Labor as a Monitor of the CEO: Evidence of Power Play in Outsourcing

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ABSTRACT

We develop a theory of a cooperative power game between the CEO and labor in corporate outsourcing, and test the model's predictions concerning the decision to outsource, division of profit, and post-outsourcing firm performance using a sample of outsourcing deals by U.S. firms. In accord with the model, we find that a firm is more likely to outsource the greater is CEO power, the greater is the firm's production cost, and the more homogeneous is the industry. And the outsourcing decision does not affect the CEO's share of profits, and CEO power is positively related to post-outsourcing performance. Interestingly poor prior firm performance moderates power dynamics between the CEO and labor. The implication is that in addition to the traditional governance mechanisms such as board institutional investors or market discipline, labor can also be an effective managerial monitor when the firm undergoes a major restructuring.

Keywords: Power play hypothesis, CEO power, Labor bargaining, Outsourcing, Stakeholder model
JEL Classification: *G14, G34, F23, J52*

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I. Introduction

The standard corporate government paradigm views the chief executive officer (CEO) as an agent serving the interests of shareholders. Agency conflicts stemming from CEO power and interests are to be ameliorated by monitoring and discipline functions of the traditional governance mechanisms such as the board or institutional investors (Jensen and Meckling, 1976; Hermalin and Weisbach, 1998). Concerns on failure or inadequacy of this shareholder-based model led to increasing appreciation of the role of other important stakeholders that can influence firm performance (Jensen, 1993, 2001; Donaldson and Preston, 1995).[1] Consistent with stakeholder theory, some such as Rajan and Winton (1995) examine the role of banks and creditors as CEO monitors; Acharya, Myers and Rajan (2011) develop a theory of internal governance systems focusing on employees; while Atanassov and Kim (2009) investigate international practices regarding the role of labor in corporate governance during restructuring.

Organized labor, in particular, is known to be contentious and challenging of the power of CEO.[2] This is especially true in situations where corporate restructuring may threaten jobs or wage security. In those situations, it is common that labor actively checks and monitors CEO's behaviors, calling on CEO excesses or mishaps. The website of the United Auto Workers of America is full of statements which express concerns on CEO compensations and perquisites as well as financial

[1] For a criticism of the shareholder model, see, for instance, Donaldson and Preston (1995), who state, "The plain truth is that the most prominent alternative to the stakeholder theory (i.e., the "management serving the shareholders" theory) is morally untenable. The theory of property rights, which is commonly supposed to support the conventional view, in fact – in its modern and pluralistic form – supports the stakeholder theory instead." Jensen (2001) also states, "As a statement of corporate purpose or vision value maximization is not likely to tap into the energy and enthusiasm of employees or managers to create value. Since a firm cannot maximize value if it ignores the interest of its stakeholders, enlightened value maximization can utilize much of the structure of stakeholder theory by accepting long run maximization of the value of the firm as the criterion for making the requisite tradeoffs among its stakeholders."

[2] Various authors (DeAngelo and DeAngelo, 1991; Hallock, 1998; Banning and Chiles, 2007) show that CEO pay decreases with labor negotiation or union activism. Agrawal (2012), however, shows that union pension funds pursue worker interests rather than firm value in their investment decisions. Freeman and Kleiner (1999) argue that unions push CEOs to increase wages to the point where union firms may expand less rapidly than nonunion firms. Addison and Hirsch (1989) find that the pressure of wage increase from labor forces the CEO to cut research and development expenses, which slows firm growth.

resources of firms facing major restructuring.[3] On the other hand, Matsa (2010) documents cases of firms engaging in a strategic use of debt to improve their bargaining positions with labor. Benmelech, Bergman and Enriquez (2012) provide empirical evidence with airlines data that firms take advantage of their financial position to renegotiate and reduce labor costs. United Airlines used deteriorating cash balance and bankruptcy prospects in securing labor agreement for significant wage concessions in exchange for equity and board participation.[4]

The power play between the CEO and labor is prominent in a firm's decision to outsource, resulting in labor strikes in some cases.[5] Williamson (2008) defines outsourcing as "outsourcing procurement for generic goods and services and for more complex transactions." Outsourcing, in effect, refers to contracting out some input production or service functions to an unaffiliated firm within the same or a different country, and should be differentiated from offshoring that involves sending jobs abroad within the same firm or to a different firm. Outsourcing is an important form of corporate restructuring.

The power contest between the CEO and labor in the decision to outsource is rooted in the following tradeoffs. On the one hand, workers are against outsourcing because they view it as a threat to their job security and it may cause wage compression (Bronars and Deere, 1993; Feenstra and Hanson, 1996; Hirsch, 2004). Thus, the power game can lead to severe union activism (Hirsch and Morgan, 1994) and cause managers to use leverage in order to improve their bargaining position relative to the union (Perotti and Spier, 1993; Matsa, 2010). On the other hand, labor can sometimes cooperate with, rather than fights against, the CEO, working jointly towards improving corporate performance. For instance, the union helped to bring a new CEO to Ford and negotiated a contract

[3] See, for instance, Statement of the International Union, United Automobile, Aerospace & Agricultural Implement Workers of America (UAW) on the Subject of Protecting Employees and Retires in Business Bankruptcies Act of 2010 (H.R. 4677), submitted to the Subcommittee on Commercial and Administrative Law, Committee on the Judiciary, United States House of Representative, May 25, 2010.
[4] http://en.wikipedia.org/wiki/United_Airlines#Bankruptcy_and_reorganization.
[5] See the cases of GM (*Wall Street Journal* October 18, 1999), FedEx (*Wall Street Journal* November 23, 1998), and the Boston Globe (Outsourcing: "Boston Globe, not Bangalore Globe" - new union ad campaign, *The Earth Times*, March 15, 2007). When the Boston Globe outsourced the firm's publishing jobs in 2007, the firm's union ferociously protested, calling it an "egregious mistake," although officials said that "the outsourcing decision is difficult, but necessary for the paper's long-term health."

with Ford to avoid a UAW strike (*Wall Street Journal,* March 26, 2008). Williamson, Wachter, and Harris (1975) suggest that unions seek to replace incompetent managers to protect their own interests. DeAngelo and DeAngelo (1991) and others provide empirical evidence that CEO compensation declines during union negotiation. For the firm, major motives of outsourcing include the desire to reduce production or operating costs (Williamson, 2008), to acquire competence (Kotabe and Murray, 1990), or to gain flexibility (Choi, Kotabe, Ju, Trigeorgis and Zhang, 2018). Nevertheless, there are economic and political adjustment costs associated with outsourcing (Mankiw and Swagel, 2006). Indeed, Bertrand and Mullainathan (2003) document incidences where CEOs, if protected by antitakeover laws, may prefer restructuring modes that involve less destruction of old plants as well as less creation of new plants.

We propose a simple theory of a power game between the CEO and labor in the decision to outsource. The game begins with Nash bargaining between the CEO and labor to decide whether the firm shall outsource or continue producing in-house and determine how profits will be split between the two. The CEO and labor then engage in an infinitely repeated stage game wherein each exerts effort to augment the productivity of the firm, and production and cost allocations are made that maximize profits. Outsourcing lowers costs of production; and, all other things being equal, labor favors not outsourcing, but cooperative game can produce optimal solutions to both the firm and labor.

Our model generates empirically testable hypotheses pertaining to the decision to outsource and the split of profits between the CEO and labor. The firm is more likely to outsource, the greater is CEO power and the weaker is labor power. The CEO favors outsourcing since it renders the firm to be more profitable; thus the more powerful he is, the more likely outsourcing is to occur. The firm is also more likely to outsource the greater is the firm's production cost; this follows from the fact that the greater are the cost savings associated with outsourcing, the stronger is the incentive to do so and the more homogeneous is the industry. The latter follows from the fact that a more homogeneous industry is associated with more price-sensitive consumers and thereby smaller profit

margins, augmenting the incentive to lower costs of production. At equilibrium, the outsourcing decision does not affect the power of the CEO relative to labor or the split of profits. Finally, consistent with upper echelon theory which – even with internal and external constraints – regards the organization as a reflection of its top managers (Hambrick and Mason, 1984), CEO power is positively related to post-outsourcing performance: a powerful CEO enables outsourcing to be implemented more effectively.

To test our model of the power game between the CEO and labor, we investigate a sample of outsourcing deals by listed U.S. firms. Two control samples of non-outsourcing firms are constructed based on propensity scores and also by one-on-one matching using firm size and two-digit SIC industry. We use eight variables to construct a measure of CEO power, and three variables to construct a measure of labor power.

Our empirical findings generally agree with the above-mentioned hypotheses from the theoretical model pertaining to the likelihood of outsourcing, division of profits, and the impact of relative CEO power on post-outsourcing performance. We find strong evidence that the likelihood of outsourcing is positively associated with CEO power and negatively related to labor power. Furthermore, prior firm performance moderates the power dynamics between the CEO and labor in the decision to outsource, consistent with union rationality theory (Blanchflower, Millward, and Oswald, 1991) that unions can work with management cooperatively. We find some evidence that firms are more likely to outsource the greater are production costs per sales and the more homogeneous is the industry. We find that stronger CEOs get a larger share of profits and the share of profits is unrelated to the outsourcing decision. Finally, we find weak evidence that firms with strong CEO power demonstrate improved post-outsourcing performance (as measured by industry-adjusted ROA and Tobin's *q*), thereby lending weak support to the view that "CEOs matter."

