}, X_{it-1}) = (\omega_{i,t-1}\, G_{it})^2\, exp(J_{it})\, \{ exp(J_{it}) - 1\},$$

where:

$$G_{it} = exp(g_{it}),\ J_{it} = \sigma_{\eta i}^2 + 2\sigma_{\varepsilon i}^2$$

and $X_{i,t-1}$ is the set of variables usable to predict g_{it}. In order to estimate $E(\omega_{it}|\omega_{it-1}, X_{it-1})$ and $Var(\omega_{it}|\omega_{it-1}, X_{it-1})$, data for the period 1990-2000, with a 5-year rolling window, based on the previous 5 years of data. Following Carrol and Samwick (1997) and Vissing-Jørgensen (2001) methodology, we regress $ln\omega_{it} - ln\omega_{it-1}$ on the set of explanatory variables $X_{i,t-1}$ and use the predicted values of such a regression as an estimate of g_{it} and the residuals as an estimate of $\eta_{it} + \varepsilon_{it} - \varepsilon_{it-1}$. The correlation between financial and non-financial income (ρ_{it}) is constructed as the conditional correlation between shocks to log non-financial income ($\eta_{it}+\varepsilon_{it}-\varepsilon_{it-1}$) and the log gross stock returns (i.e., $ln(1+R_t)$). We use rolling five-years windows to estimate the parameters.

The set of variables contained in $X_{i,t-1}$ are: demographic variables (secondary education, higher education, age, age squared, marriage status, size of the household, number of adults belonging to the household), changes in the demographic variables, industry dummies for the company the investor is working for (e.g., oil industry), dummies for the type of profession of the investor (e.g., doctor), emigration status. Following Vissing-Jørgensen (2002a), given the potential inaccuracy of estimates based on few observations, we calculate the correlation over the entire sample.

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Table 1: Descriptive statistics

This table contains the descriptive statistics of the sample. Panel A reports the general demographic characteristics (number of households for each year, members in household, adults in household, age of the oldest member of household, percentage of the sample with secondary and higher education, percentage of immigrants). Panel B reports the age and gender distribution of the sample. Panel C reports the percentage of the households paying wealth tax, having labor income, having entrepreneurial income and having real estate wealth. We report mean, standard deviation, median and inter-quartile range (IQR). They have been calculated over the whole sample (i.e., across-investors and time). The column "Representation in the sample" reports the fraction of households in the sample who pay wealth tax, earn labor or entrepreneurial income or hold real estate wealth. The other columns report statistics (Mean, Standard Deviation, IQR, Maximum) of, respectively, the value wealth, labor and entrepreneurial income gross yearly income) and real estate. All monetary values are in Swedish krowns (SEK).

Panel A: General demographic characteristics

Variable	*Mean*	*Median*	*Std.Dev.*	*IQR*	*Maximum*
Number of households	292,901	291,913	647	686	293,320
# of members in household	2.67	2.00	1.51	3.00	16.00
# of adults in household	1.77	2.00	0.69	1.00	9.00
Age of oldest household member	49.28	47	17	24	107
% with secondary education	43.5%	43.5%	0.6%	0.5%	44.3%
% with higher education	31.4%	31.2%	1.4%	1.4%	33.7%
% of immigrants	16.4%	16.3%	2.7%	4.6%	19.3%

Panel B: Age and gender distribution of the sample

Age	*Males*	*Females*	*Age of oldest household member*
0-19	18.2%	17.2%	0.5%
20-29	4.8%	4.9%	10.7%
30-39	7.1%	8.2%	21.7%
40-49	7.4%	7.4%	23.6%
50-59	5.9%	5.3%	17.9%
60+	6.6%	7.2%	25.8%
Total	49.9%	50.2%	100%

Panel C: Wealth and income characteristics of the households

Variable	*Representation in the sample*	*Mean*	*Median*	*Std.Dev.*	*I. Q. R.*	*Maximum*
Wealth-Tax Payers	7.9%	359,592	102,700	2,648,521	353,400	1,023,147,857
Real Estate Holders	54.6%	449,400	387,000	348,736	340,000	78,140,000
Labor Income Earners	100.0%	321,489	287,722	237,526	276,190	43,445,271
Entrpr.Income Earners	9.8%	88,114	43,268	172,565	111,726	7,320,000

Table 2: Differences in portfolio allocations due to college-based interaction

This table reports the results of Mean test and different Median tests of the differences of portfolios by alumni of different colleges. For each individual *i*, stock *j* and college *c*, we proceed as follows. First, for each college, we trace the investors who attended it and are present in our dataset in 1995. For each of them we identify their portfolio holdings and the fraction of their portfolios represented by each stock. This gives us the percentage investment (defined as fraction of the portfolio of the investor) of the *ith* investor who attended the *cth* college and invested in the *jth* stock. Second, we group the stocks into classes based on book-to-market, size and beta. Then, for each classification we consider three sub-groups: low, medium and high (i.e., bottom 33%, intermediate 33% and top 33%). Finally, for each college we calculate the average percentage investment in each sub-group of stocks of the investors who attended the college. This is done for each pair stock/college. The same procedure is repeated for the years 1995, 1996, 1997, 1998, 1990 and 2000. The tests are performed on the differences between portfolios. As a proxy of liquidity, we use the ratio of bid-ask spread to price. Beta is determined by running CAPM-style regression using 52 weeks of returns. All variables refer to end of the month of December. We report corresponding statistics and *p-values*.

