Sugar and Spice and Everything Nice: What Are Independent Career Directors Made of?

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Abstract

We analyze how independent non-executive directors are matched to firms in a large sample of 40,585 unique directors associated with 5,246 unique US listed firms between 1999 and 2011, focusing on personal characteristics, firm characteristics and performance, firm reputation, and macro-economic conditions. We find five characteristics that significantly predict the likelihood of an independent non-executive director obtaining a second concurrent directorship, namely firm size, stock price performance, firm risk (both stock and operating performance volatility), firm age, and the level of institutional holdings. We find little evidence that paying CEOs high excess pay or in general being nice to managers enhances the likelihood of a second directorship.

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1. Introduction

The board of directors in a firm plays a critical role in controlling principal-agent conflicts between shareholders and managers. In particular, the non-executive outside directors on the board act on behalf of the shareholders in monitoring managers, reducing agency issues and motivating managers to act on behalf of shareholders. There is however, very little research on the characteristics of these directors and the development of their careers.

This is an important issue. Extant corporate governance studies typically use the composition of the board (for example, the number of independent non-executive directors on the board, the number of other concurrent board directorships that each director holds, or the gender of the director, among others) as proxies for corporate governance. In turn, these proxies have been shown to affect firm behavior, managerial behavior, and shareholder value. For example, Core, Holthausen, and Larcker (1999) find that CEO compensation is higher when the proportion of independent directors is lower and board size is larger.

Conclusions drawn from these studies have also had significant policy implications with governments across the world typically mandating or suggesting that firms employ a significant proportion of independent non-executive directors. For example, in 1992, the Cadbury Committee in the United Kingdom (UK) issued a Code of Best Practice which recommended that boards of UK corporations include at least three outside directors. The underlying presumption was that this would lead to improved board oversight. Dahya, McConnell, and Travlos (2002) show that the negative relationship between CEO turnover and performance became stronger following the Code's issuance; and the increase in sensitivity of turnover to performance was concentrated among firms that adopted the Code. These mandates have also been adopted by other governments such as in France, China, and India, among others.

Despite this body of research and attendant policy recommendations, we still do not know much about the characteristics of these non-executive directors. We do not know why firms invite them to join boards and why these directors choose to join boards. These choices have significant implications for corporate governance. It may be, for example, that director and firm matching occurs based on the perceived character of interactions with firm management. Non-executive directors can choose to serve on "tough" boards - boards that focus on maximizing shareholder value. Alternatively, they can serve on "nice" boards – boards that are sympathetic to the chief executive officer's (CEO) concerns, forgiving in case of errors, and

generous in terms of compensation agreements. The choice is likely to depend on the tradeoffs faced both by the potential director and the firm. Bebchuk and Fried (2004) argue that entrenched boards, presumably boards selected by or that are close to management, are insulated from shareholder concerns about performance. It is plausible therefore, that tough board directors will be less likely to be hired by managers but might serve longer if the firms they serve on increase shareholder value. Similarly, it is plausible that nice board directors will be hired at greater numbers of firms but if the firms destroy shareholder value, the director's board tenure at each might be shorter. In turn, the choice has different implications for conclusions on corporate governance. Without understanding what type of candidates are appointed as non-executive board members at which types of firms, blanket recommendations on the number and the proportion of independent directors on the board are likely to prove counter-productive in many cases.

In this paper, we analyze how non-executive directors are matched to firms in a sample of 40,585 unique directors associated with 5,246 unique US firms listed on the BoardEx database. To the best of our knowledge, this is the largest sample of board members analyzed in the finance and economics literature. Most of the non-executive directors in our sample are aged between 40 and 70 years and hold only one directorship throughout their careers. A significant minority, however, about 16% of our sample, go on to obtain concurrent directorships at multiple firms. Not surprisingly, they hold the highest number of concurrent directorships later in their careers, typically in their 60s. In our sample, the maximum number of concurrent directorships held by any one director is 12. For ease of exposition, in the rest of the paper, we refer to these directors as career directors.

What distinguishes these career directors from the rest?[1] We analyze career directors along four dimensions. First, directors may be evaluated on the basis of personal characteristics. Directors who are likely to be experts in their areas, measured either in terms of their educational qualifications or prior work experience at other firms, may be more likely to be hired. Boards might prize gender diversity (Farrell and Hersch, 2005). Directors with corporate governance experience, in particular those who have served on important committees such as the

[1] We note that we cannot analyze the initial match between a first-time director and the firm because it is impossible to accurately identify the pool of potential directors the first-time directors are drawn from. We also note that our definition of a career director refers only to his career as a director. We do not exclude the possibility that these directors also have alternative occupations.

compensation committee, the nomination committee, or the compensation committee, may also be more likely to be hired. In addition, connected directors with large networks of social connections may also be more valuable.

Second and third, a prospective employer is also likely to value the performance of the director on the prior board. To measure the performance of directors, prospective employers have two options. They can measure the performance of the firm along quantitative dimensions, in terms of operating and stock price performance. Alternatively, they can examine qualitative factors –firm reputation or how the board members interacted with the management of the firm, specifically factors such as the pay granted to top management levels by the board and the entrenchment level of the management, among others. Shivdasani (1993) documents that when the CEO serves on the nominating committee to the board or when no nominating committee exists, firms appoint fewer independent outside directors and more gray outsiders with conflicts of interest. Stock price reactions to independent director appointments are significantly lower when the CEO is involved in director selection.

Finally, the performance of a director may also be affected by changes in external macro-economic factors. Oyer (2008) shows that macro-economic factors such as the state of the economy play a significant role in determining whether an MBA graduate subsequently goes on to become an investment banker. It is plausible that market performance, industry performance, and other macroeconomic factors may also influence the perceived performance of a director in obtaining a subsequent directorship.

It is important to note however that the process of matching directors to firms is a two-sided process. While the firm may choose a highly accomplished director, it may be unlikely for the director to choose to work for the firm (or even to want a second directorship at all). Similarly, while a director would like to sit on the board of a large profitable firm, the firm might not be willing to choose this director. Hence the *ex post* matched firm-director relationship may not be the *ex ante* most desired relationship. In addition, firms and directors may choose to match across multiple dimensions.

Analyzing a multi-dimensional matching problem is computationally challenging for two reasons. First, there is a significant degree of heterogeneity along each dimension on both sides of the market, which fundamentally affects the surpluses from matching. Second, in equilibrium, individual matches cannot be considered independently as in standard market models (where a

transaction takes place whenever a buyer and a seller agree on a price). Instead, a matched equilibrium is a function of the whole distribution of characteristics across multiple dimensions on both sides of the market, during which successful matches of a director with a profitable firm (say) may have strong externalities on the potential matches of an unsuccessful director with a unprofitable firm, and vice versa.

Hence we apply our methodology in two steps. Our initial analysis analyzes the ex post matched director-firm relationship without considering the ex ante *desired* matching process. We use this analysis to identify, across the sample of directors in the market, the characteristics of the directors that were matched to multiple concurrent firms (career directors) relative to those that were matched to only a single firm (non-career directors). Specifically, in our first-stage analysis, we compare the four sets of factors – the director's personal characteristics, the performance of the firm, the relationship between the board and the management, and macro-economic characteristics – at the first and subsequent directorship to examine what roles they play in the career path of a typical non-executive director. We then use Cox survival analyses to model the time to the second (and subsequent) concurrent directorship to obtain the hazard rate of obtaining a second directorship.

In the second stage of our analysis, we follow Choo and Siow (2006), in characterizing each side of the market along a single dimension. The dimensions are the ones identified as important in our first-stage analysis. In the second stage, for a single dimensional analysis, across all directors, we order the pool of the initial firms the successful directors are employed at and the pool of the subsequent firms they take employment at, by the variable in question. For each director, we calculate the corresponding percentile for the initial and subsequent firm. Regressing the subsequent firm's percentile on the initial firm's percentile ranking provides an estimate for the closeness of the match along this particular dimension. We also graph the non-parametrically smoothed density function of the matches between the first and second firms' percentiles. A perfectly positive assortative match on a particular characteristic will result in all observations evenly distributed on the diagonal of the graph. To put it another way, if firms assortatively match on a particular characteristic, a director from a firm that ranks highly (poorly) on the characteristic in question is significantly more likely to be matched with a second firm that is also ranked highly (poorly) on the same characteristic. If size is the relevant characteristic for example, this would mean that directors from large firms join the boards of other large firms. A

negative assortative match would imply that directors from large firms would join the boards of small firms.

For multiple variables, we analyze the closeness of the match along each dimension after controlling for the other relevant variables from our first stage analysis in a step by step analysis. For example, suppose the first stage analysis identifies four variables as important in distinguishing successful directors from one-time directors: firm size, a variable that has been suggested as influential in matching CEOs and firms (Gabaix and Landier, 2008), the proportion of institutional holdings as a measure of corporate governance, the stock performance of the firm and its risk. To analyze whether firm performance is an independent important factor in the matching process, we first regress the returns earned by the firm on the logarithm of firm size, the proportion of institutional holdings, and the risk of the firm, and use the same methodology on its residual.

To summarize our first-stage results, several personal characteristics of non-executive directors, such as gender, education, social network size, and prior experience appear highly significant in determining the path of a director's career. Female directors, and directors with a MBA degree, are more likely to be successful. Belonging to large social networks, having experience as a CEO, a governance committee member, or as an executive in a S&P500 firm also appear to positively correlated with success. Quantitative measures of firm performance that appear to be positively related to the likelihood of obtaining a second directorship include firm size, complexity (as proxied by the number of business segments), and stock price volatility. Qualitative measures of firm reputation that are positively related to the likelihood of obtaining a second directorship include institutional ownership while directors in firms that restate their accounts or are subject to class-action suits are less likely to be successful. Finally, consistent with Oyer (2008), macroeconomic factors, such as the state of the economy at the time of the first directorship, also shape the director's career. Directors who hold a first directorship during a recession are significantly less likely to be successful in achieving a second directorship. These results are consistent with the hypothesis that firms are unable to distinguish effectively between firm performance and director performance. Hence they are likely to attribute superior firm performance to director ability in good economic times. We also find that it is more likely for outside director to obtain a second concurrent directorship for the period after the Sarbanes-Oxley Act. The impact is statistically significant at the 1% level. The Sarbanes-Oxley Act, by

imposing more constraints on the board, appears thus to positively impact the demand side of the labor market for outside directors.

In our second-stage analysis, we compare these characteristics for the new director with the average values for the second firm where the director is hired in order to analyze what the new firm might be looking for in a new director. We show that firms look for directors from older, larger, more complex, more transparent, better governed companies, with higher past performance.

Finally, we use these variables to document whether firms and directors indeed match assortatively according to these characteristics. We find that they do. Specifically, we document five characteristics that appear highly significant in the matching process. In order, these are firm size, firm risk (return and operating performance volatility), firm stock performance, firm age, and institutional holdings. Firms also appear to match assortatively on a number of other characteristics such as growth opportunities (Tobin's Q and asset tangibility for example), but the explanatory power of these matches is considerably lower. Our results are easy to interpret intuitively. For example, directors of large firms appear to accept positions at similarly large firms. Similarly, directors at high performing firms match with other high performing firms for their second directorships. Among all characteristics available to our analysis, to our surprise, *none* exhibits a pattern of negative assortative matching.

Overall, our results contribute to increasing our understanding on what it takes to make a career board director. We show that a handful of dimensions characterize positive assortative matches between firms and directors. Equally important, we find almost no evidence of negative assortative matching. In other words, while a poorly performing firm might wish to hire a director from a high performing firm, we find little evidence that the director will in fact join that firm. These results also have important strategic implications for directors. For example, a director who accepts a directorship at a small firm is significantly less likely to ever obtain a second directorship. If he does obtain one however, it is overwhelmingly likely to be at another small firm.

The paper is organized as follows. Section 2 discusses extant literature on board careers. Section 3 discusses our data and methodology. Section 4 reports our empirical results on the determinants of career success of directors, focusing on board member characteristics, firm characteristics, firm reputation, and macroeconomic circumstances. Section 5 compares firm and

board characteristics of firms associated with the first and the second subsequent directorships at the point when the director obtains a second directorship. Section 6 analyzes the assortative firm-director matching model using variables significant in sections 4 and 5. Section 7 concludes.

2. Literature Review

The career concerns literature typically relates firm performance or agent effort to the agent's career concerns. This literature studies a wide variety of agents. For example, Fee and Hadlock (2003) document that executives who move to CEO positions at new employers come from firms that exhibit above average stock price performance and this relationship is more pronounced for more senior executives. Chevalier and Ellison (1999) show younger mutual fund managers follow incentives to avoid unsystematic risk and to "herd" into popular sectors. Brown, Goetzmann, and Park (2001) document similar relationships for hedge fund managers. Wu and Zang (2009) show that analysts with greater experience and experienced stars, in particular, are more likely to be promoted to research executive positions following mergers of their employing firms.