In sum, our theoretical model and empirical findings suggest that the likelihood of outsourcing, and its successful outcome, depend in part on obtaining a cooperative solution between the CEO and labor. Thus both the CEO and labor matter. Interestingly, we find that poor prior firm

performance – because of a fear of bankruptcy and loss of jobs – induces the CEO and labor to cooperate more and thereby moderates the power contest between them. In contrast to the popular view that considers labor as a cost to shareholders, we argue that CEO power is balanced by labor, which can monitor CEO behavior in a constructive manner and help realize the value of restructuring in general and outsourcing in particular. In situations of major restructuring, labor can serve as a monitor, as well as a countervailing force against the CEO, in addition to the traditional corporate governance institutions such as the board, institutional ownership, or market discipline.

Our work touches upon several strands of corporate governance literature. First, we develop a theoretical model of a CEO-labor power game in the context of outsourcing and examine its predictions empirically. We believe both theory and empirical work are new as it pertains to the motives and consequences of outsourcing depending on a resolution of the CEO-labor game. Second, our work is related to the CEO power literature. There is sufficient evidence regarding the impacts of the CEO in restructuring decisions – bankruptcies (Eckbo and Thorburn, 2003), mergers and acquisitions (Lehn and Zhao, 2006), survival of IPO firms (Chemmanur and Paeglis, 2005), and others. We provide evidence that the CEO power is crucial in realizing the potential value of outsourcing but the outcome also depends on a solution of a power game between the CEO and labor. Third, we add to the burgeoning corporate monitoring literature. In keeping with a stakeholder model, our paper is suggestive of implications that in addition to the board, institutional shareholders or banks, labor can also serve as a monitor of management.

The remainder of the paper is structured as follows. Section II describes the theoretical model, with proofs presented in the Appendix. Section III states the testable predictions of our model. Section IV describes our sample. Section V provides empirical results. Section VI concludes.

II. A Model of Outsourcing

A firm consists of two participants, the CEO, *C,* and labor, *L*. The CEO and labor engage in the following game. Let γ_i denote the Nash bargaining power of player *i*, for $i = C, L$, where

$\gamma_C + \gamma_L = 1$. In Period 0, the players engage in Nash bargaining to decide whether the firm shall outsource and determine how profits will be split between the two. Let α_i denote the share of player *i*, for $i = C, L$, where $\alpha_C + \alpha_L = 1$. Thereafter, the CEO and labor engage in an infinitely repeated stage game with three steps.

- ***Step 1***. The CEO and labor decide non-cooperatively how much observable effort to exert that augments the total factor productivity (TFP) of the firm. A higher level of TFP lowers the cost of production of the firm, but each player exerts the level of effort that maximizes its own payoff.[6]
- ***Step 2***. The CEO and labor cooperatively decide how much to produce so as to maximize firm profitability in a market in which the firm has a monopoly.[7]
- ***Step 3***. The CEO and labor cooperatively decide the factors of production to rent to solve a cost minimization problem. This is where the outsourcing decision has an impact on firm profitability in a manner described below.

The CEO and labor use Markov strategies, taking into account the state variables that affect their payoffs. We restrict our attention to the unique steady state Markov perfect equilibrium (SSMPE), defined below. The CEO and labor maximize their income and discount the future according to the cost of capital *r*. Let *T* denote the TFP of the firm. Player *i* augments TFP by exerting observable effort e_i that costs d_i per unit of effort, for $i = C, L$. TFP evolves according to $T' = (1-\delta)T + \lambda e_C^{\beta_C} e_L^{\beta_L}$, where λ measures the level of technology and $\delta \in (0,1)$ is the rate of depreciation of TFP. The parameter β_i denotes the importance of player *i* in the accumulation of TFP, for $i = C, L$, where $\beta_C + \beta_L = 1$. TFP depreciates due to obsolescence: the CEO and

[6] This formulation is in the spirit of Raith (2003) and Aggarwal and Samwick (1999) who model in a principal-agent framework the interaction between product market competition and incentives by having the agent exert unobservable effort that lowers the marginal cost of production of the firm.

[7] Because the firm has a monopoly, we are unable to formally examine the role of the extent of competition on the outsourcing decision. However, we proxy for this via the price elasticity of demand, which determines how price-sensitive are consumers and thereby the availability of substitutes.

labor must exert effort to ensure the firm remains on the frontier from a technological, product quality, and cost perspective.

The firm produces using *K* inputs according to the production function $TF(X_1,...,X_K)$, where $X \equiv \{X_k\}_{k=1}^K$ is the vector of inputs. The function *F* is homogeneous of degree $\theta > 0$. The vector of input prices $w \equiv \{w_k\}_{k=1}^K$ is constant and exogenous. The inverse demand function for the firm's product is constant at $P(q) = s/q^{1/\varepsilon}$, where ε is the price elasticity of demand and *s* measures the (exogenous) size of the product market.[8] A product has a higher elasticity the more substitutes are available. The price elasticity of demand is thereby a proxy for the extent to which the product is differentiated and the extent of heterogeneity in the industry: a high value of ε signifies demand is very elastic, suggesting the product is not considerably different from its competitors, implying the product offerings by firms in the industry should be relatively homogeneous.

We proceed with deriving the subgame perfect Nash equilibrium of the stage game using backwards induction. Step 3 specifies the cost minimization problem for the firm; Step 2 solves the output problem transformed from the cost function: and Step 1 examines the TFP problem with an outsourcing indicator, and solves for the SSMPE. Step 0 determines the equilibrium split of profits between the CEO and labor and solves the outsourcing decision in Period 0. Derivation of each step (in backwards induction) from Step 3 to Step 0 is provided in Appendix A.

The following propositions derive the properties of the steady state Markov perfect equilibrium (SSMPE). The proofs follow by inspection, so they are omitted. We explain the intuition of our findings in the context of the empirical hypotheses in the next section.

PROPOSITION 1: Assume (A1) holds: $\varepsilon > 1$, $\theta \leq 1$, $m < 1$.[9] The firm is more likely to outsource:

[8] This demand function arises if the representative consumer has CES preferences over a bundle of goods, such that the price elasticity of demand equals the elasticity of substitution across any pair of goods.

[9] Three assumptions, respectively, mean $\varepsilon > 1$ (revenue function is increasing in output), $\theta \leq 1$ (concave cost function), and $m < 1$ (decreasing returns to TFP). For details, see Appendix A, section A.2.

- The greater is the bargaining power of the CEO, γ_C, and the smaller is the bargaining power of labor, γ_L;
- The greater is the production cost, measured by c(0)/c(1).
- The more homogeneous is the industry (measured by an increase in the price elasticity of demand ε).

PROPOSITION 2: Assume (A1) holds. The share α_C of profits that accrue to the CEO is

- Increasing in the bargaining power of the CEO γ_C and decreasing in the bargaining power of labor γ_L;
- Independent of whether the firm outsources.

III. Empirical Hypotheses

3.1. CEO/labor power, the decision to outsource, and the share of profits of CEO/labor

Finkelstein (1992) identifies four dimensions of CEO power from which we draw upon in developing our empirical tests: structural power, ownership power, expert power, and prestige power. In addition to the economic motives of outsourcing, CEO power should affect outsourcing processes and may further cultivate firm growth. In our study, we employ the four power categories of Finkelstein to investigate the influence of CEO power on outsourcing decisions and outcomes, as well as the moderating effects of labor power on the relation between CEO power and outsourcing activities.

Structural power refers to a CEO's formal legitimacy and addresses the CEO's ability to influence the behavior and actions of internal stakeholders. Strong structural power allows a CEO to be independent of subordinate managers, board members (Hermalin and Weisbach, 1998), or firm workers (DeAngelo and DeAngelo, 1991). Ownership power refers to CEO's ownership and control such as a CEO's founder status and shares in a company. Since the interests of a CEO with a large ownership stake are more aligned with those of the firm, the CEO has an incentive to maximize firm

profits (Jensen and Meckling, 1976). Ownership power could also give the CEO the ability to make decisions without other people's interference. Expert power gives a confidence to the CEO to maneuver through uncertainties from the firm's environment. An expert CEO usually has many years of management experience. When a firm is undergoing a process of corporate restructuring, the experienced CEO who is able to make sense of changes could make effective and timely decisions, with little second-guessing from others. Prestige power refers to the attribute of having status, such as being a member of an elite social circle. Since having a prestigious status can signal his quality to internal and external stakeholders, the CEO can be more prepared to make major corporate decisions (Chemmanur and Paeglis, 2005).

Outsourcing is generally viewed as a strategy that helps firms cut operational costs (Mankiw and Swagel, 2006) and gain competitive advantage (Kotabe and Murray, 2004). Although it is subject to political pressure from government and workers, outsourcing is still very attractive for efficiency from the CEO's perspective (Gilley and Rasheed, 2000; Williamson, 2008). Moreover, strong CEO power could reduce other stakeholders' ability to meddle in corporate affairs (Hermalin and Weisbach, 1998; Gompers, Ishii and Metrick, 2003).

We therefore argue that CEO power is positively associated with the decision to outsource. Our theoretical model formally shows that a firm is more likely to outsource the greater is the bargaining power of the CEO (Proposition 1). Outsourcing renders the firm more profitable by lowering costs of production, so it is favored by the CEO; thus, the more powerful he is, the more likely it is to occur.

