



Span of Control and Span of Activity

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Abstract

For both practitioners and researchers, span of control plays an important role in defining and understanding the role of the CEO. In this paper, we combine organizational chart information for a sample of 65 companies with detailed data on how their CEOs allocate their work time, which we define as their *span of activity*. Span of activity provides a direct measure of the CEO's management style, including the attention devoted to specific subordinates and functions, the time devoted to individual work and outside constituencies, a preference for multilateral or bilateral interaction, the degree of planning, etc. We find that CEOs with a larger number of reports spend more time with subordinates, more time on large meetings, less time on unplanned activities. The presence of a delegate, such as the COO, allows the CEO to reduce the time spent with insiders and to focus on bilateral and unplanned activities. These results suggest that time-use information is helpful in interpreting how span of control determines management style.

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I. Introduction

At least since Fayol (1918) the notion of span of control has occupied a central position in management, both in scholarly analysis and practical implementation. Span of control plays an important role in organizations and has implications for organizational structure, how decisions are made, and the interactions between supervisors and subordinates. Early studies on span of control seek to determine how many subordinates a manager can supervise (e.g., Simon, 1945, Urwick, 1956, and Woodward, 1965). While these articles were written more than fifty years ago, the notion of span of control remains relevant for organizations today. For instance, the Boston Consulting Group has a federal trademark for the term “delaying” for its distinctive approach to flattening the corporate pyramid which involves the broadening of spans of control for managers at all levels.

Traditionally, span of control is defined and measured as the number of direct subordinates a manager supervises. Since all managers “manage” at least one subordinate, span of control applies to managers at all levels throughout the organization. In this paper, we focus on the top of the organization—the span of control of the Chief Executive Officer (CEO). This is arguably the most critical locus of decision making for organizations, since the CEO and his direct subordinates are the senior executives that comprise the top management group and corporate headquarters – i.e., the governing body that sets firm strategy and allocates firm’s resources (Mintzberg, 1979).¹

This paper proposes a new empirical methodology to understand the role of span of control at the CEO level. We collect detailed time use information for a sample of CEOs and we use it to determine the share of work time that they devote to different activities and to different reports. We compare how this new and more comprehensive measure – *span of activity* – is related to the span of control. We ask two related questions: How well are CEO’s patterns of behavior explained by the formal reporting structure? What CEO-level time-use phenomena are not captured by organizational chart information?

While previous work used time-use analysis to describe patterns of behavior of top executives, the sample size was always limited. To the best of our knowledge, the largest observational dataset on top executives is Kotter (1999), which includes 15 general managers, who were selected for being successful. Bandiera, Guiso, Prat, and Sadun (2010) collected time-use information on a sample of 94 CEOs of top-600 Italian firms, but lacked detailed organizational chart information.

The idea that the use of time can be informative about CEOs activities and interactions is not new in the literature. In fact, in several models, hierarchies derive specifically from a time constraint since individuals delegate tasks to subordinates only if they are overloaded. Time constraints are even more crucial at higher organizational levels, so that if the organization could increase the time available to some

¹ We view the span of control of the CEO as a proxy for Thompson’s (1967) concept of the inner circle—the group of individuals with the greatest decision-making influence in an organization.

of its workers, it would start from its top layers (Prat, 1999). This observation also formalizes a widely accepted management insight about the importance of time allocation for top management (Drucker, 1966). However, empirical work in this area has been hindered by a dearth of detailed and systematic information on CEO time use for a large sample of individuals. To our knowledge, this is the first time that information on CEOs time use is analyzed in relation to organizational structure.

The data used in this paper contains time-use information on a sample of 65 CEOs attending an executive education course at Harvard Business School. Each CEO's time allocation is monitored over a pre-selected work-week. About two thirds of the subjects are based in North America, while the rest is mainly in Europe and Asia. The time use data is complemented by classic organizational chart information, thus linking span of control and span of activity.

Our key findings are:

- (1) *Number of reports.* CEOs with a larger number of direct reports appear to spend a larger share of their time interacting with firm employees and a lower share working alone. There is no significant effect on the share of time spent with outsiders (customers, suppliers, etc) or the total number of hours worked. Thus, it appears that changes in span of control are mainly reflected in a trade-off between team work and individual work.
- (2) *Delegation.* CEOs appear to use certain organizational figures as delegates. The time that the CEO devotes to insiders goes down when the organizational chart includes a COO or a CFO (although the latter is almost always present). The presence of other functional direct reports does not appear to correlate with the CEO time allocation.
- (3) *Type of interactions.* While the organizational chart depicts all links as bilateral and homogenous, our time-use measures yield a richer description of how the CEO organizes his time with insiders: CEO interaction may be bilateral or multilateral (more than two participants, which account for about 80% of total time with insiders) and unplanned or planned (in the CEO's diary). We find that: (i) CEOs with a larger number of reports tend to have more multilateral and more planned interactions; (ii) CEOs with a COO spend relatively less time on bilateral and unplanned interactions.
- (4) *Hierarchy of functional areas.* One would think that the functional areas whose chief reports directly to the CEO should receive more attention from the CEO. However, somewhat surprisingly this is true for minor functions only, not for the main ones like finance, strategy or marketing.

Taken together, our findings suggest two conclusions on the link between span of control and span of activity. First, CEO span of control is a strategic variable that is associated with the CEO's level of involvement. The number of direct reports and the presence of a delegate (COO or CFO) are strong predictors of how the top executives runs the company. Second, span of activity allows us to examine potentially important phenomena – such as teamwork and planning - that are not fully captured by traditional measures of span of control.

The span of activity data may be helpful for scholars active in research on organizational structure and top management teams in both management and organizational economics. For instance, there is an extensive literature in management that focuses on top management teams (TMT).² Much of this research examines the effects of demographic diversity of senior managers on organizational outcomes based on the assumption that the interactions of top managers affect the choices they make (e.g., Hambrick & Mason, 1984; Carpenter, Geletkanycz, and Sanders, 2004).³ A central assumption of this literature is that executives act as a *team* – and not as a collection of *individuals* with their own goals and preferences, pursuing their own interests (Cyert and March, 1963; Hambrick, 1994). Moreover, this literature does not investigate directly the intermediate interactions and processes that through which the different demographic characteristics of the team are translated (Jackson, 1992), nor the role of organizational structure in mediating these interactions. Data on interactions among executives, and the analysis of how interactions correlate with organizational variables is a useful tool to shed light on whether executives do actually behave as teams, and to understand the relevance of processes and structures in mediating their interactions.