Despite this large body of research on career concerns of agents in general, there is very little research on tying the career concerns of board directors in particular, to shareholder value. A few studies show that "tough" directors, who are committed to improving shareholder value at the expense of managerial comfort, perform well in the market for directorships. Coles and Hoi (2003) examine the relation between a board's decision to reject the anti-takeover provisions of Pennsylvania Senate Bill 1310 and the subsequent labor market opportunities of those board members. They show that directors rejecting all protective provisions of SB1310 are significantly more likely to gain additional external directorships and retain their internal slot on the board of that current firm. For external board seats, they also show that their results are driven by non-executive directors who are not members of the management team. Similarly, Ashraf, Chakrabarti, Fu, and Jayaraman (2010) test whether directors are valued more when they tailor the choice of antitakeover provision (ATP) levels to firm characteristics or whether CEOs seek directors with inclination for uniform and high ATP levels. They examine how changes in ATP levels and approval of value creating/destroying acquisitions affect the careers of nonexecutive directors and argue that directors who apply ATP provisions depending on whether they improve shareholder value are more likely to be rewarded. Wu (2004) finds that departing

board members whose firms are publicly named as poorly governed by CalPER's corporate governance program, are less likely to take up future directorships. Ertimur, Ferri, and Stubben (2010) show that directors on boards that implement non-binding majority vote shareholder proposals that they initially opposed are significantly less likely to lose their board seat and other directorships.

However, other papers show that tough directors are not necessarily rewarded by additional directorships. Marshall (2010) reports that directors who resign in dissent from their board, experience a net loss in board seats of 85% over the five year period following the dispute, suggesting that dissenting directors are not able to recover the seat they give up by obtaining additional board seats at other public firms. In addition, "nice" directors – directors on boards who are more inclined to give managers their freedom of action, may also be successful in that they sit on many boards. In particular, Fich and White (2005) document that among large companies in 1991, about one company in seven was in a relationship whereby the CEO of one company sat on a second company's board and the second company's CEO sat on the first company's board. They argue that these reciprocal CEO interlocks primarily benefit the CEOs rather than their shareholders. Nice directors may also be nice because they are distracted by other activities. Fich and Shivdasani (2006) show that firms with busy boards exhibit lower market-to-book ratios, weaker profitability, and lower sensitivity of CEO turnover to firm performance. Non-executive but busy boards display CEO turnover-performance sensitivities indistinguishable from those of inside-dominated boards. Similarly, Ferris, Jagannathan, and Pritchard (2003) argue that directors who serve larger firms and sit on larger boards are more likely to attract directorships but find no evidence that multiple directors are associated with a greater likelihood of securities fraud litigation.

Related to our research question on the characteristics of career directors, a number of studies document the effect of board member personal characteristics, most notably gender, that affect their career prospects and performance on boards. Gul, Srinidhi, and Ng (2011) document that the stock prices of firms with gender-diverse boards reflect more firm-specific information. The relationship is stronger for firms with weak corporate governance leading them to argue that gender-diverse boards could act as a substitute mechanism for corporate governance. Farrell and Hersch (2005) show that the likelihood of a firm adding a woman to its board in a given year is negatively related to the number of women already on the board. The probability of adding a

woman is materially increased when a female director departs the board. They also document insignificant abnormal returns on the announcement of a woman added to the board, which leads them to argue that the demand for women directors is not performance based, but a response to calls for diversity. Consistent with these results, Adams and Ferreira (2009) document that female directors have better attendance records than male directors in a sample of US firms, male directors have fewer attendance problems the more gender-diverse the board is, and women are more likely to join monitoring committees. They use these results to argue that gender-diverse boards allocate more effort to monitoring. However, the average effect of gender diversity on firm performance is negative, a result driven by companies with fewer takeover defenses.

In addition to gender, a few other director-specific factors have been shown to affect their career prospects and performance on boards. Jeanjean and Stolowy (2009) report that firms with more independent boards, higher ownership concentration, and institutional ownership employ directors with above average levels of financial expertise for a sample of French firms. Güner, Malmendier, and Tate (2008) show that this does not translate into improving shareholder value - when commercial bankers join boards, financing increases but goes to firms with good credit but poor investment opportunities. Similarly, investment bankers on boards are associated with larger bond issues but worse acquisitions. Maman (2000) reports that the social capital of the directors influences whether they will be asked to join additional boards for a sample of Israeli firms between 1974 and 1988.

Finally, some studies examine how firm performance affects the career prospects of outside directors. For example, Kaplan and Reishaus (1990) examine the relation between a company's performance and its top executives' service on other boards of directors. They find that top executives of companies that reduce their dividends are significantly less likely to receive additional outside directorships than are top executives of companies that do not reduce their dividends. In addition, the probability that top executives resign from or lose outside directorships they already hold is negatively related to the performance of their own firms. Fich (2005) analyzes how the performance of the executive's current employer affects the executive's chances in getting non-executive directorships at other firms. He finds that CEOs are more likely to obtain outside directorships when the companies they head perform well. In addition, CEOs from outperforming firms are also more likely to gain directorships in organizations with growth opportunities. Fahlenbrach, Minton, and Pan (2011) show that more successful and more

powerful former CEOs are more likely to be reappointed to the board multiple times after they step down as CEOs.

To the best of our knowledge, the only other paper that directly addresses the director-firm matching process is Matveyev (2012). Matveyev considers the pool of directors and firms as a two-sided matching model and assumes that firms move first in making offers to directors.[2] In Matveyev's model, a director who has received a better offer than the one they have already accepted, resigns from the board of their least attractive firm and accepts the more lucrative offer. Hence this model does not address the possibility of concurrent directorships, the focus of our paper. In addition, like us, Matveyev is constrained in analyzing the pool of candidates that have actually been matched to firms. He has no information on the pool of potential directors that never obtained a directorship anywhere. In our analysis, since we exclusively analyze concurrent directorships, this is not an issue.

3. Data and Methodology

3.1. Data

Our sample consists of all non-executive directors serving on the boards of U.S. publicly and privately listed firms between 1999 and 2011. We obtain our data on corporate directors from the BoardEx database of Management Diagnostics Limited, which collects biographical information, past education, and employment history for directors and senior company officers. The database details the past roles of each official in a company with starting and ending dates (or years). Though BoardEx reports data only from 1999, the information on each individual's personal information and employment history date back to the 1900s. Essentially, Boardex collected information on surviving directors in 1999 and expanded the dataset backward to cover their full employment history. Thus there are individuals in our sample who became non-executive directors before 1999. For instance, the director with the longest employment history in our sample is Theodore "Ted" Rosenberg who was born in 1908. His father, Morris Rosenberg, was the founder of ABM Industries Inc. Theodore Rosenberg started his career in the firm in 1928, and was named the president of the firm at the age of 26 when his father died. He subsequently relinquished his executive role in 1989, but remained a director in the firm until 2008.

[2] The alternative assumption, that directors move to approach firms, produces a different equilibrium.

Since only the extant directors in 1999 are included in the sample, this raises the issue of survivorship bias. However, this is not a major issue in our sample. Only a small proportion of firms (816 over a total of 53,748 firm-year observations) and directors (2,207 over 289,364 director-year observations) are included in Boardex before 2000. In addition, in a robustness check, we exclude directors who enter the sample before 2000 and find broadly comparable (unreported) results to the ones reported in the paper.

In addition to the board data, we obtain financial and segment-level data from Compustat, executive compensation data from Execucomp, stock return data from the Center for Research in Security Prices (CRSP), institutional holdings data from CDA/Spectrum Institutional 13F Holdings, governance data from RiskMetrics, analyst coverage data from I/B/E/S, accounting restatement data from Audit Analytics, class action lawsuit data from the Stanford Securities Class Action Clearinghouse, and macroeconomic data from Bureau of Labor Statistics, Bureau of Economic Analysis, and the National Bureau of Economic Research. Our final sample includes 40,585 unique non-executive directors who are associated with 59,744 directorships and 5,256 unique firms from 1999 to 2011.

We identify two distinct points in the career path of each director: the point when a director joins his[3] first non-executive directorship and the point he obtains an additional *concurrent* non-executive directorship (second or more).[4] We track the directors' personal traits (age, gender, education, social ties, work experience), firm characteristics (firm size, Tobin's Q, stock returns, stock return volatility, return on assets (ROA), ROA volatility, number of segments, size of analyst following), firm reputation (accounting re-statements, class action suits) and governance quality (board size, CEO excess pay, percentage of institutional holdings), and macroeconomic conditions (industry returns, unemployment rate, GDP growth) associated with the firms where the directors acquire their first directorships, and then compare them to firms where directors subsequently are appointed to a second (or additional) directorship. Our Cox survival analyses model the probability of obtaining a second directorship based on the information associated with the first firm. In the Cox analysis, a director enters the dataset in year *t* and is tracked either till he obtains a second directorship or till the end of the sample period. The data is left-censored by construction, and it can be also right-censored in that the

[3] Directors are overwhelmingly male in our sample.
[4] If a director has given up a directorship when he obtains a second one, we treat both these directorships as independent observations.

majority of directors never obtain a second concurrent directorship. Proportional hazards models have, however, the methodological advantage of dealing with censoring issues by incorporating a positive probability that the event might never occur for cross-sectional units. The coefficient estimate from the Cox model is interpreted as the hazard rate or the probability of obtaining a second and concurrent non-executive directorship.

3.2. The sample of non-executive directors

We start our analysis by describing the sample of all non-executive independent directors in Tables 1 and 2. Panels A and B of Table 1 report descriptive characteristics of our sample of non-executive directors by calendar year and age group, respectively. The number of directors and firms are distributed almost evenly across years, with the exception of years before 2000 where, as we note, Boardex first started collecting data (as mentioned earlier, the number of directors for the period pre-2000 include a small number of surviving directors in 1999 and a larger number of surviving directors after 2000 whose information is backfilled to cover their full employment history).

Panel A shows that the average non-executive director holds a single (1.24) directorship though the maximum concurrent number is 12. On average, 16.30% of directors hold multiple directorships. As we document, even at the 90th percentile, directors hold only two concurrent directorships which justifies our analyses of the time to the second (as opposed to the third or higher) directorship. Both the average and maximum number of directorships appear to increase steadily over time, with 19.2% of the directors holding concurrent directorships in 2011.

[*Insert Table 1 about Here*]

Panel B reports the number and proportion of directorships by age group. The majority of non-executive directors are between 50 and 70 years old (53.86% of the total director-year observations). Non-executive directors start accumulating directorships in their 40s, and reach the pinnacles of their careers in their 60s – both the number of directorships and the proportion of directors with multiple directorships reach a director's lifetime maximum in this period. In their 60s, directors hold an average of 1.33 directorships, and 21.56% of them hold multiple directorships.

4. Determinants of the Career Paths of Non-Executive Directors

In the first-stage analysis, since there are few, if any, stylized facts on non-executive directors, we first report descriptive statistics for each set of variables (director characteristics, quantitative measures of firm performance and characteristics, qualitative measures of firm reputation, and macroeconomic circumstances) separately. Subsequently, we run Cox proportional hazard models to analyze the impact of each set of variables on the probability for a director to obtain a second and subsequent non-executive directorship.

4.1. Non-executive directors' characteristics

We report univariate characteristics of non-executive outside directors in Table 2. Panel A provides descriptive statistics for our first set of variables - director personal characteristics (age, gender, education level, experience, and number of social ties, as reported by BoardEx) at the point when directors obtain their first directorships (column A) and only for career directors, their characteristics at the point when they obtain their second (column B).[5] The last two columns report significance levels from a means and a Wilcoxon test of the difference between characteristics for all directors (including non-career directors who never obtained a second directorship) and career directors.

At the time of their first directorship, one third of non-executive directors have an MBA degree (32%), a minority holds a PhD degree (10%); and each of them holds 1.5 qualifications on average. The average non-executive director is aged 53½ years, with 17 years of working experience and more than 5 years of experience as an executive director. 91% of them are male. 36% of the directors in our sample have working experience at publicly listed firms and 50% in private firms.

[*Insert Table 2 about Here*]

Career directors have a significantly greater number of educational qualifications, and longer professional experience than non-career directors. They are more likely to have an Ivy League degree, to be a CEO or an employee of an S&P500 firm. Similarly, the age is higher – on average, it takes a director nearly four years more to obtain a second concurrent directorship. Once having served as a director, women are slightly more likely to obtain a second directorship. Career directors are significantly more likely to be connected, both in terms of their network

[5] For brevity, some of the characteristics discussed here are not reported in the table.

connections and school connections, than the average director. A significant portion of career directors serve on committees that interact regularly with management, a little over half served on the audit committee during their first directorship, 45% on the compensation committee, 39% on the nomination committee, and 37% on the governance committee.

4.2. Quantitative measures of firm performance and characteristics

The second set of variables we analyze include quantitative measures of firm performance and characteristics. Panel B of Table 2 reports descriptive statistics for all firms associated with directors (at the time they hire the director) and for firms that hired a career director (at the time the firm hired the career director). The characteristics we report are: firm age and size (market capitalization), leverage, growth opportunities (Tobin's Q, asset tangibility), prior performance (cumulative stock returns and operating income growth), industry competition (Herfindahl index based on industry assets), firm complexity (the total number of segments), and firm risk (stock return and ROA volatility).

In comparison to the universe of firms that hire directors, firms that hire career directors (with concurrent non-executive directorships elsewhere) appear to be older (5.35 years older), and larger ($3.4 billion larger in market capitalization). They are more levered and more complex. They experience a higher degree of volatility of stock and accounting returns but earn poorer stock returns. In unreported results, we also find that firms associated with career directors are followed by more analysts. These results are consistent with the hypothesis that successful directors are more likely to join larger and more visible firms later in their careers.

4.3. Qualitative measures of firm reputation

A third set of variables that might determine a director's career path is the reputation of the firms they serve. Jensen (1993) hypothesizes that reputation matters for non-executive directors incentivizing them to manage the firm on behalf of shareholders. If this reputational effect holds, non-executive directors from firms that perform well should have better director career paths.