Hypothesis 1*: The greater is CEO power, the more likely is the firm to outsource.*

Labor power has been widely discussed in economics, finance and management literatures. Workers usually represented by unions are very sensitive to the issue of wages. *Fortune* (April 23, 2003) reports that union leaders "revile" CEOs' "unfair" pay. Banning and Chiles (2007) show that CEOs in union firms are paid less than those in non-union firms. However, consistent with the power contest argument, Hallock (1998) provides empirical results that CEOs that implemented worker

layoffs receive a better compensation package later.

Labor power is more pronounced in major corporate restructuring decisions. For instance, Matsa (2010) provides evidence that strong labor power grants a firm a strategic incentive to increase its debt in its optimal capital structure decision, because maintaining low levels of corporate liquidity can improve the firm's bargaining position with workers. Kang and Shivdasani (1997) offer empirical results that Japanese firms, whose workers are generally more powerful than U.S., are more likely to limit downsizing and layoffs compared to U.S. firms that experience the same weak firm performance. John, Lang and Netter (1992) document that large firms that initiate voluntary restructuring cut their labor force while keeping their CEOs, which supports a notion that powerful CEOs can counter labor power. DeAngelo and DeAngelo (1991) find that CEOs may reduce reported earnings during labor negotiations to strengthen their bargaining positions in the CEO-labor contest. The evidence thereby suggests there is a power play between the CEO and labor, especially when a firm is at a restructuring stage. Outsourcing usually results in temporary or permanent wage inequality, layoffs, or even shutdowns of existing sites (Feenstra and Hanson, 1996, 1999).

We expect labor resistance to outsourcing, and hence expect a negative relation between labor power and the probability of outsourcing – confirmed by Proposition 1 in the theoretical model.

Hypothesis 2*: The greater is labor power, the less likely is the firm to outsource.*

Our theoretical model predicts that the firm is more likely to outsource the greater is the production cost faced by the firm (Proposition 1). It is intuitive that the greater are the potential cost savings associated with outsourcing, the stronger is the incentive to outsource. The model also predicts that an increase in the extent to which the industry is homogeneous leads to an increase in the payoff of outsourcing (Proposition 1). The more homogeneous is the industry, the more price-sensitive are consumers (due to the increased availability of substitutes) and thus the smaller is the firm's profit margin. Hence the likelihood of outsourcing is a positive function of savings in the firm's marginal cost of production possible with outsourcing, as well as the homogeneity of the

product.

Hypothesis 3: *The greater is the firm's production cost, the more likely is the firm to outsource.*

Hypothesis 4: *The more homogeneous is the industry, the more likely is the firm to outsource.*

Our theoretical model predicts that the more powerful is the CEO, the greater is his share of profits (Proposition 2). This follows from the fact that the CEO and labor engage in Nash bargaining; thus, the greater is the bargaining power of the CEO, the greater is his share of the surplus being split. Furthermore, our theoretical model predicts that the outsourcing decision does not affect the share of profits that accrue to the CEO or labor (Proposition 2). The intuition is that the outsourcing decision affects profits and thereby the surplus that the CEO and labor are splitting, but does not affect the power of the CEO relative to labor and thereby the manner in which profits are being split.

Hypothesis 5: *The greater is CEO power, the greater is the CEO's share of profits.*

Hypothesis 6: *The outsourcing decision does not affect the CEO's share of profits.*

Following from agency theory (Jensen and Meckling, 1976; Jensen, 1993), a powerful CEO may undertake outsourcing for his private benefits, such as perquisites or personal network construction. However, a good corporate governance system could reduce the potential agency conflicts between the CEO and shareholders (Jensen, 1993; Shleifer and Vishny, 1992). In our empirical analysis, we include corporate governance variables to control for the potential conflicts between the CEO and large shareholders.

We consider numerous moderating factors in the power contest between the CEO and labor of an outsourcing firm. Prior studies document that labor activism is generally rational. Freeman and Kleiner (1999) and Kuhn (1985) show that unions behave in an economically rational manner, and do not press for wage increases to the point of brink where firms become too unprofitable to stay in business. John, Lang and Netter (1992) find indirect evidence that unions agree to labor cost reductions when the firm is facing difficult economic conditions. Adamson and Fausti (2007) argue that union bargains more reasonably with a firm without monopoly power in the product market.

Firm performance is also a moderating variable in the event of outsourcing (Murray and Kotabe, 1999; Choi, Trigeorgis and Zhang, 2014). When a firm with both a dominant CEO and strong labor has been experiencing weak performance, the firm has a higher probability to outsource and cut in-house jobs. Furthermore, while unions have incentives to negotiate employee benefits, they often seek to protect the majority of current workers as long as firms can continue operations (Hirsch, 2004). That is, union rationality can lead to concessions between the CEO and labor in certain circumstances. Blanchflower, Millward and Oswald (1991) find that when firm survival is threatened, unionized workers concede to management and agree to wage cut and layoffs in order to protect the benefits for the majority of its members. Therefore, poor prior firm performance may induce labor to compromise more vis-à-vis management and to make outsourcing more likely.

3.2 CEO-labor power and post-outsourcing firm performance

The relation between CEO power and firm performance has been the subject of large empirical work but the results are generally ambiguous. The arguments in favor of a negative influence of CEO power on firm performance originate from agency theory (Fama and Jensen, 1983; Jensen and Meckling, 1976) and power circulation theory (Ocasio, 1994; Ocasio and Kim, 1999). Agency theory states that an entrenched CEO is more likely to take self-serving actions that expropriate shareholder wealth, in which case firm performance is negatively related to CEO power. Power circulation theory provides a similar prediction: a strong-willed, dominating CEO can discourage contributions from his subordinates and thus eventually hurt firm performance.

By contrast, upper echelon theory argues that the CEO is a critical intervening factor whose characteristics can affect strategic decisions and corporate outcomes (Hambrick and Mason, 1984). A powerful CEO can efficiently address implementation issues related to organizational changes. The upper echelon perspective predicts a positive relation between CEO power and firm performance, and the positive relation is prominent when a company is undergoing organizational changes. Existing empirical studies have also provided supportive evidence of this positive correlation. For instance, Smith, Houghton, Hood, and Ryman (2006) observe that a firm is more likely to have

strong performance when its CEO is strong; Daily, Certo and Dalton (2000) provide evidence that CEO's work experience contributes to a firm's internationalization; Chemmanur and Paeglis (2005) show that a prestigious CEO is able to act without others' interference and work productively; and Morck, Shleifer and Vishny (1988), and Shleifer and Vishny (1992) find that a CEO with large ownership fosters firm growth.

We argue that CEO power is critical for an outsourcing firm, since a powerful CEO would provide an advantage to the firm in effectively executing this strategic decision, and his strong leadership can reduce the instability that arises when the firm undergoes corporate restructuring. As part of the process of major restructuring like outsourcing, the CEO's behavior will be carefully monitored and reviewed by the firm's stakeholders, including employees. Potential agency conflicts, or the possibility that the CEO pursues his private benefits through firm investments, can be controlled. So our prior lies in favor of the upper echelon perspective, and expect that the relation between CEO power and outsourcing firms' performance is positive.

Hypothesis 7*: CEO power is positively related to post-outsourcing firm performance.*

IV. Sample and Variables

4.1 Sample description

Outsourcing announcements are obtained from *The Wall Street Journal* articles in the Factiva database. A keyword search is conducted using the following search terms: 'outsourcing', 'outsource,' and 'contract'. The time period chosen is from January 1, 1995 to December 31, 2016, which covers a complete business cycle. We include the outsourcing announcements of all U.S. publicly traded firms (including both U.S. domestic firms and foreign firms publicly traded in the U.S.) with 402 initial observations. Consequently, 92 observations are deleted from the initial sample because the outsourcing announcements are missing important data, such as the specific first announcement date, the outsourcer's CRSP data, and the outsourcer's COMPUSTAT data. Because we are interested in the outsourcing effects identified by events, we screen out other announcements (lawsuits, strikes,

layoffs, mergers and acquisitions, earnings, and dividends, etc.) that may confound the market reactions to outsourcing. We search the outsourcing firm's news from *The Wall Street Journal* in the time window (-10, 10) of the event day and further remove 8 observations that have these multi-events. Also, 47 cases with foreign outsourcers are eliminated. Our final sample includes 255 outsourcing events. Daily stock data are derived from CRSP and financial statement data from COMPUSTAT. Since events are usually reported with one day lag in print media, t=0 likely represents a day after actual announcements.

Table 1 reports a summary of the sample selection with sample distributions. We present the sample selection in Panel A and the outsourcing frequency in Panel B. We find that most outsourcers were in the manufacturing industry, consistent with the identified phenomenon of industry clustering in the outsourcing literature.

[Insert Table 1]

4.2 Variable definitions

CEO power

There are a variety of approaches for assessing CEO power in organizational settings. In order to perform our empirical tests, we need to measure how much outsourcing decision-making power is concentrated in the hands of a CEO. We therefore employ the four types of CEO power proposed by Finkelstein (1992): structural power, ownership power, and expert power.

To measure CEO structure power, we include *CEO Chairman dummy*, *Compensation committee dummy, Governance committee dummy, and Nomination committee dummy*. We code these dummy variables 1 if a firm's CEO is a chairman of the board of directors, a member of the compensation committee board, a member of the governance committee board, and a member of the nomination committee board,.