At the same time, the notion of CEO span of control is also relevant in the organizational economics literature. In this context, the classical representation of span of control is that of an inverted tree, where the span of control is the number of branches that depart from the CEO node. This powerful visual representation is widely adopted by organizations - Exhibit 1 shows, for example, the organization chart that represents the CEO span of control of Millennium Pharmaceuticals (Deborah Dunsire) in 2007 - and is prominent in the existing formal models of organizations (e.g., Keren and Levhari, 1979 as an early example).⁴ Crucially for our purposes, the classical tree-like representation and the associated formal theoretical models make rather drastic implicit assumptions about interactions between the CEO and

² For a survey of the TMT literature, refer to Chapter 5 of Finkelstein, Hambrick and Canella (2009).

³ Much of the TMT research uses demographic characteristics of executives (functional backgrounds, industry and firm tenures, educational credentials and affiliations) as proxies for executive cognitive frames and evaluates group diversity and the relationship with firm outcomes and performance. Our focus is on the structure of the top team and the types of positions - instead of the personal characteristics of the executives filling the positions.

⁴ For additional examples of theoretical models refer to Geanakoplos and Milgrom (1991), Radner (1993), Bolton and Dewatripont (1994), Van Zandt (1999, 2003), and Garicano (2000). For survey of literature on hierarchies, see Van Zandt (1999). For a survey of organizational economics with cognitive costs, see Garicano and Prat (2011).

direct subordinates. First, the interactions are pairwise, i.e., there is no multilateral interaction involving more than one subordinate, or with a subordinate and other agents. Second, CEO interactions with individual direct subordinates are identical across positions and CEO time allocation does not vary with the types of positions that report directly. The time use data – examined in conjunction with measures of organizational structure – can help understand the extent to which these assumptions might miss important elements of the interaction between the CEO and the rest of the organization.

The paper is structured as follows. Section II presents the methodology used to collect the time use data, and basic summary statistics on the firms and executives in our sample. Section III and IV provide a description of the main findings of the analysis. Section V describes different models of CEO interactions that relate to this work. Section VI concludes.

II. Data and Methodology

The key contribution of this paper consists of studying detailed records of CEO time use in conjunction with organizational structure information – such as span of control and the positions therein represented. This section briefly describes our data collection methodology, the characteristics of the CEOs and firms represented in our sample, and the basic summary statistics of the time use and organizational data underlying our analysis.

II.A. Survey Methodology

Our empirical methodology is based on the idea that since CEO time is one of the firm’s most valuable and constrained resources, the patterns of CEO time allocation are a valid measure of CEO priorities and their involvement in the different functions and activities happening within and outside the firm. Using the survey designed by Bandiera, Guiso, Prat and Sadun (2011), we are able to keep track of the time use of a large sample of international top executives over a representative week of their life. Through the time use data, we are able to measure with unprecedented detail the daily activities of CEOs and, most importantly, the interactions between CEOs and their internal and external constituencies. We classify time allocation into several categories: time alone, time interacting with others (meetings), time interacting with insiders vs. outsiders. We also explore additional characteristics of the meetings to better document the nature of the interactions between CEOs and their subordinates (length of meeting, number of participants, planned vs. unplanned, cross-functional participants, function-specific interactions).

The time use survey allows us to effectively shadow the CEO – directly or through a Personal Assistant (PA) - for every day over a one week period. The participant is asked to record real-time

information on all activities that last 15 minutes or longer in a time use diary.⁵ For each activity - defined as a task to which the CEO devotes time in excess of 15 minutes - the diary records information on the type of activity (e.g. meetings, phone calls, etc.), its duration, its location, whether it was scheduled in advance and when, and whether it is held regularly and how often. Crucially for our analysis, the diary also collects information on the number of participants in meetings, whether they are employees of the firm or not, and if insiders, their occupational areas (e.g. finance, marketing); if outsiders, their relation to the firm (e.g. investors, suppliers). The survey also asks to record the total time the CEO spends in activities that last 15 minutes or less or in travel. Hence, by summing the time spent over activities in excess of 15 minutes and the time spent in activities that last less than 15 minutes we obtain a measure of the CEO total working time.

Within the same survey, we also collected in depth information on the formal organizational structure of the firm, namely the number of positions reporting directly to the CEO and types of positions. This setting allows us to look directly at the allocation of CEO time, and its relationship with organizational measures of span of control, both in terms of its breadth and composition.

Participants to the survey were drawn from a population of 349 CEOs set to take part in an executive education course at the Harvard Business School in January 2010.⁶ Prior to the program, each participant received an email invitation from the leaders of the executive education program, providing a link to a password protected website which allowed participants to fill in their time diaries online. In order to avoid endogenous week selection, we imposed the constraint that all participants had to complete the survey in a pre-selected week in November before they arrived at HBS for the executive course. Finally, to improve the response rate, we communicated that the time use analysis would be discussed in a dedicated session during the executive course, and that participants would be offered an individualized time use analysis of their own activity data.

Out of the initial population of 349 individuals, 107 responded positively to the invitation. Of these, 42 observations had to be dropped as the records were incomplete (i.e. less than 4 days were recorded), inaccurate (i.e. the activities description was incomplete), or the respondent was not a CEO. The estimating sample thus consists of 65 CEOs observed for at least 4 complete days. While the data was effectively self-reported, we hired a project manager who could help the respondents in case of doubts or questions regarding the specific fields they had to fill in, and to make sure that respondents filled in their time diaries on a daily basis to improve the accuracy of the data. In 88% of the cases, the

⁵ More details on the survey can be found at <http://sticerd.lse.ac.uk/ExecutiveTimeUse/>

⁶ The executive education program lasts for one week with the objective to retool thinking, management and analysis skills in a dynamic environment. The participants in the program are leaders in their firms with the titles of CEO, managing director, president, chairman or equivalent. The program typically attracts smaller, privately-held firms that are headquartered in locations around the world.

survey data was filled in by the CEO's personal assistant, and in the rest of the cases the survey was filled directly by the CEO. Finally, we complemented the time use data with information from manual searches and accounting databases to obtain additional firm level characteristics such as main industry of activity, sales, employment and listed status.

II.B. Firm Characteristics and Organizational Variables

The analysis is based on data aggregated at the week level. Table 1 provides some basic information on the CEOs and firms in our sample. Most of the sample (61%) consists of CEOs, while 27% of the participants had the title of President and CEO, or Chairman and CEO (12%). The majority of CEOs are men (90%), and most of the sample (85%) reports to be between 40 and 50 years old, with an average tenure in the role of CEO of 11 years (16 years in the same firm). 46% of the CEOs report to have a college degree, and 45% a postgraduate degree. While firms in our sample are relatively small (163 employees at the median), the dataset also includes some very large corporations and the average number of employees is 2116. This wide heterogeneity in firm size reflects the differences among participants of the executive education course from which we draw our sample. We also have a wide representation of industries, with most firms being active in Manufacturing (22%), Wholesale and Retail (19%), Finance (25%) and other Services (25%). While most firms in the sample appear to be family owned (40%) we also have a good representation of widely held firms (20%). Furthermore, firms are equally split between purely domestic organizations, domestic multinationals and foreign multinationals. Finally, although the majority of firms in our sample are located in North America, we also have quite a few European (16%) and Asian organizations (14%).