	Mean Test		**Kruskal-Wallis Test**		**Median One-Way Test**		**Van der Waerden One-Way Test**		**Savage One-Way Test**	
Portfolios	*F-value*	*Prob>F*	χ^2	*Pr* > χ^2	χ^2	*Pr* > χ^2	χ^2	*Pr* > χ^2	χ^2	*Pr* > χ^2
Small Size	1.75	0.0030	67.00	0.0035	67.83	0.0029	63.76	0.0074	68.40	0.0025
Medium Size	2.26	<.0001	88.93	<.0001	84.15	<.0001	91.65	<.0001	87.45	<.0001
Large Size	1.31	0.0950	69.05	0.0021	68.25	0.0026	67.21	0.0033	68.73	0.0023
Low Market-to-Book	2.47	<.0001	97.46	<.0001	89.12	<.0001	92.19	<.0001	95.26	<.0001
Medium Market-to-Book	2.03	0.0001	84.16	<.0001	80.16	0.0002	83.08	<.0001	82.70	<.0001
High Market-to-Book	1.82	0.0012	81.33	0.0001	85.67	<.0001	74.70	0.0007	84.16	<.0001
Low Liquidity	1.42	0.0475	57.26	0.0297	45.92	0.2074	54.78	0.0481	57.96	0.0258
Medium Liquidity	2.25	<.0001	89.87	<.0001	94.51	<.0001	83.72	<.0001	93.61	<.0001
High Liquidity	1.55	0.0158	77.15	0.0003	75.80	0.0004	76.11	0.0003	76.60	0.0003
Small Beta	2.20	<.0001	89.11	<.0001	83.86	<.0001	86.08	<.0001	87.49	<.0001
Medium Beta	1.68	0.0047	72.82	0.0012	76.57	0.0004	71.67	0.0015	76.99	0.0004
Large Beta	1.87	0.0008	81.42	0.0001	81.06	0.0001	84.12	<.0001	81.43	0.0001

Table 3: College-based interaction and portfolio choice

This table reports the results for estimation of the demand of investors for risky assets. Panel A reports the estimates of the fraction of stock portfolio of individual investors (in excess of the market portfolio weights) as a function of four measures of social interaction (college-based, geographical, professional and education interaction) and control variables. The base specification contains, on top of the proxies for social interaction, a constant, the level of wealth of the investor (aggregate financial and real estate wealth) and his debt, the return and volatility of the stock in the prior 12 months, size (logarithm of market capitalization), the stock market-to-book ratio, its bid-ask-spread and the dividend yield. A second specification also contains demographic variables, such as a variable that proxies for the individual abilities of the members of the household (ability), the size of the household (i.e., the number of members in the household), the age and the square of the age of oldest member of the household. A third specification adds the hedging variables. These are the mean and volatility of the non-financial income and its correlation to the stock returns and to investor's real estate income. The different moments of non-financial income (i.e., aggregate labor and entrepreneurial income) have been constructed according to the Carrol and Samwick (1997) and Vissing-Jorgenson (2002) methodology as defined above and in the Appendix. A fourth specification includes also the heritage variables, that is the variables that proxy for the economic situation of the investor when he went to College. Those are defined as a decile of a family of the investor five years prior to his entry in college. A fifth specification also adds the familiarity variables (geographical, professional and holding period-based proximity). In all specifications we also have yearly dummies. Estimates are based on N=23,928 observations. *t-statistics* is reported in parentheses. We report also the *Adjusted R-Square* and the results for *Wald test* of equality of all the social interaction variables, of the absence of all social interaction variables, and of the absence of all proximity variables. Panel B reports estimates of the fraction of the risky portfolio (i.e., stocks and mutual funds) invested in mutual funds as a function of four measures of social interaction (college-based, geographical, professional and education interaction) and control variables. The estimates for specifications I-IV are done similarly to the estimates in Panel A. N=19,603 observations are used. Panel C reports the fractions of total explained variance explained by each variable. It is defined as Partial R^2 normalized by Total R^2. We report the results for Specification V of Panel A and Specification IV of Panel B. Panel D reports the estimates of the fraction of stock portfolio of individual investors (in excess of the market portfolio weights) as a function of five measures of social interaction (college-based, bonding, geographical, professional and education interaction) and control variables. The measures of social interaction are defined in the text. All the estimates are based on a n instrumental variable methodology. We use as instruments the fundamental characteristics of the investor (gender) as well the specific characteristics of his parental family (family size, income and wealth). We also include the characteristics of the college such as the decile of labor and capital income of the students who attended the college, their gender composition and the geographical distribution of the places they were coming from.

Panel A: Stock holdings (Overall Sample)

	Specification I		*Specification II*		*Specification III*		*Specification IV*		*Specification V*	
	Estimate	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*
College-based interaction	1.524	(6.96)	1.069	(5.14)	1.249	(5.98)	1.361	(6.50)	1.401	(6.72)
Geographical Interaction	0.335	(5.32)	0.328	(5.47)	0.288	(4.78)	0.273	(4.53)	0.251	(4.17)
Professional Interaction	0.067	(0.65)	0.071	(0.71)	0.044	(0.44)	0.050	(0.50)	0.039	(0.39)
Education Interaction	-0.890	(-4.35)	-0.375	(-1.93)	-0.457	(-2.34)	-0.523	(-2.68)	-0.691	(-3.54)
Control Variables										
Return (Previous 12 months)	0.021	(4.99)	0.022	(5.52)	0.023	(5.55)	0.023	(5.71)	0.023	(5.70)
Risk	-0.051	(-1.01)	-0.115	(-2.34)	-0.119	(-2.41)	-0.116	(-2.35)	-0.051	(-1.01)
Bid-Ask Spread	0.003	(1.74)	0.006	(3.63)	0.006	(3.69)	0.006	(3.81)	0.006	(3.38)
Size	0.034	(11.41)	0.040	(14.12)	0.040	(14.02)	0.040	(14.03)	0.039	(13.28)
Market-to-Book Ratio	0.000	(-0.71)	0.000	(-0.15)	0.000	(-0.07)	0.000	(-0.01)	0.000	(0.22)
Dividend Yield	-0.036	(-4.06)	-0.006	(-0.77)	-0.005	(-0.59)	-0.005	(-0.64)	-0.006	(-0.76)
Wealth	-0.256	(-56.12)	-0.302	(-65.75)	-0.302	(-65.69)	-0.303	(-65.36)	-0.304	(-65.59)
Debt	0.010	(9.36)	0.008	(7.33)	0.008	(7.23)	0.007	(6.99)	0.008	(7.16)
Ability			0.011	(3.52)	0.005	(1.55)	0.004	(1.17)	0.004	(1.24)
Size of Household			0.060	(33.54)	0.058	(31.95)	0.057	(31.68)	0.058	(31.84)
Age			0.020	(14.30)	0.022	(15.52)	0.025	(16.62)	0.024	(16.59)
Age^2			-0.017	(-12.19)	-0.019	(-13.59)	-0.022	(-14.81)	-0.022	(-14.77)
Non-Financial income (Level)					-0.005	(-1.31)	-0.007	(-1.73)	-0.007	(-1.78)
Non-Financial income (Volatility)					-0.006	(-1.96)	-0.007	(-2.27)	-0.005	(-1.88)
Corr(Non-Financial Income, Stock Returns)					-0.005	(-0.85)	-0.006	(-1.10)	-0.006	(-1.07)
Corr(Non-Financial Income, Real Estate)					-0.058	(-11.68)	-0.054	(-10.83)	-0.053	(-10.69)
Parental Status (Labor Income decile)							0.008	(10.53)	0.007	(10.41)
Parental Status (Capital Income decile)							-0.003	(-3.77)	-0.003	(-3.95)
Geographic Proximity									0.010	(4.95)
Professional Proximity									0.005	(1.03)
Holding Period-based Proximity									0.013	(6.88)
Intercept	1.716	(44.88)	1.213	(25.38)	1.175	(24.35)	1.093	(22.18)	1.150	(22.24)
Time Dummies	YES		YES		YES		YES		YES	
Adj R-Square	0.1788		0.2371		0.2519		0.2529		0.2536	