Ownership is also a key source of power. We use *CEO ownership* and *CEO ownership dummy*. *CEO ownership* is defined as the ratio of the number of shares owned by a CEO after adjusting for stock splits to total shares outstanding. *CEO ownership dummy* is equal to 1 if CEO ownership is larger

than 1%. We also use half of the mean of CEO ownership in our sample as an alternative cutoff point to address potential sample selection bias.

To measure CEO expert power, we use *CEO tenure* and *CEO tenure dummy*. *CEO tenure* is the number of years since the CEO was appointed. *CEO tenure dummy* is 1 if the tenure year of a CEO is longer than 3 years, which is half of the mean of CEO tenure in our sample.

Researchers have cautioned against reliance on single indicators of power, as CEO power has been shown to be multidimensional in character (Finkelstein, 1992; Krackhardt, 1990). Including more than one measure of power is important to have a better understanding of the effect of CEO power on corporate decisions, as well as organizational outcomes. We therefore define a *CEO power index* based on the above three categories. *CEO power index* is the average of *Chairman dummy, Compensation committee dummy, Governance committee dummy, Nomination committee dummy, CEO ownership dummy, and CEO tenure dummy*. All the CEO power variables are manually collected from firms' proxy statements, annual reports, and internet news.

Labor power

Labor has legitimate and social power in some countries. For instance, Addison (2005) states that labor power stems from worker representation in unions and councils in Germany; and Kang and Shivdasani (1997) discuss the power of lifetime employment in Japanese companies. In contrast to those countries, the influence of labor in the United States declined (Hirsch, 2004). We employ three measures to proxy for labor power in U.S. firms. First, following Hirsch and MacPherson (2003), we include the *Union ratio,* the ratio of unionized employees relative to the total number of employees, as a measure of labor power. We also use *Union dummy*, which is equal to 1 if a firm's union ratio is greater than the two-digit industry level union ratio.[10] Second, the existence of collective bargaining agreements in a firm's history is also identified as a measurement of labor

[10] The information was obtained from The Union Membership and Coverage Database, available at www.unionstats.com. Constructed by Hirsch and MacPherson (2003), the database provides labor union membership, coverage, and density estimates compiled from the Current Population Survey (CPS), a monthly household survey. The database reports those estimates by state, industry (four-digit SIC codes), occupation, and metropolitan area, while the firm-level estimates are not publicly available. Matsa's (2010) firm-level estimates of union coverage are provided by Richard Freeman and Barry Hirsch.

resistance. We obtain the publicly reported collective bargaining agreements of outsourcing firms from the U.S. Department of Labor. *Collective bargaining dummy* is set to 1 if a firm has at least one collective bargaining agreement reported in the U.S. Department of Labor; otherwise, it is 0. Third, we code *Strike dummy* to equal 1 if a firm announced strikes in *The Wall Street Journal* in the time window of one-year prior to outsourcing; otherwise, it is 0.

Similar to *CEO power index*, we formulate *Labor power index*, which is the average of *Union dummy, Collective bargaining dummy*, and *Strike dummy*.

To assess the sensitivity of results to different variable specifications, we computed alternative measures of CEO-labor power indexes. *CEO net power* is the difference between CEO power index and Labor power index; and *CEO relative power* is the ratio of CEO power index to the sum of CEO power index and Labor power index.

Corporate governance

Agency theory (Jensen and Meckling, 1976) argues that management teams often pursue their private benefits through firm investments. Outsourcing leaves room for a firm's managers to expropriate shareholder wealth. Therefore, stock markets may negatively react to outsourcing activities when firms have ineffective corporate governance. The potential value of flexibility afforded by outsourcing may be realized only by a firm with low agency conflicts. We employ the Governance Index (*G-index*) of Gompers, Ishii and Metrick (2003) as a proxy for the potential of managerial expropriation.[11]

Market reactions

We follow the standard event study method to calculate cumulative abnormal return (CAR) over various time windows.[12] Z-statistics are employed to indicate the level of significance. Stock data

[11] The *G-index* is a comprehensive measure of corporate governance based on 24 firm-specific provisions. A large value of *G-index* implies poor corporate governance and potentially severe agency conflicts.

[12] We define R_{jt} as the continuously compounded rate of return for firm *j* on day *t*; R_{mt} as the market rate of return on day *t;* and α_j and β_j as estimates of regression parameters for firm *j*, estimated over the 150-day period beginning at 250 trading days and ending at 101 trading dates prior to announcement. We then have: $AR_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt})$ and $CAR_j = \sum_{t \in wiondow} AR_{jt}$

are obtained from CRSP.

Firm performance

Consistent with prior literature, we use the industry median-adjusted Tobin's q (*Ind-adj. Tobin's q*) to measure firm performance. We consider Tobin's q one and three years after the outsourcing event. We also employ the industry median-adjusted ROA (*Ind-adj. ROA*) three years after the outsourcing event as an alternative.

Other variables of interest

Production cost is the ratio of cost of goods sold to sales. Following Parrino (1997), *Industry homogeneity* is the average across all firms in each two-digit SIC industry of the mean partial correlation coefficient for an industry return index in a two-factor market model (that also includes a market return index) from 1995 to 2016. *CEO's share of profits* is the ratio of the value of CEO total compensation (including salary, bonus, stocks and options as reported by the firm) to sales one year prior to outsourcing. *Labor's share of profits* is the ratio of labor and related expenses to sales one year prior to outsourcing.

Control variables

Firm size is the natural logarithm of book value of total assets. *SD of stock returns* is the standard deviation of the stock return residual in the time window of 365 calendar days to 10 calendar days prior to the outsourcing event. Stock return residuals are calculated based on the CAPM. Stock data are obtained from CRSP. *Firm size* is the natural logarithm of book value of total assets from COMPUSTAT. *No. of business segments* is the number of business segments listed in COMPUSTAT.

V. Empirical Results

Table 2 presents the definitions and descriptive statistics of all variables. Panel A defines the variables. Panel B reports descriptive statistics of firm performance, including CAR, *Ind-adj. ROA* and *Ind-adj. Tobin's q*. The results show that stock markets have a positive response to outsourcing

events in general. The CARs of outsourcers are all positive for a variety of time windows. Particularly, CAR (-1, 1) and CAR (-3, 1) have a significance level of one percent, with magnitudes of 0.017 and 0.023, respectively. The pattern of consistently positive CARs indicates that outsourcing generally increases firm value in a short time period. *Ind-adj. Tobin's q* for one-year and three-year post-outsourcing are positive, with a mean of 1.797 and 1.807, respectively, which implies that outsourcing firms have superior performance relative its peer in the same industry. *Ind-adj. ROA* one-year and three-year post-outsourcing have means of 0.115 and 0.115, respectively. Panel C reports descriptive statistics of power and other variables.

[Insert Table 2]

To examine the power play between the CEO and labor as it pertains to the decision to outsource, we conduct logistic regressions and report the results in Table 3. Control sample of non-outsourcing firms are constructed in two ways. In control sample 1 (model 1-model 3), non-outsourcing firms are matched one-on-one with outsourcing firms in the same two-digit SIC industry and the closest firm size (measured by total assets). In control sample 2 (model 4-model 6), the non-outsourcing firms are selected based on predicted propensity scores using firm size.[13] This method takes account of the endogeneity problem.

We find positive and significant coefficients of *CEO power index* in models 1 and 4. For instance, in model 1, CEO power index has a significance level of five percent, with a magnitude of 0.043, on the likelihood of outsourcing. These findings are supportive of *Hypotheses 1 and 2*. Negative but insignificant coefficients of *Labor power index* on the likelihood of outsourcing are also found[14].

We find that a firm is more likely to outsource the greater is its cost of production in two out of six model specifications, wherein *Production cost* has a positive and significant coefficient, which is weakly supportive of *Hypothesis 3*. We do not find that a firm is more likely to outsource the more

[13] Admittedly the use of one variable may be too narrow but is necessitated due to the difficulty of obtaining distinguishing firm-specific variables across the entirety of non-outsourcing firms comparable to outsourcing firms. Firm size, however, is one of the major characteristics distinguishing outsourcing and non-outsourcing firms.

[14] We also use *CEO net power* and *CEO relative power* as additional power proxies, but we do not find significant coefficients on these two variables.

homogeneous is its industry in three out of six model specifications as in *Hypothesis 4*, as *Industry homogeneity* has mixed sign.

[Insert Table 3]

We next test whether CEO/labor power affects the share of profits prior to outsourcing decisions. The control sample of non-outsourcing firms is matched one-on-one to outsourcing firms in the same two-digit SIC industry and the closest firm size (measured by total assets).

Models 1 to 3 in Table 4 are with G-index, while models 4 to 6 are without G-index. Regression results in Table 4 show that the greater is CEO (labor) power, the greater is the CEO's (labor's, respectively) share of profits. *Hypothesis 5* is thereby accepted. Models 1 and 4 provides evidence that CEO power index is positively and significantly related to CEO's share of profits, with a magnitude of 0.203 and 0.299 respectively. Furthermore, we find that in all model specifications, *Outsourcing dummy* has no effect on the share of profits, offering support for *Hypothesis 6*.

[Insert Table 4]

We then study the effects of CEO and labor power on the long-term performance of outsourcers, and on the market reaction to outsourcing announcements. Long-term firm performance is measured by *Ind-adj. Tobin's q* (one and three years after the outsourcing event) and *Ind-adj. ROA* (three years after the outsourcing event). Market reactions to outsourcing announcements is measured by outsourcer's *CAR (-3, 1)*. The results are provided in Table 5.