Organizational variables play a crucial role in the paper. Table 2 explores this aspect of the data in detail. First, CEOs in our sample report to have on average 7.44 direct reports, but a relatively wide heterogeneity exists across firms (standard deviation 4.48). Second, the data also show a great deal of variation in the type of positions reporting directly to the CEO. The Chief Financial Officer seems to be by far the most common position (reporting directly to the CEO in 78% of the sample), immediately followed by the Chief Operating Officer (57% of the sample reports to have one), and the Chief Human Resource Officer (CHRO). Other organizational positions⁷ seem to be much less prevalent in comparison. It is interesting to note that the averages of the organizational variables in our sample are surprisingly similar to those reported by other samples of large US firms. For example, Rajan and Wulf (2006), looking at a sample of large, publicly-traded US firms (average employees of approximately 50,000), find

⁷ Other positions include Business Unit Managers (reporting directly in 37% of the sample), Chief Legal Officer (29%), Chief Information Officer (25%), Chief Marketing Officer (22%), Chief Strategy Officer (15%) and Chief Administrative Officer (12%).

– similarly to our data - that the number of positions reporting to the CEO was 6.79 in 1998 (standard deviation 3.90), that the CFO reported directly to the CEO in 91% of the sample, and 45% of the sample reported to have a COO.

The key innovation of our data is that it allows us to link directly information on organizational structure with data on the time allocation of CEOs.⁸ It is important to note, however, that this richness of information comes with some limitations. First, while the sample size is much larger than prior studies on managerial time allocation, it is still relatively smaller in comparison to existing studies on organizational structure (e.g. Rajan and Wulf, 2006, Bloom, Sadun and Van Reenen 2011). Furthermore, we do not observe work-related activities that the CEO may perform in the evenings or on weekends, and we miss the characteristics of those that take less than 15 minutes. Finally, while we have data on which positions make up the top management team and on the specific types of functions (e.g. finance, HR, etc) interacting with the CEO, our data does not allow us to identify with precision whether direct reports vs. other subordinates lower in the hierarchy attend meetings with the CEO. While we acknowledge that direct reports might not attend *all* meetings in which the CEO interacts with other employees of the firm, given the relatively small size of the firms in our sample, we believe that it would be unlikely not to have direct reports present in most CEO interactions. Instead, our data are rich in information on the activities undertaken by the CEO - including the length of meetings, whether the activity was planned or unplanned, and the number and types of participants present in the meetings - which we exploit extensively in our analysis.

II.C. Overview of CEO Use of Time

Before looking at the relationship between time use and organizational structure, it is useful to start our analysis by providing some basic information on the overall patterns of time allocation reported by the CEOs in our sample. Table 3, Panel A shows that CEOs report to work on average 55 hours a week. Of these, we can rely on very detailed information for about 35 hours a week, or 63% of their overall time spent working. Table 3, Panel B shows that CEOs tend to be mostly engaged in interactions with other people (28.6 hours per week on average), while about 7.63 hours per week are dedicated to time spent working alone. It is important to emphasize that, similarly to the time use data collected in other contexts (see Bandiera, Guiso, Prat and Sadun, 2011, for time use data on Italian CEOs and Bandiera, Prat and Sadun, 2012 for the same data on Indian CEOs), a wide heterogeneity exists in terms of CEOs overall time spent at work and allocation across different constituencies.

⁸ Our data addresses some of the measurement issues related to various measures of span of control discussed by Ouchi and Dowling, 2004.

Spending time with insiders (i.e. people directly employed by the firm) appears to be a major activity of CEOs: this can be seen by the fact that insiders are reported to attend the vast majority interactions involving the CEO (21 hours per week), while only 7.6 hours per week are spent on average with outsiders only. Interestingly, there is a wide heterogeneity in time spent with insiders along both the intensive and the extensive margin, even when we focus on the 5 insider functions absorbing the majority of CEO time (Table 3, Panel C).⁹ For example, on average CEOs spend 4 hours with finance per week vs. only 2 hours with HR. This difference is mostly – but not entirely - explained by the fact that only 52% of the sample reports to spend any positive amount of time with HR, vs 82% of the CEOs reporting to have some sort of interaction with finance during the week. In fact, once we condition on the set of CEOs that do report to spend some time with HR, the average amount of time spent with this function increases to 4 hours per week on average.

III. Organizational Measures and CEO Use of Time

In this section, we explore whether and how the number and the type of positions that report directly to the CEOs correlate with their use of time, or their *span of activity*. We focus in particular on three specific issues.

First, we are interested in understanding whether measures of organizational structure can in any way predict how CEOs allocate their time between two major activities: spending time alone or interacting with other people. This aspect of CEO time use is central to the existing studies of executive time use (Mintzberg, 1973, Kotter, 1999, and more recently by Porter and Nohria, 2010). Time spent alone might be dedicated to analysis, planning, and strategic thinking, or it could be a measure of organizational slack, which is an optimal response when projects requiring attention are unpredictable (Iliev and Welch, 2011). More generally, the propensity to interact with other people vs. working alone is arguably one of the salient determinants of different CEO “styles”, and we are interested in understanding whether organizational variables show any systematic correlation with it.

Second, focusing more specifically on the type of participants involved in the interactions, we are interested in exploring the relationship between span of control and the nature of CEO involvement in the internal affairs of the organization, measured as the time spent with his employees. This is a question of

⁹ Although this is not the focus of this paper, our data also allows us to track in detail the time allocation across different types of outsiders (i.e. people not directly employed by the firm). There is much more heterogeneity in both the extensive (i.e. share of CEOs that spend any positive amount of time) and the intensive margin (i.e. the average amount of time spent) of time use when we look at outsiders. CEOs spend about an hour a week with external consultants, clients and investors – although only about a third of the CEO sample reports to spend any positive amount of time with these constituencies. We did not find any significant correlation between the allocation of time across specific types of outsiders and organizational variables (span of control and types of positions reporting directly to the CEO).

relevance, in light of the debate on the precise meaning of broader spans of control in organizations. CEOs over the past two decades have doubled their span of control from about 5 in 1986 to 10 in 2006 (Rajan and Wulf, 2006; Guadalupe, Li and Wulf, 2011). Both academics and practitioners have traditionally associated a broader span of control with greater delegation of decision making and less involvement in the activities of subordinates (Aghion and Tirole, 1997; BCG, 2006). The basic argument is that when time-constrained managers have more direct reports, they are less likely to interfere in subordinate activities. In this light, the increase in CEO span over the past two decades might be interpreted as a movement towards greater delegation of decision-making and increased empowerment of lower level managerial positions. However, a counter argument is that the increase in the number of direct reports is associated with greater involvement in different functions of the organization and more centralized decision-making. Regardless, empirical evidence on the relationship between broader span and delegation is remarkably thin.¹⁰

