Decision Sciences
Volume 32 Number 4
Fall 2001
Printed in the U.S.A.

Financial Implications of the Decision to Increase Reliance on Contingent Labor*

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ABSTRACT

This paper provides the first systematic examination of the financial implications associated with increased reliance on contingent (i.e., temporary/part-time) labor. Using measures of performance from income statement and balance sheet data, and stock returns, we find that the adoption of this labor practice is associated with superior subsequent performance. Concurrently, no increase in systematic risk and standard deviation of stock returns is observed. The increase in performance with no concurrent increase in systematic risk and standard deviation of returns perhaps explains the increasing popularity of this labor practice.

Subject Areas: Corporate Finance, Labor Management, Labor/Staff Relations, and Optimal Contracting.

INTRODUCTION

Miles (1989, p. 9) observed that "increasing international competition and the rapid pace of technological change are favoring organizations that are lean, fast, and flexible." To be lean, fast and flexible, a firm needs to implement policies that ensure that those desired attributes are achieved. From a basic microeconomic perspective, an essential ingredient necessary to compete successfully is the lowest possible cost structure (i.e., to be "lean"). To be competitive in the

*The first author is grateful for summer research support from the Baer Chair at Lehigh University, and previous summer support from the Michael F. Price College of Business Administration and The Center for Financial Studies at the University of Oklahoma to develop the topic of this paper. We thank Rob Brandenburg, Ilian Komitski, and Frank Sewell for excellent research assistance, and Uday Chandra, Louis Ederington, Scott Linn, Anne Tsui, and Dan Wren for comments on a previous draft. The paper also benefited from presentations at the University of Arkansas, Northern Arizona University, University of Oklahoma, and the Financial Management Association Meetings.

global marketplace, American businesses attempt to reduce costs in numerous ways. In this regard, *Business Week* (1995), Kirkland (1997), and Roth (1995) discussed the evidence that indicates that American businesses have become increasingly competitive.

Decisions regarding cost reduction have important implications for stockholder wealth maximization. Specifically, if costs are reduced, then other things being constant, there will be greater after-tax profits to distribute to stockholders and, consequently, stockholder welfare is enhanced. There are several ways in which costs can be contained and/or reduced. One of the easiest and highly visible methods is to control labor costs. Several papers have examined the impact of employment downsizing on stock prices. Contrary to the expectations that downsizing will result in higher stock prices, Worrel, Davidson, and Sharma (1991) found that for their sample as a whole, there was a negative stock price reaction to the downsizing announcement. However, upon further examination, they found that the stock price reaction was dependent on the reasons cited for the layoffs. Specifically, those that cited restructuring and consolidation as the reason underlying the decision for layoffs experienced an increase in stock price, while those firms that attributed the layoffs to financial distress experienced declines in their stock values. Lin and Rozeff (1993) also examined the relationship between employee layoffs and stock prices, and reported that stock price reactions to announcements of layoffs are significantly negative on average. Lin and Rozeff posited that in an asymmetric information environment where managers know more about the firm than outsiders, the stock market views the layoff as a managerial response to lower expected future demand for the firm's product. This "signal" of lower sales revenue is impounded into stock prices, which causes the negative stock price reaction.

More recently, Cascio, Young, and Morris (1997) examined the financial consequences of changes in employment in major American corporations. They adopted a long-term perspective of performance as opposed to the short-term stock price reactions used by Worrel et al. (1991), and by Lin and Rozeff (1993). Cascio et al. examined the financial profitability (measured by Return on Assets) and the stock return in the year of the change, and two subsequent years for firms that altered the labor force. They found that firms that adopted pure employment downsizing did not perform better than the average firm in their respective industries. However, firms that downsized in conjunction with asset restructuring exhibited stronger performance than the industry averages.

Besides the downsizing strategy, another popular alternative available to managers is the increased reliance on contingent (i.e., temporary/part-time) workers. The popular business press depicts the use of contingent labor as a mechanism to reduce costs because, in contrast with full-time employees, contingent workers need not be provided any employment benefits. In addition, such workers may not be members of a union. Consequently, they suffer from the lack of an organized entity to bargain more effectively for higher future wages and benefits. In addition to these factors, the use of contingent workers also provides managerial flexibility. Specifically, if demand for the company's products is volatile, the workforce strength can be tailored relatively easily to cope with the variable production schedules that may arise. This "tailoring" can be accommodated without any

costly hiring or firing (severance packages) normally associated with full-time employees (see Coolidge, 1996; Wysocki, 1996). This popular view of contingent labor has also been embraced by a number of academic papers (see Abraham, 1988; Davis-Blake & Uzzi, 1993; Tsui, Pearce, Porter, & Hite, 1995), and cited as the major reason for the rapid growth in the contingent labor industry. More recently, the implications of contingent labor for the transfer of knowledge and the knowledge base within the corporation have been explored by Matusik and Hill (1998). An excellent discussion of the benefits of increasing contingent labor usage is contained in von Hippel, Mangum, Greenberger, Heneman, and Skoglind (1997).

There is ample anecdotal evidence of the practical and managerial relevance of such managerial decisions and the issues involved. Fairly recently, the nation's labor market and small business economy was seriously affected when employees of United Parcel Service (UPS) went on strike. Apparently, the strike had its origins in the high usage of part-time labor by the firm. In *Business Week* (see the June 16, 1997 issue), Aaron Bernstein writes, "If the delivery giant doesn't produce more full time jobs, the union could walk" (p. 90). He goes on to say that UPS had recently realized record profits and experienced the highest margins in the delivery industry. He attributes these performance characteristics to an aggressive growth strategy that was based on using large numbers of temporary employees and part-timers to contain and reduce labor costs.

In an era where it is becoming increasingly expensive to provide employee benefits like health care, long-term care, and pensions, such labor practices seem to be gaining popularity. Castro (1993) reported that according to Robert Reich, the Secretary of Labor at that time, 90% of the jobs created in February of 1993 were temporary/part-time jobs and held by people who would rather have had full-time, regular positions. Furthermore, Castro stated that fully one-third of American workers were contingent employees with temporary, part-time, or contract jobs, usually with no benefits or job security. In a situation where other factors stay constant, an increasing reliance on contingent workers appears to be a sound economic strategy. This is because of the lower costs associated with not providing employment benefits to contingent employees, and other advantages cited earlier.