[Insert Table 5]

The results show that *CEO power index* is significantly positively associated with *Ind-adj. Tobin's q* (one year after the outsourcing event) in model 1. The effect of CEO power on *Ind-adj. Tobin's q* (three years after the outsourcing event) is insignificant, while the *CEO relative power* is positive and significant in models 6 and 8. *Labor power index* is significantly negatively associated with *ROA* in model 7. These findings show that the CEO contributes to post-outsourcing performance improvement to some extent. To investigate the moderating effect of prior performance, we include the interaction terms of *CEO relative power index* and *Ind.-adj. Tobin's* q_{t-1}. The significant coefficient of

the interaction term in model 8 (with a magnitude of -0.034) shows that the impact of CEO relative power on CAR depends on prior firm performance. A larger positive CAR is associated with a firm having stronger CEO power and weaker prior firm performance. Stock markets respond more positively to outsourcing firms that have been experiencing poor performance with strong CEO power, in part because outsourcing may strengthen CEO power.

Robustness tests relating to individual power measures are undertaken as well (not reported). We examine the impacts of individual power measures on the share of profits of the CEO, post-outsourcing firm performance and CAR. We find that when the dependent variables are the share of profits of the CEO or post-outsourcing performance, *CEO ownership* as one of the *CEO power* component, is the only variable that is significant.

In another robustness test, we also try adding the financial crisis dummy in the model specifications, and we find that the results are very similar to these of Tables 4 and 5, in terms of both signs and magnitudes.

VI. Conclusion

Although CEO power has drawn significant attention in the literature, the CEO's influence on corporate restructuring decisions, as well as consequent firm performance, is not fully understood. Previous studies mostly focus on the role of CEO in a shareholder model which leaves out the role of other important stakeholders such as labor. In this paper, outsourcing was used as an experiment to study the extent and impact of CEO power in a restructuring firm where labor can check and monitor the CEO's behavior. Instead of focusing on the traditional governance institutions such as boards of directors and large shareholders, we shifted our attention to the challenges faced by the CEO from labor.

We propose a theory that models a cooperative game between the CEO and labor in the decision to outsource. Hypotheses drawn from our model were tested on outsourcing data by U.S. firms. We found evidence in agreement with the model pertaining to the likelihood of outsourcing,

the split of profits, and post-outsourcing performance. Furthermore, we found that firms with powerful CEOs demonstrate improved long-term performance after outsourcing, lending support to the view that "CEOs matter." However, the likelihood of outsourcing, and its successful outcome, also depends on obtaining a cooperative solution with labor – indicating that a cooperative solution between labor and CEO is important in major restructuring situations such as outsourcing. Interestingly, poor prior firm performance – because of a fear of bankruptcy and loss of jobs – induces them to cooperate more and thereby moderates the power contest between the CEO and labor.

Moreover, we show that labor can have a moderating influence on the CEO power. In contrast to the popular view that considers labor as a cost to shareholders, we show that the CEO power is balanced by labor that can monitor the CEO behavior in a constructive manner and thereby help realize the value of outsourcing for the firm. In situations of major restructuring such as outsourcing, labor can act as a monitor as well as a countervailing force of the CEO. The implication is that labor can be a monitoring agent of management, in addition to the traditional corporate governance institutions such as the board or institutional investors.

In the spirit of a stakeholder model, we treated the CEO and labor as power players at the same level, rather than viewing labor as a cost or subordinate usually assumed in a shareholder model. For a fuller analysis, the present theoretical and empirical work needs to be extended to reflect alternative gaming assumptions (e.g., the likelihood of bargaining impasse) as well as to incorporate third-way endogenous interactions with the board in addition to the CEO and labor. Moreover, the basic implication that labor monitoring of management can lead to improved managerial conduct is an open issue. These are left to future work.

Appendix A

This appendix provides detailed derivation of the model outlined in the text, in backwards induction, from Step 3 on cost minimization in A.1 to Step 2 on production problem in A.2, and Step 1 on the TFP problem in A.3 and solution of the SSMPE (Steady State Markov Perfect Equilibrium) in A.4. Step 0 determines equilibrium split of profits between the CEO and labor and solves for outsourcing decision in A.5.

A.1 The cost minimization problem of the stage game (Step 3)

Let T denote the equilibrium level of TFP determined in Step 1. Given the firm desires to produce q units of output, its cost-minimization problem in Step 3 is

(1) $\min_{\{X_k\}_{ik1}^{K}} \sum_{k=1}^{K} w_k X_k$ subject to $TF(X_1,...,X_K) \geq q$.

Applying Theorem 3.4 in Jehle and Reny (2001, p. 131), we can show that the cost function associated with (1) satisfies

(2) $C(q;T,w,z) = c(z)(q/T)^{1/\theta}$,

where $c(z)$ is an increasing and concave function of the vector of input prices w and z is an index that equals 1 if the firm is outsourcing and 0 otherwise. From Shephard's lemma, factor demand is

given by $X_k(z) = c_k(z)(q/T)^{1/\theta}$, where $c_k(z) = \partial c(z)/\partial w_k$. If the firm outsources, then it faces the cost function $c(1)$; otherwise, it faces the cost function $c(0)$, where $c(0) > c(1)$. For simplicity, we assume the outsourcing decision does not affect the product's quality. This reflects the fact that, when outsourcing, a firm has access to cheaper factors of production and an enlarged set of factors of production, which potentially affects its entire mix of inputs. Since outsourcing may involve a complex mix of domestic and foreign inputs, we abstract away from such details by modeling instead the impact of outsourcing as reducing the cost function faced by the firm. Hereafter, we suppress the index z until sub-sections A.4 and A.5 wherein we derive the equilibrium and solve the outsourcing decision.

A.2 The production problem of the stage game (Step 2)

The CEO and labor anticipate that the cost function in Step 3 is $c(z)(q/T)^{1/\theta}$. The firm's output problem in Step 2 is to maximize monopoly profits:

(3) $\max_{\{q\}} sq^{1-1/\varepsilon} - c(z)(q/T)^{1/\theta}$.

The first-order condition (FOC) yields the output policy $q(z) = [(1-1/\varepsilon)s\theta T^{1/\theta}/c(z)]^{\varepsilon\theta/(\varepsilon(1-\theta)+\theta)}$. It follows that firm profits $\Pi(z) = sq(z)^{1-1/\varepsilon} - c(z)(q/T)^{1/\theta}$ as a function of TFP are

(4) $\Pi(z) = \pi(z)T^m$,

where $\pi(z) \equiv [1-(1-1/\varepsilon)\theta]\{s^{\varepsilon}[(1-1/\varepsilon)\theta/c(z)]^{(\varepsilon-1)\theta}\}^{1/(\varepsilon(1-\theta)+\theta)}$ measures the profitability of the firm as a function of its outsourcing decision and $m \equiv \dfrac{\varepsilon-1}{\varepsilon(1-\theta)+\theta}$ determines the responsiveness of firm profits to TFP, thus we refer to *m* as the *returns to TFP*.

To satisfy the second-order condition (SOC) of the output problem, we assume demand is elastic (such that the revenue function is increasing in output), $\varepsilon > 1$, and that there are constant or decreasing returns to scale in production (such that the cost function is convex), $\theta \le 1$; and to satisfy the SOC associated with the TFP problem in Step 1 (to be solved below), we assume there are

decreasing returns to TFP, $m < 1$:

Assumption (A1): $\varepsilon > 1$, $\theta \leq 1$, $m < 1$.

The assumptions $\varepsilon > 1$ and $\theta \leq 1$ have two further implications. First, they ensure firm profits $\Pi(z) = \pi(z)T^m$ are positive. Second, they imply the returns to TFP, m is increasing in the price elasticity of demand ε and the homogeneity θ of the firm's production function. Hence, the more elastic is demand and the greater are the returns to scale, the more responsive are firm profits to increases in TFP; that is, the more the firm has to gain from effort being exerted by the CEO and labor.

A.3 The TFP problem of the stage game (Step 1)

Let α_i denote the equilibrium equity stake of player *i*, for $i = C, L$, as determined in Period 0. The CEO and labor anticipate that the firm profits to be split in Step 2 are $\Pi(z) = \pi(z)T^m$. For ease of exposition, in this sub-section, we suppress the outsourcing indicator z. Taking as given the effort of player *j*, the value function of player *i* satisfies the Bellman equation

(5) $V_i(T) = \max_{\{e_i\}} \alpha_i \pi T^m - d_i e_i + (1+r)^{-1} V_i(T')$,

subject to the law of motion

(6) $T' = (1-\delta)T + \lambda e_C^{\beta_C} e_L^{\beta_L}$.

The FOC with respect to effort is

(7) $d_i = \lambda \beta_i (1+r)^{-1} e_i^{\beta_i - 1} e_j^{\beta_j} V_i'(T')$.

The SOC with respect to effort is

(8) $-(1-\beta_i)V_i'(T') + \lambda \beta_i e_i^{\beta_i} e_j^{\beta_j} V_i''(T') \leq 0$.

The envelope condition (EC) with respect to TFP is

(9) $V_i'(T) = \alpha_i \pi m T^{m-1} + (1-\delta)(1+r)^{-1} V_i'(T')$.