Third, moving beyond the broad notion of span of control, we investigate whether the *composition* of the team reporting directly to the CEO correlates with his span of activity. This is an interesting issue to tackle in light of the fact that substantial heterogeneity in roles and functions might exist even within a relatively homogeneous group of top executives. For example, Guadalupe, Li and Wulf, 2011 find evidence suggesting that the role of functional managers in the top team (e.g., CFO, CHRO, CMO, etc.) is potentially very different from that of general managers of a business unit with P&L responsibilities. This question is also relevant in the management literature. Hambrick and Canella (2004) analyze the determinants of a Chief Operating Officer (COO) position and argue that the presence of the position significantly changes the nature of the CEO's job, since it allows them to delegate internal operating matters and focus more intensively on external and strategic activities.¹¹ Another position that is often singled out is the Chief Financial Officer (CFO). Since Sarbanes-Oxley, CFOs (in addition to CEOs) are required by securities law to personally certify accounting statements prior to filing, and some have argued that the CFO position is the "new COO" position in terms of the scope of the job and breadth of responsibilities associated with the position. The COO position has become less common in firms over time (Rajan and Wulf, 2006), while the responsibilities of the CFO have increasingly shifted towards line

¹⁰ Guadalupe, Li and Wulf (2011) document that the composition of executive teams (defined as CEO span of control) has shifted toward more functional managers (e.g., CHRO, CFO, CMO) in large US firms over the past two decades (1986-2006). This is consistent with functional centralization of activities in the second level of the hierarchy. However, this result says nothing about whether the CEO is more or less involved with subordinates. A significant advantage of the CEO time use data is that we can directly assess whether CEOs are more or less involved and how that varies with the structure at the top.

¹¹ Bennett and Miles (2006) also discuss how the COO acts as the interface between the CEO and the internal operations of the business.

management responsibility.¹² For our purposes, we note that if the positions are homogenous, each manager responsible for a function (COO, CFO, CHRO, etc.) should be equally correlated or uncorrelated with specific patterns of time use. If, instead, positions serve different roles and purposes, then the regression analysis would reveal different patterns of association across the different positions.

We illustrate the correlations between different dimensions of time use and organizational variables in the next few sections. Our analysis is purely descriptive, i.e. we do not in any way claim that the various measures of organizational structure considered in our analysis should *cause* specific patterns of time allocation. Rather, our interest is to see to what extent, if any, standard metrics used to characterise organizations (the breadth and the composition of the team reporting to the CEO), are able to capture the intensity and the nature of different CEOs activities. We pursue this goal by choosing a very simple econometric specification, whereby we correlate different components of CEO time use with measures of organizational structure, controlling for basic firm level variables (firm size, listed status, sector, and the geographical area where the firm is located), and variables capturing specific CEO characteristics (CEO age, educational level and tenure in position). The inclusion of these extra controls is useful to attenuate the concern that the patterns of correlations could be driven by possible confounding factors other than organizational variables. For example, executive job demands are important to consider when analysing the behaviour of teams (Hambrick, Finkelstein and Mooney, 2005) and can vary by firm size, sector, ownership, location, and challenges facing the firm. Also, it has been shown that span of control is larger for newly tenured CEOs (Guadalupe and Wulf, 2010). Finally, all regressions show robust standard errors in parentheses under the coefficients.

III.A Main Findings

As briefly discussed in Section II, the data shows stark differences in the amount of time CEOs allocate to interactions vs. time spent working alone, and in the intensity of their interactions with their subordinates. In this section we investigate the extent to which differences in these specific dimensions of time allocation are correlated with organizational variables.

We show the results of this analysis in Table 4. We start by looking at the relationship between time use and the number of positions reporting directly to the CEO, i.e., his span of control. Column 1 shows that a broader span of control does not have any association with the total amount of time spent working in a week. However, column 2 shows that a broader span of control does indeed correlate with the share of time the CEOs spend working alone, as opposed to interacting with other people. The magnitudes of this effect are non-trivial. For example, a one standard deviation change in the span of

¹² See “A New CFO Agenda: The Activist”, *Financial Executive*, December 2004 (V. Couto and G. Neilson).

control of the CEO is associated with a decrease in time spent working alone (and, symmetrically, an increase in time spent in interactions) of about 2.6 hours per week.

Interestingly, this result is entirely driven by the fact that CEOs with broader spans of control tend to allocate more time in interactions with their employees (insiders), while no significant relationship exists between span of control and time spent with outsiders only. This can be seen by comparing columns 3 and 4, where we break down the time devoted to interactions according to the type of participants involved in the activity, looking first at interactions involving at least one insider (column 3) and interactions with outsiders only (column 4).

Next, we examine whether the correlation between time use and span of control varies systematically according to the composition of executives reporting directly to the CEO. We focus in particular on the presence of a COO and/or a CFO in the top management team, based on the notion discussed above that these figures are considered to be fundamentally different from other functional reports. To look at this issue directly, we include in the regressions of Table 4, columns 3 and 4 a dummy taking value one if a COO or a CFO exists and reports directly to the CEO. This reveals that – indeed – the relationship between time use and involvement varies dramatically across different types of direct reports. While a broader span is still positively correlated with a higher fraction of time spent in interactions with insiders, the presence of a COO or a CFO is significantly associated with a *decrease* in time spent in interactions of about 9 weekly hours.¹³ Similarly to what shown above, organizational variables do not seem to be significantly correlated with time spent with outsiders.

It is worth noting that the specific pattern of time use illustrated in Table 4, column 5 can be found only for the positions of COO and CFO, as we show in Table A1 in Appendix.¹⁴ Further analysis also reassures that the presence of a COO or a CFO does not proxy for important firm characteristics that are not controlled for in our regressions.¹⁵ Overall, the findings suggest a fundamental asymmetry between the roles of the COO and CFO, in that their presence is associated with a higher fraction of CEO

¹³ As a robustness check, we also verified that the results were not driven by mechanical correlations due to multicollinearity between the total number of direct reports and the COO/CFO dummy by re-estimating the regressions using a definition of span which excluded the CFO or COO. This did not have any remarkable effects on the estimates shown in Table 4, columns 5 and 6. Furthermore, we checked that the results held for both the COO and CFO dummies considered individually, rather than combined in a single binary indicator, and we did not find evidence that the interaction term between a broader span and the COO/CFO dummy had any significant correlation with time use – i.e. it does not appear that COOs or CFOs partially substitute for the CEO in dealing with direct reports.