However, the caveat that "other factors stay constant" is a critical one for such hiring practices to be profitable. It is possible for situations to arise where such a strategy may backfire on managers, and lead to increased costs. In particular, it is important to note that contingent workers may not be committed to the firm's mission and values (see Castro, 1993, for details). For example, they may not be willing to acquire specialized skills and training, and may not have motivation or any corporate loyalty. This tendency may cause such workers to turn out a shoddy work product that, in turn, may result in reduced future demand for the firm's products. Consequently, in the long run, the use of contingent workers may not be a prudent managerial strategy at all. In exploring the negatives of this labor policy decision, McNerney (1995) discussed the costs that are associated with increased reliance on contingent labor. The costs basically stem from the contingent workers' lack of attachment to the firm. He classifies these costs as arising from: (a) low productivity, (b) low return on training investments, (c) disrupted teamwork, and (d) poor safety in the workplace. McNerney (p. 3) also stated, "In some cases, these costs

can wipe out the wage-and-benefits savings achieved with contingent workers." Recent evidence on this issue is provided by Tsui, Pearce, Porter, and Tripoli (1997) who studied the performance of employees in organizations under different models of employer-employee relationships. They found that employees performed better on core tasks, expressed higher levels of commitment, and demonstrated increased corporate citizenship under environments of overinvestment by the employer, or where the employee felt a mutual-investment relationship with the employer. Their results clearly indicated that employee performance would be inferior under an underinvestment relationship with the employer. Indeed, Caudron (1994) cited a quote by Jeffrey Schmidt of Towers Perrin, "If you are using large numbers of contingent workers without knowing the return they provide, you risk weakening the organization's ability to withstand unpredictable business cycles, rather than strengthening it" (p. 48). Thus, it is not a foregone conclusion that switching to contingent labor will result in increased profitability.

While both sides of the picture have been discussed above, the empirical evidence in this area is sparse to nonexistent. There appear to be no papers in the business literature that compare and contrast the financial profitability and riskiness of firms with a larger contingent workforce with their competitors that do not. In fact, despite the procedures suggested by Nollen (1993) for human resource managers to evaluate the costs and benefits of contingent labor, Caudron (1994) lamented the absence of any national studies comparing the costs and returns of contingent workers with the costs and returns of permanent employees. The lack of evidence on this very important and timely topic provides the motivation for this paper. Specifically, in this paper we examine the financial performance characteristics and riskiness of firms that use more contingent workers versus competing firms that do not. It is clear from the evidence quoted by former Secretary of Labor, Robert Reich, that the use of contingent workers is increasing and may bring about dramatic changes in the way the labor markets function. In the absence of empirical evidence regarding its benefits, this human resource strategy decision remains a mystery that deserves to be addressed as soon as possible before it leads to undesirable consequences. Our paper seeks to provide the evidence on this key labor policy decision.

THEORY AND HYPOTHESES DEVELOPMENT

The theory of the firm promotes the view that stock price maximization should be a major managerial objective. If managerial decisions to increase the contingent workforce strength are optimal, then financial performance and, in turn, stock prices should increase. To understand the mechanism through which stock prices may increase, it is instructive to examine the equation for the present (i.e., time t) stock price, P_t, which is determined as the present value of an expected cash flow stream as in equation (1) below:

$$P_t = \sum_{j=t+1}^{\infty} \frac{E(X_j)}{(1+k)^j}. \tag{1}$$

In (1), *E(.)* is the expectations operator based on the information set at time *t*, X_j is the cash flow at future date *j*, and *k* represents the discount rate that incorporates the riskiness of the stock involved. It is clear from (1) that an increase in stock price can arise as a result of revision of market beliefs regarding (a) the value of the discount rate, *k*, or (b) the expected future cash flows, X_j, or both (a) and (b).

Therefore, in this study we examine the effects of using a higher contingent workforce on proxies for future cash flows, and the discount rate used by stock market participants to determine the implications for stock prices. If the use of contingent workers helps to reduce costs at a given level of sales revenue, this implies that there will be more after-tax cash flows. As predicted by equation (1), these increased cash flows would cause the stock price to increase. Examining the realized future financial performance helps to reveal the effects of increased reliance on contingent labor on cash flows. Several papers have examined the impact of an operational decision by managers on future financial performance. Earlier, we cited the example of the paper by Cascio et al. (1997). Other recent examples include Balakrishnan, Linsmeier, and Venkatachalam (1996), and Bharadwaj, Bharadwaj, and Konsynski (1999). Balakrishnan et al. investigated the financial performance of firms adopting Just-in-Time inventory practices, while Bharadwaj et al. examined the effects of information technology on financial performance. In this vein, we examine the impact of an increased reliance on contingent labor on financial characteristics of the firm to ascertain the optimality of the decision. This leads to our first null hypothesis:

> H1: Firms will show no change in performance in terms of cash flow proxies, or in terms of stock returns, after adopting the increased use of contingent labor.

If the shift to contingent workers causes financial performance to improve (implying that cash flows increase), then other things being constant, stock prices will increase. However, a complete investigation should also examine changes in risk, because the required rate of return (i.e., which appears in the denominator in equation (1)) is related to risk. It is widely known from the Capital Asset Pricing Model (CAPM) that the required rate of return on any asset is positively related to its systematic risk. Although the evidence in Fama and French (1992) has fostered doubts about the efficacy of the CAPM in measuring the risk-return trade-off, more recent papers by Kothari and Shanken (1995) and Kothari, Shanken, and Sloan (1995) have allayed some of those fears. Despite this ongoing debate, the CAPM is still viewed as an important pricing model. In this spirit, we examine the implications of temporary labor for risk within the context of the CAPM. Consequently, systematic risk changes can affect the required rate of return and, in turn, stock prices.