Applying the FOC (7), the EC (9) becomes $V_i'(T) = \alpha_i \pi m T^{m-1} + \frac{d_i(1-\delta)}{\lambda \beta_i e_i^{\beta_i - 1} e_j^{\beta_j}}$. Shifting

this forward in time, we obtain $V_i'(T') = \alpha_i \pi m(T')^{m-1} + \frac{d_i(1-\delta)}{\lambda\beta_i (e_i')^{\beta_i - 1}(e_j')^{\beta_j}}$. Applying this to the FOC (7) yields

$$(10)\quad \frac{d_i(1+r)}{\lambda\beta_i e_i^{\beta_i-1} e_j^{\beta_j}} = \alpha_i \pi m(T')^{m-1} + \frac{d_i(1-\delta)}{\lambda\beta_i (e_i')^{\beta_i-1}(e_j')^{\beta_j}}.$$

Equations (6) and (10) jointly define a non-linear dynamical system with three state variables consisting of the two effort policies and the TFP of the firm. The evolution of this system describes the Markov perfect equilibrium.

A.4 The Steady State Markov Perfect Equilibrium

To render the problem tractable, we restrict the analysis to the steady state Markov perfect equilibrium (SSMPE). We show in Lemma 1, which is stated and proved in the Appendix B, that the SSMPE arises under the restriction that TFP and the effort levels of the CEO and labor grow at the same constant rate over time.[15] Let an upper bar denote the steady state value of a variable. The steady state effort policy of player *i* is

$$(11)\quad \bar{e}_i(z) = \delta\left(\left(\frac{m\pi(z)\lambda^m}{r+\delta}\right)\left(\frac{\alpha_i(z)\beta_i}{d_i}\right)^{1-m\beta_j}\left(\frac{\alpha_j(z)\beta_j}{d_j}\right)^{m\beta_j}\right)^{1/(1-m)} \quad \text{for } i = C, L;$$

and the steady state level of TFP is

$$(12)\quad \bar{T}(z) = \left(\left(\frac{m\pi(z)\lambda}{r+\delta}\right)\left(\frac{\alpha_C(z)\beta_C}{d_C}\right)^{\beta_C}\left(\frac{\alpha_L(z)\beta_L}{d_L}\right)^{\beta_L}\right)^{1/(1-m)}.$$

The outsourcing decision z affects the profitability of the firm via the cost function: $\pi(z) = [1-(1-1/\varepsilon)\theta]\{s^{\varepsilon}[(1-1/\varepsilon)\theta/c(z)]^{(\varepsilon-1)\theta}\}^{1/(\varepsilon(1-\theta)+\theta)}$. Furthermore, the outsourcing decision may affect the profit shares of the CEO $\alpha_C(z)$ and labor $\alpha_L(z)$. If the firm outsources,

[15] The result follows from the fact that our framework exhibits the same properties as a neoclassical growth model in the macroeconomics literature. As in such models, we can also show that the steady state is unique and stable because there are decreasing returns to TFP under assumption (A1). TFP does not grow along the balanced growth path (BGP) because there is no source of exogenous growth, nor is there an engine of endogenous growth.

then it faces lower costs of production, which enhance firm profitability. The implications are that, holding constant the split of profits between the CEO and labor, the CEO and labor exert greater effort if the firm outsources, and the steady state TFP of the firm is greater if the firm outsources.

The ratio of steady state effort policies is

$$(13)\quad \frac{\bar{e}_C(z)}{\bar{e}_L(z)} = \frac{\alpha_C(z)\beta_C / d_C}{\alpha_L(z)\beta_L / d_L}.$$

Suppose the CEO and labor incur the same marginal cost of exerting effort (i.e., $d_C = d_L$) and have the same relative importance in the accumulation of TFP (i.e., $\beta_C = \beta_L$); then the CEO exerts more effort than labor if it has a greater share of profits (i.e., $\alpha_C(z) > \alpha_L(z)$).

To further simplify the framework, we assume the CEO and labor seek to maximize their steady state value function. From the Bellman equation (5), the steady state value function of player *i* satisfies $\bar{V}_i(z) = \alpha_i(z)\pi(z)\bar{T}(z)^m - d_i\bar{e}_i(z) + (1+r)^{-1}\bar{V}_i(z)$. Combining the steady state effort policy and TFP equations (11) and (12), respectively, we obtain the relation $\bar{e}_i(z) = \left(\frac{\alpha_i(z)\beta_i}{d_i}\right)\left(\frac{m\pi(z)\delta}{r+\delta}\right)\bar{T}(z)^m$, which, when applied to the Bellman equation, yields the steady state value function of player *i* in terms of TFP:

$$(14)\quad \bar{V}_i(z) = (1+1/r)\left(1 - \frac{\delta m\beta_i}{r+\delta}\right)\alpha_i(z)\pi(z)\bar{T}(z)^m \text{ for } i = C, L.$$

Under (A1) that there are decreasing returns to TFP (i.e., $m < 1$), the steady state value functions are non-negative, such that the CEO and labor obtain positive returns. We show in Lemma 2, which is stated and proved in the Appendix B, that the SOC with respect to effort (8) is satisfied in the steady state.

A.5 Equilibrium split of profits and outsourcing decision (Step 0)

In Step 0. the split of profits between the CEO and labor and the outsourcing decision of the firm are implemented via Nash bargaining in Period 0. The players bargain so as to maximize

their steady state value function. To capture the fact that labor receives benefits when the firm does not outsource, let $\overline{V}_{LO}(z)$ denote the steady state present value that accrues to labor stemming directly from the outsourcing decision z, independently of the profits it earns. All other things being equal, labor is more content if the firm does not outsource, $\overline{V}_{LO}(1) < \overline{V}_{LO}(0)$, reflecting all implicit and explicit benefits it earns (such as higher employment in the absence of outsourcing). Let $\psi \in (0,1)$ denote the weight that labor assigns to the steady state present value of profits $\overline{V}_L(z)$ and $1-\psi$ the weight it assigns to $\overline{V}_{LO}(z)$. For tractability, the CEO and labor have a payoff of zero if they do not participate in the relationship, such that the Nash product is $\overline{V}_C(z)^{\gamma_C}(\overline{V}_L(z)^{\psi}\overline{V}_{LO}(z)^{1-\psi})^{\gamma_L}$.

Define $\hat{\pi} \equiv [1-(1-1/\varepsilon)\theta]\{s^{\varepsilon}[(1-1/\varepsilon)\theta]^{(\varepsilon-1)\theta}\}^{1/(\varepsilon(1-\theta)+\theta)}$, which is independent of the outsourcing decision z, such that $\ln\pi(z) = \ln\hat{\pi} - \theta m \ln c(z)$. Applying the steady state TFP equation (12) to the steady state value function of the CEO and labor (14), and taking the log, the Nash bargaining problem is

$$
\begin{aligned}
&\max_{\{\alpha_C,\alpha_L,z\}} (\gamma_C+\psi\gamma_L)\ln(1+1/r) + \frac{(\gamma_C+\psi\gamma_L)\ln\hat{\pi}}{1-m} - \frac{(\gamma_C+\psi\gamma_L)\theta m \ln c(z)}{1-m} \\
&+\gamma_C \ln\left(1-\frac{\delta m\beta_C}{r+\delta}\right) + \psi\gamma_L \ln\left(1-\frac{\delta m\beta_L}{r+\delta}\right) \\
&+\left(\frac{m(\gamma_C+\psi\gamma_L)}{1-m}\right)\left(\ln\left(\frac{m\lambda}{r+\delta}\right) + \beta_C \ln\left(\frac{\beta_C}{d_C}\right) + \beta_L \ln\left(\frac{\beta_L}{d_L}\right)\right) \\
&+\left(\gamma_C + \frac{m(\gamma_C+\psi\gamma_L)\beta_C}{1-m}\right)\ln\alpha_C + \left(\psi\gamma_L + \frac{m(\gamma_C+\psi\gamma_L)\beta_L}{1-m}\right)\ln\alpha_L + (1-\psi)\gamma_L \ln\overline{V}_{LO}(z)
\end{aligned}
\tag{15}
$$

which is maximized subject to the conditions $\alpha_C + \alpha_L = 1$ and $\gamma_C + \gamma_L = 1$.

The FOC with respect to α_C yields the equilibrium share of the CEO:

$$\alpha_C = m\beta_C + (1-m)\gamma_C/(\gamma_C+\psi\gamma_L), \tag{16}$$

while that of labor is

(17) $\alpha_L = m\beta_L + (1-m)\psi\gamma_L /(\gamma_C + \psi\gamma_L)$.

The firm outsources (i.e., $z = 1$) if and only if

(18) $$(1-\psi)\gamma_L \leq \frac{\left(\frac{\theta m}{1-m}\right)\ln\left(\frac{c(0)}{c(1)}\right)}{\ln\left(\frac{\overline{V}_{LO}(0)}{\overline{V}_{LO}(1)}\right)+\left(\frac{\theta m}{1-m}\right)\ln\left(\frac{c(0)}{c(1)}\right)}.$$

Appendix B

Lemma 1: Assume (A1) holds. Along a balanced growth path (BGP), wherein TFP and the effort levels of the CEO and Labor are restricted to grow at the same constant rate over time, they are constant over time, which is labeled the *steady state*.

Proof of Lemma 1: Let *g* denote the common growth rate, such that $T' = (1+g)T$ and $e_i' = (1+g)e_i$ for $i = C, L$. From the law of motion (6), we obtain the following relationship between contemporaneous TFP and the effort policies:

(A.1) $(g+\delta)T = \lambda e_C^{\beta_C} e_L^{\beta_L}$.