In Panel C of Table 2, we contrast changes that occurred in both firms (the firm that initially employed the career director and the firm that subsequently employed the career director concurrently with the first firm) over the period between the two directorships. Our reputation variables include both quantitative and qualitative measures. Quantitative measures are related to

the firm's financial performance (the logarithm of average monthly stock return and the average annual return on assets (ROA)). Qualitative measures include indicator measures of corporate scandals (whether either firm announces an accounting re-statement and whether either firm is faced with a class–action lawsuit), the level of corporate governance (institutional holdings, board size) and interaction with executive compensation policies (as a proxy for generosity towards the executives).

Consistent with our results from Panel B, Panel C shows that directors appear to move to firms that earn significantly lower stock or operating returns over the intervening period. To put it simply, second firms are more likely to hire directors from better performing firms. The first firm also appears to have a higher reputation than the second, suffering significantly fewer accounting restatements and class action suits. The level of institutional holdings also appears higher in the first than the second firm. Other governance measures appear similar between the two types of firms. Finally, there appears to be no significant differences between the two firms in the level of excess executive compensation. Overall, directors in firms with a higher level of reputation seem more likely to appointed career directors.

4.4. Macroeconomic factors

A director might enjoy a more successful career, not because of his/her performance, but because of luck. To put it differently, macroeconomic conditions might impact the directors' career path. While Oyer (2008) shows how macroeconomic factors determine whether a MBA graduate influences his likelihood of becoming an investment banker, to the best of our knowledge, there have been no studies on how macroeconomic factors impact the labor market for non-executive directors.

Panel D of Table 2 reports descriptive statistics of macroeconomic factors that might impact directors' career paths. Column A of Panel D reports macroeconomic factors associated with a director's first directorship across all directors: market and industry peer returns, market and industry volatility prior to the first directorship, a dummy for recession based on the NBER index, and a dummy for the post-Sarbanes-Oxley period. Column B of Panel D reports the same macroeconomic factors associated at the time of the first directorship for the subgroup of eventual career directors.

Our results from Panel D are consistent with Oyer (2008): in comparison to other directors, eventual career directors obtain their first directorship when macro-economic

conditions are better. Directors who obtain their first directorship when market and peer returns are higher are significantly (at the 1% level) more likely to achieve a second directorship: the difference in market and peer returns are 3.6% and 2.7% for the two subgroups, respectively. Directors who obtain the first directorship when market and peer returns are more volatile are also more likely to become career directors: the differences in market and peer volatility are statistically significant. On average, 24% and 52% of candidates become directors when the economy is in a recession and for the post-SOX period, while the figures are 19% and 37% for career directors. Again the differences are statistically significant at the 1% level.

4.5. Determinants of multiple directorships: A multivariate analysis

In this section, we rely on a Cox proportional model to investigate the impact of the four groups of variables (personal characteristics of non-executive directors, quantitative measures of firm reputation and characteristics, qualitative measures of firm reputation, and macro-economic factors) on the likelihood of becoming a career director. As explanatory variables, we select the (most uncorrelated) significant variables from each group and use them in a pooled regression. Regression results are reported in Table 3.

[*Insert Table 3 about Here*]

Column 1 reports regression results on variables that represent directors' personal characteristics. In column 2, we add firm-level control variables. In column 3, we add qualitative proxies for firm reputation. Finally, in column 4, we add macroeconomic factors and run a pooled regression including all four sets of control variables. In our discussion below, we focus on factors that appear consistently significant across all models.

There is some evidence in the extant literature that directors' personal characteristics affect their performance, risk-taking behavior, and their careers (see, for example, Adams and Ferreira (2009) or Farrell and Hersch (2005) among others.) We find evidence for some of these factors in our multivariate framework. Director age appears not to be a significant determinant of the probability of a second directorship. In contrast, the coefficient on our (male) director dummy is negative and significant in all four models, indicating that male directors are less likely than female to become career directors. This result is consistent with our descriptive statistics in Panel A of Table 2: only 9.30% of non-career directors are female in contrast to 11.5% of career directors. Conditioning on being appointed a director, a female director appears significantly more likely to become a career director.

Having an MBA matters. A director with a MBA degree is significantly more likely to become a career director across all four models. The number of qualifications is not important while social network size is highly significant in obtaining a second directorship. A director with longer work experience, a CEO-director, or an S&P500 firm executive are all significantly more likely to become career directors. Some types of board experience also appear to increase the likelihood of a second directorship. A member of the governance committee in particular is significantly more likely to become a career director. Other types of board experience appear less significant.

Turning to firm-level characteristics, our most consistent finding is that firm size (logarithm of market capitalization) matters. Directors from larger firms are significantly and consistently more likely to become career directors. The effect is positive and significant at the 1% level in all models. Firm age, firm complexity, and stock return volatility are weaker explanatory variables. Oddly, growth opportunities (Tobin's Q) appear negatively related to the probability of second directorships though again the effect is not significant across all models. Industry competition does not appear to matter. The effect is insignificant in all regressions.

Proxies for the reputation of firms associated with a director's first directorship are measured between the first and second concurrent directorship, or between the first directorship and the year when the director exits the firm or our sample. They include indicator variables for whether the firm restates its earnings or is hit by a class action lawsuit, the average institutional ownership holdings, the average fraction of independent directors, the average board size, indicator variable for whether CEO pay is beyond the industry's median, and the average CEO pay over the next best pay.

Reputation matters. Across all models, a director whose firm restated its earnings or was hit by a class action lawsuit over the period between his first and second directorships (or exit) is significantly less likely to become a career director. These results are consistent with Jensen (1993). Institutional ownership, a proxy for good governance, is significantly and positively related to the likelihood of becoming a career director. Not surprisingly perhaps, the percentage of independent directors on the board is negatively related to the likelihood of a second directorship. The larger the number of independent outside directors on the board, the less likely it is that any individual director will stand out. Other measures of reputation are weaker. In particular, none of the variables on executive compensation is significant.

Finally, turning to macroeconomic factors, return volatility for the firm's peers is positively and significantly related to the likelihood of a second directorship, perhaps because in industries with highly volatile returns, it is relatively more difficult for an external firm to disentangle the director's performance from the firm's performance. In contrast, the coefficient on the recession dummy is negative and significant. An economic recession appears to reduce the likelihood of a second directorship. More interestingly, we find a positive and significant (at the 1% level) on our indicator for our post Sarbanes-Oxley indicator. The result indicates that it is more likely for non-career directors to become career directors in the post Sarbanes-Oxley period. Perhaps requirements from the Sarbanes-Oxley Act create a greater demand for qualified directors from a limited pool of potential candidates.

In summary, Table 3 identifies several factors that explain the potential likelihood of becoming a career director. In particular, gender (female), qualifications (MBA), work experience (especially S&P500 firm experience and CEO experience), social network size, experience on the firm governance committee, all impact the likelihood of becoming a career director. Directors who serve at large, complex, volatile and qualitatively reputable firms, with higher levels of institutional ownership are also more likely to become career directors. Finally, being a member of a more independent board or obtaining the first directorship during a recession act against obtaining a second directorship.

5. Firm and Board Characteristics of the First and Second Directorships

We have so far analyzed factors that might impact the career of an outside director from the perspective of the directors (his/her director characteristics, firm performance, characteristics, and reputation and macroeconomic factors). Our analysis has therefore been on the supply side of the labor market of outside directors. In this section, we explore the career paths of outside directors from the perspective of the firms that appoint career directors. Our analysis thus moves to the demand side of the market for outside directors.[6]

Our first step is to compare firm and board characteristics of the first firm (who originally appointed the career director) and the second firm (that eventually appointed the career director concurrently with the first firm) at the time the director joins the second firm. In doing so, we

[6] There is little evidence on the demand side of the market for outside directors. Hermalin and Weisbach (1998) provide a model of an endogenous choice of a board of directors. Nguyen and Nielsen (2010) report that it is costly to replace an independent director. Many firms simply do not replace directors following sudden deaths of independent directors.

attempt to analyze the *ex post* match between the two firms in which a non-executive director holds concurrent directorships. This match is likely to be informative about the demand for outside directors. Table 4 summarizes our results.

[*Insert Table 4 about Here*]

Column A of Table 4 reports firm and board characteristics of the prior firms (in which career directors served their first non-executive directorship) measured in the year when they accepted the second concurrent directorship. Column B reports descriptive firm and board statistics for the second firm in the year when the director accepted the second directorship. The last column reports a means test of the difference between variables associated with the first directorship and the second and concurrent directorship in the year of second directorship.

Comparing firm characteristics of the new director's first and second firms reveals some interesting patterns. First, firms associated with the career directors are younger (by around 2.5 years on average), smaller (by around $640 million in terms of market capitalization), with fewer tangible assets, earn lower but more volatile stock returns, have higher growth opportunities (at the mean but not the median level), are less complex (with around 4% fewer business segments), and less visible firms (followed by fewer analysts), than firms associated with the first directorship. Our results indicate that firms tend to offer a second directorship to directors from more established, larger, more complex, and more transparent companies.

In addition, governance standards appear to matter. Directors who obtain a second directorship come from firms with better governance standards, for example firms that do not suffer from class-action suits, are not likely to overpay the CEO relative to the next executive, and have greater fraction of independent directors and greater institutional ownership. Board experience is not significantly different between the board members on the first firm and the second firm.

However, this analysis only provides some stylized facts on the demand side of the market for outside directors. It ignores the supply side. While a firm might choose to offer a second directorship to a director from a larger firm, the director is not obliged to take the position. To analyze both sides of the market simultaneously, we rely on a theoretical model of markets for selective observably heterogeneous buyers and sellers, based on the economic theory of matched markets.

6. The Matching Between Directors and Firms

6.1. Literature and methodology

As noted before, decisions on second directorships are made by both sides of the market, namely by both firms and directors. The problem of matching directors to firms is akin to a marriage market. Both sexes try to maximize the individual surplus they obtain during the matching process by matching with the highest possible match across all dimensions the choice depends on. Unfortunately, a multi-dimensional matching process is analytically not very tractable for two reasons.

First, there is a considerable degree of heterogeneity across each dimension on both sides of the market, and such heterogeneity fundamentally affects the surpluses from matching. Second, in equilibrium, individual matches cannot be considered in isolation as in standard market models where a transaction takes place whenever a buyer and a seller agree on a price. Instead, a matched equilibrium is a function of the whole distribution of characteristics from both sides of the market, by which successful matches of two high types may have strong externalities on the potential matches of two low types, and vice versa. In the context of a marriage market, an attractive female matching with an unattractive male significantly affects the matching possibilities of all the remaining males and females in the market.

In our analysis therefore, we choose to focus on a single-dimension, transferable utility matching problem, and leave the highly technical problem of multiple-dimension matching for future research. We draw on Becker (1973, 1974) to argue that when both sides' characteristics are complementary in producing a match's surplus, then the matched equilibrium is assortative. In other words, firms and directors match according to their rank along the single dimension on their side.

To practically implement this argument, we follow Choo and Siow (2006, henceforth CS), who propose a simple, tractable model of matching with transferable utility. Each side of the market is categorized by a single characteristic, and draws utility from fundamental characteristics, a potential transfer from/to the partner, and an unobservable component that is independently and identically distributed according to a type-I extreme-value distribution (based on McFadden, 1974.) It follows that in equilibrium, the surplus of the match between type *i* and type *j*, Π_{ij}, must satisfy:

$$\Pi_{ij} = \frac{\mu_{ij}}{\sqrt{\mu_{0j}\,\mu_{i0}}} \quad (1)$$

where μ_{ij} is the proportion of pairs of types *i-j*, while μ_{0j} and μ_{i0} are the proportions of type *j* and type *i* who are not matched with anyone.

To practically implement this model, for a single variable analysis, across all directors, we order the pool of the initial firms the successful directors are employed at and the pool of the subsequent firms they take employment at, by the variable in question. We sort all firms into vingtiles along the variable of analysis (size for example) and for each director, calculate the corresponding vingtile ranking for the initial and subsequent firm at the time the director joins the second firm. Regressing the subsequent firm's vingtile on the initial firm's vingtile across directors then provides an estimate for the closeness of the match along this particular dimension.[7] We also graph the non-parametrically smoothed density function of the matches between the first and second firms' vingtile rankings. A perfectly positive assortative match on a particular characteristic will result in all observations evenly distributed on the diagonal of the graph. A perfectly negative assortative match would result in observations clustering on the other diagonal. For multiple variables, we analyze the closeness of the match along each dimension after controlling for the other relevant variables from our first stage analysis in a step by step analysis.

Computing the surplus also enables us to measure the importance of the matched vingtile on each pair's surplus. From equation (1), we obtain:

$$\log \mu_{ij} = \log \Pi_{ij} + \frac{1}{2}\log \mu_{0j} + \frac{1}{2}\log \mu_{i0} \quad (2)$$

We are interested in the effect of the difference between two vingtiles *i* and *j* on the log surplus function $\log \Pi_{ij}$. The difference between the first firm's vingtile rank and the second firm's vingtile rank could be thought of as a measure of mismatch. To identify its effect on surplus in a sample of all possible pairs (*i,j*), from equation (2), we simply regress $\log \mu_{ij}$ on the difference between two vingtiles, controlling for the fixed effects of vingtile *i* and vingtile *j*. The sample size is the product of the number of types *i* and the number of types *j*.