The increased use of contingent labor could be a highly risky strategy. This argument is especially believable given the evidence presented by Tsui et al. (1997). They documented that given an underinvestment in employees, those employees perform worse and exhibit a lack of commitment and corporate citizenship. If contingent employees are not committed to the firm, they may turn out a shoddy product, which could lead to larger amount of product returns, lost market

share and reputation, and even product liability lawsuits. The latter could result in severe penalty payments, as well as divert management's focus. Thus, it is possible that the lower bound on the cash flows of the firm may be lower than it would otherwise be had the firm not used contingent labor. This leads to a wider variance in possible earnings and future cash flows and, consequently, increased systematic risk (i.e., beta) for the firm. This argument is based on the evidence in Beaver, Kettler, and Scholes (1970), where a significant relationship was documented between beta and volatility of earnings.

However, this view of an increased beta may not be the only possibility—beta could decline, too. We thank an anonymous referee for alerting us to this possibility of beta decreasing as the degree of operating leverage declines. This decline is because beta is positively related to the degree of operating leverage of a firm (see Gahlon & Gentry, 1982). The use of contingent workers may reduce a firm's fixed costs (i.e., because of lower overall labor costs and expenses related to employment benefits), thereby lowering its degree of operating leverage. This reduction in the degree of operating leverage of the firm reduces the firm's beta. Thus, it is possible for the beta of the stock to decrease with an increasing reliance on contingent labor. Given the discussion above, the use of contingent labor could either cause an increase or a decrease in beta, making this an empirical question. This leads to our second null hypothesis:

> H2: Firms that adopt increased usage of contingent labor will experience no change in their systematic risk measure.

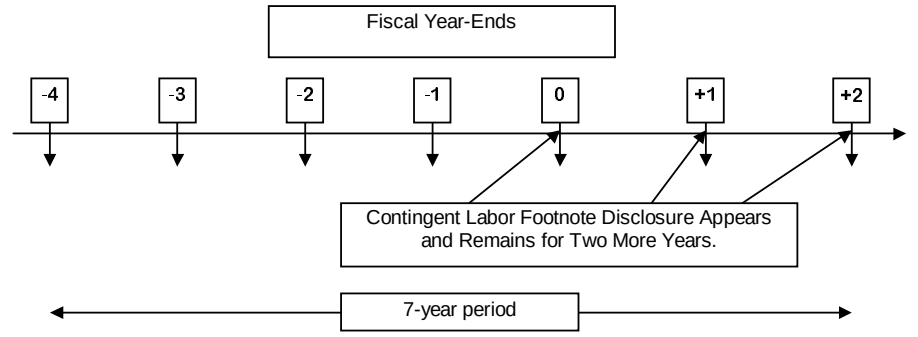
DATA AND SAMPLE DETAILS

We drew our sample from the 1993 annual COMPUSTAT tapes, including the merged industrial annual and the full coverage annual tapes. Firm-years that contained an "IE" in footnote 25 were first collected. The "IE" designation denotes a firm that has 10% or more seasonal or part-time employees in that particular fiscal year. Hanka (1998) also used a similar procedure to identify usage of temporary/part-time labor. From this initial set, we included a firm and designated a particular year to be its Year 0, that is, the year of first adoption of contingent labor policy (please see Figure 1) under the following restrictions:

- Footnote 25 does not contain the "IE" designation for the prior four years
- Footnote 25 contains the "IE" for the next two years, in addition to Year 0.

Thus, over a seven-year period, the first four years do not have the requisite designation in the footnote field, and the subsequent three years have the "IE" in footnote 25. Following this, we included firms if they (in total) made up less than 50% of the total firms in their industry group (i.e., as measured by their COMPUSTAT industry group, DNUM). This was done for two purposes: (1) to ensure that contingent labor usage was not the dominant practice in the industry, and (2) that there would be a sufficient number of other firms to choose from to get control firms that did not rely heavily on contingent workers. In conjunction with this restriction, there had to be a minimum of at least 10 firms in that industry group. After these filters, a total sample of 695 firms was obtained. Following this, only firms with

Figure 1: Timeline for description of sample selection and empirical tests.



the necessary data to compute the control and test variables for financial performance (see the next section) were retained, which resulted in a sample of 366 firms.

The sample is distributed as follows: 17 in 1978, 15 in 1979, 12 in 1980, 11 in 1981, 20 in 1982, 22 in 1983, 13 in 1984, 18 in 1985, 36 in 1986, 41 in 1987, 46 in 1988, 43 in 1989, 33 in 1990, and 40 in 1991. This distribution indicates that there are more firms adopting this policy in recent years. However, this may be due to greater data availability for firms in those years. With respect to the distribution of firms across industry groups, we found that the sample firms came from a variety of industries. Specifically, the sample was distributed across 177 different four-digit SIC codes. The only industry groups to have 10 or more firms in the sample were from SIC codes of 1311 (Crude Petroleum and Natural Gas) and 5812 (Eating Places).

The creation of our sample is also dependent on data availability for control firms. Consequently, we now provide details on the selection of the control firms. For our original sample of firms, we required each of those firms to have a matched firm in the same industry (DNUM) group that satisfied the following criteria:

- Must not have had an "IE" in footnote 25 field in COMPUSTAT for the entire seven-year window mentioned earlier.
- Must be the closest match among all those firms with respect to "Total Assets," in relation to the sample firm's value.

The rationale for matching based on total assets is intuitive. Given that the sample firm and its matched firm have the same asset base with which to generate revenues, we are interested in examining the impact of contingent labor on operating performance. Specifically, we would like to determine whether a greater reliance on contingent labor using the same asset base results in differential performance.

Descriptive statistics on the sample firms and the control firms used in the analysis are provided in Table 1. There is a wide range in total assets, sales, and market value of equity. This indicates that the sample is quite general and spans the spectrum of financial characteristics. Specifically, the sample is not dominated by firms in any specific size category, or that possess some common financial characteristic

Table 1: Descriptive statistics for sample firms increasing their reliance on contingent labor and their control firms matched by total assets.