Wald Test of Differential Impact	χ^2	Pr > χ^2	χ^2	Pr > χ^2	χ^2	Pr > χ^2	χ^2	Pr > χ^2	χ^2	Pr > χ^2
All Social Interaction Variables are equal	54.4	<0.0001	25.4	<0.0001	30.9	<0.0001	35.0	<0.0001	42.1	<0.0001
All Social Interaction Variables = 0	217.2	<0.0001	157.1	<0.0001	191.6	<0.0001	202.3	<0.0001	177.7	<0.0001
All Proximity Variables = 0									77.8	<0.0001

Panel B: Mutual Funds (Overall Sample)

	Specification I		*Specification II*		*Specification III*		*Specification IV*	
	Estimate	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*
College-based interaction	-0.280	(-12.92)	-0.275	(-12.67)	-0.276	(-12.66)	-0.282	(-12.83)
Geographical Interaction	0.065	(6.29)	0.060	(5.81)	0.059	(5.66)	0.057	(5.53)
Professional Interaction	0.047	(2.73)	0.044	(2.58)	0.046	(2.69)	0.046	(2.68)
Education Interaction	0.157	(5.29)	0.152	(5.00)	0.164	(5.39)	0.164	(5.37)
Control Variables								
Wealth	0.008	(4.09)	0.004	(1.93)	0.005	(1.97)	0.004	(1.88)
Debt	-0.003	(-3.45)	-0.003	(-3.34)	-0.002	(-3.12)	-0.003	(-3.22)
Ability			0.000	(0.00)	0.003	(0.94)	0.004	(1.05)
Size of Household			0.004	(3.42)	0.004	(3.08)	0.004	(3.13)
Age			-0.002	(-1.99)	-0.003	(-2.94)	-0.003	(-2.85)
Age^2			0.003	(2.54)	0.004	(3.43)	0.004	(3.34)
Non-Financial income (Level)					0.000	(-0.08)	0.000	(0.00)
Non-Financial income (Volatility)					-0.016	(-6.00)	-0.016	(-6.01)
Corr(Non-Financial Income, Stock Returns)					-0.012	(-0.65)	-0.012	(-0.62)
Corr(Non-Financial Income, Real Estate)					0.008	(2.19)	0.008	(2.10)
Parental Status (Labor Income decile)							-0.001	(-1.33)
Parental Status (Capital Income decile)							0.001	(1.99)
Intercept	0.865	(57.46)	0.905	(36.07)	0.938	(36.66)	0.938	(35.64)
Time Dummies	YES		YES		YES		YES	
Adj R-Square	0.0068		0.0076		0.0095		0.0101	
Wald Test of Differential Impact	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$
All Social Interaction Variables equal	197.53	<0.0001	183.67	<0.0001	187.6	<0.0001	191.09	<0.0001
All Social Interaction Variables =0	197.5	<0.0001	184.23	<0.0001	188.04	<0.0001	191.71	<0.0001

Panel C: Fraction of explained variance due to different determinants (College-based Specification)

	Partial R^2/Total R^2	
Variables	**Stock Picking**	**Mutual Fund Investing**
College-based interaction	16.31%	1.62%
Geographical Interaction	1.18%	6.09%
Professional Interaction	0.08%	0.00%
Education Interaction	0.00%	11.06%
3		
Control Variables		
Return (Previous 12 months)	0.51%	
Risk	0.00%	
Bid-Ask Spread	0.20%	
Size	2.98%	
Market-to-Book Ratio	0.00%	
Dividend Yield	0.00%	
Wealth	49.58%	0.62%
Debt	0.75%	1.74%
Ability	0.00%	1.86%
Size of Household	16.41%	44.00%
Age and Age^2	4.71%	10.07%
Non-Financial income (Level)	0.08%	2.86%
Non-Financial income (Volatility)	0.08%	0.12%
Corr(Non-Financial Income, Stock Returns)	1.81%	4.10%
Corr(Non-Financial Income, Real Estate)	0.00%	0.50%
Parental Status (Labor Income decile)	1.73%	2.49%
Parental Status (Capital Income decile)	0.27%	0.25%
Geographic Proximity	0.47%	
Professional Proximity	0.00%	
Holding Period-based Proximity	0.90%	
Time Dummies	1.61%	12.63%

Panel D: Stock holdings (Bonding-based Sample)