¹⁴ In summary, time spent in interactions is positively correlated with the presence of a Chief Human Resource Officer and a Chief Legal Officer. Time spent in interactions is negatively correlated with the presence of the following positions: Chief Information Officer, Chief Security Officer, Chief Manufacturing Officer, Chief Administrative Officer, Business Unit Manager. The coefficient on these positions was never significantly different from zero.

¹⁵ The number of direct reports is virtually identical across the samples with and without COOs/CFOs. Firms with a COO or a CFO tend to be larger on average and have a slightly higher probability of being listed – characteristics that are controlled for in the regressions. Results available upon request.

time allocated to working alone, and significantly lower share of time dedicated to interactions with the firm's employees.

III.B Interpretation

In summary, the results shown in Table 4 reveal three basic facts about the relationship between CEO time use and organizational structure:

- (1) CEOs with a larger number of direct reports appear to spend a larger share of their time interacting with firm employees and a lower share working alone.
- (2) There is no significant effect on the share of time spent with outsiders (customers, suppliers, etc) or the total number of hours worked. Thus, it appears that changes in span of control are mainly reflected in a trade-off between team work and individual work.
- (3) The time that the CEO devotes to insiders goes down when the organizational chart includes a COO or a CFO (although the latter is almost always present). The presence of other functional direct reports executives does not appear to correlate with the CEO time allocation.

The precise interpretation of these findings crucially hinges on the mapping between patterns of time allocation and decision-making. If CEOs interact with their employees primarily to instruct them and channel their decisions – more than, say, to monitor and gather employee specific information that cannot be easily codified through indirect (i.e. non-physical) means of communication – then higher levels of interactions with insiders might proxy for higher levels of CEO involvement with the internal operations of the firm.

In this case, the positive correlation between broader span of control and time spent with insiders would be in direct contrast with the notion that broader spans of control encourage CEOs to delegate more and discourage the micromanaging of their subordinates (Wulf, 2011). At the same time, assuming that the mapping between time spent with insiders and greater involvement is broadly accurate, the result that time spent with insiders decreases when a COO or a CFO are among the team of direct reports, suggests that CEOs use certain organizational figures as delegates.

IV. Additional Insights from the Time Use Data

The analysis so far suggests that organizational variables – such as the breadth and the composition of span of control - may capture some salient features of CEO managerial style, in particular the extent to which they are directly involved with their employees. We now turn to discussing how the

time use data can be used to analyse potentially important phenomena that are not fully captured by these traditional measures of span of control.¹⁶

We focus on two related issues. First, we exploit our time-use measures to study the extent to which organizational variables correlate with different *types* of interaction with their subordinates. This is interesting because heterogeneity in the size, planning horizon and composition of the meetings can capture salient differences in CEO styles, that are largely ignored in standard organizational models. Second, we ask whether the presence of a direct reporting relationship is a good predictor of the intensity with which CEOs interact with specific functions (for example, does a CEO spend more time with the marketing function when the CMO reports directly to him?).

IV.A Reporting Relationship and Types of Interactions

Standard models of organizational structure are typically built on the assumption that the interactions between the CEO and his subordinates are largely homogenous and bilateral. The time use data, however, reveals a much richer degree of richness in the variety of interactions. In other words, CEOs differ significantly not only in the total amount of time they spend with insiders, but also in *how* they decide to organize this time, i.e. as one-to-one vs. multilateral, uni- vs. cross-functional, and planned vs. unplanned meetings.

We report on this aspect of the time use data in Table 5. In our data, the majority of time dedicated to insiders is actually planned in advance (82% of all insider interactions).¹⁷ Interactions with insiders appear to involve in the majority of cases more than one participant (16 out of 21 hours spent with at least one insider are of this nature, and almost 50% of the meetings with insiders are cross functional. Crucially, a wide heterogeneity exists in all these dimensions of time use.

Arguably, these differences in the *type* of interactions between CEOs and employees can actually be quite revealing of specific managerial styles. For example, the prevalence of multilateral and cross functional meetings with the CEO might proxy for a “ring-team” model of decision-making with extensive cross interactions and collective decision-making. On the contrary, the preference for one-to-one and uni-functional meetings is closer to the “hub and spoke” model of decision-making—characterized by one-to-one interactions with the CEO as the hub and subordinates as spokes (e.g., Tushman, Smith and Binns, 2011).

An interesting question to ask is how the organizational variables of span of control considered so far correlate with different types of interactions between CEOs and their employees. We examine this

¹⁶ See Simons (2005) for a discussion of span of control as a measure of the resources controlled by the manager.

¹⁷ Earlier work on managerial time allocation has investigated extensively whether the time spent with insiders may be seen as involuntary “interruptions” of the CEO workday, rather than voluntary interactions (e.g., Perlow (1997) and Sesjadri and Shapira (2001)).

question in Table 6, where we repeat the specification show in Table 4 breaking down the interactions with insiders according to the number of participants involved (columns 2 and 3), their planning horizon (columns 4 and 5), and their cross-functional nature (columns 6 and 7). The unambiguous picture emerging from this exercise is that a broader span of control and the presence of a COO or a CFO primarily capture larger and cross-functional meetings, which are primarily planned in advance.

In summary, the availability of the time use data allows us to conclude that the correlation between the number of direct reports and time spent in meetings with insiders is not mechanical - i.e., if more people report to the CEO, he needs to spend more time with insiders in total, even if the time dedicated to each is lower. In fact, a broader span of control appears to be associated with a different type of interaction altogether, in which teamwork and planning play a major role, while the opposite holds for the COO/CFO dummy.

IV.B Reporting Relationship and CEO Time Allocation

A possible interpretation of the reporting relationship represented in a standard organizational chart is that the functional areas whose chief reports directly to the CEO might receive more attention from the CEO. An additional advantage of the time use data is that we can investigate this hypothesis directly, by examining whether the presence of a direct reporting relationship with the CEO is a good predictor of the time allocated by the CEO to the different functions. We show the results of this analysis in Table 7. We focus in particular on three functions: finance, human resources and legal, as for these we can build a direct mapping between time use and presence in the organizational chart (i.e. presence of, respectively, a Chief Financial Office, Chief Human Resource Officer and Chief Legal Officer or General Counsel). Interestingly, the presence of a direct reporting relationship has a very marginal correlation with the time spent by the CEO with the function. The only case in which time use seems to be significantly larger when the function reports directly to the CEO is legal, which absorbs however a very small fraction of CEO time (only about 20 minutes on average per week).

This finding suggests that, while span of control might be able to predict some broad features of CEOs use of time – i.e. the their different level of interaction with insiders – it is not a sufficient statistic to predict CEO interactions with *specific* insider functions.

V. Related Literature: Models of CEO Interactions

In this section, we discuss how our findings are related to the existing literature on span of control in both management and economics. We focus in particular on two elements of CEO interactions: (i) how

CEOs interact with other managers; and (ii) whether this interaction is a function of the composition of the top team and CEO span of control.