The sample was obtained from the 1993 COMPUSTAT full coverage and merged industrial annual tapes. For inclusion in the sample, financial statements must have revealed that the percentage of labor force consisting of contingent labor was less than 10% for four previous years, and greater than 10% for three subsequent years (total of seven years). Other restrictions on industry membership and composition were also imposed (see the section describing the data for complete details). Control firms were selected if they (i) were in the same industry, (ii) never revealed the use of contingent labor over the seven-year period, and (iii) if they were the closest in terms of total assets to the sample firm. Data presented below is as of the year-end in which the contingent labor policy is first adopted.

	Sample Firms			Control Firms			Difference Tests	
Item	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	*t*-test Statistic (*p*-value)	Wilcoxon *z* Statistic (*p*-value)
Sales ($100Million)	300.37	26.60	1348.86	329.98	23.90	1151.41	0.3184 (.7503)	–0.6608 (.5087)
Total Assets ($100Million)	210.70	24.09	671.95	224.45	21.01	691.43	0.2725 (.7853)	–0.4354 (.6632)
Market Value of Equity ($Million)	134.23	23.54	344.80	119.74	20.81	311.54	–0.5414 (.5887)	–1.1961 (.2316)
Total Liabilities to Total Assets Ratio	0.59	0.55	0.50	0.83	0.54	3.17	1.4119 (.1588)	–0.1547 (.8770)
MVE / BVE Ratio	3.52	1.76	11.80	7.65	1.65	63.72	1.0893 (.2757)	–2.0950 (.0361)*

*Indicates significant difference at .05 level

that may be the cause of the results we present in the paper. In two-sample difference of location tests, both nonparametric and parametric tests indicate no significant differences between the two samples based on most of the variables indicated in Table 1. The only exception to this is the ratio of market value of equity to book value of equity when tested using the nonparametric Wilcoxon test. The ratio seems to be higher for the sample firms than for the control firms. Possible reasons may be that the sample firms have higher growth prospects or, alternately, that they have lower book value of equity which may have been caused by losses over the recent past. However, the parametric *t*-test indicates no statistical difference in the ratio.

The results in Table 1 also support the view that the treatment and control firms are suitably matched in terms of size (as measured by sales revenues, total assets, and market value of equity) and leverage (as measured by the ratio of total liabilities to total assets). This argues for the view that the pre-adoption risk associated with size and leverage for the two samples is comparable. The treatment and control firms are also examined for differences in pre-adoption performance. Specifically, there was no statistically significant difference in the gross profit margin between the two samples in the pre-adoption period.

EMPIRICAL METHODS AND RESULTS

In this section, we present the empirical methods and discuss the associated results arising from those methods.

Changes in Financial Performance Using Financial Statement Variables

To measure financial performance, we employ two variables that are derived from financial statement data. The first of these variables is the gross profit margin, GPM, which is computed as follows:

$$\text{GPM} = \{\text{Sales} - \text{Cost of Goods Sold}\} / \text{Sales}.$$

This variable is frequently used in ratio analysis of financial statements to measure the success of a firm at controlling costs (and/or charging a higher output price). Assuming that contingent labor is used in the production process thereby lowering the Cost of Goods Sold, this should imply a higher GPM, other things being equal. However, it could be argued that in addition to the production process, firms may use contingent labor for other purposes as well. An example is when firms use contingent labor in selling or administrative duties that are, by their very nature, not captured in the Cost of Goods Sold variable. Additionally, depreciation is included in the Cost of Goods Sold variable as a normal product of the cost accounting process. Firms may employ different depreciation computation methods and report vastly different results even if the underlying economic results are the very same. Thus, the GPM variable may not entirely capture the effect of contingent labor adoption, but nonetheless, we report evidence using this variable because it is a commonly used variable by analysts in examining financial statements.

In order to allay any fears about the problems inherent in the *GPM* variable, we examine another variable—earnings before interest, taxes, depreciation and amortization, divided by sales revenue, denoted as *EBITDA_S*. We thank the associate editor for suggesting this variable. *EBITDA* is a very common construct in corporate valuation. For example, see Damodaran (1997), page 641, and Kaplan and Ruback (1995). We scale *EBITDA* by Sales Revenue to produce a ratio, *EBITDA_S*, which enables interfirm comparisons. It should be noted that *EBITDA_S* is a number that does not deduct interest, taxes, depreciation, and amortization expenses. This eliminates any possible contamination due to financial differences (debt and tax structure), and restructuring (amortization of goodwill), etc., and enables a clearer inference regarding operational efficiencies. This is our primary variable of interest because it addresses the shortcomings of the *GPM* variable. Specifically, this variable captures the benefits of contingent labor if it is additionally used in selling and general administration expense, as opposed to being purely present in production costs (cost of goods sold).

For our tests, we compute these variables for the period from four years before the disclosure to two years after. Before using these firm-year values in the empirical tests, all values greater (lower) than the 95th (5th) percentile are replaced by the 95th (5th) percentile value. Balakrishnan et al. (1996) used a similar winsorizing process in their study. We also restated extreme observations using the 1st and 99th percentile values, and re-examined the results herein to find that the tenor of our findings remains unaltered. This winsorizing procedure is used to eliminate the effect of extreme observations, while preserving the median of the distribution. In what follows (refer to Figure 1), let year 0 be the fiscal year-end in which the relevant IE designation first appears in Compustat's Footnote 25 field. The four previous years, years –4 through –1 are designated the pre-adoption period, and years +1 and +2 are designated the post-adoption period. We omit Year 0 because it may be considered to be an adjustment year, that is, in which the kinks are being worked out in administering the contingent labor policy. We initially conduct tests on the sample of firms that report the increased reliance on contingent workers, without comparing against the control firms. In our description below, we only discuss the tests for the *EBITDA_S* variable. The tests using the *GPM* variable are similar and the description is omitted for brevity.