	Specification I		*Specification II*		*Specification III*		*Specification IV*		*Specification V*	
	Estimate	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*	*Estimate*	*t-test*
College-based interaction	0.999	(2.66)	1.579	(4.39)	1.332	(3.72)	1.170	(3.29)	0.989	(2.58)
Bonding-based interaction	3.617	(2.96)	2.107	(1.77)	2.264	(1.93)	3.010	(2.58)	3.510	(2.88)
Geographical Interaction	0.498	(8.80)	0.398	(7.28)	0.400	(7.35)	0.408	(7.53)	0.403	(7.44)
Professional Interaction	0.141	(1.21)	-0.011	(-0.10)	0.042	(0.37)	0.087	(0.78)	0.112	(0.99)
Education Interaction	-1.420	(-2.87)	-1.786	(-3.77)	-1.466	(-3.12)	-1.268	(-2.71)	-1.165	(-2.38)
Control Variables										
Return (Previous 12 months)	0.025	(5.67)	0.027	(6.52)	0.027	(6.41)	0.027	(6.45)	0.026	(6.19)
Risk	-0.046	(-0.83)	-0.030	(-0.56)	-0.053	(-0.99)	-0.058	(-1.10)	-0.006	(-0.12)
Bid-Ask Spread	0.004	(2.41)	0.006	(3.91)	0.006	(4.02)	0.006	(4.05)	0.006	(3.65)
Size	0.044	(10.39)	0.056	(13.74)	0.054	(13.27)	0.053	(12.98)	0.051	(11.23)
Market-to-Book Ratio	0.000	(0.02)	0.000	(1.18)	0.000	(1.06)	0.000	(0.98)	0.000	(1.07)
Dividend Yield	0.000	(-2.05)	0.000	(1.09)	0.000	(1.41)	0.000	(1.30)	0.000	(1.15)
Wealth	-0.260	(-54.88)	-0.304	(-62.73)	-0.305	(-63.38)	-0.306	(-63.44)	-0.307	(-63.55)
Debt	0.010	(9.43)	0.008	(7.17)	0.007	(7.14)	0.007	(6.88)	0.007	(7.06)
Ability			0.010	(3.26)	0.004	(1.39)	0.004	(1.11)	0.004	(1.23)
Size of Household			0.061	(33.55)	0.059	(32.41)	0.059	(32.05)	0.059	(32.05)
Age			0.020	(14.28)	0.022	(15.56)	0.024	(16.78)	0.024	(16.78)
Age^2			-0.017	(-12.45)	-0.019	(-13.90)	-0.022	(-15.26)	-0.022	(-15.24)
Non-Financial income (Level)					-0.006	(-1.45)	-0.008	(-1.97)	-0.008	(-2.06)
Non-Financial income (Volatility)					-0.005	(-1.90)	-0.006	(-2.11)	-0.005	(-1.68)
Corr(Non-Financial Income, Stock Returns)					0.009	(1.69)	0.007	(1.30)	0.007	(1.32)
Corr(Non-Financial Income, Real Estate)					-0.056	(-11.49)	-0.053	(-10.80)	-0.052	(-10.71)
Parental Status (Labor Income decile)							0.007	(10.08)	0.007	(10.16)
Parental Status (Capital Income decile)							-0.002	(-3.23)	-0.002	(-3.42)
Geographic Proximity									0.008	(3.51)
Professional Proximity									0.005	(0.96)
Holding Period-based Proximity									0.012	(6.13)
Intercept	1.613	(29.57)	1.048	(17.29)	1.044	(17.34)	0.969	(16.20)	1.026	(15.26)
Time Dummies	YES		YES		YES		YES		YES	
Adj R-Square	0.2289		0.2779		0.2871		0.2909		0.2930	
Wald Test of Differential Impact	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$	χ^2	$Pr > \chi^2$
	7.1	0.0079	19.3	<.0001	13.8	0.0002	10.8	0.001	6.7	0.0099
Bonding-based interaction = 0	8.7	0.0031	3.1	0.077	3.7	0.0532	6.7	0.0099	8.3	0.004
All Social Interaction Variables are equal	44.8	<.0001	33.9	<.0001	27.3	<.0001	24.4	<.0001	25.1	<.0001
All Social Interaction Variables = 0	162.0	<.0001	173.7	<.0001	168.8	<.0001	169.6	<.0001	137.7	<.0001
All Proximity Variables = 0									46.6	<.0001

Table 4: Interaction and stock returns: Pooled Regressions

This table reports the result of linear regression of returns on the set of stock characteristics. Panels A and B are based on measures of intensity/dispersion of college-based interaction, while Panels C and D are based on measures of intensity/dispersion of bonding-based interaction. We define $Intensity_j = \sum_{c=1}^{C}\left(\sum_{i=1}^{I}\frac{N_{ijc}}{\sum_{c=1}^{C}\sum_{i=1}^{I}N_{ijc}}\right)^2$, where N_{ijc} is the number of shares that individual *i* who graduated from college *c* holds in company *j*. We also define measure of the difference of opinions as: $Dispersion_j = \sum_{c=1}^{C} w_{jc} \sum_{g\neq c}^{C-1} w_{jg}\left(f_{jg} - f_{jc}\right)$, where, for college *c*, f_{jc} (f_{jg}) is the average fraction of the portfolio invested in the *jth* stock for all the investors who went to the *cth* (*gth*) college. The weight w_{jc} (w_{jg}) represents the fraction of company's *j* equity represented in our sample that is held by the investors went to the *cth* (*gth*)college. Other notations are as in Table 3. In Panels A and C we are using measures of changes of dispersion and intensity, and in Panels B and D we are using dummies that are equal to 1 if the observation belongs to 40% of the companies with largest changes in dispersion and intensity. *ΔDispersion* is measured as changes in logarithms of *Dispersion* from year *t-1* to year *t* (i.e., $log(Dispersion_t)-log(Dispersion_{t-1})$). *ΔIntensity* is measured as changes in logs of *Intensity*. *Market-to-Book Ratio* is measured as the ratio of the market value of the company as of end of previous calendar year to the book value of common equity (previous fiscal year). *Size* is the logarithm of market value of the company as of the end of previous calendar year. *Leverage* is the ratio of debt to sum of equity and debt as of end of previous fiscal year. *Employees* is number of employees (categories 1-8) as provided by MM Partners. *Bid-Ask Spread* is bid-ask spread as of month t-2. *Price* is the price (in SEK) of a share as of *t-2*. *Return 23* is the compounded gross return for the period between months t-2 and t-3. *Return 46* the compounded gross return for the period between months t-4 and t-6. *Return 712* is the compounded gross return for the period between months t-7 and t-12. *High Tech Dummy* is a dummy equal to 1 if the company belongs to high-tech industries. *A-list* is dummy equal to 1 if the company is listed in A list at t. *Turnover* is defined as the logarithm of the ratio of shares traded to shares outstanding at month t-2. *Volume* is the trading volume (defined as the logarithm of the number of shares traded times price, in SEK) at month t-2. *DIVY* is the dividend yield of stock, defined as ratio of the dividends paid in the previous fiscal year divided by the share price at year end. We report estimations done with and without year fixed effects and for both raw returns and market-adjusted returns (residuals of market model). The estimations are done using heteroscedastisity-consistent estimator. All the estimates are multiplied on 100. Trading volume estimates are multiplied on 1e12.