We make certain simplifying assumptions in interpreting our results. In particular, we study the firm-director complementarity in producing the surplus of matching, and abstract from

[7] This is very similar to the correlation coefficient between the two percentile measures since their variances ought to be very close (they will be the same for a large enough sample).

possible complementarities between different directors on the same board (one such complementarity comes from the limitations on board size.) We also ignore the market for debutant directors, because it contains too many characteristics unobservable to the econometrician. This exercise serves thus as an initial study of the matching problem between directors and firms, one that should be further enhanced with more technically elaborate methods in the future.

6.2. Predictive power of the first firm's characteristics on the second firm's characteristics

The results from Tables 3 and 4 show a set of factors that appear to consistently determine both the director's likelihood of obtaining a second and concurrent directorship and the choice of the second firm. In an ideal world, a multi-dimensional assortative model would inform us how the firm-director match occurs and how each matching factor contributes to the match. Such a model is unfortunately not very tractable, as it would be impossible to determine all the factors that have been taken into account in each match. We thus focus our study on a limited number of potential firm-specific matching variables from Tables 3 and 4. Our candidate set consists of all variables that are consistently significant across both tables. We ignore director-specific and macro-economic variables here since these are identical across both firms. We also eliminate all indicator variables that have more than 20% of zero or single-valued observations. For example, audit committee members are typically restricted to a maximum of three members. Hence with a limited number of outcome variables, this will lead to spurious matches.

In our final list of variables, among firm-level characteristic variables, we use firm age, size (market capitalization), industry-adjusted leverage, and growth opportunities (industry-adjusted Tobin's Q and industry-adjusted tangibility). Among firm performance variables, we use prior 3-year cumulative returns, prior 3-year return and ROA volatility, and firm visibility (analyst following). Among governance characteristics, we use the fraction of independent directors, fraction of institutional ownership, board size, CEO pay/next best pay, average board member age, percentage of MBA directors, average of the log of board connections, and average of board member experience in years.

To implement our empirical tests of assortative matching, we first rank each of the first firms and each of the second firms as a percentile of the matching variable or of the residual of the matching variables after controlling for other matching variables. To illustrate this ranking,

we report the mean and the median percentile distances across all directors in Column C of Table 4. In terms of market capitalization, our proxy for firm size, for example, the absolute mean and median of the difference in percentile ranking between firms 1 and firms 2 are 23 and 19 (percentile points), respectively. Since a percentile ranking results in many matches with too few observations, our basic analysis is based on vingtile rankings which are reported in the following tables.

To illustrate our methodology, Table 5 provides descriptive statistics for the specific example of market capitalization. We use quintile rankings in this example as it involves only a 5 by 5 match, resulting in 25 cases (cells) of quintile matches. (A vingtile match based market capitalization would result in 400 cells.) In each cell in this table, for brevity, we only report the number of directors, the growth rate, and the cumulative returns. In reality, our dataset contains much more information for firms and director in each vingtile match.

[*Insert Table 5 around Here*]

In the first row in Table 5, we report how many directors are matched to second firms for the smallest firms (lowest quintile). The first cell in the first row shows that there are 840 directors in total in the smallest quintiles where an outside director from a small (first) firm obtains a second concurrent directorship in another small (second) firm. The average market capitalizations, $55 million and $54 million for first firms and second firms, respectively, are very close. Growth opportunities as proxied by the growth rate of sales (row 3 in the cell) for the first and second firms are 40% and 113%, respectively for the two firms. Past performance, as proxied by the 3-year lagged cumulative returns, for the two sets of firms are 13.3% and 12.6% respectively.

In contrast, the fifth cell in the first row exhibits a case when a director from a small (first) firm (in the first quintile of market capitalization of all first firms) obtains a second concurrent directorship in a large (second) firm (in the fifth quintile of market capitalization of all second firms). This cells shows that there are only 101 directors who move from the smallest to the largest quintile. The average market capitalizations for the first and second firms in this cell are $80 million and $19,845 million, respectively. The growth rate of sales for the two firms are 39.2% and 37.8% for first firms and second firms, respectively, while the 3-year lagged cumulative returns are 1.9% and 55.9%, respectively.

We note that the numbers along the diagonal (directors in the first quintile matching second firms in the same quintile and so on) are much larger than off-diagonal matches suggesting that market capitalization indeed is a significant predictor of an assortative match between directors and firms. The match between the first and second firms' market capitalization is also illustrated more intuitively in Figure 1. Figure 1 depicts the non-parametrically smoothed density function of all matches by the first and second firms' size vingtiles, using a 3D plot (1.A) and a contour plot (1.B).[8] We observe a clear pattern of much higher density along the main diagonal on the contour map, suggesting that size is a primary determinant of second directorships. The matches are particularly concentrated among the smallest and the largest firms, as seen on two outstanding spikes at both ends of the range. Heavily mismatched cases (bottom right and top left corners) are very rare.

[*Insert Figure 1 around Here*]

To test this more formally, we regress the market capitalization vingtile rank for the initial firm on the second firm. If firms indeed match positively on size, the regression should result in a significant positive coefficient on market capitalization. Table 6 provides measures of the predictability of match between a director's second and first firms using vingtile matches for ten variables among our initial list of 17 variables. Column 3 reports regression coefficients for these ten variables: market capitalization, firm risk (return and ROA volatility), percentage of institutional ownership, firm performance, age, growth opportunities (Tobin's Q, sales growth, and asset tangibility) and leverage, both in isolation and after controlling for the other 9. The same procedure using the remaining seven variables produces a considerably higher level of noise, i.e. the matches seem to be more random than assortative, so in the interest of brevity, we do not report them.

Table 6 report results from OLS regressions of the second firm's vingtile on the first firm's vingtile. Rows 1 and 11 reports coefficients for the match on the logarithm of market capitalization[9], in isolation and after controlling for the other nine variables. In isolation, the first firm's size vingtile is highly significant in predicting the second firm's vingtile, with a coefficient of 0.45 (standard deviation smaller than 0.01). A difference of 50 in the first firm's size vingtile (i.e. a jump of 2 quartiles) thus translates into a difference of 23 in the second firm's

[8] The density is estimated using a bivariate kernel regression with a Gaussian kernel using an optimally data-determined bandwidth (Stata procedure by Baum, 2012)

[9] Since we only rank the firms based on market capitalization, taking the logarithm makes no difference.

size vingtile (i.e. almost one quartile.) (The distribution of vingtiles is uniform by definition, with a standard deviation of $100/\sqrt{12}$, or about 29 vingtiles.) In a perfectly assortatively matched sample, the coefficient would be exactly one. In presence of many unobservable characteristics, we certainly expect the coefficient to be far below one. However, even after controlling for the other nine variables, the explanatory power of firm size continues to be significant. The coefficient on size falls to 0.31 but is still highly significant.

[*Insert Table 6 around Here*]

Ranking all the other variables in order of their explanatory power (after controlling for the other 9 variables in each case) shows that the order of importance for career directors is return volatility, prior three year stock price performance, ROA volatility, firm age, institutional holdings, Tobin's Q, leverage, asset tangibility, and sales growth. However, we note that the last four factors appear significantly less economically important than the first six, with coefficients falling to 0.08 for Tobin's Q and becoming insignificant for sales growth once the other factors are controlled for. Hence we conclude that five factors in particular, size, firm risk (return and ROA volatility), firm performance, age and institutional holdings appear to be the most significant dimensions on which firms match assortatively.

6.3. Mismatch and matching surpluses

Using Choo and Siow's (2006) model, we next study the impact of assortative matching on the match's surplus between a director's first and second firms. As in Table 6, we report results for the 10 significant factors in the assortative matching process, both in isolation and after controlling for the other 9 factors. For each matching variable and for each director, we compute the first firm's vingtile ranking among all first firms, and then each director's second firm's vingtile ranking among all second firms. The observations are grouped into a symmetric 20×20 matrix by the two firms' vingtile rankings. We then regress the log of each cell size (number of observations) on 20 fixed effects for first firms' vingtile rankings, 20 fixed effects for second firms' vingtile rankings, and the difference (gap) in vingtiles between the first and second firm, in a sample of 400 cells. The OLS coefficient on this gap is the impact of a 1-vingtile drift from the first to the second firm on the match surplus, which is then interpolated to derive the magnitude of a 50-vingtile drift on surplus.

The results on the impact of the mismatch on the match's surplus are reported in Table 7. Consider row 2, where the coefficient on market capitalization, considered in isolation is -11.37%, significant at the one percent level. To interpret this variable, if we move a firm-director pair from no gap to a gap of 50 percentiles, the surplus is reduced by 68%. In contrast, if we move a firm-director pair from a gap of 50 percentiles to no gap, the surplus is increased by 212%. Row 11 similarly reports coefficients for the residual of the market capitalization (after controlling for the nine other matching variables) as the main matching variable. The coefficient is -9%, translating into a reduction of 50% and an increase of 101% of the surplus, if we move a firm-director pair from no gap to a gap of 50 percentile points or from a gap of 50 percentile points to no gap, respectively.

[*Insert Table 7 around Here*]

The other rows report our results for the other matching variables, in isolation and after controlling for the other variables. The results are ordered by the drop in surplus for a 50-percentile drift on surplus and are in exactly the same order as in Table 6. We note that these coefficients are all highly precise (very low standard errors). In addition, Tobin's Q, leverage, asset tangibility and sales growth appear to have the smallest effects on the surplus when firms and directors are mismatched on those dimensions. Thus, consistent with our prior results, apart from firm size, firm performance (cumulative returns and volatility), age and institutional holdings continue to appear to be the most important determinants of the surplus of the match. It is worth noting that since we do not undertake a multidimensional matching exercise, the coefficients come from different, non-nested estimation equations (each with a separate matching variable), and their sizes cannot be easily combined.

Figure 2 illustrates the relationship between mismatch and surplus across different cases. Figure 2.A shows the case of matching by log market capitalization, where the match surplus (the log of density of the matches) is plotted against the mismatch (difference in vingtile rankings between the initial and subsequent firms), using a nonparametric fitted line. Figure 2.B illustrates matching by log market capitalization, after controlling for the other nine factors. In both case, we observe a clear, homogenous, almost linear relationship between mismatch and log density as proxy for log of surplus. The difference in surplus between both ends of the range of mismatch is huge.

[*Insert Figure 2 around Here*]

Similarly, Figures 2.C, D, and E replicate the same plot for return volatility, ROA volatility, the percentage of institutional ownership, and Tobin's Q. The graphs confirm the results from the regression analysis: across the board, match surplus goes down sharply when mismatch increases. Although the relationships are somewhat less stark than for log market capitalization, the impact on surplus is always economically large in magnitude.

Finally Figure 2.F replicates the same plot for Tobin's Q. The non-parametric fitted line appears to start sloping slightly upwards when mismatches become greater, which is another reason to argue that this is not a clear determinant of a firm-director match.

6.4. Determinants of matching surpluses

In Table 7, we investigate the impact of mismatch on the match's surplus based on one matching variable, while controlling for the remaining matching variables. However, our framework allows us to go further. Specifically, it allows us to investigate if factors are complementary, in other words, whether match surpluses increase when one matching factor highly complements another matching factor. For example, a high-sales growth firm (the second firm) might be interested in hiring a director from a larger firm (the first firm) because the former might want to benefit from the director's expertise in dealing with a large firm's issues.[10] We thus specifically focus on how the match surplus is impacted when directors at large firms accept second directorships at high-growth firms.

Using the sample that includes only career directors, we compute the first firm's vingtile ranking for each director among all first firms, and the second firm's vingtile ranking among all second firms. As before, we group all observations into a symmetric matrix of 20×20 (400 cells in total) on the basis of the two firms' vingtile rankings. Using the sample of 400 cells, we again regress the log of cell size (number of observations) on the gap in vingtiles between the first and the second firm, its squared term, and various interactions of the first firms' market capitalization and proxies for the second firms' growth, while controlling for 20 fixed effects each for the two firms' vingtile rankings. Table 8 reports our results.

[*Insert Table 8 around Here*]

[10] Since previous tables show that firm size is the most significant determinant of the match between the first firm and the second firm, we use market capitalization as the matching variable.

Column 1 first shows that the impact of mismatch on the match's surplus, based on assortative matching by firm size, is nonlinear. The included squared mismatch term has a negative significant coefficient of 0.58%, implying that the cost of mismatch on surplus is strongly convex. In effect, while the marginal cost of a one-vingtile increase in mismatch is only 2.69% when the mismatch equals zero, it equals 2.69%+10×0.58%=8.49% when mismatch is 50% (10 vingtiles), and up to 2.69%+19×0.58%= 13.71% when mismatch is 95% (19 vingtiles). In all following columns, we appropriately control for this quadratic form of the mismatch.

In column 2, we address the potential complementarity between the first firm's size and second firm's growth opportunities as follows. We rank all second firms on sales growth over the past year, and identify the top decile (the fastest growing second firms). Then, in each cell among the 400, we use the fraction of top decile firms (number of fast-growing firms divided by number of observations in cell) as a proxy for whether each cell corresponds to high-growth second firms. We then multiply this fraction with an indicator of whether the first firm belongs to the top quartile in market capitalization. The resulting interaction term matches the largest first firms with the fastest-growth second firms. We thus regress the log of cell size on this variable, while including quadratic controls for the mismatch, and the fraction of high-growth second firms.[11] The resulting coefficient of 82.87%, significant at the 5% level, is the matching complementarity between a large first firm and a fast-growth second firm. To interpret this interactive effect, the match surplus would increase by 8.29% for the second firm in the top decile of growth if the director hired comes from a firm belonging to the top quartile in size (compared with the other three quartiles).