For each firm, *j*, in the sample, the mean and median of the EBITDA_S variable are computed for the pre-adoption period, years –4 through –1. We denote these variables for firm *j* as ME_j, and MD_j. Next, for year *t*, (*t* = 1,2) in the post-adoption period, we compute for each firm, *j*, the differences in *EBITDA_S* for that year versus the mean and the median *EBITDA_S* from the pre-adoption period. Specifically, we compute: $\Delta EBITDA\_S1_{jt} = \{EBITDA\_S_{jt} - ME_j\}$, and $\Delta EBITDA\_S2_{jt} = \{EBITDA\_S_{jt} - MD_j\}$, respectively, for year *t*, (*t* = 1,2). Under the null hypothesis of no abnormal increase in *EBITDA_S* in the post-adoption period compared to the pre-adoption period, the mean and the median of $\Delta EBITDA\_S1_{jt}$ and $\Delta EBITDA\_S2_{jt}$ over *j* and *t* should be zero. We test this hypothesis by conducting a parametric *t*-test and a Wilcoxon signed-rank test on the distributions of $\Delta EBITDA\_S1_{jt}$ and $\Delta EBITDA\_S2_{jt}$. We also compute their equivalents for the second variable, *GPM*, which we denote as $\Delta GPM1_{jt}$ and $\Delta GPM2_{jt}$, and similar tests are performed.

The results are reported in Table 2. In the first two rows, we report the result for the difference in the *EBITDA_S* variable from the mean and the median, respectively. The difference is positive and statistically significant using both the parametric *t*-test as well as the nonparametric Wilcoxon signed-rank test. The magnitude of the difference suggests that there is approximately a 41% (5.6%) to 48% (9.1%) increase in the mean (median) *EBITDA_S* for the post-adoption period relative to the pre-adoption period. The above result is also corroborated when using the *GPM* variable. As expected, the results using *EBITDA_S* are stronger than those using *GPM*. The evidence thus far suggests that financial statement measures of performance improve after increasing reliance on contingent labor.

The results discussed above could have been due to a general improvement in the prospects of the industries in which the firms are engaged, and not due to the increased reliance on contingent labor, per se. To examine this issue further, we compare the performance using our sample firms against a matched control firm sample. For testing purposes, we first compute equivalent measures of $\Delta EBITDA\_S1_{jt}$, $\Delta EBITDA\_S2_{jt}$, $\Delta GPM1_{jt}$, and $\Delta GPM2_{jt}$ for the control firms, which we denote as $\Delta EBITDA\_S1C_{jt}$, $\Delta EBITDA\_S2C_{jt}$, $\Delta GPM1C_{jt}$, and $\Delta GPM2C_{jt}$. Following this, the test variable is obtained by subtracting the equivalent measure for the control firm from that for the sample firm. Specifically, we compute the following four variables:

$$\Delta EBITDA\_S1_{mc} = \Delta EBITDA\_S1_{jt} - \Delta EBITDA\_S1C_{jt},$$

$$\Delta EBITDA\_S2_{mc} = \Delta EBITDA\_S2_{jt} - \Delta EBITDA\_S2C_{jt},$$

$$\Delta GPM1_{mc} = \Delta GPM1_{jt} - \Delta GPM1C_{jt},$$

$$\Delta GPM2_{mc} = \Delta GPM2_{jt} - \Delta GPM2C_{jt}.$$

In the left-hand terms above, the subscript, *mc*, indicates that the value is obtained after deducting the value for the control firm matched on industry and size of total assets. Balakrishnan et al. (1996) also used a similar control firm approach. In a sense, these measures can be regarded as abnormal performance measures (i.e., how well the firm does compared to a size-matched firm). Under the null hypothesis of no abnormal improvement in performance, the distributions of $\Delta EBITDA\_S1_{mc}$, $\Delta EBITDA\_S2_{mc}$, $\Delta GPM1_{mc}$, and $\Delta GPM2_{mc}$ should be centered on zero. This hypothesis is tested using a parametric *t*-test and a nonparametric Wilcoxon signed-rank test. The results are presented in Table 3.

In the first two rows, we observe that $\Delta EBITDA\_S1_{mc}$ and $\Delta EBITDA\_S2_{mc}$ are both significantly positive using both parametric and nonparametric tests. It appears that the mean (median) increase in *EBITDA_S* for firms adopting contingent labor is about 36% (14%) to 43% (9%) higher than the mean (median) increase in *EBITDA_S* for control firms. To better explain this, a numerical example is provided: assume that the mean pre-adoption *GPM* for treatment firms is 10%, that for control firms is 10%, and the mean post adoption *GPM* is 17.5% for treatment firms, while it is 14% for control firms. Then, the change in *GPM* for treatment firms is (17.5% – 10%) = 7.5%, while it is (14% – 10%) = 4% for control firms.

Table 2: Univariate tests on the difference in (1) earnings before interest, taxes, depreciation and amortization scaled by sales revenue, and (2) gross profit margin, for firms before and after increasing their reliance on contingent labor.

For each firm, j, and year in the post-adoption period, t, $t = (1,2)$ the variables $\Delta EBITDA\_S1_{jt}$ and $\Delta EBITDA\_S2_{jt}$ are computed as follows. In the pre-adoption period consisting of years –4 through –1 relative to the year of adoption, the mean and the median values of earnings before interest, taxes, depreciation, and amortization divided by sales revenue, (ME_j and MD_j, respectively) are computed. Then, in each of years 1 and 2, the difference between that year's value and ME_j (MD_j) is computed and denoted $\Delta EBITDA\_S1_{jt}$ ($\Delta EBITDA\_S2_{jt}$). Under the null hypothesis of no change in the variable, the distributions of $\Delta EBITDA\_S1_{jt}$ and $\Delta EBITDA\_S2_{jt}$ should be centered on zero across all firms, j, and post-adoption years, t, $t = 1,2$. The equivalents of $\Delta EBITDA\_S1_{jt}$ and $\Delta EBITDA\_S2_{jt}$ are computed for the gross profit margin variable and denoted as $\Delta GPM1_{jt}$ and $\Delta GPM2_{jt}$, respectively. Similar tests are conducted on these variables. In the table, p-values are for two-tailed tests for difference from zero.