Panel A: Value-based Estimation
College-based Interaction

	Raw Returns								Market-Adjusted Returns							
	I		II		III		IV		I		II		III		IV	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
ΔDispersion	0.809	3.49	0.831	3.65	0.799	3.47	0.823	3.64	0.827	3.62	0.795	3.52	0.809	3.57	0.781	3.48
ΔIntensity	2.197	1.39	1.884	1.20	2.235	1.43	1.942	1.25	2.448	1.63	3.062	1.05	2.484	1.67	3.042	1.06
Controls																
Market-to-Book Ratio	0.024	1.06	0.027	1.19	0.025	1.15	0.027	1.21	0.025	1.16	0.024	1.07	0.025	1.12	0.023	1.02
Size	1.972	7.57	1.946	7.60	1.954	7.45	2.001	7.73	1.801	7.24	1.439	5.88	1.828	7.25	1.515	6.07
Leverage	0.043	0.28	0.173	1.09	0.080	0.52	0.200	1.26	0.070	0.43	0.063	0.38	0.113	0.69	0.092	0.55
Employees	-0.261	-1.81	-0.246	-1.72	-0.279	-1.96	-0.270	-1.92	-0.245	-1.72	-0.118	-0.83	-0.280	-1.98	-0.148	-1.05
Bid-Ask Spread	0.046	0.93	0.042	0.84	0.052	1.15	0.057	1.25	0.048	1.02	0.050	1.06	0.082	1.83	0.073	1.65
Price	-0.014	-5.14	-0.016	-5.98	-0.014	-5.33	-0.016	-6.30	-0.012	-5.26	-0.012	-5.21	-0.012	-5.56	-0.012	-5.47
Return 23	5.355	3.45	5.383	3.48	5.232	3.38	5.176	3.35	2.966	2.03	3.396	2.32	2.519	1.73	2.959	2.03
Return 46	-1.431	-1.91	-1.726	-2.31	-1.387	-1.87	-1.723	-2.32	-0.969	-1.36	-0.219	-0.31	-0.995	-1.41	-0.273	-0.39
Return 712	-1.287	-3.15	-1.625	-4.13	-1.239	-3.05	-1.600	-4.11	-0.723	-1.88	-0.157	-0.42	-0.725	-1.91	-0.186	-0.50
High Tech Dummy	-0.139	-0.14	-0.540	-0.56	-0.438	-0.51	-0.731	-0.86	-0.091	-0.10	-0.379	-0.41	-0.452	-0.56	-0.498	-0.62
A-list Dummy	-1.742	-4.05	-1.163	-2.75	-1.635	-3.91	-1.142	-2.75	-1.625	-3.81	-0.844	-2.02	-1.529	-3.67	-0.834	-2.02
Turnover	-0.226	-0.65	-0.384	-1.07					-0.913	-2.69	-0.726	-2.09				
Volume in SEK					-0.190	-1.09	-0.264	-1.51					-0.184	-1.90	-0.196	-2.10
Dividend Yield	-3.493	-2.15	-4.203	-2.56	-3.535	-2.17	-4.217	-2.57	-3.948	-2.50	-3.509	-2.21	-3.957	-2.50	-3.489	-2.20
Intercept	-15.711	-5.62	-16.663	-5.98	-15.311	-5.52	-16.375	-5.94	-16.593	-6.36	-17.192	-6.62	-15.036	-5.73	-16.204	-6.20
Year Fixed Effects	Yes		No		Yes		No		Yes		No		Yes		No	
Adj R2	0.040		0.033		0.040		0.032		0.029		0.016		0.027		0.015	

Panel B: Dummy-based Estimation
College-based Interaction

	Raw Returns								*Market-Adjusted Returns*							
	I		II		III		IV		I		II		III		IV	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
High Dispersion Dummy	1.234	3.40	1.229	3.39	1.192	3.39	1.205	3.43	1.310	3.71	1.322	3.73	1.196	3.49	1.223	3.56
High Intensity Dummy	0.054	0.15	-0.076	-0.22	0.152	0.44	0.046	0.13	-0.006	-0.02	-0.141	-0.42	0.075	0.22	-0.067	-0.20
Controls																
Market-to-Book Ratio	0.024	0.99	0.024	0.95	0.028	1.17	0.027	1.07	0.029	1.26	0.032	1.36	0.030	1.28	0.032	1.37
Size	2.182	8.14	2.137	8.08	2.189	8.15	2.211	8.32	2.027	7.94	1.661	6.63	2.076	8.06	1.755	6.91
Leverage	-0.141	-0.71	-0.058	-0.29	-0.131	-0.66	-0.054	-0.27	-0.113	-0.57	-0.113	-0.56	-0.105	-0.53	-0.113	-0.57
Employees	-0.351	-2.50	-0.337	-2.41	-0.389	-2.76	-0.380	-2.72	-0.351	-2.53	-0.203	-1.45	-0.405	-2.89	-0.255	-1.81
Bid-Ask Spread	0.076	1.50	0.071	1.40	0.065	1.42	0.070	1.52	0.077	1.57	0.080	1.62	0.097	2.13	0.090	1.99
Price	-0.016	-6.03	-0.019	-7.01	-0.016	-6.31	-0.019	-7.40	-0.014	-6.21	-0.014	-6.16	-0.015	-6.63	-0.015	-6.52
Return 23	4.459	3.80	4.391	3.75	4.929	4.18	4.778	4.06	2.298	2.04	2.641	2.34	2.475	2.19	2.849	2.52
Return 46	-0.809	-1.39	-1.190	-2.06	-1.040	-1.82	-1.430	-2.52	-0.622	-1.13	-0.084	-0.15	-0.872	-1.61	-0.353	-0.66
Return 712	-0.725	-1.83	-1.090	-2.71	-0.681	-1.73	-1.046	-2.62	-0.276	-0.80	0.083	0.26	-0.271	-0.78	0.088	0.27
High Tech Dummy	-0.428	-0.49	-0.825	-0.95	-0.627	-0.80	-0.923	-1.18	-0.292	-0.35	-0.563	-0.69	-0.588	-0.80	-0.650	-0.89
A-list Dummy	-2.143	-5.14	-1.469	-3.57	-2.052	-5.03	-1.467	-3.61	-2.061	-4.96	-1.244	-3.05	-1.981	-4.85	-1.252	-3.11
Turnover	0.160	0.42	0.008	0.02					-0.559	-1.54	-0.408	-1.12				
Volume in SEK					-0.267	-1.52	-0.346	-1.94					-0.257	-2.59	-0.271	-2.78
Dividend Yield	-3.372	-2.06	-4.146	-2.51	-3.479	-2.13	-4.226	-2.57	-3.885	-2.44	-3.556	-2.22	-3.935	-2.48	-3.565	-2.23
Intercept	-17.045	-6.43	-17.730	-6.70	-17.716	-6.79	-18.551	-7.12	-17.909	-7.20	-18.231	-7.38	-17.407	-7.03	-18.255	-7.41
Year Fixed Effects	Yes		No		Yes		No		Yes		No		Yes		No	
Adj R2	0.040		0.033		0.040		0.032		0.029		0.016		0.027		0.015	