Columns 3 to 7 provide sensitivity checks for this complementarity effect. In column 3, we construct similar variables for 3-year sales growth. The complementarity effect from column 2 remains significant at 5% and increases in magnitude, though by not much, while the corresponding coefficient for 3-year sales growth is not significant. Column 4 further includes variables using all second firms with above-median growth (instead of growth in the top decile as in column 2); and column 5 interacts second firm growth with an indicator of above-median-sized first firm. In either case, the result remains robust. Finally, columns 6 and 7 use average sales growth of the second firm in each cell (instead of an indicator for the top decile of sales

[11] We do not need to control for the indicator of whether the first firm belongs to the top quartile in size, since it is already absorbed by fixed effects.

growth as in column 2), and interact it with the indicator for the first firms in the top quartile. While this interaction term is significant at 5% level as a standalone variable, once we include column 2 variables, it becomes insignificant, suggesting that the complementarity is strongly driven by the fastest growing firms hiring directors from the largest first firms.

Table 8 therefore shows a strongly robust complementarity effect along different dimensions of firm characteristics. In particular, we demonstrate strong complementarities between size and sales growth. The effect's magnitude is large, and suggests that many cases of apparent mismatches between the first and second firms might be explained by other concurrent phenomena of complementarity.

7. Conclusions

This paper analyzes how non-executive independent directors are matched to firms using a large sample of 40,585 unique directors associated with 5,246 unique US listed firms in the BoardEx database. Among the stylized facts we report, the average non-executive director is aged 53 years, with 17 years of work experience and 5 years of experience as executive director. Nearly all of them are male. The majority of non-executive directors hold multiple qualifications, with almost one-third of them holding an MBA. Social connections are important - the average number of school connections per educational institution is over 2,000. However, only around 16% of these independent directors become career directors.

Using Cox proportional hazard analyses to model the probability of a second concurrent directorship, we find that female directors, MBAs, directors with long work experience, and committee experience in particular; directors with a large education-based social network, CEOs, and executives from large, complex, volatile and reputable firms, with high levels of institutional ownership are significantly more likely to become career directors. Being member of a more independent board and obtaining the first directorship during a recession reduces the likelihood of a second concurrent directorship.

We show that firms and career directors match on a handful of dimensions – firm size, risk, performance, age, and institutional holdings. Equally important, we find almost no evidence of negative assortative matching. In other words, while a poorly performing firm might wish to hire a director from a high performing firm, we find little evidence that the director will in fact

join that firm. Finally, we adapt our methodology to address complementarities, where the likelihood of a match on one dimension is increased by matches on others.

These results have important strategic implications for directors. For example, a director who accepts a directorship at a small firm is significantly less likely to ever obtain a second directorship. If he does obtain one however, it is overwhelmingly likely to be at another small firm. Complementarities might increase this probability. For example, we show that being a director at a large firm increases the likelihood of a second directorship at a fast-growing company. However, we do not exhaustively investigate other complementarities. Can they explain important cases of matching in practice? Can directors affect the likelihood of being chosen on one dimension by excelling on others?

Our results also have implications for matching models in other labor markets. In the academic market, for example, will a PhD graduate from a non-top academic school be able to eventually find a position at a top school? If schools assortatively match on pedigree, this may be unlikely. Further research is required to answer this and other interesting questions.

References

Adams, Renée B., and Daniel Ferreira, 2009, Women in the boardroom and their impact on governance and performance, *Journal of Financial Economics* 94, 291-309.

Ashraf, Rasha, Rajesh Chakrabarti, Richard Fu, and Narayanan Jayaraman, 2010, Takeover immunity, takeovers, and the market for nonexecutive directors, *Financial Management* 39, 83-127.

Bebchuk, Lucian, and Jesse Fried, 2004. Pay without performance: The unfulfilled promise of executive compensation (Harvard University Press, Cambridge).

Becker, Gary S., 1973, A Theory of Marriage: Part I, *Journal of Political Economy* 81, 813-46.

Becker, Gary S., 1974, A Theory of Marriage: Part II, *Journal of Political Economy* 82, S11-S26.

Brown, Stephen J., William N. Goetzmann, and James Park, 2001, Careers and survival: Competition and risk in the hedge fund and CTA industry, *Journal of Finance* 56, 1869-1886.

Chevalier, Judith, and Glenn Ellison, 1999, Career concerns of mutual fund managers, *Quarterly Journal of Economics* 114, 389-432.

Choo, Eugene and Aloysius Siow, 2006, Who marries whom and why, *Journal of Political Economy* 114, 175-201.

Coles, Jeffrey L., and Chun Keung Hoi, 2003, New evidence on the market for directors: Board membership and Pennsylvania senate bill 1310, *Journal of Finance* 58, 197-230.

Core, John E., Robert W. Holthausen, and David F. Larcker, 1999, Corporate governance, chief executive officer compensation, and firm performance, *Journal of Financial Economics* 51, 371-406.

Dahya, Jay, John J. McConnell, and Nickolaos G. Travlos, 2002, The Cadbury committee, corporate performance, and top management turnover, *Journal of Finance* 57, 461-483.

Ertimur, Yonca, Fabrizio Ferri, and Stephen R. Stubben, 2010, Board of directors' responsiveness to shareholders: Evidence from shareholder proposals, *Journal of Corporate Finance* 16, 53-72.

Fahlenbrach, Rüdiger, Bernadette A. Minton, and Carrie H. Pan, 2011, Former CEO directors: Lingering CEOs or valuable resources?, *Review of Financial Studies* 24, 3486-3518.

Farrell, Kathleen A., and Philip L. Hersch, 2005, Additions to corporate boards: The effect of gender, *Journal of Corporate Finance* 11, 85-106.

Fee, C. Edward, and Charles J. Hadlock, 2003, Raids, rewards, and reputations in the market for managerial talent, *Review of Financial Studies* 16, 1315-1357.

Ferris, Stephen P., Murali Jagannathan, and A.C. Pritchard, 2003, Too busy to mind the business? Monitoring by directors with multiple board appointments, *Journal of Finance* 58, 1087-1111.

Fich, Eliezer M., 2005, Are some outside directors better than others? Evidence from director appointments by Fortune 1000 firms, *Journal of Business* 78, 1943-1972.

Fich, Eliezer M., and Lawrence J. White, 2005, Why do CEOs reciprocally sit on each other's boards?, *Journal of Corporate Finance* 11, 175-195.

Fich, Eliezer M., and Anil Shivdasani, 2006, Are busy boards effective monitors?, *Journal of Finance* 61, 689-724.

Gabaix, Xavier and Augustin Landier, 2008, Why has CEO pay increased so much?, *Quarterly Journal of Economics* 123(1), 49-100.

Gul, Ferdinand A., Bin Srinidhi, and Anthony C. Ng, 2011, Does board gender diversity improve the informativeness of stock prices?, *Journal of Accounting and Economics* 51, 314-338.

Güner, A. Burak, Ulrike Malmendier, and Geoffrey Tate, 2008, Financial expertise of directors, *Journal of Financial Economics* 88, 323-354.

Hermalin, Benjamin E. and Weisbach, Michael S., 1998, Endogenously chosen boards of directors and their monitoring of the CEO, *American Economic Review* 88, 96–118.

Jeanjean, Thomas, and Hervé Stolowy, 2009, Determinants of board members' financial expertise - Empirical evidence from France, *International Journal of Accounting* 44, 378-402.

Jensen, Michael C., 1993, The modern industrial revolution, exit, and the failure of internal control systems, *Journal of Finance* 48, 831-880.

Kaplan, Steven N., and D. Reishaus, 1990, Outside directorships and corporate performance, *Journal of Financial Economics* 27, 389-410.

Maman, Daniel, 2000, Who accumulates directorships of big business firms in Israel? Organizational structure, social capital, and human capital, *Human Relations* 53, 603-629.

Marshall, Cassandra D., 2010, Are dissenting directors rewarded?, unpublished working paper, University of Richmond.

Matveyev, Egor, 2012, How do firms and directors choose each other? Evidence from a two-sided matching model of the director labor market, unpublished working paper, University of Alberta.

McFadden, Daniel, 1974, Conditional logit analysis of qualitative choice behavior. In *Frontiers in Econometrics*, edited by Paul Zarembka (New York: Academic Press.)

Nguyen, Bang Dang, and Kasper Nielsen, 2010, The value of independent directors: Evidence from sudden death, *Journal of Financial Economics* 98, 550-567.

Oyer, Paul, 2008, The making of an investment banker: Macroeconomic shocks, career choice, and lifetime income, *Journal of Finance* 63, 2601-2628.

Shivdasani, Anil, 1993, Board composition, ownership structure and hostile takeovers, *Journal of Accounting and Economics* 16, 167-198.

Wu, Joanna Shuang, and Amy Y. Zang, 2009, What determine financial analysts' career outcomes during mergers?, *Journal of Accounting and Economics* 47, 59-86.

Wu, YiLin, 2004, The impact of public opinion on board structure changes, director career progression, and CEO turnover: Evidence from CalPERS' corporate governance program, *Journal of Corporate Finance* 10, 199-227.

Table 1: Summary Statistics

This table reports characteristics of the sample of non-executive directors. Our sample consists of all non-executive directors serving on the boards of U.S. publicly and privately listed firms between 1999 and 2011. We obtain our data on corporate directors from the BoardEx database of Management Diagnostics Limited, which collects biographical information, past education, and employment history for directors and senior company officers. BoardEx database details the past roles of each official in a company with starting and ending dates (or years) and reports data only from 1999. Information on surviving directors in 1999 are collected and expanded backward to cover their full employment history. Information on each individual's personal information and employment history dates back to the 1900s. Our sample includes people who became non-executive directors before 1999. Panel A shows the distribution of non-executive directors by year. Panel B reports the distribution of non-executive directors by age.

Panel A: Number and Proportion of Directorships by Calendar Year

Year	Firms	Number of Directorships	Number of Directors	% Directors with Multiple Directorships	Number of Directorships per Director			
					Mean	90pct	99pct	Maximum
<2000	47,347	150,497	128,006	12.8%	1.18	2.00	3.00	10.00
2000	3,934	22,270	17,881	16.8%	1.25	2.00	4.00	9.00
2001	4,059	24,549	19,708	16.8%	1.25	2.00	4.00	10.00
2002	4,182	26,303	21,168	16.6%	1.24	2.00	4.00	10.00
2003	4,291	28,552	22,984	16.5%	1.24	2.00	4.00	10.00
2004	4,458	31,192	24,985	16.9%	1.25	2.00	4.00	10.00
2005	4,592	33,030	26,262	17.4%	1.26	2.00	4.00	11.00
2006	4,718	34,520	27,307	17.7%	1.26	2.00	4.00	11.00
2007	4,887	36,059	28,305	18.3%	1.27	2.00	4.00	11.00
2008	4,858	35,924	27,985	19.2%	1.28	2.00	4.00	12.00
2009	4,561	32,843	25,732	18.9%	1.28	2.00	4.00	12.00
2010	4,348	30,314	23,594	19.6%	1.28	2.00	4.00	11.00
2011	4,044	26,996	21,246	19.2%	1.27	2.00	4.00	11.00
All	100,279	513,049	415,163	0.163	1.24	2.00	4.00	12.00
Unique	5,246	59,744	40,585	23.4%	1.47	3.00	6.00	20.00

Panel B: Number and Proportion of Directorships by Age Group

Age	Number of Directorships	Number of Directors	% Directors with Multiple Directorships	Number of Directorships per Director			
				Mean	90pct	99pct	Maximum
<20s	10	10	0.00%	1.00	1.00	1.00	1.00
20s	1,211	1,162	3.87%	1.04	1.00	2.00	3.00
30s	16,948	15,369	8.00%	1.10	1.00	3.00	6.00
40s	76,499	67,482	10.15%	1.13	2.00	3.00	10.00
50s	167,307	138,259	15.20%	1.21	2.00	4.00	11.00
60s	184,196	138,924	21.56%	1.33	2.00	4.00	12.00
70s	59,430	47,329	17.10%	1.26	2.00	4.00	11.00
80s	7,044	6,265	9.11%	1.12	1.00	3.00	6.00
>80s	404	363	9.64%	1.11	1.00	3.00	4.00
All	513,049	415,163	16.3%	1.24	2.00	4.00	12.00

Table 2: Characteristics of Outside Non-Executive Directors

This table presents descriptive statistics of personal characteristics of directors, quantitative measures of firm reputation and characteristics, qualitative measures of firm reputation and characteristics, and macroeconomic factors. Our dataset includes all directors from public firms provided by BoardEx of Management Diagnostics from 1999 to 2011. Panel A reports directors' characteristics when they first become a director and when they accumulate their second directorship (age, gender, education level, work experience (in years), work experience before becoming a director, board experience during the first directorship and second directorship, and total number of school connections.) Panel B reports quantitative proxies for firm performance and other characteristics, associated with a director's first directorship and second and concurrent directorship (firm age, market capitalization (in million), industry-adjusted leverage, industry-adjusted Tobin's Q, industry-adjusted asset tangibility, firm prior performance (stock cumulative returns and growth in operating performance), industry competition (Herfindahl index based on industry market capitalization), firm complexity (the total number of business segments), and firm uncertainty (stock return volatility and ROA volatility). Panel C reports descriptive statistics of proxies for the reputation of firms associated with a director's first directorship and of firms associated with a director's second directorship between the first and second concurrent directorship (stock return and operating return, indicator variables for whether a firm has an accounting restatement, whether a firm encounters a class action lawsuit, corporate governance characteristics (average institutional ownership, fraction of independent directors, and board size), and executive compensation (average of CEO pay over the next best pay, indicator for whether CEO pay is beyond the industry's median). Panel D reports descriptive statistics of macroeconomic factors associated with a director's first directorship and second directorship: cumulative stock market and peers' returns, and stock market and peers' return volatility, indicator variable for recession based on the NBER, and indicator variable for post Sarbanes-Oxley period. For each panel, the last column reports the parametric t-test and non-parametric Wilcoxon test of the difference between variables associated with the first directorship, and the ones with the second and concurrent directorship.

Panel A: Personal Characteristics of Non-Executive Directors

Variable	Universe of all directors at first directorship		Universe of directors at second directorship		Difference		
	Obs=42,599		Obs=9,536				
	(A) Mean	Median	(B) Mean	Median	(B) - (A)	T-Test	Wilcoxon
Personal characteristics							
Director Age	53.503	54	57.318	58	3.815	***	***
Male Director (Indicator)	0.907	1	0.885	1	-0.022	***	***
Education							
Ivy League Degree (Indicator)	0.187	0	0.278	0	0.091	***	***
Law Degree (Indicator)	0.142	0	0.150	0	0.008	**	**
MBA (Indicator)	0.322	0	0.387	0	0.065	***	***
PhD (Indicator)	0.103	0	0.112	0	0.009	**	***
Number of Qualifications	1.525	2	1.904	2	0.379	***	***
Work experience							
Work Experience (Years)	17.082	16	23.574	23	6.492	***	***
Government (Indicator)	0.073	0	0.113	0	0.040	***	***
Universities (Indicator)	0.029	0	0.035	0	0.006	***	***
Private Firm (Indicator)	0.501	1	0.454	0	-0.047	***	***
CEO (Indicator)	0.099	0	0.156	0	0.057	***	***
S&P500 (Indicator)	0.180	0	0.289	0	0.109	***	***
Board Experience							
Audit Committee (Indicator)	0.506	1.000	0.522	1.000	0.016	***	***
Compensation Committee (Indicator)	0.454	0.000	0.453	0.000	-0.001		
Nomination Committee (Indicator)	綢386	0.000	0.387	0.000	0.001		
Governance Committee (Indicator)	0.372	0.000	0.434	0.000	0.062	***	***
Connections							
School Connection Size	1,600	717	1,895	966	295	***	***

Panel B: Quantitative Measures of Firm Performance and Other Characteristics

Variable	Universe of all firms that hire a director Obs=42,599		Universe of all firms that hire a concurrent second director Obs=9,536		Difference		
	(A) Mean	Median	(B) Mean	Median	(B) - (A)	T-Tes	Wilcoxon
Firm Characteristics							
Firm Age (Years)	10.95	6.00	16.30	11.00	5.35	***	***
Market Capitalization	2597.12	266.69	6001.03	695.72	3403.91	***	***
Industry-adjusted Leverage	0.029	-0.001	0.085	0.015	0.06	***	***
Industry-adjusted Tobin's Q	0.55	0.02	0.57	0.04	0.02		***
Industry-adjusted Tangibility	0.01	0.00	0.00	0.00	0.00		**
Firm Performance							
Past 3-Yr Cumulative Return	0.48	0.23	0.39	0.16	-0.09	***	***
Past 3-Yr Growth in Operating Income	1.00	0.31	0.90	0.29	-0.10	***	
Competition							
Industry HHI	0.1	0.1	0.1	0.1	0.00		***
Complexity							
Number of Business Segments	2.4	1.0	2.9	2.0	0.48	***	***
Uncertainty							
Past 3-Yr Return Volatility	0.027	0.013	0.023	0.011	0.00	***	***
Past 3-Yr ROA Volatility	0.019	0.001	0.016	0.001	0.00	**	***

Panel C: Qualitative Measures of Firm Reputation

Variable	Firm characteristics computed between first and second directorships – First firm Obs=9,345		Firm characteristics computed between first and second directorships – Second firm Obs=9,536		Difference		
	(A) Mean	Median	(B) Mean	Median	(B) - (A)	T-Test	Wilcoxon
Firm Performance							
Average Monthly Stock Return	0.014	0.013	0.013	0.011	-0.001	***	***
Average Annual ROA	0.006	0.040	-0.008	0.035	-0.014	***	***
Corporate Scandal indicators							
Accounting Restatement	0.018	0.000	0.207	0.000	0.189	***	***
Class Action Lawsuit	0.008	0.000	0.128	0.000	0.120	***	***
Corporate Governance							
Average Institutional Holdings	0.496	0.527	0.483	0.503	-0.013	***	***
Average % of Independent Directors	0.704	0.732	0.709	0.740	0.005		
Average Board Size	9.586	9.000	9.524	9.000	-0.062		*
Executive Compensation							
Average CEO pay/next best pay	2.292	1.902	2.372	1.918	0.080		
Average CEO Excess Pay (Indicator)	0.503	0.500	0.498	0.500	-0.005		

Panel D: Macroeconomic Factors

Variable	Macroeconomic characteristics at the time of first Directorship – all directors Obs=42,599		Macroeconomic characteristics at the time of first Directorship – directors with second concurrent directorship Obs=9,345		Difference		
	(A) Mean	Median	(B) Mean	Median	(B) - (A)	T-Test	Wilcoxon
Market and industry performance							
Past 2-Yr Cumulative Market Return	0.311	0.273	0.347	0.301	0.036	***	***
Past 2-Yr Cumulative Peer's Return	0.314	0.244	0.341	0.257	0.027	***	***
Past 2-Yr Market Return Volatility	0.003	0.002	0.003	0.003	0.000		**
Past 2-Yr Peer's Return Volatility	0.030	0.022	0.032	0.023	0.002	***	***
Macro-economic factors							
Recession (Indicator)	0.236	0.000	0.187	0.000	-0.049	***	***
Post Sarbanes Oxley (Indicator)	0.515	1.000	0.373	0.000	-0.142	***	***

Table 3: Determinants of a second and concurrent outside directorship in a Cox proportional hazard model

This table reports results from Cox proportional hazard regressions for the probability that a non-executive director obtains a second non-executive directorship. Our sample includes all individuals in the BoardEx dataset with at least a non-executive directorship from 1999 to 2011. We include variables representing director characteristics, firm characteristics, macroeconomic factors, and proxies for director's efforts in pooled regressions. Director characteristics include directors' age, gender, education backgrounds, work experience, board experience, and connections. Firm characteristics include firm age, size, firm growth opportunity (Tobin's Q), competition in the firm's industry (HHI), firm complexity (number of segments), and firm uncertainty (prior return volatility). Director and firm characteristics of firms associated with the first directorship are measured when the director takes up the first directorship. Proxies for the reputation of firms associated with a director's first directorship are measured between the first and second concurrent directorship, or between the first directorship and the year when the director exits the firm or our sample. They include indicator variables for whether the firm encounters an accounting restatement or a class action lawsuit, the average of institutional ownership holding, the average fraction of independent directors, the average board size, the average CEO pay over the next best pay, indicator variable for whether CEO pay is beyond the industry's median, and the percentage of CEO excess pay. Macroeconomic conditions include variables that represent financial market conditions (market and industry past returns and volatility), and macroeconomic factors (recession and Sarbanes Oxley). Columns 1 report regression results on variables that represent directors' personal characteristics. Column 2 report regression results on proxies for directors' personal characteristics and for firm performance and other characteristics. Column 3 repeats the regression in Column 2, controlling for proxies for firm reputation. In column 4, we run a pooled regression that includes all control variables in columns 1 to 3 and macro-economic factors at the time of first directorships. Robust standard errors are estimated following Lin and Wei (1989). T-statistics are reported in brackets. *, ** and *** denote statistical significance at 10%, 5% and 1%, respectively.

Model:	(1)	(2)	(3)	(4)
A. Personal characteristics of board members				
Director Age	-0.009***	-0.010***	-0.005	-0.005
	(0.002)	(0.002)	(0.004)	(0.004)
Male Director (Indicator)	-0.207***	-0.113**	-0.230***	-0.224***
	(0.045)	(0.054)	(0.081)	(0.082)
MBA (Indicator)	0.182***	0.144***	0.221***	0.212***
	(0.032)	(0.040)	(0.065)	(0.066)
Number of Qualifications	0.058***	0.027	0.002	0.001
	(0.015)	(0.019)	(0.029)	(0.029)
Log(School Connection Size)	0.067***	0.049***	0.047**	0.049***
	(0.009)	(0.012)	(0.019)	(0.019)
Work Experience (Years)	0.013***	0.012***	0.013***	0.013***
	(0.001)	(0.002)	(0.003)	(0.003)
CEO (Indicator)	0.582***	0.427***	0.360***	0.360***
	(0.041)	(0.051)	(0.080)	(0.080)
S&P500 (Indicator)	0.495***	0.314***	0.417***	0.385***
	(0.034)	(0.042)	(0.067)	(0.068)
Audit Committee (Indicator)	-0.038	0.010	0.155***	0.176***
	(0.029)	(0.036)	(0.060)	(0.061)
Compensation Committee (Indicator)	-0.036	0.048	0.128**	0.155**
	(0.029)	(0.036)	(0.059)	(0.061)
Nomination Committee (Indicator)	-0.243***	-0.093*	-0.087	-0.108
	(0.041)	(0.051)	(0.083)	(0.085)
Governance Committee (Indicator)	0.250***	0.136***	0.158*	0.201**
	(0.040)	(0.050)	(0.082)	(0.084)
B. **Firm performance and other characteristics**				
Firm Age (Years)		-0.000	0.006***	0.007***
		(0.001)	(0.002)	(0.002)
Log(Market Capitalization)		0.139***	0.229***	0.206***
		(0.010)	(0.026)	(0.026)
Industry-adjusted Tobin's Q		-0.016	-0.067***	-0.055**
		(0.010)	(0.025)	(0.025)
Industry HHI		0.044	-0.162	-0.105
		(0.177)	(0.310)	(0.314)
Log(Segment Count)		-0.040	0.136***	0.121***
		(0.026)	(0.042)	(0.043)
Past 3-Yr Return Volatility		0.543	6.981***	5.406***
		(0.545)	(1.023)	(1.158)
C. **Firm reputation**				
Accounting Restatement (Indicator)			-1.081***	-1.072***
			(0.183)	(0.181)
Class Action Suit (Indicator)			-1.153***	-1.151***
			(0.276)	(0.277)
Average Institutional Holdings			0.681***	0.435**
			(0.170)	(0.173)
Average % of Independent Directors			-1.164***	-1.524***
			(0.216)	(0.223)
Average Board Size			-0.039**	-0.022
			(0.016)	(0.016)
Average CEO pay/next best pay			-0.159	-0.125
			(0.113)	(0.114)

CEO Excess Pay (Indicator)			-0.126	-0.347
			(3.074)	(3.004)
% of CEO Excess Pay			-0.002	-0.002
			(0.017)	(0.017)
D. Macroeconomic factors				
Past 2-Yr Cumulative Peer's Returns				-0.028
				(0.056)
Past 2-Yr Peer's Return Volatility				3.147***
				(1.068)
Recession (Indicator)				-0.151*
				(0.078)
Post Sarbanes Oxley (Indicator)				0.480***
				(0.072)
$\chi 2$	1137	838.2	569.5	661.3
Prob. > $\chi 2$	0	0	0	0
Observations	24,066	14,283	6,415	6,408

Table 4: The differences in firm characteristics between the first and second directorship

This table reports descriptive statistics of the differences in firm characteristics between the first and second non-executive directorships when directors get their second non-executive directorships. Section A reports the characteristics of the firms in which these directors serve their first non-executive directorship in the year of their second directorship. Section B reports descriptive statistics for the characteristics of the firm of the second directorship in the year of second directorship. Section C. considers each director's first firm's percentile among all first firms, second firm's percentile among all second firms, computes the absolute difference in percentiles, and reports the mean and the median across all directors. Section D reports the parametric t-test and non-parametric Wilcoxon test of the mean difference between variables associated with the first directorship, and the ones with the second and concurrent directorship at the year of the second directorship. Our dataset include all directors from public firms provided by BoardEx of Management Diagnostics from 1999 to 2011.

Variable	A. First Directorship Obs=9345		B. Second Directorship Obs=9536		C. Percentile Distance		D. Difference		
	(A) Mean	Median	(B) Mean	Median	Mean	Median	(A)-(B)	T	Wilcoxon
Firm Characteristics									
Firm Age (Years)	18.841	14.000	16.301	11.000	28	23	2.540	***	***
Market Capitalization	6640.670	819.955	6001.032	695.723	23	19	639.638	*	***
Industry-adjusted Leverage	0.101	0.021	0.085	0.015	32	27	0.016		
Industry-adjusted Tobin's Q	0.457	0.056	0.568	0.040	31	26	-0.111	***	
Industry-adjusted Tangibility	0.009	0.000	0.004	-0.001	32	27	0.005	**	***
Firm Performance									
Past 3-Yr Cumulative Return	0.470	0.218	0.390	0.164	26	20	0.080	***	***
Past 1-Yr Sales Growth	0.673	0.081	1.065	0.088	30	25	-0.392	**	***
Competition									
Industry HHI	0.087	0.058	0.084	0.056	25	19	0.003	*	*
Complexity									
Number of Business Segments	3.055	3	2.893	2	26	22	0.162	***	***
Uncertainty									
Past 3-Yr Return Volatility	0.022	0.011	0.023	0.011	21	15	-0.001	***	**
Past 3-Yr ROA Volatility	0.015	0.001	0.015	0.001	28	24	0.000		*
Firm Visibility									
Analyst Following	9.770	8.000	9.222	7.000	28	24	0.548	***	***
Corporate Governance									
Institutional Holdings	0.557	0.600	0.522	0.556	24	19	0.035	***	***
% of Independent Directors	0.739	0.778	0.733	0.778	27	23	0.006	*	
Board Size	9.569	9	9.584	9	24	17	-0.015		
Corporate Scandal									
Past 3-Yr Accounting Restatement (Ind.)	0.177	0	0.179	0	11	0	-0.002		
Past 3-Yr Class Action Suit (Indicator)	0.089	0	0.102	0	7	0	-0.013	**	**
Board Experience									
Audit Committee (Indicator)	0.517	1	0.522	1	19	0	-0.005		
Compensation Committee (Indicator)	0.454	0	0.453	0	21	0	0.001		
Nomination Committee (Indicator)	0.378	0	0.387	0	21	1	-0.009		
Governance Committee (Indicator)	0.431	0	0.434	0	21	0	-0.003		
CEO Relationship									
CEO pay/next best pay	2.284	1.754	2.411	1.768	33	29	-0.127	*	
Excess Pay (Indicator)	0.3	0	0.259	0	17	2	0.041	***	***

Table 5: Descriptive statistics of the quintile match of the first and second firms

This table describes the match between the first and second firms for second directors. For each director, we compute the first firm's quintile ranking among all first firms, and the second firm's quintile ranking among all second firms. A cell numbered (a,b) among the 5×5 cells represents all directors whose first firm is in the a^{th} quintile, and whose second firm is in the b^{th} quintile. In each cell, we report the number of directors, and the evolution of averages of (1) market capitalization, (2) growth rate of sales, and (3) cumulative returns over 3 years from the first firm to the second firm. In each cell, the first row reports the number of firms; the second row the average of first and second firms' market capitalization respectively; the third row the average of first and second firms' growth rate of sales; the fourth row the average of first and second firms' three-year lagged cumulative returns, respectively.

Market capitalization of first firms	**Quintiles of Market Capitalization for second firms**					
	Q1 (Smallest)	**Q2**	**Q3**	**Q4**	**Q5 (Largest)**	**Total/Average**
Q1 (Smallest)	**840** M$:55-->54 40.0%-->112.9% 13.3%-->12.6%	**456** M$:63-->250 25.4%-->37.9% 7.5%-->43.7%	**296** M$:65-->684 8.0%-->32.7% -5.2%-->55.0%	**173** M$:69-->2,074 19.9%-->32.5% 13.5%-->79.7%	**101** M$:80-->19,845 39.2%-->37.8% 1.9%-->55.9%	1,866 M$:61-->1,452 27.6%-->62.3% 8.3%-->33.6%
Q2	**426** M$:284-->59 18.6%-->263.9% 39.9%-->-4.2%	**467** M$:282-->247 48.0%-->177.2% 44.2%-->20.7%	**438** M$:289-->693 40.0%-->21.8% 34.9%-->34.7%	**331** M$:280-->2,057 40.0%-->21.7% 21.3%-->68.3%	**200** M$:293-->17,853 15.0%-->29.8% 15.6%-->111.5%	1,862 M$:285-->2,517 34.5%-->104.1% 33.8%-->38.3%
Q3	**276** M$:794-->61 24.8%-->24.8% 74.8%-->4.5%	**401** M$:856-->258 17.5%-->26.8% 55.9%-->28.4%	**432** M$:847-->713 28.9%-->15.7% 79.8%-->50.6%	**432** M$:871-->2,156 21.7%-->20.0% 66.7%-->89.3%	**324** M$:874-->19,011 13.4%-->27.9% 50.5%-->59.9%	1,865 M$:851-->4,031 21.4%-->22.5% 65.6%-->49.6%
Q4	**199** M$:2,516-->62 18.4%-->409.3% 63.5%-->2.1%	**333** M$:2,515-->258 20.7%-->1651.6% 81.3%-->22.0%	**398** M$:2,635-->719 14.9%-->27.8% 71.0%-->63.3%	**474** M$:2,576-->2,266 21.6%-->25.0% 74.4%-->74.3%	**465** M$:2,674-->22,854 10.7%-->18.3% 51.8%-->67.5%	1,869 M$:2,596-->6,470 17.0%-->308.8% 68.1%-->54.6%
Q5 (Largest)	**113** M$:24,773-->69 19.6%-->21.6% 83.0%-->-0.4%	**191** M$:23,069-->276 19.7%-->162.1% 119.5%-->25.5%	**294** M$:25,457-->749 15.0%-->22.7% 96.3%-->50.0%	**471** M$:23,210-->2,300 805.3%-->25.7% 91.4%-->75.9%	**800** M$:36,683-->35,071 12.2%-->18.5% 67.8%-->69.4%	1,869 M$:29,418-->15,763 214.1%-->32.8% 84.6%-->60.8%
Total/Average	1,854 M$:1,978-->58 27.2%-->167.8% 37.2%-->5.9%	1,848 M$:3,104-->255 27.1%-->392.5% 53.1%-->29.0%	1,858 M$:4,865-->711 22.8%-->23.4% 56.0%-->49.8%	1,881 M$:6,720-->2,195 227.8%-->24.1% 62.6%-->77.5%	1,890 M$:16,392-->26,687 13.5%-->22.3% 51.8%-->71.2%	9,331 M$:6,652-->6,052 67.3%-->108.7% 52.1%-->47.4%

Table 6: Predictive power of the first firm's characteristics on the second firm's characteristics

This table provides measures of the predictability of match between a second director's second and first firms. Each of the first ten rows treats a matching variable among ten variables: market capitalization, 3-year lagged return volatility, institutional ownership, 3-year cumulative stock returns, firm age, 3-year lagged ROA volatility, past year sales growth, industry-adjusted Tobin's Q, industry-adjusted leverage, and industry-adjusted tangibility. Each of the last ten rows treats a matching variable among the ten matching variables which is calculated as the residual of the main matching variable after controlling for the other remaining nine variables. For each matching variable, we compute each director's first firm's percentile among all first firms, and then each director's second firm's percentile among all second firms. The table reports the OLS coefficient of the second firm's percentile over the first firm's percentile. *** denotes significance at the 1% level.

Variables used for matching	Controls	1st firm percentile predicts 2rd firm percentile	Standard errors	#Observations
Log Market Capitalization		0.4531	[0.0089]***	9306
3-year Return Volatility		0.5493	[0.0109]***	5620
% Institutional Holdings		0.3432	[0.0102]***	9200
3-year Cumulative Stock Returns		0.2739	[0.0135]***	5624
Firm Age		0.2410	[0.0112]***	8169
3-year ROA Volatility		0.2364	[0.0129]***	5692
Past year sales growth		0.1216	[0.0126]***	6936
Industry-adjusted Tobin's Q		0.0586	[0.0121]***	7520
Industry-adjusted Leverage		0.0521	[0.0118]***	7441
Industry-adjusted Tangibility		0.0352	[0.0121]***	7107
Log Market Capitalization	All 9 others	0.3132	[0.0146]***	4289
3-year Return Volatility	All 9 others	0.2892	[0.0148]***	4289
3-year Cumulative Stock Returns	All 9 others	0.2554	[0.0150]***	4289
3-year ROA Volatility	All 9 others	0.2028	[0.0151]***	4289
Firm Age	All 9 others	0.1639	[0.0157]***	4289
% Institutional Holdings	All 9 others	0.1562	[0.0156]***	4289
Industry-adjusted Tobin's Q	All 9 others	0.0794	[0.0160]***	4289
Industry-adjusted Leverage	All 9 others	0.0674	[0.0155]***	4289
Industry-adjusted Tangibility	All 9 others	0.0312	[0.0156]***	4289
Past year sales growth	All 9 others	0.0183	[0.0152]	4289

Table 7: Mismatch and matching surpluses

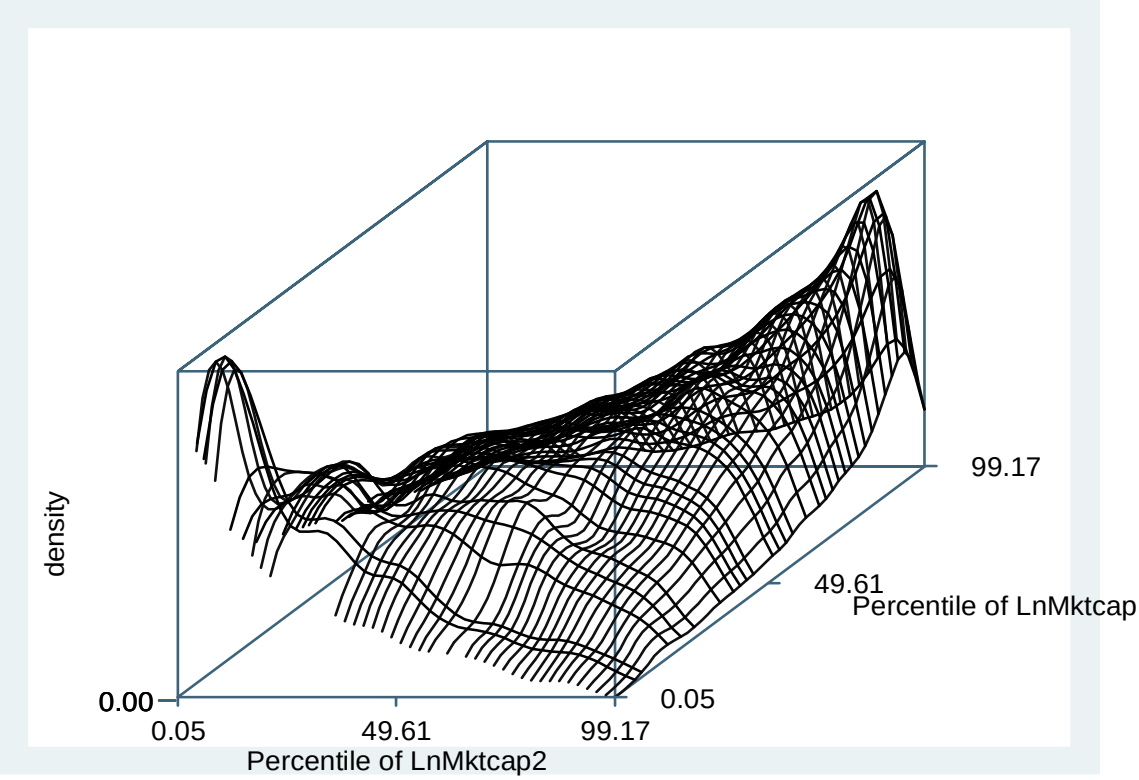
This table shows the importance of assortative matching on the match's surplus between a second director's first and second firms. Each of the first ten rows treats a matching variable among ten variables: market capitalization, 3-year lagged return volatility, institutional ownership, 3-year cumulative stock returns, firm age, 3-year lagged ROA volatility, past year sales growth, industry-adjusted Tobin's Q, industry-adjusted leverage, and industry-adjusted tangibility. Each of the last ten rows treats a matching variable among the ten matching variables which is calculated as the residual of the main matching variable after controlling for the other remaining nine variables. For each matching variable and for each director, we compute the first firm's vingtile among all first firms, then the second firm's vingtile among all second firms. Observations are ranked into 20×20 cells by the first firm's and the second firm's vingtile rankings. The log of cell size (number of observations) is regressed on 20 fixed effects for the first firm's vingtile, 20 fixed effects for the second firm's vingtile, and the gap in vingtiles between the first and second firm, in a sample of 400 cells. The OLS coefficient of this gap is the impact of a 1-vingtile drift from the first to second firm on the match surplus. It is then interpolated to compute the effects of a 50-percentile (i.e. 10-vingtile) drift on surplus: if a 1-vingtile drift reduces surplus by x, the negative effect of a 50-percentile drift is $(1-x)^{10}-1$, and the positive effect of reducing the gap by 50 percentiles is $(1-x)^{-10}-1$. *** denotes significance at the 1% level.

Variable used for matching	Controls	Effect of 1st-2nd one-vingtile difference on log surplus	Standard Errors	=> Effect of a 50-percentile drift on surplus	=> Effect of reducing 50-percentile in difference	#Observations
3-year Return Volatility		-0.1303	[0.0089]***	-73%	268%	5620
Log Market Capitalization		-0.1137	[0.0047]***	-68%	212%	9306
% Institutional Holdings		-0.0800	[0.0072]***	-55%	123%	9200
3-year Cumulative Stock Returns		-0.0689	[0.0042]***	-50%	99%	5624
3-year ROA Volatility		-0.0539	[0.0045]***	-42%	71%	5692
Firm Age		-0.0497	[0.0044]***	-39%	64%	8169
Past year sales growth		-0.0314	[0.0032]***	-27%	37%	6936
Industry-adjusted Tobin's Q		-0.0181	[0.0039]***	-17%	20%	7520
Industry-adjusted Leverage		-0.0146	[0.0027]***	-14%	16%	7441
Industry-adjusted Tangibility		-0.0118	[0.0028]***	-11%	13%	7107
Log Market Capitalization	All 9 others	-0.0698	[0.0048]***	-50%	101%	4289
3-year Return Volatility	All 9 others	-0.0651	[0.0040]***	-48%	92%	4289
3-year Cumulative Stock Returns	All 9 others	-0.0596	[0.0037]***	-45%	81%	4289
3-year ROA Volatility	All 9 others	-0.0482	[0.0040]***	-38%	62%	4289
Firm Age	All 9 others	-0.0392	[0.0037]***	-32%	48%	4289
% Institutional Holdings	All 9 others	-0.0355	[0.0048]***	-30%	43%	4289
Industry-adjusted Tobin's Q	All 9 others	-0.0227	[0.0040]***	-20%	25%	4289
Industry-adjusted Leverage	All 9 others	-0.0143	[0.0038]***	-13%	15%	4289
Industry-adjusted Tangibility	All 9 others	-0.0086	[0.0038]**	-8%	9%	4289
Past year sales growth	All 9 others	-0.0042	[0.0033]	-4%	4%	4289

Table 8: Determinants of matching surpluses

This table investigates a source of matching surplus between a director's first and second firms: directors moving from large firms to high-growth firms. All columns use market capitalization as matching variable. The sample considers only directors with a second directorship. We compute each director's first firm's percentile among all 1st firms, then each director's 2nd firm's percentile among all second firms. Observations are grouped into 20x20 cells by 1st firm's vingtile and 2nd firm's vingtile. In the population of 400 cells, the log of cell size (number of observations) is regressed on 20 fixed effects for 1st firm's vingtile, 20 fixed effects for 2nd firm's vingtile, and independent variables including the gap in vingtiles between the 1st and 2nd firm and its square. Columns (2) to (5) also include the density of the following cases in each cell: 2nd firm's growth in top 10%, 2nd firm's growth in top 10% AND 1st firm's market cap in top 25%, 2nd firm's past 3-year growth in top 10%, 2nd firm's past 3-year growth in top 10% AND 1st firm's market cap in top 25%, 2nd firm's growth in top half, 2nd firm's growth in top half AND 1st firm's market cap in top 25%, 2nd firm's growth in top 10% AND 1st firm's market cap in top half. Columns (6) and (7) include cell average sale growth and its interaction with 1st firm's market cap in top 25%. The OLS coefficients provide the effect of each mechanism on the match surplus. *** and ** denote significance at the 1% and 5% levels, respectively.

Matching variable	Market Cap (1)	Market Cap (2)	Market Cap (3)	Market Cap (4)	Market Cap (5)	Market Cap (6)	Market Cap (7)
Gap between first-second firms' vingtile rankings	-0.0269	-0.027	-0.0258	-0.0259	-0.0266	-0.037	-0.0352
	[0.0162]	[0.0169]	[0.0166]	[0.0175]	[0.0169]	[0.0162]**	[0.0173]*
Gap^2	-0.0058	-0.0059	-0.006	-0.006	-0.0059	-0.0049	-0.0052
	[0.00101]***	[0.0010]***	[0.0010]***	[0.0011]***	[0.0010]***	[0.0009]***	[0.0010]***
Firm 2's growth in top decile – Indicator		-0.2258	-0.2344	-0.1587	-0.1398		-0.0808
		[0.2533]	[0.2614]	[0.2300]	[0.2904]		[0.2483]
(Firm 1's market cap in top quartile) × (firm 2's growth in top decile)		**0.8287**	**0.9117**	**0.9412**	**1.0459**		**0.8352**
		[0.3534]**	**[0.3169]*****	**[0.2896]*****	**[0.4902]****		**[0.3229]****
Firm 2's past 3-year growth in top decile – Indicator			0.0956				
			[0.1878]				
(Firm 1's market cap in top quartile) × (firm 2's past 3-year growth in top decile)			0.3914				
			[0.4014]				
Firm 2's growth in top half – Indicator				-0.1482			
				[0.2331]			
(Firm 1's market cap in top quartile) × (firm 2's growth in top half)				-0.1338			
				[0.2845]			
(Firm 1's market cap in top half) × (firm 2's growth in top decile)					-0.3055		
					[0.4850]		
Past 1-year sales growth						-0.0307 **	-0.0293 **
						[0.0129]	[0.0136]
(Past 1-year sales growth)×(top quartile in 1st firm's market cap)						**0.0393 ****	0.015
						[0.0174]	[0.0159]
Fixed effects of each type	YES	YES	YES	YES	YES	YES	YES
Number of observations	400	400	400	400	400	400	400



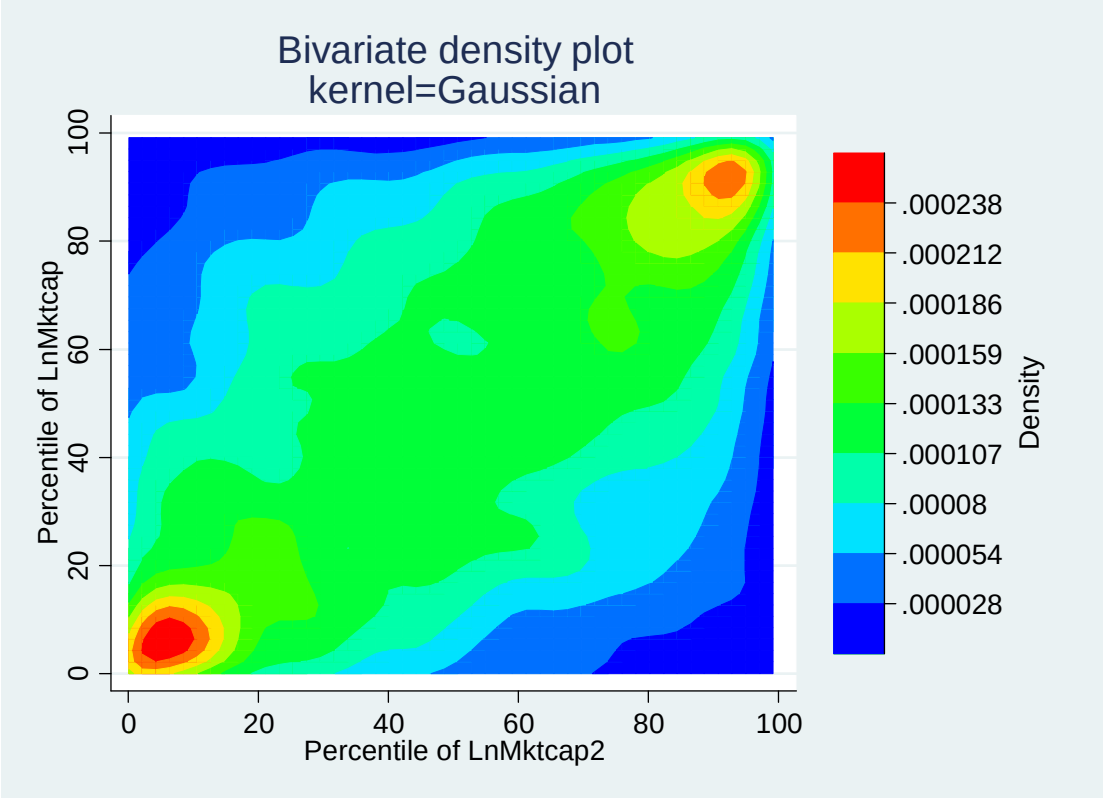
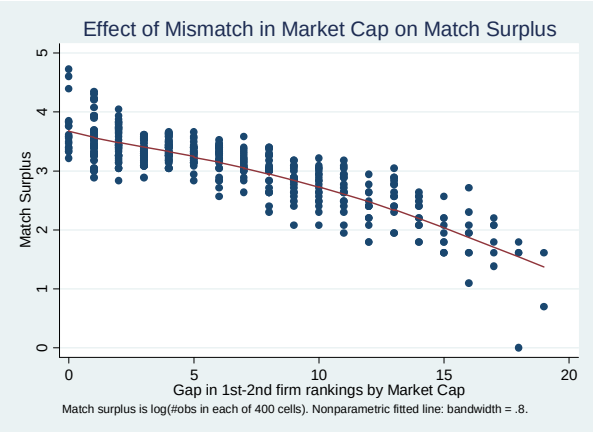


Figure 1: Density of matches between the market capitalizations for the first and second firms employing the second director: (A) 3D plot (B) Contour plot



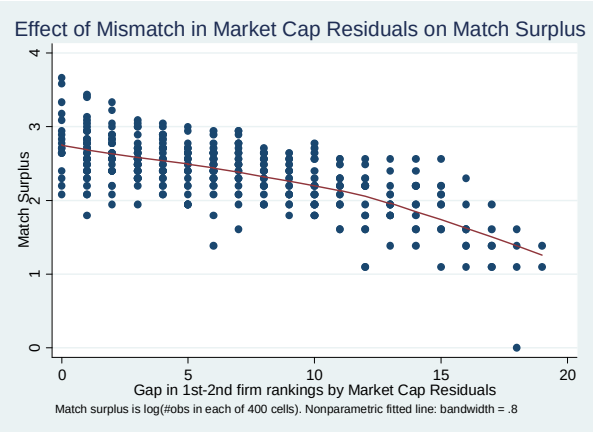
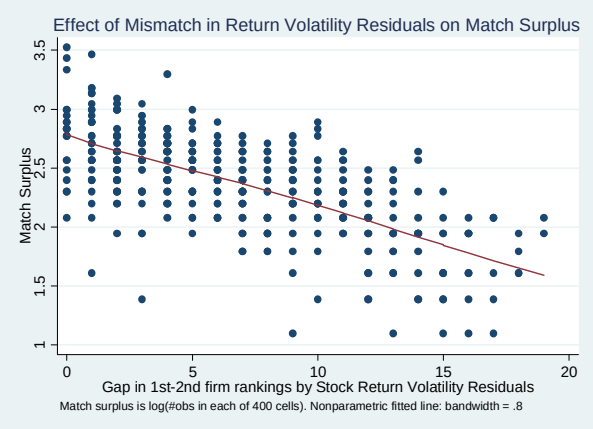


Figure 2.A-B: Match surplus (log density of #matches) vs. the percentile gap between a director's 1st and 2nd firm size percentiles, (A) without controls, and (B) controlling for the other 9 variables.



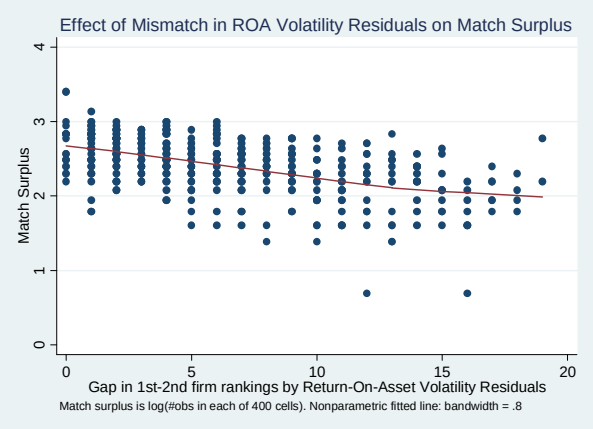
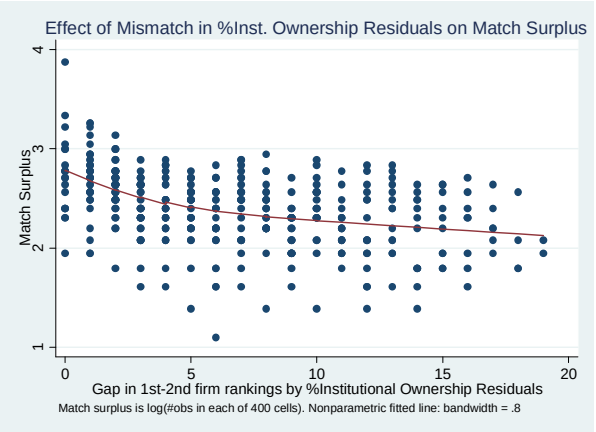


Figure 2.C: Match surplus (log density of #matches) vs. the percentile gap between a director's 1st and 2nd firm past 3-year stock return volatility, controlling for the other 9 variables.

Figure 2.D: Match surplus (log density of #matches) vs. the percentile gap between a director's 1st and 2nd firm past 3-year return-on-asset volatility, controlling for the other 9 variables.



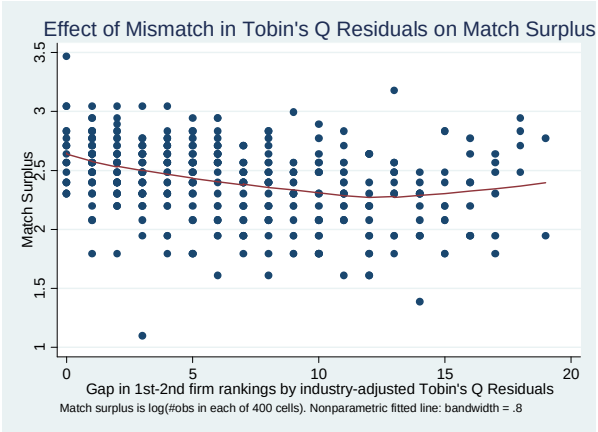


Figure 2.E: Match surplus (log density of #matches) vs. the percentile gap between a director's 1st and 2nd firm % of institutional ownership, controlling for the other 9 variables.

Figure 2.F: Match surplus (log density of #matches) vs. the percentile gap between a director's 1st and 2nd firm % of industry-adjusted Tobin's Q, controlling for the other 9 variables.