Applying (A.1) to the law of motion (10), we obtain the effort policy of player *i* in terms of TFP the next period:

(A.2) $e_i = \left(\frac{\alpha_i \beta_i}{d_i}\right)\left(\frac{m\pi(g+\delta)(T')^m}{(r+\delta)(1+g)}\right)$.

Applying the effort policy (A.2) to (A.1), we obtain the following expression for TFP the next period:

(A.3) $T' = \left(\left(\frac{m\pi\lambda}{r+\delta}\right)\left(\frac{\alpha_C \beta_C}{d_C}\right)^{\beta_C}\left(\frac{\alpha_L \beta_L}{d_L}\right)^{\beta_L}\right)^{1/(1-m)}$.

We infer that along the BGP, TFP is constant over time, i.e. $g = 0$, which arises if the effort policies are constant over time.

Lemma 2: Assume (A1) holds. In the steady state Markov perfect equilibrium, the second-order condition with respect to effort (8) is satisfied.

Proof of Lemma 2: From the EC with respect to TFP (9), in the steady state, we have $\overline{V}_i' = \alpha_i \pi m \overline{T}^{m-1} + (1-\delta)(1+r)^{-1}\overline{V}_i'$, which yields the steady state marginal return on TFP:

(A.4) $\overline{V}_i' = \frac{(1+r)\alpha_i \pi m \overline{T}^{m-1}}{r+\delta}$.

Take the derivative of the EC with respect to TFP and evaluate it at the steady state, to obtain

(A.5) $\overline{V}_i'' = \dfrac{(1+r)\alpha_i \pi m(m-1)\overline{T}^{m-2}}{1+r-(1-\delta)^2}$.

In the steady state, the SOC (8) is $-(1-\beta_i)\overline{V}_i' + \lambda\beta_i \overline{e}_i^{\beta_i} \overline{e}_j^{\beta_j} \overline{V}_i'' \le 0$. Applying (A.4) and (A.5), and using the fact that $\overline{T} = \lambda \overline{e}_C^{\beta_C} \overline{e}_L^{\beta_L} / \delta$, the steady state SOC is given by

(A.6) $m \le 1 + \dfrac{(1/\beta_i - 1)[1+r-(1-\delta)^2]}{\delta(r+\delta)}$,

which is satisfied given $m < 1$ under Assumption (A1).

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Table 1: Sample and Distribution of Outsourcing Events

Our initial event sample consisted of 402 outsourcing events by all publicly traded firms in the US during the 22-year period of 1992-2016, as reported in the *Wall Street Journal* included in the *Factiva* database. After eliminating events due to missing data, multiple-event contaminations, and foreign firms, we are left with a final event sample of 255 firms (see Panel A). Exclusion of multiple-event cases is due to the presence of announcements of other major corporate events (e.g., lawsuits, layoffs, strikes, mergers and acquisitions, earnings, dividends) along with outsourcing during the event window (-10, 10). Panel B presents the frequency of events in the final sample, respectively, by year and industry.

Panel A: Sample Selection

Initial number of outsourcing events in the *Wall Street Journal*, 1995-2016	402
Less: Missing CRSP data, COMPUSTAT data, or event dates	-92
Less: Impacted by multi-events during the event window (-10, 10)	-8
Less: Outsourcer is a foreign firm traded in US	-47
Final usable sample events	255

Panel B: Outsourcing Frequency

Frequency by year

Year	Obs	Year	Obs
1995	13	2006	11
1996	16	2007	14
1997	6	2008	12
1998	9	2009	13
1999	11	2010	8
2000	29	2011	10
2001	16	2012	10
2002	15	2013	5
2003	15	2014	6
2004	12	2015	5
2005	15	2016	4

Frequency by industry

SIC Code	Industry Description	Outsourcer	Insourcer
1000-1999	Mining	6	0
2000-2999	Construction	29	26
3000-3999	Manufacturing	66	61
4000-4999	Transportation and communications	56	40
5000-5999	Trade	16	5
6000-6999	Finance, insurance and real estate	25	8
7000-7999	Business services	41	50
8000-8999	Legal, educational and social service	16	8
	Total	255	198

Table 2: Variable Definitions and Descriptive Statistics

Our sample includes 255 outsourcing announcements of all U.S. publicly traded firms from 1995 to 2016 from *The Wall Street Journal* (*WSJ*) articles in Factiva. Most financial data are from COMPUSTAT. CEO power data are from ExecuComp, Mergent's Manuals, proxy statements, annual reports, and the Internet. Most labor power data are from firms' Collective bargaining agreements, *Wall Street Journal* articles, and www.unionstats.com. Corporate governance data are from proxy statements and the IRRC database. Stock data are from CRSP. Most variables are lagged one year.

Panel A: Definitions of Variables

Variables	Definitions
CEO power	
Chairman dummy	Chairman dummy is equal to 1 if the CEO is the chairman of the firm's board of directors; 0 otherwise.
Compensation committee dummy	Compensation committee dummy is 1 if the CEO is a member of the compensation committee board; 0 otherwise.
Governance committee dummy	Governance committee dummy is 1 if the CEO is a member of the firm's governance committee board; 0 otherwise.
Nomination committee dummy	Nomination committee dummy is 1 if the CEO is a member of the firm's nomination committee board; 0 otherwise.
CEO ownership	CEO ownership is defined as the ratio of the number of shares owned by the CEO after adjusting for stock splits to total shares outstanding.
CEO ownership dummy	CEO ownership dummy is 1 if CEO ownership is larger than 1%; 0 otherwise.
CEO tenure	CEO tenure is the number of years since the CEO was appointed with a title of 'CEO'.
CEO tenure dummy	CEO tenure dummy is1 if the year of CEO tenure is longer than 3 years; 0 otherwise.
CEO power index	CEO power index is the average of Chairman dummy, Compensation committee dummy, Governance committee dummy, Nomination committee dummy, Founder dummy, CEO ownership dummy, CEO tenure dummy and Layoff dummy.
Labor power	
Union ratio	Union ratio, obtained from www.unionstats.com, is the number of unionized employees relative to the total number of employees.
Union dummy	Union dummy is equal to 1 if a firm's union ratio (the firm-level union ratio is proxied by the union ratio in a given industry with the same first three-digit SIC codes as the specific firm) is greater than the industry level (the industry-level union ratio is proxied by the union ratio in a given industry with the same first two-digit SIC codes as the specific firm); 0 otherwise. Union data are from www.unionstats.com.
Collective bargaining dummy	Collective bargaining dummy is 1 if a firm has at least one collective agreement reported with the U.S. Department of Labor; 0 otherwise.
Strike dummy	Strike dummy is 1 if a firm has reported strikes in The *Wall Street Journal* one-year prior to outsourcing; 0 otherwise.
Labor power index	Labor power index is the average of Union dummy, Collective bargaining dummy and Strike dummy.

Relative power	
CEO net power	CEO net power is the difference between CEO power index and Labor power index.
CEO relative power	CEO relative power is the ratio of CEO power index to the sum of CEO power index and Labor power index.
Firm performance	
Ind-adj. Tobin's *q*	Calculated a firm's Tobin q = [(book value of total assets) + (market value of common equity)-(book value of common equity)]/(book value of total assets), minus the median q of the same two-digit SIC industry.
Ind-adj. ROA	A firm's ROA minus the median ROA of the same two-digit SIC industry. A subscript to the right of the variable indicates the year when we obtain the data.
CAR	CAR is cumulative abnormal return. The event date, day 0, the date of an outsourcing announcement as reported in the *Wall Street Journal* (rather than the actual event day). The estimation period is (-250, -101). Firm return R_{jt} is the compounded rate of return for firm *j* on day *t*; market return R_{mt} is the rate of return for CRSP value-weighted market index on day *t*.
Other variables of interest	
Production cost	The ratio of the cost of goods sold to sales.
G-index	Corporate governance index as per Gompers, Ishii, and Metrick (2003) obtained from http://faculty.som.yale.edu/andrewmetrick/data.html. It is used as a proxy for shareholder rights: the lower the index, the stronger the shareholder rights and the lower the agency costs.
Industry homogeneity	Industry homogeneity is calculated by averaging, across all firms in each two-digit SIC industry, the mean partial correlation coefficient for an industry return index in a two-factor market model that also includes a market return index from 1992 to 2005 (Parrino, 1997).
Labor's share of profits	Labor's share of profits is the ratio of labor and related expenses to sales (COMPUSTAT data 42/data 12) one year prior to outsourcing.
CEO's share of profits	CEO's share of profits is the ratio of CEO compensation to sales, where CEO compensation is the sum of CEO's salary, bonus, and stocks/options (COMPUSTAT Executive Compensation data TDC1) one year prior to outsourcing.
Control variables	
Firm size	Firm size is the natural logarithm of book value of total assets.
SD of stock returns	Standard deviation of stock return residual in the time window of 365 calendar days to 10 calendar days prior to the outsourcing event. Stock return residuals are calculated based on the CAPM.
No. business segments	The number of business segments of the firm in the COMPUSTAT segment database.