Panel C: Value-based Estimation
Bonding-based Interaction

	Raw Returns								*Market-Adjusted Returns*							
	I		II		III		IV		I		II		III		IV	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
ΔDispersion	0.646	2.70	0.680	2.89	0.605	2.55	0.642	2.75	0.690	2.94	0.523	2.24	0.632	2.70	0.479	2.06
ΔIntensity	1.849	1.23	1.482	0.99	1.849	1.24	1.523	1.03	2.051	1.43	2.712	1.90	2.071	1.47	2.683	1.91
Controls																
Market-to-Book Ratio	0.023	1.03	0.028	1.22	0.025	1.10	0.028	1.26	0.026	1.17	0.027	1.18	0.025	1.12	0.026	1.15
Size	2.211	7.74	2.257	8.00	2.223	7.68	2.327	8.11	2.017	7.40	1.760	6.51	2.084	7.48	1.848	6.68
Leverage	0.061	0.35	0.157	0.89	0.091	0.52	0.182	1.04	0.113	0.61	0.023	0.12	0.151	0.81	0.056	0.29
Employees	-0.342	-2.09	-0.334	-2.06	-0.365	-2.25	-0.363	-2.27	-0.337	-2.08	-0.215	-1.32	-0.380	-2.36	-0.254	-1.57
Bid-Ask Spread	0.045	0.88	0.040	0.79	0.049	1.06	0.052	1.12	0.045	0.94	0.047	0.96	0.083	1.80	0.069	1.52
Price	-0.014	-4.98	-0.015	-5.56	-0.014	-5.16	-0.016	-5.84	-0.012	-5.07	-0.011	-4.72	-0.012	-5.37	-0.011	-4.92
Return 23	5.252	3.28	5.236	3.29	5.132	3.21	5.054	3.17	2.836	1.88	3.222	2.14	2.332	1.55	2.773	1.83
Return 46	-1.359	-1.78	-1.661	-2.19	-1.300	-1.72	-1.638	-2.17	-0.897	-1.24	-0.133	-0.19	-0.928	-1.29	-0.183	-0.25
Return 712	-1.406	-3.39	-1.718	-4.31	-1.364	-3.32	-1.699	-4.30	-0.831	-2.14	-0.215	-0.57	-0.841	-2.19	-0.249	-0.67
High Tech Dummy	-0.454	-0.45	-0.802	-0.79	-0.660	-0.72	-0.946	-1.03	-0.338	-0.35	-0.498	-0.52	-0.674	-0.77	-0.622	-0.72
A-list Dummy	-1.850	-3.90	-1.473	-3.12	-1.787	-3.83	-1.474	-3.16	-1.706	-3.62	-1.252	-2.67	-1.654	-3.55	-1.257	-2.71
Turnover	-0.213	-0.53	-0.329	-0.81					-1.060	-2.75	-0.755	-1.93				
Volume in SEK					-0.204	-1.17	-0.269	-1.53					-0.197	-2.02	-0.199	-2.12
Dividend Yield	-4.196	-2.26	-4.829	-2.59	-4.197	-2.26	-4.827	-2.59	-4.698	-2.61	-3.836	-2.13	-4.636	-2.57	-3.798	-2.11
Intercept	-16.818	-5.57	-19.143	-6.43	-16.750	-5.57	-19.114	-6.54	-17.844	-6.35	-19.948	-7.20	-16.517	-5.79	-19.015	-6.85
Year Fixed Effects	Yes		No		Yes		No		Yes		No		Yes		No	
Adj R2	0.040		0.034		0.039		0.033		0.027		0.015		0.025		0.014	