V. A. Group (pairwise) vs. Team (multilateral) Model of CEO Interaction

As mentioned in the introduction, interactions between top executives are central to the top management team (TMT) literature in management. A central premise of work done in this area is that senior management acts as a *team* – in which the CEO interacts with senior managers and senior managers interact with each other to share information and collectively make decisions - and not as a group of executives operating independently. In contrast, models in economics typically embrace the classic inverted tree model of organizational structure, whereby: a) the interaction between the CEO and each subordinate has a pairwise nature (i.e., one-to-one); and b) there is no multilateral interaction involving more than one subordinate, or with a subordinate and other managers (i.e., one-to-many).

Our findings generally support the team or multilateral model of interaction. As we show in Table 5, in the majority of cases, insider interactions appear to involve more than one participant (16.0 out of 20.8 hours spent with insiders are of this nature). Although this finding is in contrast with the simplest version of the tree model, this is not conclusive evidence in support of the team notion of the top management team. In fact, there are two types of interactions with multiple insider participants that might occur. In the first case, the CEO might interact with insiders of the same function, for example the CFO and other finance employees. One might argue that this type of interaction may be more consistent with the group model, as it would still imply that the CEO interacts only with one function at a time. In the second case, the interaction involves multiple insiders from different functions, for example, both the CFO and the CHRO. This latter type of interaction is more consistent with the team model in that it involves interactions between managers in different functions. Our data shows almost a half of CEO interactions with insiders are in fact cross-functional, which provides some initial supportive evidence for the team model of managerial interactions.

V.B. Homogenous vs. Heterogeneous Model of CEO Interaction

To our knowledge, the TMT literature is relatively silent on the structure or composition of the top team (Jackson, 1992). The implicit assumption from this omission is that CEO interactions with other team members do not vary by the type of position. Not only are team members identical in terms of their influence, the TMT research typically includes the CEO as an equal member. This assumption is quite similar to the second implicit assumption of the tree model, i.e., that CEO interactions with individual direct subordinates are homogenous and identical across positions. More specifically, the CEO tends to devote the same amount of time to each direct report and CEO time allocation doesn't vary by the type of

positions reporting directly to the CEO (i.e., the composition of the team). Simply put, all positions that report directly to the CEO are created equal. Overall, our findings suggest a fundamental asymmetry between the roles of the COO and CFO, in that their presence is associated with a higher fraction of CEO time allocated to working alone, and significantly lower share of time dedicated to interactions with the firm's employees. This finding contradicts the simple assumption of homogeneity across positions, since the roles of the COO and the CFO seem to be fundamentally different from other direct reports. Furthermore, this finding highlights the importance of considering role differentiation and team composition when analyzing interactions and the division of responsibilities in top managerial teams.

In summary, we find evidence consistent with the team model of CEO interactions and that positions in the top management team are not homogenous. That is, we find that CEO interactions commonly involve multiple participants from across functions and that CEO time allocation varies substantially by the type of positions reporting directly to the CEO. Our findings suggest that the assumptions of the simple inverted tree model have little empirical support and that top management team composition is critical in explaining how CEOs allocate their time.

VI. Conclusion

We propose a new empirical methodology to understand the role of span of control at the CEO level. We collect detailed time use information for a large sample of CEOs, and we use it to determine the share of work time that they devote to different activities and to different reports. We compare how this new and more comprehensive measure – *span of activity* – is related to the more traditional notion of span of control. We ask two related questions: How well are CEO's patterns of behavior explained by the formal reporting structure? What CEO-level time-use phenomena are not captured by organizational chart information?

Overall, our findings suggest that organizational variables such as the breadth and the composition of the CEO span of control capture salient features of his involvement in the firm. In particular, CEOs with a larger number of direct reports appear to spend a larger share of their time interacting with firm employees and a lower share working alone. Furthermore, our analysis shows that certain organizational features act as delegates of the CEO. In particular, the time that the CEO devotes to insiders goes down when the organizational chart includes a COO or a CFO, while the presence of other functional direct reports does not appear to correlate with the CEO time allocation.

At the same time, our analysis shows some clear limitation of the standard organizational variables. For example, the data use data shows a great deal of heterogeneity not only in the intensity, but also in the specific way CEOs interact with their subordinated (size of the meetings, cross functionality, planning horizons) that are typically not captured in standard organizational charts but may be useful to

understand differences in managerial styles. Furthermore, the presence of a direct reporting relationship appears to be a poor predictor of the amount of time a CEO dedicates to a specific function.

This paper contributes to the existing literature on top executives in both management and economics. In general, our findings suggest that CEOs interact with their subordinates in a team-like fashion and less as a group of independent executives. This is generally supportive of the central implicit assumption of the TMT literature that senior managers interact like teams, and in contrast with the simple inverted-tree model prevalent in the organizational economics literature. Furthermore, we show that CEO time use varies substantially by the types of positions that report directly to him, in that the presence of a COO or a CFO in the direct reports of the CEO is associated with a significant increase in time spent working alone (and, symmetrically, with a reduction in time spent in interactions). This suggests that inference on the CEO role based on organizational variables should take into consideration not only the breadth of the CEO span of control, but also its composition.

Although our study presents several limitations, which we discuss in the paper, we believe that a more systematic study of managerial activities over a large sample of executives could bring significant benefits to scholars in both management and economics. First, looking at interactions in conjunction with organizational structure may provide the basis for more realistic formal models of organizations. More generally, activity analysis allows scholars to shift from the focus on individual managers to analyzing teams and complementarities inherent in human capital. At the same time, this study also suggests the importance of refining definitions and sharpening the empirical predictions of top management team models prevalent in the management literature. For example, our findings suggest that it would be beneficial to move beyond the use of simple demographic information of top team members, and consider in more detail the types of positions that comprise the team.

Practitioners may also benefit from time use data for several reasons. First, basic calendar analysis can be used as a tool for assessment for individual managers to evaluate their own patterns of time allocation. In the debrief with the participants of the executive education program at Harvard Business School, for example, we found that the executives' assessment of how they spend their time was quite different from actual records. Executives also find it fascinating to compare their time allocation to that of other peers in the same industry, as a way to gauge differences in their respective managerial styles. Finally, activity analysis enables senior managers to evaluate whether they are allocating time in a manner that is consistent with firm strategy and priorities critical to the implementation of strategy.

Ultimately, we argue that it is critical to complement traditional notions of organizational structure and team characteristics – *span of control* – with rich data on CEO interactions – *span of activity*. Although the collection of activity data for large sample of individuals presents clear methodological challenges, our experience across several countries and the availability of electronic calendars convince

us of the feasibility of this research agenda. Most importantly, we believe that this strand of research could facilitate the establishment of a much-needed connection between the formal models of organizational structure in economics and the richness of the theories and empirical findings of the management literature.