Panel B: Descriptive Statistics of Firm Performance

	N	Mean	Std Dev	Min	Max
Ind-adj. Tobin's q_{t-1}	255	1.798	1.234	0.469	9.387
Ind-adj. Tobin's q_{t+1}	255	1.797	1.234	0.469	9.387
Ind-adj. Tobin's q_{t+3}	240	1.807	1.237	0.469	9.387
Ind-adj. ROA $_{t-1}$	255	0.114	0.081	-0.205	0.299
Ind-adj. ROA $_{t+1}$	255	0.115	0.081	-0.205	0.299
Ind-adj. ROA $_{t+3}$	240	0.115	0.082	-0.205	0.299
CAR (0, 1)	255	0.019	0.099	-0.299	0.697
CAR (-1, 1)	255	0.017	0.108	-0.411	0.695
CAR (-3, 1)	255	0.023	0.118	-0.517	0.611

Panel C: Descriptive Statistics of Power and Other Variables

	N	Mean	Std Dev	Min	Max
CEO power					
Chairman dummy	255	0.070	0.256	0.000	1.000
Compensation committee dummy	255	0.203	0.126	0.000	1.000
Governance committee dummy	255	0.086	0.281	0.000	1.000
Nomination committee dummy	255	0.118	0.324	0.000	1.000
CEO ownership dummy (>1%)	255	0.462	0.500	0.000	1.000
[CEO ownership]	255	0.013	0.018	0.002	0.658
CEO tenure dummy (>3 years)	255	0.387	0.488	0.000	1.000
[CEO tenure]	255	4.305	6.386	1.000	26.000
CEO power index	255	0.415	0.235	0.250	1.000
Labor power					
Union ratio	255	0.135	0.105	0.018	0.342
Union dummy	255	0.091	0.289	0.000	1.000
Collective bargaining dummy	255	0.194	0.396	0.000	1.000
Labor power index	255	0.095	0.162	0.000	0.667
Relative power					
CEO net power	255	0.320	0.275	-0.417	0.875
CEO relative power	255	0.872	0.221	0.273	1.000
Other variables of interest					
G-index	255	8.864	2.334	4.000	15.000
Production cost	255	0.447	0.271	0.000	0.549
Industry homogeneity	255	0.013	0.030	0.000	0.296
Labor's share of profits	255	0.354	0.128	0.102	0.758
CEO's share of profits	255	0.714	0.853	0.321	1.314
Control variables					
Firm size	255	10.005	2.483	3.225	14.194
SD of stock returns	255	0.028	0.018	0.007	0.130
No. business segments	255	1.081	3.498	0.000	24.000

Table 3: Logistic Regressions of the Likelihood of Outsourcing

Logistic regressions are conducted to estimate the likelihood of outsourcing. The dependent variable is a dummy variable (1 for outsourcing; 0 for non-outsourcing). Two control samples of non-outsourcing firms are constructed. In control sample 1 (Models 1-3), non-outsourcing firms are matched one-on-one to outsourcing firms in the same two-digit SIC industry and the closest firm size (measured by total assets). In control sample 2 (Models 4-6), the non-outsourcing firms are selected based on predicted propensity scores using firm size as instruments. This method takes into account the endogeneity problem. Industry fixed effects (two-digit SIC) are imposed in all models. All explanatory variables are lagged one year and defined in Table 2. The numbers in parentheses are t-statistics of coefficients. *, ** and *** denote significance at the 10%, 5%, and 1% on two-tailed tests, respectively.

	One to one matching			Propensity score matching (based on closest firm size)		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Power variables						
CEO power index	0.043**		0.032	0.033*		0.032
	(1.984)		(1.607)	(1.896)		(0.640)
Labor power index		-0.172	-0.191		-0.219	-0.061
		(-0.826)	(-0.665)		(-1.279)	(-1.075)
Other variables of interest						
Production cost			0.144*			1.517
			(1.906)			(0.960)
Industry homogeneity			0.565			-0.027
			(0.845)			(-0.004)
Control variables						
Firm size	0.037*	-0.003	0.041*	0.146	0.162*	0.149
	(1.824)	(-0.253)	(1.799)	(1.477)	(1.666)	(1.304)
SD of stock returns	-0.337	2.022	-1.705	-8.125	-6.928	-8.083
	(-0.160)	(1.500)	(-0.717)	(-0.748)	(-0.768)	(-0.573)
No. Business segments	-0.011	-0.009	-0.012	0.591	0.774	0.623
	(-0.966)	(-0.885)	(-0.991)	(1.405)	(1.427)	(1.267)
Intercept	-0.524**	-0.142	-0.544*	-0.032**	-0.031**	-0.032*
	(-1.997)	(-1.026)	(-1.829)	(-2.247)	(-2.003)	(-1.799)
Obs.	510	510	510	510	510	510

Table 4: Impact of CEO-Labor Power on the Share of Profits

This table reports OLS regressions of the share of profits of the CEO. The control sample of non-outsourcing firms is matched one-on-one to outsourcing firms in the same two-digit SIC industry and the closest firm size (measured by total assets). Outsourcing dummy is 1 for outsourcing firms and 0 for non-outsourcing firms. Industry fixed effects (two-digit SIC) are imposed in all models. All explanatory variables are lagged one year and defined in Table 2. The numbers in parentheses are t-statistics of coefficients. *, ** and *** denote significance at the 10%, 5%, and 1% level on two-tailed tests, respectively.

	DV: CEO's share of profits prior to outsourcing					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Power variables						
CEO power index	0.203**		0.186	0.299*		0.226
	(2.535)		(1.514)	(-1.837)		(1.617)
Labor power index		0.222	0.018		-0.086	-0.850
		(0.062)	(0.006)		(-0.527)	(-0.502)
Other variables of interest						
G-index	0.079	0.085	0.079			
	(1.236)	(0.982)	(1.253)			
Outsourcing dummy	0.070	-0.406	0.070	0.026	0.463	0.991
	(0.251)	(-0.881)	(0.231)	(0.738)	(0.781)	(0.734)
Control variables						
Firm size	0.035	0.634	0.035	0.633*	0.711**	1.587**
	(0.285)	(1.587)	(1.283)	(1.916)	(1.988)	(1.989)
SD of stock returns	37.368*	39.569	37.387*	35.928	37.765	36.484
	(1.845)	(1.480)	(1.682)	(1.243)	(1.244)	(1.241)
No. business segments	-0.028	-0.040	-0.028	0.262	0.271	0.286
	(-1.149)	(-1.250)	(-1.079)	(0.959)	(0.930)	(0.946)
Intercept	-1.689	6.303**	-1.698	7.095	7.828	4.357
	(-1.070)	(2.525)	(-0.895)	(0.682)	(0.760)	(0.401)
R-square	0.102	0.067	0.052	0.113	0.095	0.096
Number of obs.	510	510	510	510	510	510

Table 5: Impact of CEO-Labor Power on Post-Outsourcing Firm Performance and Market Reaction

This table reports OLS regressions of outsourcers' firm performance. Performance is measured by *Ind.-adj. Tobin's q* or *Ind.-adj. ROA or CAR (-3, 1)*. Industry fixed effects (two-digit SIC) are imposed in all models. All explanatory variables are lagged one year and defined in Table 2. The numbers in parentheses are t-statistics of coefficients. *, ** and *** denote significance at the 10%, 5%, and 1% level on two-tailed tests, respectively.

	Ind.-adj. Tobin's q $_{t+1}$			*Ind.-adj. Tobin's q* $_{t+3}$			*ROA* $_{t+3}$	*CAR (-3, 1)*
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Power variables								
CEO power index	0.098*			0.013			-0.001	
	(1.859)			(0.170)			(-0.206)	
Labor power index		-0.207			-1.478		-0.275**	
		(-0.913)			(-1.558)		(-2.351)	
CEO relative power			0.531			0.112*		0.087**
			(1.262)			(1.835)		(1.919)
Other variables of interest								
G-index	0.020	0.024	0.020	0.051	0.032	0.051	-0.001	-0.002
	(0.381)	(0.089)	(0.362)	(1.208)	(1.091)	(1.327)	(-0.277)	(-0.643)
Ind-adj. Tobin's q $_{t-1}$			0.127***			0.389		0.027
			(2.568)			(1.078)		(1.158)
Ind.-adj. ROA $_{t-1}$							0.134	
							(1.019)	
CEO relative power × Ind.-adj. Tobin's q $_{t-1}$			-0.201			0.909		-0.034**
			(-1.178)			(1.783)		(-2.471)
Control variables								
Firm size	0.206*	0.108	0.206*	-0.010	0.077	-0.114	-0.014*	-0.002
	(1.678)	(1.373)	(1.801)	(-0.144)	(1.049)	(-1.386)	(-1.725)	(-0.339)
SD of stock returns	-5.704	2.712	-5.713	1.693	14.643	-2.085	-1.970*	2.098*

	(-0.602)	(0.310)	(-0.564)	(0.164)	(1.046)	(-0.207)	(-1.935)	(1.955)
No. business segments	0.029	0.026	0.029	-0.014	-0.016	-0.016	0.000	0.001
	(0.648)	(0.628)	(0.651)	(-0.917)	(-0.951)	(-0.922)	(0.027)	(1.003)
Intercept	4.015***	2.786**	4.019**	1.914*	2.555**	3.587***	0.325**	-0.081
	(4.258)	(2.314)	(2.559)	(1.725)	(1.989)	(2.778)	(2.573)	(-0.863)
R-square	0.068	0.045	0.068	0.007	0.097	0.074	0.157	0.195
Number of obs.	255	255	255	240	240	240	240	255