Panel D: Dummy-based Estimation
Bonding-based Interaction

	Raw Returns								Market-Adjusted Returns							
	I		II		III		IV		I		II		III		IV	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
High Dispersion Dummy	0.674	1.86	0.736	2.02	0.639	1.92	0.692	1.97	0.787	2.22	0.815	2.29	0.649	1.99	0.689	2.00
High Intensity Dummy	0.218	0.62	0.029	0.08	0.337	0.98	0.169	0.50	0.230	0.67	0.158	0.47	0.325	0.97	0.245	0.73
Controls																
Market-to-Book Ratio	0.017	0.71	0.018	0.73	0.023	0.94	0.022	0.88	0.024	1.02	0.027	1.16	0.025	1.07	0.028	1.20
Size	2.321	8.40	2.262	8.28	2.295	8.30	2.310	8.44	2.152	8.16	1.787	6.89	2.180	8.21	1.864	7.11
Leverage	-0.222	-1.12	-0.116	-0.57	-0.207	-1.05	-0.112	-0.55	-0.180	-0.91	-0.165	-0.82	-0.171	-0.86	-0.166	-0.83
Employees	-0.395	-2.74	-0.378	-2.64	-0.437	-3.01	-0.426	-2.96	-0.404	-2.81	-0.257	-1.77	-0.461	-3.17	-0.313	-2.14
Bid-Ask Spread	0.080	1.56	0.076	1.48	0.062	1.35	0.069	1.50	0.077	1.57	0.079	1.59	0.093	2.06	0.087	1.93
Price	-0.017	-6.11	-0.019	-7.05	-0.016	-6.33	-0.019	-7.41	-0.015	-6.27	-0.014	-6.13	-0.015	-6.63	-0.015	-6.45
Return 23	4.470	3.80	4.430	3.78	4.986	4.22	4.846	4.11	2.349	2.08	2.719	2.40	2.544	2.25	2.927	2.58
Return 46	-0.744	-1.28	-1.115	-1.94	-0.968	-1.70	-1.353	-2.40	-0.562	-1.02	-0.010	-0.02	-0.813	-1.51	-0.287	-0.54
Return 712	-0.738	-1.87	-1.099	-2.74	-0.691	-1.76	-1.054	-2.65	-0.280	-0.81	0.093	0.29	-0.272	-0.79	0.099	0.31
High Tech Dummy	-0.492	-0.56	-0.876	-1.00	-0.681	-0.86	-0.976	-1.23	-0.328	-0.39	-0.554	-0.67	-0.632	-0.85	-0.674	-0.91
A-list Dummy	-2.159	-5.01	-1.441	-3.37	-2.054	-4.87	-1.438	-3.41	-2.072	-4.80	-1.294	-3.05	-1.990	-4.70	-1.305	-3.11
Turnover	0.295	0.76	0.096	0.24					-0.500	-1.33	-0.394	-1.05				
Volume in SEK					-0.242	-1.38	-0.320	-1.79					-0.236	-2.39	-0.250	-2.59
Dividend Yield	-3.337	-2.03	-4.080	-2.46	-3.463	-2.11	-4.168	-2.51	-3.830	-2.39	-3.446	-2.14	-3.888	-2.43	-3.459	-2.15
Intercept	-17.187	-6.35	-18.496	-6.86	-17.893	-6.72	-19.252	-7.26	-18.472	-7.25	-19.293	-7.64	-17.890	-7.07	-19.155	-7.63
Year Fixed Effects	Yes		No		Yes		No		Yes		No		Yes		No	
Adj R2	0.040		0.033		0.040		0.032		0.029		0.016		0.027		0.015	

Table 5: College-based interaction and stock returns: Fama MacBeth Regressions

This table reports the average coefficients and time-series standard errors for 60 cross-sectional regressions for each month from January, 1997 to December, 2001. The dependent variable is the stock returns for month *t*. The results are presented using both raw and market-adjusted returns. Panel A reports the results for dispersion and intensity measures based on overall school sample. Panel B reports estimates based on the bonding-based sample. The definitions of the explanatory variables are reported in Table 4.

Panel A: College-based Interaction

	Raw Returns								***Market-Adjusted Returns***							
	I		II		III		IV		I		II		III		IV	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
ΔDispersion	0.567	2.74	0.511	2.54					0.539	2.56	0.483	2.36				
ΔIntensity	1.408	1.30	1.209	1.20					1.553	1.42	1.364	1.32				
High Dispersion Dummy					0.949	3.64	0.950	3.54					0.939	3.54	0.946	3.47
High Intensity Dummy					-0.013	-0.05	0.006	0.02					0.016	0.06	0.032	0.12
Controls																
Market-to-Book Ratio	0.074	0.93	0.054	0.80	0.103	1.91	0.106	1.94	0.077	0.97	0.057	0.82	0.108	1.97	0.112	2.01
Size	1.348	3.63	1.412	3.74	1.588	4.21	1.596	4.20	1.343	3.52	1.400	3.64	1.623	4.13	1.631	4.13
Leverage	0.099	0.45	0.114	0.54	-0.122	-0.64	-0.073	-0.41	0.044	0.19	0.056	0.26	-0.092	-0.49	-0.043	-0.26
Employees	-0.086	-0.57	-0.081	-0.53	-0.151	-1.02	-0.184	-1.15	-0.095	-0.58	-0.088	-0.54	-0.134	-0.88	-0.170	-1.03
Bid-Ask Spread	0.044	0.44	0.078	0.95	0.135	1.46	0.120	1.33	0.036	0.37	0.066	0.81	0.132	1.58	0.117	1.44
Price	-0.010	-3.53	-0.010	-3.95	-0.012	-4.49	-0.013	-4.61	-0.010	-3.60	-0.010	-4.02	-0.012	-4.78	-0.012	-4.94
Return 23	1.160	0.68	1.157	0.68	1.138	0.64	1.098	0.62	1.149	0.67	1.166	0.68	1.092	0.62	1.041	0.60
Return 46	1.962	1.49	1.592	1.28	2.210	2.05	2.023	1.85	1.578	1.14	1.207	0.93	1.890	1.91	1.700	1.71
Return 712	0.600	0.85	0.839	1.22	-0.035	-0.06	0.199	0.31	0.545	0.77	0.776	1.12	0.087	0.15	0.328	0.50
High Tech Dummy	-0.440	-0.44	-0.675	-0.79	-0.084	-0.09	0.083	0.09	-0.271	-0.27	-0.498	-0.57	-0.495	-0.58	-0.326	-0.37
A-list Dummy	-1.180	-2.43	-1.120	-2.31	-1.551	-3.37	-1.635	-3.39	-1.213	-2.43	-1.154	-2.31	-1.503	-3.30	-1.583	-3.32
Turnover	-0.324	-0.92			-0.051	-0.16			-0.280	-0.76			0.000	-1.57		
Volume in SEK			-0.345	-1.17			-0.056	-0.18			-0.339	-1.14			-0.519	-1.57
Dividend Yield	-3.783	-2.56	-3.624	-2.50	-3.380	-2.34	-3.664	-2.43	-4.033	-2.70	-3.879	-2.66	-3.420	-2.46	-3.708	-2.54
Intercept	-14.063	-3.42	-14.161	-3.41	-15.570	-3.72	-18.240	-4.33	-16.137	-3.73	-16.234	-3.75	-15.717	-3.74	-18.384	-4.39

Panel B: Bonding-based Interaction

	Raw Returns								***Market-Adjusted Returns***							
	I		II		III		IV		I		II		III		IV	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
ΔDispersion	0.390	2.36	0.350	2.12					0.370	2.20	0.329	1.97				
ΔIntensity	1.697	1.27	1.361	1.08					1.801	1.36	1.470	1.03				
High Dispersion Dummy					0.655	2.53	0.648	2.43					0.613	2.25	0.606	2.18
High Intensity Dummy					0.158	0.54	0.216	0.75					0.146	0.51	0.203	0.71
Controls																
Market-to-Book Ratio	0.094	0.61	0.104	0.66	0.097	1.84	0.100	1.90	0.098	0.63	0.107	0.68	0.100	1.86	0.103	1.93
Size	1.061	2.17	1.252	2.54	1.628	4.23	1.649	4.12	1.062	2.14	1.246	2.50	1.634	4.22	1.657	4.12
Leverage	-0.043	-0.11	0.076	0.22	-0.158	-0.81	-0.122	-0.64	-0.091	-0.23	0.026	0.08	-0.110	-0.61	-0.075	-0.44
Employees	-0.140	-0.85	-0.146	-0.87	-0.164	-1.10	-0.157	-1.03	-0.152	-0.86	-0.156	-0.88	-0.192	-1.19	-0.187	-1.14
Bid-Ask Spread	0.107	0.35	0.452	1.62	0.139	1.52	0.142	1.69	0.098	0.32	0.439	1.57	0.124	1.39	0.127	1.53
Price	-0.009	-2.82	-0.012	-3.46	-0.013	-4.60	-0.012	-4.80	-0.010	-2.87	-0.012	-3.50	-0.013	-4.73	-0.012	-4.98
Return 23	1.477	0.63	0.553	0.22	1.192	0.67	1.123	0.64	1.470	0.62	0.566	0.23	1.165	0.66	1.086	0.63
Return 46	1.542	1.02	1.363	0.92	2.330	2.14	2.007	2.00	1.161	0.74	0.982	0.64	2.169	1.98	1.849	1.85
Return 712	0.269	0.32	0.113	0.11	-0.033	-0.06	0.067	0.12	0.210	0.25	0.047	0.05	0.204	0.32	0.314	0.48
High Tech Dummy	-0.592	-0.63	-0.688	-0.80	-0.088	-0.10	-0.477	-0.55	-0.426	-0.46	-0.514	-0.59	0.081	0.09	-0.306	-0.34
A-list Dummy	-0.914	-1.73	-1.150	-2.35	-1.572	-3.31	-1.531	-3.24	-0.956	-1.77	-1.195	-2.37	-1.656	-3.31	-1.612	-3.25
Turnover	-0.739	-1.63			-0.085	-0.26			-0.694	-1.49			-0.090	-0.28		
Volume in SEK			-0.161	-0.29			-0.445	-1.28			-0.156	-0.29			-0.447	-1.29
Dividend Yield	-2.962	-1.58	-3.057	-1.63	-3.261	-2.30	-3.320	-2.42	-3.189	-1.68	-3.290	-1.74	-3.559	-2.39	-3.618	-2.50
Intercept	-11.553	-2.01	-10.999	-1.75	-16.053	-3.80	-15.975	-3.75	-13.675	-2.31	-13.129	-2.06	-18.734	-4.42	-18.663	-4.40

Table 6: Interaction and stock volatilities

This table reports the results for pooled regressions (Panel A) and Fama MacBeth regressions (Panel B) for the period January, 1997 - December, 2001. The observations are monthly. The dependent variable is the standard deviation of daily stock returns for month t. Definitions of explanatory variables are reported in Table 4. Estimates are multiplied to 1000.

Panel A: Pooled regression

	College-based Interaction				Bonding-based Interaction			
	I		II		I		II	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
ΔDispersion	-0.067	-1.39	-0.050	-1.92	-0.060	-1.76	-0.049	-1.55
ΔIntensity	-0.336	-2.10	-0.320	-2.09	-0.505	-2.75	-0.449	-2.56
Controls								
Market-to-Book Ratio	0.007	1.19	0.012	2.20	0.073	9.39	0.056	6.93
Size	-0.261	-7.83	-0.158	-4.37	-0.524	-11.58	-0.384	-7.61
Leverage	-0.263	-11.00	-0.205	-8.24	-0.327	-7.31	-0.251	-5.53
Employees	0.008	0.42	-0.038	-1.09	0.010	0.42	0.006	0.29
Bid-Ask Spread	0.061	4.24	0.051	4.01	0.061	4.69	0.043	3.26
Price	-0.002	-4.27	-0.002	-3.85	-0.002	-3.43	-0.001	-2.97
High Tech Dummy	1.027	9.40	0.741	6.47	0.804	7.78	0.621	5.83
A-list Dummy	-0.681	-12.18	-0.466	-6.17	-0.506	-6.32	-0.404	-5.19
Dividend Yield	0.315	1.51	0.172	0.90	-0.229	-0.64	-0.080	-0.24
Intercept	4.891	12.00	4.010	9.50	7.931	18.45	5.901	10.20
Lagged Dep. Var			26.940	4.89			24.368	4.48
Adj R2	0.169		0.197		0.168		0.219	

Panel B: Fama-MacBeth Estimates

	College-based Interaction				Bonding-based Interaction			
	I		II		I		II	
	Est.	t-stat	Est.	t-stat	Est.	t-stat	Est.	t-stat
ΔDispersion	-0.003	-0.14	-0.013	-0.69	-0.004	-0.43	-0.002	-0.19
ΔIntensity	-0.296	-2.53	-0.292	-2.73	-0.230	-3.03	-0.190	-2.63
Controls								
Market-to-Book Ratio	0.021	3.93	0.018	3.46	0.045	3.87	0.049	3.40
Size	-0.242	-6.60	-0.195	-6.05	-0.213	-6.08	-0.181	-5.39
Leverage	-0.115	-3.98	-0.088	-3.29	-0.138	-4.25	-0.107	-2.97
Employees	-0.007	-0.39	-0.002	-0.12	0.020	1.63	0.017	1.27
Bid-Ask Spread	0.046	4.54	0.039	3.68	0.044	2.24	0.032	1.79
Price	-0.001	-4.75	-0.001	-3.78	-0.001	-3.44	-0.001	-2.36
High Tech Dummy	0.439	6.46	0.362	5.60	0.333	4.25	0.267	3.53
A-list Dummy	-0.145	-3.24	-0.127	-2.92	-0.205	-4.06	-0.192	-3.86
Dividend Yield	-0.266	-1.48	-0.135	-0.79	-0.287	-1.42	-0.187	-0.88
Intercept	4.116	10.63	3.252	9.40	3.612	9.56	2.965	8.93
Lagged (-1) Dep. Var	31.408	8.98	25.142	8.41	38.994	10.74	31.707	8.06
Lagged (-2) Dep. Var			21.957	6.61			20.567	5.08