Item	Mean	Median	Standard Deviation	t-statistic (p-value)	Wilcoxon Signed Rank (p-value)
$\Delta EBITDA\_S1$	0.411	0.091	0.616	18.24 (< .0001)	80833 (< .0001)
$\Delta EBITDA\_S2$	0.481	0.0558	0.750	17.497 (< .0001)	73372 (< .0001)
$\Delta GPM1$	0.04042	0.0025	0.4206	2.531 (.0193)	11723.5 (.0220)
$\Delta GPM2$	0.03560	0.0010	0.4316	2.173 (.0301)	7647 (.1366)

Further, treatments firms' change in *GPM* exceeds the change in control firms' *GPM* by (7.5% – 4%) = 3.5%. The last two lines of Table 3 actually reveal that the increase is about 3.4% to 3.8%.

Thus, the result that an increase in performance accompanies greater reliance on contingent labor appears to be robust to controlling for industry-wide performance. Once again, the evidence using the *GPM* variable is also supportive of the inference that financial statement measures of performance have increased after the contingent labor initiative was adopted.

Changes in Financial Performance Using Buy-and-Hold Abnormal Stock Returns

To examine the benefits of a managerial decision, we believe that it is not sufficient to merely document the effects on financial statement measures of performance. It is extremely important to also study the effects of the managerial decision on stock prices. Although financial statement measures of performance may improve as in the previous subsection and in Balakrishnan et al. (1996), the effect on stock price is not necessarily straightforward. Two main reasons can be advanced to support the examination of stock price performance. First, stock prices may not react directly to improvements in financial statement measures of performance. For example, Kang (1993) showed the various stock price effects that could occur with increases in performance associated with inventory accounting changes and demonstrated that

Table 3: Univariate tests on the difference in (1) earnings before interest, taxes, depreciation and amortization scaled by sales revenue and (2) gross profit margin, for firms before and after increasing their reliance on contingent labor after deducting their equivalents for matched control firms.

For each firm, j, and year in the post-adoption period, t, $t = (1,2)$ the variables $\Delta EBITDA\_S1_{mc}$ and $\Delta EBITDA\_S2_{mc}$ are computed as follows. In the pre-adoption period consisting of years –4 through –1 relative to the year of adoption, the mean and the median of the *EBITDA* divided by Sales Revenue variable (ME_j and MD_j, respectively) are computed. Then, in each of years 1 and 2, the difference between that year's value and ME_j (MD_j) is computed and denoted $\Delta EBITDA\_S1_{jt}$ ($\Delta EBITDA\_S2_{jt}$). Analogous measures are computed for matched control firms. Following this, the difference between the sample firm's values and the control firm's value is computed and is the variable to be tested. Under the null hypothesis of no change in gross profit margin, the distributions of $\Delta EBITDA\_S1_{mc}$ and $\Delta EBITDA\_S2_{mc}$ should be centered on zero across all firms, j, and post-adoption years, t, $t = 1,2$. The equivalents of $\Delta EBITDA\_S1_{mc}$ and $\Delta EBITDA\_S2_{mc}$ are computed for the gross profit margin variable and denoted as $\Delta GPM1_{mc}$ and $\Delta GPM2_{mc}$, respectively. Similar tests are conducted on these variables. In the table, p-values are for two-tailed tests for difference from zero.

Item	Mean	Median	Standard Deviation	t-statistic (p-value)	Wilcoxon Signed Rank (p-value)
$\Delta EBITDA\_S1_{mc}$	0.3627	0.1461	0.6778	14.597 (< .0001)	73229 (< .0001)
$\Delta EBITDA\_S2_{mc}$	0.4291	0.0917	0.8114	14.426 (< .0001)	70993 (< .0001)
$\Delta GPM1_{mc}$	0.0380	0.0065	0.4650	2.065 (.0309)	11854 (.0114)
$\Delta GPM2_{mc}$	0.0343	0.0050	0.4808	1.808 (.0710)	9614 (.0403)

there could even be a stock price decrease in response to an improvement in financial statement measures. Second, examining stock price effects increases the power of the tests. If the impact of the change on financial statement measures is a permanent one, and if it is relevant to stock valuation, then stock prices will reflect this performance change with a "multiplier effect." Specifically, the increased performance over several years will be impounded into stock price. As opposed to this, measuring the difference in financial statement measures for just one or two years in the future will lead to less powerful empirical tests.

As mentioned before, if financial markets perceive the managerial decision as a temporary remedy to a permanent problem, stock prices may not react to the managerial decision (or even worse, stock prices may fall). The benefits of an optimal managerial decision should therefore manifest themselves in stock price—the ultimate litmus test.

In this spirit, we examine the change in financial performance by measuring the change in excess stock returns surrounding the change in labor policy. Specifically, we implement the following test. We measure buy-and-hold returns for each firm in our sample over two periods: a pre-adoption period of 250 days that ends

on day –151 prior to the fiscal year-end in Year 0 (i.e., the year in which the disclosure regarding contingent labor is made), and a post-adoption period of 250 days that begins on day +151 relative to the above-mentioned fiscal year-end. To compute excess returns for the firm over those two 250-day periods, we subtract the buy-and-hold returns for the CRSP value-weighted index from the buy-and-hold returns for the sample firms for those specific periods. The reader is referred to Canina, Michaely, Thaler, and Womack (1998) for details on computing long run excess returns and the advantages of using the value-weighted index. These buy-and-hold excess returns for firm, *j*, are denoted as $BHER_{bj}$ in the pre-adoption period and $BHER_{aj}$ in the post-adoption period, respectively. Under the null hypothesis of no increase in excess returns, $\Delta BHER_j$ the difference between pre-adoption excess returns and post-adoption excess returns, that is, ($\Delta BHER_j = BHER_{aj} - BHER_{bj}$) should be zero. We conduct univariate tests on this difference.