Obviously, this paper is just an initial step in this direction, and there are many ways in which the activity data can be improved, suggesting several directions for future research. First, by collecting information on the purpose of the meetings, we could distinguish between interactions that primarily facilitate information exchange versus interactions that involve decision-making and the relationship meeting objectives and top team structure. Second, by collecting data on the firm's strategy and scope of businesses, we could explore how interactions and team structure relate to the interdependence of tasks.¹⁸ For example, the role of the CEO might be very different in firms that operate in related businesses versus diversified firms, and we could characterize the CEO's role by the nature of interactions and relate it to team structure. Also, it would be interesting to analyze smaller groups of teams using our span of activity measure since all team members are not involved in every decision.¹⁹ Lastly, span of control complemented by span of activity will allow us to explore the relationship between organizational structure, management interactions, firm strategy and performance. We leave these topics for further research.

¹⁸ Barrick, Bradley and Colbert, 2007 emphasize how the importance of interdependencies (e.g., relatedness of businesses) will determine the importance of interactions (and team-based behavior) and the effect on firm performance. Firms should consider firm and industry characteristics (as well as leadership style) when thinking about the optimal level of TMT interactions.

¹⁹Jackson (1992) discusses how top management teams are typically assigned to task forces comprised of smaller teams that focus on specific issues, initiatives, and decisions. Relatedly, Friesch (2011) argues that CEOs rely on a few key executives in top teams that are deeply involved in key decisions.

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Table 1 - Firm characteristics

	Mean	Median	Std. Dev.	Obs.
Number of Employees	2116.033	162.5	5808.563	60
Sector (%)				65
<i>Mining and Construction</i>	4.48			
<i>Manufacturing</i>	22.39			
<i>Transportation, Communications, Electric, Gas, And Sanitary Services</i>	1.49			
<i>Wholesale and Retail Trade</i>	19.4			
<i>Finance, Insurance, And Real Estate Services</i>	25.37			
<i>Public Administration</i>	25.38			
<i>Public Administration</i>	1.49			
Ownership (%)				65
<i>Family</i>	40			
<i>Founder</i>	18.46			
<i>Other</i>	24.62			
<i>Widely Held</i>	19.92			
Firm Nationality (%)				65
<i>Domestic</i>	32.76			
<i>Domestic MNE</i>	29.31			
<i>Foreign MNE</i>	37.93			
Firm is listed (%)	29			65
Geographic area (%)				65
<i>Asia</i>	13.85			
<i>Europe</i>	15.38			
<i>North America</i>	64.62			
<i>Oceania</i>	3.08			
<i>Other</i>	3.08			
Interviewee Title				59
<i>CEO</i>	61.02			
<i>CEO/Chairman</i>	11.86			
<i>CEO/President</i>	27.12			

Notes: All variables are drawn from the time use survey, except for Industry affiliation and employment, which are drawn from Orbis.

Table 2 - Span of Control

	Mean	Median	Std. Dev.	Obs.
Number of direct reports	7.44	6	4.48	61
			Reports to CEO (%) - conditional on existing	
Positions	Exists (%)	Reports to CEO (%)		
<i>Chief Administrative Officer</i>	0.12	0.12	1.00	65
<i>Chief Strategy Officer</i>	0.26	0.15	0.59	65
<i>Chief Marketing Officer</i>	0.34	0.22	0.64	65
<i>Chief Information Officer</i>	0.35	0.25	0.70	65
<i>Chief Legal Officer</i>	0.42	0.29	0.69	65
<i>Business Unit Manager</i>	0.45	0.37	0.83	65
<i>Chief Human Resource Officer</i>	0.71	0.48	0.67	65
<i>Chief Operating Officer</i>	0.57	0.57	1.00	65
<i>Chief Financial Officer</i>	0.85	0.78	0.93	65

Notes: All variables are drawn from the time use survey.

Table 3 - Span of Activity

Panel A. Time at Work				
	Mean	Median	Std. Dev.	Obs.
<i>Total Hours Worked</i>	54.73	53.73	11.06	65
<i>Total Hours Recorded</i>	35.08	36.25	10.54	65
Panel B. Interactions				
Total weekly hours spent:	Mean	Median	Std. Dev.	Obs.
<i>Working Alone</i>	6.48	5.50	6.17	65
<i>Interactions</i>	28.60	28.98	10.67	65
<i>Interactions, at least one insider</i>	20.77	20.00	10.33	65
<i>Interactions, outsiders only</i>	7.63	6.25	7.35	65
Panel C. Insiders - top 5 categories				
	Mean	Share of CEOs with hrs>0	Mean if hrs>0	Obs.
<i>Finance</i>	4.19	0.82	5.14	65
<i>Business Units</i>	6.15	0.74	8.32	65
<i>Marketing</i>	2.85	0.58	4.87	65
<i>Strategy</i>	3.16	0.58	5.41	65
<i>HR</i>	2.12	0.52	4.06	65

Notes: All variables are drawn from the time use survey. Total hours worked include all activities, including those shorter than 15 minutes and travel. Total hours recorded only includes activities that are longer than 15 minutes and does not include travel. All variables report average total hours spent by the sample of CEOs over the survey week in the listed activities.

Table 4 – Number and Types of Direct Reports and Span of Activity

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Total time recorded	Total time spent:				
		Working Alone	At least one Insider	Outsiders only	At least one Insider	Outsiders only
ln(number of direct reports)	-0.306 (2.150)	-2.601* (1.304)	3.878** (1.916)	-1.353 (1.785)	3.797* (1.916)	-1.328 (1.820)
Dummy=1 if COO or CFO report to CEO					-9.363*** (2.861)	2.865 (2.318)
Total hours recorded		0.089 (0.067)	0.466*** (0.121)	0.407*** (0.094)	0.462*** (0.123)	0.408*** (0.097)
Constant	37.967*** (8.833)	11.216* (6.251)	-8.831 (8.003)	-4.448 (5.765)	-4.982 (7.314)	-1.625 (5.700)
N	65	65	65	65	65	65
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
CEO controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: All variables are drawn from the time use survey. Total hours worked include all activities, including those shorter than 15 minutes and travel. Total hours recorded only includes activities that are longer than 15 minutes and does not include travel. All variables report average total hours spent by the sample of CEOs over the survey week in the listed activities.