A more appropriate test for abnormal stock return performance should control for the difference in excess returns for competing firms. To do this, we first compute the equivalent of $\Delta BHER_j$ for the industry and asset-size matched control firm, denoted by $\Delta BHER_c$ over an equivalent period. Then, $\Delta BHER_{mc}$, the difference between $\Delta BHER_j$ and $\Delta BHER_c$, is computed. Under the null hypothesis, the difference in excess returns for the sample firm over and above the difference for the control firm is expected to be zero, that is, the distribution for $\Delta BHER_{mc}$ is centered on zero. The results for the excess returns tests are presented in Table 4.

The results using $\Delta BHER_j$ indicate some support that the difference in excess returns is positive and significant. The parametric *t*-test has a *p*-value of .1234, whereas the nonparametric test produces a *p*-value of .0940. The mean excess buy-and-hold returns in the post-adoption period appear to be 9.7% higher than the pre-adoption period.

After using the control firms' equivalent excess returns, the evidence seems much stronger that there is an increase in stock returns for firms that increase their reliance on contingent labor. We argue that this is the more appropriate test because it is important to control for industry-wide competition, and that the appropriate benchmark to use is one's own competition. Using $\Delta BHER_{mc}$, we observe that there is a 15.6% larger excess return for the contingent labor adopters over and above the increase in mean returns for the control firms, which is statistically significant using both parametric (*p*-value of .0392) and nonparametric (*p*-value of .0193) tests. In summary, it appears that financial statement measures (*EBITDA_S* and *GPM*) and excess buy-and-hold stock return (*BHER*) performance measures indicate robustly that financial performance is enhanced after companies increase their reliance on contingent labor.

Changes in Systematic Risk Measures

As mentioned earlier, it is important to document the differences in risk when a strategy that increases its reliance on temporary labor is adopted. If an improvement in financial performance is observed, but is subsumed by increased risk and correspondingly higher required rate of return, this leads to a drop in stock price (see equation (1)). Obviously, this is an undesirable outcome for the corporation. For this purpose, we examine changes in the familiar beta, β, of the CAPM, which quantifies systematic risk. Monthly stock returns are extracted for the sample

Table 4: Univariate tests on the difference in buy-and-hold excess stock returns for firms before and after increasing their reliance on contingent employees.

For each firm, *j*, buy-and-hold returns in excess of the buy-and-hold returns for the CRSP value-weighted index are computed for two 250-day periods, that is, a pre-adoption period ending on day –151 relative to the fiscal year-end, and a post-adoption period beginning on day +151 relative to the fiscal year-end. The difference in these buy-and-hold excess returns is denoted $\Delta BHER_j$ for firm *j*. Under the null hypothesis, $\Delta BHER_j$ is expected to be zero across the entire sample. The variable $\Delta BHER_{mc}$ is computed by deducting the equivalent of $\Delta BHER_j$ for the matched control firm from $\Delta BHER_j$. Under the null hypothesis, $\Delta BHER_{mc}$ is expected to be zero across the entire sample. In the table, *p*-values are for two-tailed tests for difference from zero.

Item	Mean	Median	Standard Deviation	*t*-statistic (*p*-value)	Wilcoxon Signed Rank (*p*-value)
$\Delta BHER_j$	0.097	0.021	1.2071	1.544 (.1234)	2103.5 (.0940)
$\Delta BHER_{mc}$	0.1563	0.033	1.4468	2.069 (.0392)	4105.5 (.0193)

firms, the control firms, and the CRSP value-weighted index over two periods. In a previous version of this paper, beta shift tests were performed with daily return data. An anonymous referee rightly pointed out that betas estimated from daily data are subject to the non-synchronous data problem identified in Scholes and Williams (1977). Consequently, monthly data is used for these tests.

The first period begins on month –60 and ends on month –6, where month 0 is the fiscal year-end for Year 0. The second period commences on month +6 and extends to month +60. For each sample firm, the following model was estimated:

$$R_{jt} = \alpha_j + \beta_j R_{Mt} + \lambda_j R_{Mt} D_{jt}.$$

In the above model, R_{jt} is the return in month *t* for stock *j*, R_{Mt} is the value-weighted market return in month *t*, D_{jt} is a dummy variable that takes on a unit value in the second period (i.e., after the disclosure regarding contingent labor) and is zero in the first period, and α_j, β_j, λ_j are event-specific regression coefficients. The coefficient λ_j represents the shift in β_j in the post-adoption period.

If using higher contingent workforce is associated with a perception of higher risk for the affected firms, λ_j should be positive on average. Since our procedure yields a unique estimate of λ_j per firm, the total number of estimates of λ_j across the sample constitutes a sampling distribution, on which tests for significance can be carried out. Univariate tests on the sampling distribution of λ_j reveal that it is statistically insignificant for the sample of firms that begin to increasingly rely on contingent labor (results not shown in the paper but available from authors). We also conducted tests to see if the estimates of λ_j for our sample firms are different from the estimates for the control firms. Once again, we find an insignificant difference (results not shown in the paper but available from authors), implying that the sample firms and their control firms did not experience any

increase in systematic risk over the periods concerned. Consequently, the evidence thus far suggests that increasing the reliance on contingent workers results in increased operating performance (as measured by gross profit margins) and financial performance (as measured by buy-and-hold excess returns), and a lack of increased systematic risk.

There are other measures of risk besides beta. To explore these, tests were performed on two other measures of risk commonly found in the literature. The first of these is the change in the standard deviation of monthly returns from before the adoption to after. The second is the change in the standard deviation of market model residuals between the two periods. In both of these measures, no significant changes were seen. These changes were also compared to changes for the control firms. Once again, the changes in these measures were not significantly different from the changes for the control firms. These tests support the inference that the risk of firms adopting contingent labor did not increase, and also did not change compared to their control firms.

Managerial Stock Ownership Tests

Proponents of agency theory (e.g., Jensen & Meckling, 1976) believe that if managers own a higher fraction of the shares of their firm, they will be more proactive and make decisions that will increase stockholder wealth. In the context of our study and given our results thus far, agency theory would predict that the firms that increase their reliance on temporary and part-time workers must be those with higher insider ownership of shares compared to their control firm counterparts. We test this prediction by examining insider holding data collected from Q-Data Corporation's microfiche photographic images of proxy statements. Anderson and Lee (1997) provided evidence to justify why this may be the best source of insider holding data. In our study, we collect insider holding data and the total number of shares outstanding for the year in which the contingent labor footnote disclosure appears for the first time, that is, in year 0. We do this for the sample firm and the matched control firm. Following this, the shares owned by management as a fraction of total shares outstanding is computed.

Details of the distribution of this percentage insider ownership variable for sample and control firms are provided in Table 5a. We succeeded in obtaining data for 185 sample firms and 197 control firms. However, each firm out of the 185 sample firms for which we have insider holdings may not have a control firm with insider holding data among the 197 control firms. From the data presented therein, it appears at first blush that the fractional insider holdings across the two samples appear similar to one another. When we paired the 185 firms with the 197 control firms, the number of matches reduced to 109 (i.e., where we have fractional insider holdings for both the sample firm and its matched control firm). Next, we subtracted the control firm's fractional insider holdings from the treatment firm's fractional insider holdings. Under the agency theory prediction, the mean and the median of the distribution of this difference across the sample firms should be greater than zero (i.e., positive). In Table 5b, we provide details of the distribution of this difference. An examination of the distributional properties of this difference is analogous to a matched pair test. From Table 5b, it would seem that there is weak evidence to indicate that insider holdings are higher in the control firms as opposed

Table 5: Details of insider holdings.

For each firm, *j*, the fraction of shares owned or controlled by management is computed using data from proxy statements for the year in which the sample firm first adopted the contingent labor practice. An analogous variable is also computed for control firms. Due to unavailability of data on insider holdings, the statistics below do not apply to the sample used in examining financial performance measures.

a: Descriptive statistics for fraction of insider holdings

Item (number of observations in parenthesis)	Mean	Median	Standard Deviation	*t*-statistic (*p*-value)	Wilcoxon Signed Rank (*p*-value)
Fractional insider holdings for sample firms (185)	31.4%	27.8%	22.1%	19.35 (< .0001)	8602.5 (< .0001)
Fractional insider holdings for control firms (197)	32.9%	29.2%	22.8%	20.23 (< .0001)	9751.5 (< .0001)

b: Descriptive statistics for the difference in the fraction of insider holdings in sample firms versus control firms.

Item (number of observations in parenthesis)	Mean	Median	Standard Deviation	*t*-statistic (*p*-value in one tail test)	Wilcoxon Signed Rank (*p*-value in one-tail test)
Fractional insider holdings for sample firms minus that for control firms (109)	–3.3%	–6.3%	29.7%	–1.155 (.125)	–498.5 (.061)

to the sample firms. This suggests that firms that engage in the temporary/part-time labor strategy have lower insider holdings than the matched control firm. A potential explanation for this result may be that insiders who own little stock may not pay the price if the labor strategy fails but may reap the rewards in the form of extra salary and bonuses if the strategy succeeds. However, we caution the reader that we have only weak evidence on this finding.

CONCLUSION

The current trend towards increased hiring of contingent workers has neither been justified nor discredited empirically. Furthermore, the evidence on its efficacy is scant and limited. The continuing popularity of this unproven human resource strategy is indeed worrisome. Consequently, this paper is aimed at addressing this important issue.

Using a carefully constructed sample, our evidence indicates that firms that increased their reliance on contingent labor experienced increased earnings before interest, taxes, depreciation and amortization, and gross profit margins. This result is valid even after comparing the performance of those firms against a control sample matched on industry and the size of the asset base. The implications of this result are fairly obvious. Given the same asset base with which to generate revenues, firms that increase their reliance on contingent labor experience higher performance because their costs are lower (on average).

To examine the robustness of the result that financial performance is enhanced after increasing the dependence on contingent labor, we then turned to stock return measures. Specifically, using buy-and-hold excess returns to gauge financial performance, we find strong evidence supporting the profitability associated with using contingent labor. Specifically, we find that buy-and-hold excess returns in a 250-day period subsequent to the fiscal year in which the reliance on contingent labor is revealed, is greater than a prior 250-day period. More important, that return far exceeds the return of the industry and asset matched control firm over similar periods. Thus, the results indicate that both financial statement measures and market valuation measures improve after the increased use of contingent labor.

An important issue related to the increased reliance on contingent labor is the effect of such a policy on the riskiness of the firms involved. Indeed, it is very possible that such a policy may be fraught with peril because contingent employees may lack the commitment and zeal to perform well. For example, contingent employees may just walk off the job if another better paying job turns up. In such situations, it is possible that production targets may not be achieved, and earnings and cash flows may become more volatile. Consequently, an increase in risk may occur.

It is also possible that reductions in risk could occur. In times of slow demand for the firm's product, the firm may lay off contingent workers with greater impunity than they might with permanent employees. This may cause dips in the cash flows and earnings that are not as steep, thus lowering their volatility, leading to reductions in risk. However, we document neither an increase nor a reduction in systematic risk. Specifically, the beta of the firms involved (on average) did not appear to change in the period after the increased reliance on contingent labor. Even after comparing the beta change for the sample firms against the matched control firms, we find no evidence of a beta change. In examining managerial ownership of equity, we did not observe higher insider ownership in firms employing the specific labor strategy. On the contrary, we found weak evidence that stock ownership in the firms adopting the temporary/part-time labor strategy was smaller than in matched control firms.

In summary, we believe our evidence supports the contention that the practice of using contingent workers improves gross profit margins. This, in turn, causes the stock market to respond favorably with respect to the stock price of those firms, thereby resulting in higher stock returns. The lack of risk changes implies that the stock market does not incorporate any detrimental consequences from the increased reliance on contingent workers into stock returns. Given the robust evidence of enhanced operating and stock return performance with no concurrent increase in

risk, it is thus not surprising that firms are increasing their reliance on contingent labor. [Received: May 19, 2000. Accepted: September 20, 2001.]

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