Table 5 - Exploring the Heterogeneity in the Type of Interactions

Panel A. Interactions by participant type	Mean	Median	Std. Dev.	Obs.
Total weekly hours spent in:				
<i>Interactions, at least one insider</i>	20.77	20	10.33	65
<i>Interactions, at least one insider, More than 2 Participants</i>	16.04	15	9.29	65
<i>Interactions, at least one insider, More than 1 Function</i>	8.45	6	7.50	65
<i>Interactions, at least one insider, Planned</i>	17.40	16.5	9.63	65
Panel B. Characteristics of interactions with insiders	Mean	Median	Std. Dev.	Obs.
<i>Number of participants</i>	3.84	3.51	1.49	65
<i>Cross functional (%)</i>	0.48	0.43	0.25	65
<i>Duration (in hours)</i>	1.58	1.45	0.61	65

Notes: All variables are drawn from the time use survey. Total hours worked include all activities, including those shorter than 15 minutes and travel. Total hours recorded only includes activities that are longer than 15 minutes and does not include travel. All variables report average total hours spent by the sample of CEOs over the survey week in the listed activities.

Table 6 - Looking at long meetings with at least one insider in detail

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total time spent in interactions with at least one insider, and with the following characteristics:						
Dependent Variable	All	Just 1 participant	More than 1 participant	Unplanned	Planned	Just 1 function	More than 1 function
In(number of direct reports)	3.797* (1.902)	0.391 (0.668)	3.766** (1.727)	-0.036 (0.871)	3.832* (2.099)	0.620 (1.407)	3.177 (1.927)
Dummy=1 if COO Exists	-9.363*** (2.861)	-0.199 (2.081)	-7.560** (2.980)	-1.015 (1.288)	-8.348*** (2.332)	-5.549* (2.903)	-3.814 (3.944)
Total hours recorded	0.462*** (0.123)	0.068 (0.057)	0.388*** (0.117)	0.086 (0.065)	0.376*** (0.132)	0.320*** (0.077)	0.142 (0.121)
Constant	-4.982 (7.314)	-3.066 (2.767)	-2.653 (7.482)	-1.130 (3.549)	-3.852 (7.419)	-2.943 (5.186)	-2.039 (7.067)
N	65	65	65	65	65	65	65
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *, **, *** indicate that the coefficient is significantly different from zero at the 10%, 5%, 1% level, respectively. OLS estimates, robust standard errors in parentheses under coefficients. The dependent variable in column 1 is the total number of hours recorded over the survey week. The dependent variable in columns 2 and 3 is the total number of hours spent in interactions over the revelation week. Columns 4 and 5 distinguish, respectively, between interactions lasting more than one hour, and interactions lasting up to one hour. **Firm controls** include dummies to denote the geography where firm's is headquartered (North America, Europe, Asia, Other), a dummy to denote if the firm is listed, the log of firm employment, and a manufacturing dummy. **CEO controls** include a control for the number of years spent as CEO of the firm, the age of the CEO, and dummies for the highest educational level achieved by the CEO.

Table 7 – Reporting Relationship and CEO Time

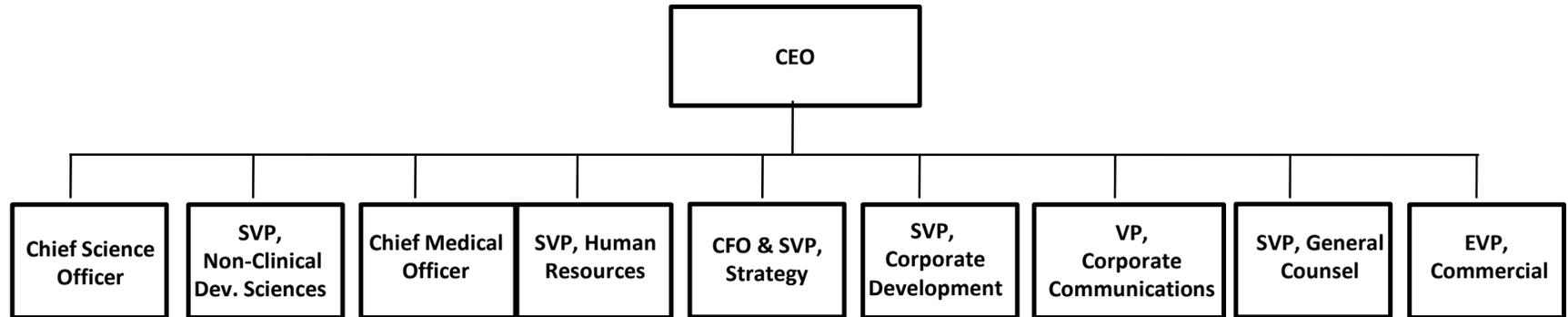
CFO reports directly to CEO	Time spent in meetings with Finance
No	3.28
Yes	4.44
Total	4.19
Difference	-1.15
t test on difference	0.85

CHRO reports directly to CEO	Time spent in meetings with HR
No	2.06
Yes	2.18
Total	2.12
Difference	-0.12
t test on difference	0.12

CLO reports directly to CEO	Time spent in meetings with Legal
No	0.02
Yes	0.59
Total	0.18
Difference	-0.57
t test on difference	3.32

Notes: All variables are drawn from the time use survey. All variables report average total hours spent by the sample of CEOs over the survey week in interactions lasting more than one hour with the listed functions. CFO=Chief Financial Officer; CHRO=Chief Human Resource Officer; CLO=Chief Legal Officer.

Exhibit 1: CEO (Deborah Dunsire) Span of Control for Millennium Pharmaceuticals (2007)



Source: Adapted from company management

Table A1 - Breakdown by position

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total time spent in interactions with at least one insider								
In(number of direct reports)	3.540*	4.137**	4.394**	3.877*	3.914**	3.817**	4.448**	3.874**	3.776*
	(1.955)	(1.917)	(1.927)	(1.937)	(1.923)	(1.820)	(1.760)	(1.877)	(2.003)
Dummy=1 if COO Exists	-3.746*								
	(2.163)								
Dummy=1 if CFO reports directly to CEO		-5.877**							
		(2.566)							
Dummy=1 if CHRO reports directly to CEO			-2.648						
			(2.274)						
Dummy=1 if CLO reports directly to CEO				-0.098					
				(2.767)					
Dummy=1 if CIO reports directly to CEO					-1.633				
					(2.894)				
Dummy=1 if CSO reports directly to CEO						-4.007			
						(3.373)			
Dummy=1 if CMO reports directly to CEO							-3.885		
							(3.326)		
Dummy=1 if CAO reports directly to CEO								-1.575	
								(3.598)	
Dummy=1 if Business Unit Manager reports directly to CEO									0.503
									(2.753)
Total hours recorded	0.475***	0.463***	0.466***	0.466***	0.471***	0.487***	0.502***	0.479***	0.467***
	(0.122)	(0.122)	(0.122)	(0.124)	(0.118)	(0.110)	(0.117)	(0.113)	(0.121)
Constant	-6.431	-6.850	-8.311	-8.834	-8.709	-9.348	-11.685	-9.225	-8.990
	(7.961)	(7.566)	(7.842)	(8.078)	(8.203)	(7.699)	(7.637)	(7.864)	(7.970)
N	65	65	65	65	65	65	65	65	65
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes