Corporate Pension Plans and Investment Choices: Bargaining or Conforming?

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Abstract

This paper investigates the impacts of defined-benefit (DB) pension plans on the corporate investment choices between diversifying and non-diversifying investments. We find a firm's DB plan coverage is negatively associated with its propensity of making a major investment. Subject to a major investment decision, however, the firms with higher DB plan coverage is more likely to diversify, i.e. acquire firms abroad or in other industries, rather than invest in fixed assets or make non-diversifying (i.e. domestic horizontal) acquisitions. Moreover, in diversifying acquisitions, they are more likely to invest in countries or industries with strongly unionized workforce. Further analysis on post-investment performance shows that firms with higher DB plan coverage experience a greater improvement in operating profitability after a diversifying acquisition, and the improvement mainly comes from a higher asset turnover rather than cost reduction. On the other hand, DB plan sponsoring firms experience a decline in profitability after a large capital expenditure or a non-diversifying acquisition. We propose both bargaining motive and conforming motive can explain these results.

I. Introduction

At present there is a growing amount of research on how the corporate-sponsored defined-benefit (DB hereafter) pension plans affect corporate investment decisions. Among others, Rauh (2006) shows that the mandatory contribution to DB pension funds results in lower investment in fixed assets. Chang, Kang and Zhang (2012) conclude that firms with more DB pension plan deficits are more likely to engage in value-enhancing mergers. Cocco and Volpin (2013) indicate that firms sponsoring DB pension plans are less likely to be a takeover target while the acquirer firms with DB pension plans are more likely to pay in cash than their counterparts without such plans. The above studies mainly focus on how DB plan affects a particular type of investment. However, we still know little about its impacts on corporate investment decisions and the channels through which pension plans affect corporate investment choice.

Our paper contributes to the literature by demonstrating that DB pension plans affect the firms' decisions on capital expenditure and choice of investment industries and locations. We propose that both the bargaining motive, and the conforming motive implied by the stakeholder theory can explain firms' investment choices. The bargaining motive predicts that firms invest strategically to reduce employees' influence over corporate resource allocations. Previous studies and anecdotal evidences widely suggest that employees have strong incentives to fight for better compensation through threats of actions, especially in good states of firm performance. We argue that the existence of DB pension plans reflects employees' bargaining power because unionized workers generally have a much higher participation rate in DB plans than non-unionized workers.[1] When facing strong employees' bargaining power,

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[1] Nowadays, although the powers of labour unions are declining and more and more firms are shifting their pension plans towards defined-contribution schemes, unionized workers still have a much higher participation rate in DB plans than non-unionized workers (Bureau of Labor Statistics, 2013). At present when firms shift away from DB to DC plans, they mostly keep the pension benefits of existing employees unchanged while

the firms would respond strategically by changing their investment decisions. Several theoretical models imply that firms can strengthen their bargaining position against the employees through under-investment (Baldwin, 1983; Grout, 1984), cross-industry diversification (Rose, 1991), moving their investments towards overseas plants (Lommerud, Meland and Sorgard, 2003; and Eckel and Egger, 2009), or carrying out international or vertical acquisitions (Lommerud, Staume and Sorgard, 2006).[2]

The conforming motive, on the other hand, predicts that firm managers would consider employees' benefits and concerns while aiming at increasing shareholders' value in investment decisions. Recent studies on the stakeholder theory of capital structure show that firms would take employees' benefits into consideration when deciding their debt policies (Bae, Kang and Wang, 2013) and higher debt ratios do result in higher compensation to top managers and employees (Chemmanur, Cheng and Zhang, 2013). Compared to defined-contribution (DC hereafter) pension plans, DB plans are not only more costly to maintain (Comprix and Muller, 2011; Rauh, Stefanescu and Zeldes, 2013) but also expose sponsoring firms to additional funding risks arising from financial market fluctuations, uncertainties in participants' longevity, employees' mobility, among others (Rauh, 2006; Shivdasani and Stefanescu, 2010; Cocco and Volpin, 2013). Subjecting to competitive disadvantages in their operating industries, a DB plan sponsoring firm has strong incentives of investing abroad or other industries to reduce its financial risk. Previous studies find that geographical or product-market diversification provides benefits by moderating stock return volatility (Fatemi, 1984), lowering the cost of capital (Yan, 2006; Hovakimian, 2011; Hann, Ogneva and Ozbas, 2013), and increasing financial flexibility (Jang, 2016). From the employees' perspective, they are essentially the long-term creditors of DB plan sponsoring firms, and their propensity of

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excluding new hires from DB pension plans. Therefore, the existence of DB plans and the extent thereof indicate the employees' bargaining power in a firm.
[2] Besides changing their investment strategies, firms can strategically reduce the financial resources on the bargaining table by adopting a tightened financial policy to increase their bargaining power. See Perotti and Spier (1993), Klasa, Maxwell, Molina (2009), and Matsa (2010) for examples and detailed discussions.

receiving full pension benefits upon retirement depends on their employers' financial viability. As a result, employees receiving DB-plan benefits also hope their employers to invest safely and reduce the cash-flow risk by diversification.

In short, both bargaining motive and conforming motive indicate not only a lower propensity of investment but also an investment preference towards aboard or new industries over local or similar industries. However, the two theories predict differently on the post-investment performances, as well as choices of target countries and target industries in diversifying (cross-border or cross-industry) acquisitions.[3] Firstly, the bargaining motive implies that DB-plan sponsoring firms achieve better operating performance by gaining a stronger bargaining power against local employees. Consequently, the improvement in performance after a diversifying acquisition should mostly come from reduction of costs, especially labour-related expenses. The conforming motive, however, suggests that the DB plan sponsoring firms would improve their operating performance by other methods such as augmenting the operating efficiency rather than cutting labour-related expenses. Secondly, the bargaining motive predicts DB-plan sponsoring firms to invest in countries or industries with weak unionized workforce so as to prevent incumbent labour unions from joining force with unions in the countries or industries of new investments. The conforming motive, however, predicts DB-plan sponsoring firms would invest in countries or industries with strong unionized workforce. Although investing abroad or in other industries can reduce DB plan sponsoring firms' cash flow risks, the decision could also be viewed as an unfriendly strategy of keeping new investments out of touch by existing employees.[4] In order to gain the employees' support for new investments, DB-plan sponsoring firms have to commit and

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[3] In the M&A literature, diversifying acquisitions mostly refer to cross-industry acquisitions. However, as firms can diversify their risks by acquiring firms or assets abroad, we classify diversifying acquisitions as either cross-border or cross-industry acquisitions, and non-diversifying acquisitions as domestic horizontal acquisitions.

[4] For example, a firm's foreign subsidiary is not liable for the parent firm's DB plan liabilities. As a result, the parent firm's DB pension plans are protected by fewer assets. We thank the guest editor for providing this argument.

cement their relations with unionized workforce by investing in countries or industries with strong union power but higher labour productivity.[5]

To the best of our knowledge, this is the first study that empirically tests the implications of both bargaining and conforming motives of corporate investment. Utilizing information gleaned from US IRS 5500 filings that cover all US pension plans with at least 100 participants, we construct our proxy for DB plan coverage as the ratio of DB pension plan assets to total pension assets. Examining a sample of 27,883 US manufacturing firm-years in 1990-2003, we find that DB plan coverage is negatively associated with the propensity of a major investment defined as a large capital expenditure or an acquisition of firm. A one-standard-deviation increase in DB plan coverage is associated with a reduction of 0.062 in odds ratio for acquisition and 0.244 in odds ratio for large capital expenditure. Subject to a major investment decision, a firm with higher DB plan coverage is more likely to acquire rather than to invest in fixed assets. A one-standard-deviation of increase in DB-plan coverage is related to an increase of 0.217 in odds ratio of acquisition versus capital expenditure. Among various forms of acquisitions, a firm with higher DB plan coverage prefers diversifying acquisition over non-diversifying acquisition. A one-standard-deviation of increase in DB plan coverage is linked with an increase of 0.184 in odds ratio of diversifying acquisition versus non-diversifying acquisition. The above findings are consistent with both bargaining motive and conforming motive that higher DB-plan coverage results in less investment and the dominance of diversifying acquisitions over non-diversifying investments.

To test the bargaining motive versus the conforming motive, we first examine the financial impacts of DB plan coverage by investigating changes in operating performance around major investment. Our empirical result indicates that firms with higher DB-plan coverage tend to have lower return on assets after a big capital expenditure or a non-

diversifying acquisition. Further analysis shows that the result is related to a decline in operating profit margin and increase in pension expense, but unrelated to change in asset turnover. The finding is consistent with the bargaining motive that firms with higher DB plan coverage would avoid large local investments because such investments will further expose their assets to local union forces while workers in the same industry with common interests can join forces more easily.

On the other hand, our empirical evidence shows that diversifying acquisitions bring in higher return on assets for firms with higher DB plan coverage, and the improvement in operating profitability is related to improvement in asset turnover instead of cost cutting effort. Therefore, the finding is inconsistent with the bargaining motive but consistent with the conforming motive which indicates that cost cutting is not the main motive of diversifying acquisitions.

We then examine the impact of DB plan coverage on acquirers' choice of target location and target industry in diversifying acquisitions. The bargaining motive predicts that firms with higher DB-plan coverage will invest in countries and industries with weaker union power, while the conforming motive predicts the opposite. Two measurements are employed to test these two predictions. For each cross-border acquisition, we gauge a target country's labour power with the collective relations law index constructed by Botero et al. (2004). We then compute the average value of all countries in which a firm has carried out it cross-border deals to measure its preference of labour power in cross-border acquisitions. We measure firm's preference of labour power in cross-industry acquisitions in a similar way by using the industry unionization rate provided by Barry Hirsch and David Macpherson available at www.unionstats.com. Our finding supports the conforming motive but not the bargaining motive. Together with the above finding for operating performances, we suggest that weakening labour bargaining power is not the main objective of diversifying acquisitions by

DB plan sponsoring firms. Instead, those firms are willing to consider employees' job-related concerns when they choose the location and industry of acquisition.

We perform additional tests to show the robustness of our main findings. First, previous studies find that other than employees' bargaining power, cross-border acquisitions are driven by many factors such as cross-border trade activity, corporate tax rate, institutional ownership, and so on. Our main results for investment choice survive after controlling those factors. Second, we perform an additional test to address the potential endogeneity concern. Examining change in performance rather than the level of performance can eliminate omitted time-invariant firm characteristics that could cause a spurious relation between DB plan coverage and firm performance. However, some time-varying omitted firm or industry characteristics may still simultaneously affect DB plan coverage and firm performance. For example, technological development and trade liberalization may change a firm's investment opportunities and labour policies. We address the endogeneity concern by using instrumental variable regressions with firm fixed effects. The main results are qualitatively unchanged, implying the robustness of our empirical evidences.

This study contributes to the literature in two ways. Firstly, although the impact of employees' bargaining power on corporate investment choice has been investigated theoretically, the empirical evidences are scant (Clougherty et al., 2014). We find that higher DB plan coverage induces more diversifying acquisitions rather than non-diversifying acquisitions or capital expenditures. Although the finding is consistent with the theoretical predictions proposed by Rose (1991), Lommerud, Straume and Sorgard (2003 & 2006), and Eckel and Egger (2009) that firms shift capital outside their core areas in response to increasing labour power, our evidence suggests that cutting costs is not the main objective of diversifying acquisitions by DB plan sponsoring firms. At the same time, DB plan sponsoring firms indeed avoid investing in existing industries because cost synergies are difficult to

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realize when labour power is strong. In sum, our findings support both bargaining and conforming motives of DB plan sponsoring firms in investment decisions.

Secondly, our study sheds new light on the growing literature on cross-border mergers. Previous studies find that at the aggregate level, the volumes of cross-border merger are driven by country factors such as accounting standards, corporate governance, investor protection (Rossi and Volpin, 2004; Martynova and Renneboog, 2008), taxation (Scholes and Wolfson, 1990; Huizinga and Voget, 2009), culture (Ahern, Daminelli and Fracassi, 2015), as well as geographical distance, quality of accounting disclosure, and bilateral trade (Erel, Liao and Weisbach, 2014). At the firm level, cross-border mergers create value by binding targets from countries with lower standards of corporate governance and investor protection with the higher standards in bidders' countries (Bris, Brisley and Cabolis, 2008; Bris and Cabolis, 2008), governing targets by foreign institutional investors (Ferreira, Massa and Matos, 2010), and disciplining poorly performing CEOs in countries with weak investor protection (Lel and Miller, 2015). Our results show that corporate pension plans induce firms to invest abroad but the motivations are more complicated than reducing labour influence through shifting assets abroad or to other industries.

The remainder of this paper proceeds as follows. Section 2 provides institutional background and reviews prior research. Section 3 describes data and construction of key variables. Section 4 presents the main empirical results. Section 5 compares our research with other studies for cross-border M&As and provides robustness check. Finally, Section 6 concludes.

2. Institutional Background and Literature Review

Firms generally offer two types of pension plans to their employees, namely defined-benefit plans and defined-contribution plans. The main difference between DB and DC plans

is that the firms with DB plans promise the employees a fixed retirement benefit defined by a given formula, which is usually a function of the employee's tenure, wage (usually in the final year), and sometimes age, while the firms with DC plans provide fixed annual contributions to a pension fund. In recent years, there has been an increasing trend for US companies to switch from DB to DC pension plans or freeze the existing DB plans and shut out new hires. The share of DB plan assets has dropped from 65% in 1995 to 40% in 2005 (Broadbent, Palumbo and Woodman, 2006). From the employer's perspective, DC plans are less costly to maintain than DB plans. A direct benefit of freezing DB plans is that the pension liability is immediately reduced by the amount of expected future benefits, which significantly improves funding status of plans and the bottom line (Comprix and Muller, 2011). Rauh, Stefanescu and Zeldes (2013) find that firms save 2.7-3.6% of payroll per year by shifting from DB to DC plans over a ten-year horizon. Moreover, shifting to DC plans reduce firms' uncertainty for their future contributions to DB plans which are affected by the expected rate of return of asset and market interest rates.

2.1 DB plan and employees' bargaining power

The extent of DB plans reflects employees' bargaining power for three reasons. First, compared with a DC plan, an employee's pension benefit under a typical DB plan is "back-loaded" and is mostly predetermined by a formula based on his (her) earnings before retirement (Kapinos, 2009). As a result, employees in DB plans face a higher cost of job change and their values of outside options are lower. They are more concerned for and more loyal towards their employers' long term prospects than employees in DC plans. Employees covered by DB plans are hence expected to have strong incentives to stay and bargain collectively with their employers when their benefits are threatened, while employees under

DC plans are more likely to consider outside options and leave if they are not satisfied with the pension benefits offered by the employers.

Secondly, many corporate-sponsored DB plans are reached through collective bargaining and most of them were set up in earlier years when labour unions were strong enough to protect the employees' post-retirement benefits. Although labour union power is declining and there is a growing trend of moving towards DC plans, unionized workers still have a much higher participation rate in DB plans than non-unionized workers. A survey by the Bureau of Labour Statistics (2013) shows that the unionized workers enjoy better retirement benefits than the non-unionized workers. The former group is much more likely to own corporate-sponsored pension plans (86% versus 45%), and to be covered by the DB plans (68% versus 11%). As firms are shifting to DC plans due to the cost disadvantages of DB plans, the percentage of frozen DB plans is also much higher for non-unionized workers than that for their unionized counterparts (33% versus 15%). In contrast, the participation rates of the defined contribution (DC) pension plans are very close for the two groups of workers (44% versus 42%).[6]

Thirdly, most employers have been shifting away from DB plans in recent years. They keep the pension benefits of existing employees unchanged and exclude new hires from DB pension plans so as to reduce the resistance from current workers and labour unions. This strategy is believed to reduce the alignment between new and existing employees, and hurt employees' bargaining power and collective forces. Indeed, quite a few of the labour strikes nowadays are caused by employers' attempting to freeze old DB plans while offering DC plans to new employees.[7] For example, Bob Woods, spokesperson of The International

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[6] See "National Compensation Survey: Employee Benefits in the United States, March 2013" by Bureau of Labor Statistics.

[7] There are generally two types of pension plan freeze. A "hard" freeze eliminates the accrual of new benefits for all employees, while a "soft" freeze excludes some classes of employees, usually new employees, from the accrual of benefits under the old plan.

Association of Machinists and Aerospace Workers (IAM), told In These Times during the strike against Lockheed Martin in April 2012:

The first time..., they take away pension for new hires. Next time around, when new hires [are in the union], they say 'we are going to freeze the pension.' Of course, the new hires that don't have a pension aren't going to strike, so then the pension is frozen ... Companies like Lockheed Martin simply want to eliminate defined benefit pensions plans.

Facing strong employees' bargaining power, the firms would respond strategically by changing their investment decisions. Baldwin (1983) and Grout (1984) theoretically demonstrate that the renegotiation risk causes firms to under-invest in the face of strong labour bargaining power, as evidenced by Hirsch (1992), and Bronars and Deere (1993). The firms can also improve their bargaining position in relation to their employees by moving their investments towards overseas plants, or carrying out international or vertical acquisitions.[8] The international oligopoly model by Lommerud, Staume and Sorgard (2006) shows that a cross-border acquisition triggers increased competition between labour unions for job security and firm's commitment to future investments because the firm can exploit the potential of shifting inputs and production between plants in different countries. Such union rivalry consequently leads to workers' concession on wage, which has been an important determinant of a firm's decision to invest abroad. Moreover, it is more difficult for unions in different locations to cooperate than unions in the same location. This reality further weakens the employees' bargaining power. The equilibrium market structure implies that a cross-border acquisition is an effective corporate strategy to reduce union rents. Lommerud, Meland and Sorgard (2003), and Eckel and Egger (2009) predict that investing and producing abroad can increase a firm's bargaining power by allowing it to continue its operations even in the

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[8] Alternatively, firms can strategically reduce the financial resources on the bargaining table by adopting a tightened financial policy to increase their bargaining power. See Perotti and Spier (1993), Klasa, Maxwell, Molina (2009), and Matsa (2010) for examples and detailed discussions.

case of disagreement with local workers. The theoretical model developed by Rose (1991) also implies that cross-industry diversification can improve a firm's ability to take strikes and reduce wage settlements. It can be expected that diversifying acquisitions would have a similar effect on employees' bargaining power as cross-border acquisitions. As labour unions exist to protect workers with similar working conditions and interests, it is difficult for labour unions representing workers in different industries to collude with each other.

Diversifying acquisitions are also less likely to induce the "envy effect" than non-diversifying acquisitions because the acquired overseas businesses are remotely comparable to the original one. Goel and Thakor (2005) demonstrate that an agent's utility increases with what she/he has and decreases with what others have due to social status (Frank, 1984) or equity considerations (Akerlof and Yellen, 1990). Envious workers may even attempt to sabotage other workers (Lazear, 1989). Goel and Thakor (2005) also argue that people are jealous of those who are close and comparable to them. In a workplace, workers will compare their compensation packages with others doing the same tasks. As DB plans generally offer higher and more stable post-retirement benefits than DC plans, it is likely that employees under DC plans will be envious of their colleagues under DB plans. Therefore, even a firm with high DB plan coverage may have identified a potential target with low DB-plan coverage in the same industry or in the same country, it may have to consider the additional costs and problems in lining up the compensation packages of employees from different original firms.

The above bargaining view implies that DB plan sponsoring firms can dilute the influence of labour unions by investing in foreign countries and industries with weak presence of labour unions. In particular, by shifting capital abroad, firms are subject to less scrutiny by local labour unions over corporate resources if the local unions do not have a strong partner in the foreign countries where the firm assets locate.

2.2 DB plan and financial risk

In offering a DB pension plan, a sponsoring firm is not free from financial liability after making its contributions to the plan. The value of DB plan assets is volatile and depends on quite a few of factors including a pension fund's asset allocation, risk management and investment performance, as well as the pension plan participant's longevity and employee mobility. When the market value of the pension asset is less than the pension liability, the pension plan is in deficit. In this case, the sponsoring firms are required to make up the difference.

Previous studies suggest DB plan sponsoring firms have larger financial burdens and are more opaque than its counterpart. Rauh (2006) indicates that the mandatory contribution to DB pension changes a firm's internal financial resources and reduces its capital expenditures. Bakke and Whited (2012) show that Rauh's finding is driven by the sample of heavily underfunded firms. They further find that the mandatory contribution also affects research, development and employment growth. In addition to the mandatory contribution, the DB pension deficit is also a long-term liability to the firm. Shivdasani and Stefanescu (2010) find that firms' debt ratios are indeed 35% higher if the pension liabilities had been considered as debt, and firms with higher pension liabilities have lower debt ratios, consistent with the trade-off theory of capital structure. All of these contribute to the uncertainty of the firms' internal financial resources. In addition, Cocco and Volpin (2013) argue that DB pension plans increase firms' information asymmetry and therefore act as a takeover deterrent when the potential acquirers are worried about the lemon problem. They show that firms sponsoring DB plans are less likely to be a takeover target. Moreover, these firms are more likely to use cash rather than stock when acquiring other firms. The explanation they propose is that the uncertainty in the value of DB plan liabilities expose the merger counterparty to additional risk and information asymmetry. Therefore, DB plan is costly to maintain and the

uncertainty in the pension fund investment increases firms' financial risk.

Financial burdens may harm firm's relationship with its employees and other stakeholders when firm-specific or asset-specific investments are subject to a large cost in liquidation (Titman, 1984). Therefore, firms in financial distress always face the choice between losing their business partners and valuable employees, and using resources to maintain such relationships. Berk, Stanton and Zechner (2010) theoretically show that the costs of human capital can sometimes be so high to stop firms from issuing debt. Chemmanur, Cheng and Zhang (2013) empirically find that employee pay is positively related to financial leverage. Both suggest that labour costs affect the financing decision.

Motivated by these studies, we argue that DB plan sponsoring firms with pension liabilities have stronger needs than their counterparts to address labour concerns in their investment decisions by investing less or making investments that will not exacerbate their financial risks. As diversification can reduce cash flow volatility and therefore the likelihood of bankruptcy, we expect DB plan sponsoring firms are more likely to acquire firms aboard or in other industries. However, regarding diversifying acquisitions as a strategy to reduce their bargaining power, the employees may fight hard to block acquisitions that shift capital outside the core businesses. To maintain the relationship with their employees, the firms can show their conformity to unionized workforce by investing in countries with high labour protection standards and union coverage such as the Scandinavian countries, or in industries with strong presence of labour unions. Therefore, the conforming view suggests that DB plan sponsoring firms may invest in countries or industries with stronger presence of labour unions to moderate employees' concern about financial risks and bargaining power.

3. Data Sample, Construction of Variables and Empirical Strategy

3.1 Data sample

Our sample covers the manufacturing firms (SIC 2000-3999) in CRSP/Compustat Merged Database and IRS 5500 filings compiled by Centre for Retirement Research at Boston College from 1990 to 2007. We extend the data to 2013 by downloading the IRS 5500 filings from The Department of Labour. We join records from CRSP/Compustat and IRS filings using Employer Identification Number (EIN), the only identifier available in both databases. We include only manufacturing firms where labour union activities tend to be more intensive. In addition, DB pension plans are more prevalent in labour-intensive manufacturing industries than in hi-tech or service industries. We exclude firms with missing values for the regressions on investment choice. Our final sample consists of 27,883 firm-years.

The IRS 5500 filings cover both DB and DC pension plans with at least 100 participants. Employers are required to file a separate form for each of their plans. The information recorded contains type and status of plan, summary statistics of participants, plan assets and liabilities, etc. In addition, employers are required to file Actuarial Information (Schedule B) for each DB plan, including in particular the estimation of projected benefit liabilities and the funding status of the plan. In our study, we aggregate plan-level data to firm-level.

3.2 DB-plan coverage

The main explanatory variable of this study is DB plan coverage (*DB_Cover*), defined as the value of DB plan assets over the total assets of both DB and DC plans available on IRS 5500 filings. Since many DB plans are usually maintained only for senior employees while new hires are excluded from it, an implicit assumption of this measurement is that more weight is given to more senior employees who tend to have higher values in their pension accounts. This is consistent with our assumption that DB plan coverage may reflect

employees' bargaining power because senior employees are more likely to occupy higher occupational ranks and therefore be more influential.

There are two potential biases of this measure of DB plan coverage. First, the value of pension assets fluctuates with market conditions. To check the robustness of our findings, we use the number of employees covered by the DB-plan as an alternative measurement and the results are qualitatively unchanged[9]. Secondly, Compustat provides consolidated financial information on parent level, while IRS 5500 filings can be made by group subsidiaries rather than the parents. Since the filings do not provide any information about the parent company of the filer, we cannot consolidate all pension plan data to the parent level. Therefore, our calculated pension assets may underestimate the actual pension assets for a company with subsidiaries. However, the missing information should add noise rather than systematic bias to our measure of DB plan coverage because the DB plan assets are scaled by total pension assets rather than total firm assets.

Unlike most previous studies on DB pension plans (e.g. Shivdasani and Stefanescu, 2010; Chang, Kang and Zhang, 2012; Cocco and Volpin, 2013), our DB plan coverage accounts for not only the existence but also the extent of DB plans relative to DC plans, which allows us to compare among firms offering different levels of DB pension plans to employees.

3.3 Major investment decision

We constructed two indicators to gauge the major investment decisions in a year. The first one is the major capital expenditure decision, *LargeCAPX*, which equals one if a firm's capital expenditure scaled by lagged one-period total assets is above the 90th percentile for all sample firms in the year.[10] In a robustness check, we use 75th percentile as a cut-off and the results are qualitatively the same. The second one is major mergers and acquisitions, *Acquire*,

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[9] We do not report the results due to the space constraint, but they are available upon request.
[10] In Compustat database, capital expenditures exclude property, plant and equipment of acquired companies, and net assets of businesses acquired.

which equals one if a firm acquires at least one firm in the year. Specifically, we collect from Thomson One for all mergers and acquisition transactions that are indicated as "Mergers". We exclude acquisitions of minority interests or acquisitions of remaining interests because they do not involve a change in control. We also exclude acquisitions of assets because those deals tend to be small.[11]

For acquirers in a year, we further check if they acquire foreign firms or firms in other industries, and define three types of mergers: (1) *CrossBorder* which equals one if a firm acquires at least one firm out of the United States in the year; (2) *CrossIndustry* which equals one if a firm acquires at least one firm belonging to a different 4-digit SIC code; and (3) *CBI* which equals one if either *CrossBorder* or *CrossIndustry* equals one.

3.4 Empirical strategy and explanatory variables

To examine the choice of major investment, we use the logit model for binary choices and the multinomial logit model for multiple (> 2) choices. More specifically, for each firm k that faces $N+1$ alternatives in year t, the utility of choice j in year $t+1$ is defined as follows:

$$u_{kjt+1} = w_{kt}^{'}\beta_j + \varepsilon_{kjt+1}, \ j = 0, 1, ..., N,$$

where w_{kt} is a set of firm-specific and industry-specific variables of interest in year t. Given this utility function, each firm chooses the investment type that maximizes its utility. The probability that firm k choose j^{th} choice is modelled as,

$$Prob(Y_{kt+1} = j|w_{kt}) = P_{kjt+1} = \frac{\exp(w_{kt}^{'}\beta_j)}{\sum_{j=0}^{N}\exp(w_{kt}^{'}\beta_j)}.$$

The model implies that we can compute the log-odds ratio of two alternative, j and h, as:

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[11] Our definition of *Acquire* does not distinguish large M&As from small M&As because Thomson One does not report deal values for a significant percentage of M&A transactions. From our initial collection of all M&As in 1970-2014, about 54% of mergers report deal values, while only about 32% of asset acquisitions report deal values.

$$ln\left(\frac{P_{kjt+1}}{P_{kht+1}}\right) = w_{kt}'(\beta_j - \beta_h).$$

Suppose h is the base case. Conventionally, we normalize the base case by setting β_h to zero (pp. 844, Greene, 2008), so that we can identify the effect of firm-specific variables on the odds ratio by observing β_j.

We include the following firm-specific variables for the investment-choice models:

1. *DB_Cover*, the key explanatory variable of interest;

2. *CashFlow*, the sum of net income and depreciation minus dividends, divided by lagged total assets;

3. *Q*, the market-to-book ratio of assets;

4. *Size*, the natural logarithm of total assets in 2005 constant value;

5. *Tang*, net property, plant and equipment scaled by total assets;

6. *WC*, net working capital less cash, divided by total assets;

7. *Div*, cash dividend divided by lagged total assets;

8. *CumRet*, the 12-month cumulative stock return in fiscal year *t*.

All variables are one-period lagged the choice variables and they are winsorized at 1st and 99th percentiles of respective distributions. Furthermore, year dummies ($Yrdum$) are included to control for all firm-invariant variables and adjusted for trends like nationwide legislation or policy changes. The dummies for 2-digit SIC industries ($SIC2$) are added to control for all unobserved factors that are time-invariant and peculiar to each industry.

3.5 Summary statistics

Panel A of Table 1 reports the distribution as well as the summary statistics for DB plan coverage and investment choices of the sample firms by year. Panel B reports the summary statistics of other key firm-specific variables used for our analysis.

As the explanatory variables are lagged by one year relative to the investment decision variables, the summary statistics in Panel A for *DB_Cover* are for the period 1990-2013, and the summary statistics for *Merger*, *CrossBorder*, *CrossIndustry*, and *CBI* are for the period 1991-2014. Column 1 shows that the number of sample firms increases from 1990 to 1996, and then experiences abrupt drops in 1999 and 2000.[12] The number of firms picks up again in 2001, but experiences a gradual decline after 2004. Consistent with the summary statistics documented in previous studies, columns 2&3 indicate that DB-plan coverage (*DB_Cover*) dropped from 30.6% in 1990 to 16.1% in 2012.

Column 3 presents the intensity of overall acquisition activity. The number in each entry is the percentage of sample firms acquiring at least one firm in the year. On average, about 10.9% of the sample firms acquire at least one firm in a year. The overall acquisition activity is volatile over time, peaking at 13-14% in 1996-2000 and plunging to 8% in 2002-2003 after the internet bubble burst. Columns 4-6 report the intensity of acquisition activity by acqustion type. Cross-industry acquisitions are more than two times as popular as cross-border acquisitions on average, but the activities of the two types of acquisitions vary closely to that of the overall. This suggests we should control for time-fixed effects in models for investment choices.

[Insert Table 1]

4. Empirical results

Table 2 reports the results of the logit regressions for major investment decisions. In column 1, the dependent variable is an indicator for acquisition that equals one if a firm acquires at least one firm in year *t*+1. To address the potential simultaneity issue, all explanatory variables are lagged one year relative to the dependent variable, or they are

[12] We check with the source document by Buessing and Soto (2006) at the Center for Retirement Research at Boston College, which states that for 1999 and 2000, the information of a significant number of plans is not available.

measured at year *t*. The result shows that higher DB-plan coverage is associated with a lower propensity of acquisition at a statistical significance of 5%. In terms of the economic magnitude, a one-standard-deviation increase in *DB_Cover* is associated with a 0.062 reduction in odds ratio for acquisition.[13] The signs of other coefficients are consistent with previous studies on mergers and acquisitions. Firms with stronger cash flow, higher valuation and better past stock returns are more likely to acquire others. Large firms are also more likely to be an acquirer than small firms, which probably reflects the fact that large firms have a larger capacity to absorb financial risks and stronger capability to raise external funds for acquisitions than small firms. On the other hand, asset tangibility is negatively related to the propensity of acquisition. A possible explanation is that a high level of tangible assets is generally associated with low growth options. Therefore, firms with high asset tangibility tend to growth internally rather than via acquisitions.

In column 2, the dependent variable is an indicator for large capital expenditure that equals one if a firm's capital expenditure-to-assets ratio is above 90th percentile of the sample firms in year *t*+1. The result indicates that higher DB plan coverage is associated with a lower propensity of large capital expenditure and the result is statistically significant at 1% level. A one-standard-deviation increase in *DB_Cover* is associated with a 0.244 reduction in odds ratio for making large capital expenditure. Consistent with column 1, firms with stronger cash flow, higher valuation and better past stock returns are more likely to invest in fixed assets. However, as opposed to column 1, large firms are less likely to invest in fixed assets than small firms, and asset tangibility is positively associated with the propensity of large fixed-asset investment. As argued above, smaller firms have weaker ability to absorb risk and raise external financing, so they have to rely more on fixed-asset investments for growth. The

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[13] In a logit model, the proportional impact of an increase of *y* for a variable *Y* on the odds of a positive outcome is estimated as $exp(\alpha \times y) - 1$, where α is the coefficient of *Y* in the model. As the coefficient of *DB_Cover* in model (1) is -0.214, the impact of a one-standard-deviation reduction in *DB_Cover* on the odds of Acquisition is $exp(-0.214 \times 0.297) - 1 = -0.062$.

positive correlation between asset tangibility and large capital expenditure is consistent with our above argument that high asset tangibility indicates low growth options.

[Insert Table 2]

Table 3 reports the results from multinomial logit regressions for investment decision. In particular, it aims to identify the determinants for capital expenditure versus acquisition decisions. The dependent variable is an indicator that equals zero (0) if a firm makes neither large capital expenditure nor a merger at t+1, one (1) if a firm makes a large capital expenditure no mergers at t+1, and two (2) if a firm completes at least one merger at t+1.

Column 1 reports the choices between no major investment (0) and large capital expenditure (1). The coefficients are close in magnitudes but in opposite signs to that of column 2 of Table 2. As large capital expenditure is the base case, the coefficients reported represent the effects of explanatory variables on the propensity of no major investment. Therefore, the result is consistent with that of column 2 of Table 2.

Column 2 reports the decision between large capital expenditure (1) and acquisition (2). The result indicates that higher DB-plan coverage is significantly related with a higher propensity of acquisition rather than large capital expenditure. A one-standard-deviation increase in *DB_Cover* is associated with a 0.217 increase in odds ratio for acquisition versus large capital expenditure. Surprisingly, cash flow, firm valuation, and past stock return are all negatively linked with the propensity of acquisition versus large capital expenditure. Previous studies show that the merger wave is highly correlated with valuation wave because firms have strong tendency to issue stock to finance their mergers in high valuation for behavioral reasons (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf, Robinson and Viswanathan, 2005). It turns out that the correlation between capital expenditure and valuation overshadows the correlation between acquisition and valuation.

Consistent with Table 2, more tangible assets are related with more capital expenditure and fewer acquisitions.

[Insert Table 3]

Table 4, Panel A examines the impact of DB plan coverage on the choices of acquisitions. Column 1 reports the multinomial logit regression for the decision between cross-border acquisition and domestic acquisition. The dependent variable is an indicator that equals zero (0) if a firm does not complete any mergers at $t+1$, one (1) if a firm completes at least one domestic merger but no cross-border merger at $t+1$, and two (2) if a firm completes at least one cross-border merger at $t+1$. Result for case (2) versus case (1) is reported. It indicates that higher DB plan coverage is significantly related with a higher propensity of cross-border versus domestic acquisition. A one-standard-deviation increase in *DB_Cover* is associated with a 0.135 increase in odds ratio for cross-border versus domestic acquisition.

Column 2 reports the multinomial logit regression for the choice between cross-industry acquisition (2) and horizontal acquisition (1). The result indicates that higher DB plan coverage is associated with a higher propensity of cross-industry versus horizontal acquisition, and the result is statistically significant at 5% level. A one-standard-deviation increase in *DB_Cover* is associated with a 0.134 increase in odds ratio for cross-industry versus horizontal acquisition. Column 3 combines the cases in columns 1&2 and examines the decision between cross-border or cross-industry (i.e. diversifying) acquisition (2) and domestic horizontal (i.e. non-diversifying) acquisition (1). The results are qualitative the same as those reported in columns 1&2. DB-plan coverage is positively associated with the propensity of acquiring foreign firms or firms in other industries. The economic magnitude is that a one-standard-deviation increase in DB-plan coverage is associated with an increase of 0.184 in odds ratio of diversifying acquisition versus non-diversifying acquisition.

Table 4, Panel B examines the impact of DB plan coverage on the type of investment. The dependent variable is an indicator that equals zero (0) if a firm does not make any large capital expenditure or acquisition at t+1, one (1) if a firm makes a large capital expenditure but does not complete an acquisition at t+1, two (2) if a firm completes at least one non-diversifying acquisition but no diversifying acquisition at t+1, and three (3) if a firm completes at least one diversifying acquisition at t+1.

Column 1 reports the decision between non-diversifying acquisition (2) and large capital expenditure (1), and column 2 reports the decision between diversifying acquisition (2) and large capital expenditure (1). The result indicates that DB-plan coverage has a statistically insignificant impact on the decision between non-diversifying acquisition and large capital expenditure, while it is positively related to the propensity of diversifying acquisition versus large capital expenditure. A possible explanation for the difference is that both capital expenditure and non-diversifying acquisition are mainly for expanding local production facilities. As a result, the choice between the two should not result in a significant difference in labour bargaining power and financial risk. On the other hand, a diversifying acquisition allows the acquirer to stay further away from labour power in its core business or to diversify its financial risk. Therefore, firms with stronger DB-plan coverage are inclined to acquire foreign firms or firms in other industries.

[Insert Table 4]

Although the results above could suggest that firms stay away from labour power by acquiring firms abroad or in other industries, it is also possible that firms maintain DB plans in order to gain support from existing employees and labour unions for their investment plans. For example, foreseeing weakening bargaining power as a result of diversifying acquisitions, existing employees and labour unions may strongly oppose the investments unless they get the employers' guarantee of keeping employees' benefits untouched. There are two potential

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ways to gain support from labour unions. First, firms can pre-commit not to reduce employees' benefits after acquisition. Second, firms can invest in countries or industries with strong presence of unionized workforce as a signal to respect the collective bargaining rights.

Tables 5&6 disentangle the bargaining motive from the conforming motive of DB plan sponsoring firms who engage in diversifying acquisitions. If firms intentionally reduce labour bargaining power by acquiring firms abroad or in other industries, we should observe greater benefits accrued to firms where the labour power proxied by DB-plan coverage is stronger. This prediction is supported by Rose (1991)'s finding that compared with focused firms, diversified firms can endure longer labour strikes and therefore reduce wage settlements. Besides, DB plan sponsoring firms would invest mainly in countries or industries with weak presence of labour unions, and they are more likely to reduce costs including labour costs after acquisition. In contrast, although the conforming view also predicts that DB plan sponsoring firms are more likely to invest abroad and other industries to reduce financial risks than non-sponsoring firms, it suggests that those firms are more likely invest in countries and industries with strong unionized workforce and less likely to reduce labour benefits after acquisition.

Empirically, we regress changes of the performance variables on the indicators of major investments. The performance variables include: (1) $\Delta ROA_{t,t+2}$, change in earnings before interest, taxes and depreciation, scaled by lagged total assets, from t to $t+2$; (2) $\Delta OM_{t,t+2}$, change in earnings before interest, taxes and depreciation, scaled by net sales, from t to $t+2$; (3) $\Delta ATO_{t,t+2}$, where ATO is net sales scaled by lagged total assets; and (4) $\Delta Pen\_Emp_{t,t+2}$ where Pen_Emp is the pension and retirement expense scaled by number of employees (in thousands of dollars). Indicators of major investments include: (1) an indicator that equals one if a firm makes a large capital expenditure or non-diversifying acquisition (*Local*); (2) *CBI* as defined above. We combine large capital expenditure and non-diversifying

acquisitions into a group because Table 4 shows that *DB_Cover* does not affect the choice between the two. Besides, we interact the investment indicators with *DB_Cover* to examine if the benefit from a particular type of investment is greater for firms with higher DB plan coverage.

We run the following ordinary least squares (OLS) model regression for the change in operating performance:

$$\Delta Performance_{t,t+2} = \beta_0 + \beta_1 Local_{t+1} + \beta_{1a} CBI_{t+1} + \beta_2 DB\_Cover_t + \beta_3 DB\_Cover_t \times Local_{t+1} + \beta_{3a} DB\_Cover_t \times CBI_{t+1} + \beta_4' Firm_t + \beta_{4a}' \Delta Firm_{t,t+2} + \sum_{i=1991}^{2013} \beta_{yr,i} Yrdum_{i,t} + \sum_{j=21}^{39} \beta_{ind,j} SIC2_{j,t} + \varepsilon_t \qquad (1)$$

The dependent variable, $\Delta Performance_{t,t+2}$, is one of $\Delta ROA_{t,t+2}$, $\Delta OM_{t,t+2}$, $\Delta ATO_{t,t+2}$, and $\Delta Pen\_Emp_{t,t+2}$, as defined above. *Firm* is a vector of firm characteristics including *Q*, *Size*, *Tang*, *WC* and *Div* as defined in Table 1, in year *t*. Δ*Firm* is the change in firm characteristics (*Firm*) from *t* to *t*+2. Note that *CashFlow* is not included because it is highly correlated with *ROA*. We include Δ*Firm* in the regressions to control for changes in firm policies that are unrelated to the investment decisions but affect change in firm performance. Nevertheless, we report results with and without Δ*Firm* in Panel A and Panel B of Table 5.

Panel A shows that without a major investment, DB plan coverage has a positive and significant effect on firm performance. This suggests DB pension plans do not negatively affect firm performance. However, large capital expenditures or non-diversifying acquisitions negatively affect firms' performance, especially for firms with high DB-plan coverage (column 1) as indicated by the negative coefficient of the interaction term. To further investigate change in return on assets ($\Delta ROA_{t,t+2}$), we use change in operating profit margin ($\Delta OM_{t,t+2}$), change in asset turnover ($\Delta ATO_{t,t+2}$), and change in fixed asset to employee ratio ($\Delta Pen\_Emp_{t,t+2}$) as dependent variables in columns 2, 3 and 4 respectively.[14] The

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[14] Notice that *ROA = OM × ATO*.

regression results show that the operating profit margin declines and pension expense per employee increases after such investments for firms with higher DB plan coverage. Therefore, large capital expenditures and non-diversifying acquisitions seem to destroy value for DB plan sponsoring firms by reducing their ability to cut costs. The finding is consistent with the bargaining motive of DB plan sponsoring firms. The new investments in local and existing businesses expose more firm assets to unionized workforce, making firms difficult to improve profitability by reducing costs. As a result, DB plan sponsoring firms tend to avoid investing in existing businesses locally.

While diversifying acquisitions also result in worse operating profitability (column 1), the effect is less negative for firms with higher DB-plan coverage. The finding suggests that diversifying acquisitions create more value for DB plan sponsoring firms than non-sponsoring firms. Columns 2, 3 and 4 show that the relative outperformance of DB plan sponsoring firms is mainly due to an improvement in asset turnover. On the other hand, there is no indication that those firms reduce operating expense after investing abroad or other industries, as suggested by insignificant coefficients of the interaction term in regressions for $\Delta OM_{t,t+2}$ and $\Delta Pen\_Emp_{t,t+2}$. Therefore, cutting costs is unlikely to be a major motivation for DB plan sponsoring firms to invest abroad or in new industries, which is inconsistent with the bargaining motive but consistent with the conforming motive.

In Panel B, we include $\Delta Firm$ in the model. The main results are qualitatively the same as those in Panel A, except that the interaction term $Local{\times}DB\_Cover$ becomes statistically insignificant in the regression for $\Delta Pen\_Emp_{t,t+2}$.

[Insert Table 5]

Table 6 examines the target location of diversifying acquisition and target industry in diversifying acquisition. The bargaining motive suggests DB plan sponsoring firms invest in countries or industries with weak unionized workforce while the conforming motive suggests

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the opposite. To test the two predictions, we first identify the union power of target country in each cross-border acquisition and that of target industry in each domestic diversifying acquisition. To gauge country-level union power, we obtain the collective relations law index developed by Botero et al. (2004), a composite index of eighteen indicators that measure labour union power and the rights of collective disputes. Industry union power is gauged by the industry unionization rate provided by Barry Hirsch and David Macpherson. Then for each firm-year, we calculate the average collective relations law index for target countries of all cross-border acquisitions (*Avg_cUnion*) and the average unionization rate for target industries of all domestic diversifying acquisitions (*Avg_iUnion*) done by the firm, if any.

We run the following OLS regressions for *Avg_cUnion* (column 1) and *Avg_iUnion* (column 2):

$$Avg\_cUnion_{t+1} \ (or \ Avg\_iUnion_{t+1}) = \gamma_0 + \gamma_1 DB\_Cover_t + \gamma_2 CashFlow_t + \gamma_3 Q_t + \gamma_4 Size_t + \gamma_5 Tang_t + \gamma_6 WC_t + \gamma_7 Div_t + \gamma_8 CumRet_t + \sum_{i=1991}^{2013} \gamma_{yr,i} Yrdum_{i,t} + \sum_{j=21}^{39} \gamma_{ind,j} SIC2_{j,t} + \varepsilon_t \qquad (2)$$

By construction, for column 1, only firms that acquire at least on foreign firm in a year are considered, while for column 2, only firms that make at least one domestic diversifying acquisition in a year are considered. As a result, the numbers of observations are much lower than those for previous tables.

The regression results suggest that firms with higher DB plan coverage generally prefer investing in countries or industries with stronger unionized workforce, as indicated by the positive coefficients of *DB_Cover* in both regressions. The finding is in line with the conformity motive of DB plan sponsoring firms who consider employees' benefits and concerns in their investment decisions. However, it is inconsistent with the bargaining motive that predicts firms to strategically reallocate their capital to areas outside the scrutiny by labour unions.

[Insert Table 6]

In sum, the results in Tables 5&6 show that DB plan sponsoring firms experience an improvement in operating profitability relative to non-sponsoring firms after diversifying acquisitions. However, such improvement is not due to cost cutting or reduction in pension expense but an improvement in asset turnover. Further analysis shows that in cross-border or domestic diversifying acquisitions, DB plan sponsoring firms tend to invest in countries or industries with strong union power. All these findings are consistent with the conforming motive but against the bargaining motive of firms in their investment decisions. At the same time, we do find some supporting evidences for the bargaining motive of DB plan sponsoring firms in their capital expenditure and non-diversifying acquisition decisions. After those investments, DB plan sponsoring firms experience a reduction in operating profitability and an increase in pension expense relative to non-sponsoring firms. The finding can explain why DB plan sponsoring firms tend to under-invest in existing businesses especially in the domestic market.

5. Further discussions and robustness checks

5.1. Relation with other studies in cross-border acquisitions and additional controls for investment choice

Previous studies for cross-border mergers have identified country-levels and industry-level factors that are not included in our baseline models in Table 4. Many studies suggest that a spill-over of good governance standards from the bidder to the target creates value. For example, Rossi and Volpin (2004) finds that countries with better accounting standards and stronger shareholder protection have more M&A activities, and that cross-border mergers are mostly initiated by firms in countries with better investor protection to acquire firms in countries with weaker investor protection. Martynova and Renneboog (2008) show that takeover returns are positively related to the difference between the bidder and target country-

level corporate governance. Bris, Brisley and Cabolis (2008) find that industry valuation increases when firms in the industry are acquired by firms in other countries with better investor protection and accounting standards. Bris and Cabolis (2008) find that bidders from countries with better shareholder protection and accounting standards pay a higher merger premium in cross-border mergers relative to matching domestic mergers. Lel and Miller (2015) document that after a country passes a takeover law, poorly performing firms experience a higher probability of being taken over.

Taxation is another consideration when firms choose between domestic and cross-border acquisitions. Scholes and Wolfson (1990) show that the Tax Reform Act of 1986 that discourages tax-induced M&A activity reduces domestic M&A activity but increases the demand for foreign acquisitions. Huizinga and Voget (2009) show that double taxation of foreign subsidiaries' income reduces the incentives to acquire foreign firms. Erel, Liao and Weisbach (2012) find that cross-border mergers are likely to happen if the tax rate in the bidder's country is higher than that of the target's country. Geographic and cultural distances also affect M&A activity between two countries. Erel, Liao and Weisbach (2012) show cross-border mergers are more likely to happen between two countries if the two countries are geographically close to each other and they have more bilateral trades. Ahern, Daminelli and Fracassi (2015) show that M&A activity between two countries is more intensive if they are culturally close in terms of trust, hierarchy and individualism. Besides, greater distances in trust and individualism result in lower combined merger announcement returns.

However, as our study assesses US firms' investment decisions, we cannot include those country-level factors in our analysis. Instead, we create several industry-level or firm-level substitutes to address some of those issues. First, we control for cross-border trades at industry-level. We collect import and export values at Harmonized System (HS) level from Peter Schott's website in 1990-2012, aggregate the HS product-level values into industry-

level levels, and calculate the industry's share of import (export) in a year as its import (export) value divided by the total import (export) value of all industries in the year.[15] We expect an industry's demand for cross-border acquisitions are correlated with its international trade volume.

Second, we collect firm-level after-interest marginal tax rates by Blouin, Core and Guay (2010). Foley et al. (2007) document that many firms hold excess cash abroad because of facing high repatriation taxes on their foreign incomes. Therefore, we expect firms facing higher marginal tax rates on their incomes to be more likely to explore foreign opportunities for reducing their tax expenses.

Third, we include the yearly intensity of cross-border (diversifying) acquisitions at industry level, defined as the number of cross-border (diversifying) acquisitions divided by the total number of acquisitions in the industry. The two variables control for unknown industry factors that drive the differences in cross-border and diversifying acquisitions across industries. Besides, Clougherty et al. (2014) theoretically and empirically show that more cross-border mergers in a highly unionized industry, particularly those involve firms in same industry, result in lower wages for rival firms. Therefore, we include the variables in both the choice model and the models for changes in pension expense and operating performance.

Fourth, we include institutional ownership to account for the degree of institutional monitoring. Ferreira, Massa and Matos (2010) find that foreign institutional ownership increases the completion rate of cross-border acquisition and they argue that foreign institutions help reduce the information asymmetry between bidders and targets. As US institutions are supposed to be sophisticated in collecting and processing information, we expect that a higher level of institutional ownership should increase a firm's probability to acquire a foreign firm. However, previous studies also suggest that short-termism of

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[15] The data is available at http://faculty.som.yale.edu/peterschott/sub_international.htm and it is funded by Yale Social Sciences Library. We thank Peter Schott to make it available free for academic use. See Pierce and Schott (2012) for detailed documentation of concordance between HS System codes and SIC/NAICS codes.

institutional investors lead to managerial short-termism, resulting in distorted corporate decisions. For example, Bushee (1998) finds that short-term institutional holding causes corporate managers to engage less in research and development that provides long-term benefits but results in short-term downward pressure on earnings. Gaspar, Massa and Matos (2005) find that target firms with short-term institutional investors are likely to get lower premiums. They attribute the finding to weak monitoring from short-term investors that allow managers to seek private benefits rather than maximize proceeds from acquisitions. Similarly, Chen, Harford and Li (2007) find that independent long-term institutional holding is positively related to post-merger stock performance and operating performance. To calculate short-term and long-term institutional holdings, we base on investor classification by Brian Bushee to classify institutional investors into dedicated investors, quasi-indexers, and transient investors. [16] We then obtain institutional holding data from Thomson Reuters Institutional (13f) Holdings. Dedicated (Transient) ownership for each quarter is the number of shares held by dedicated (transient) investors divided by the total number of shares outstanding at the end of quarter. We then average the quarterly measures into annual ones.

Finally, we include pension deficits, defined as pension benefit obligation minus fair value of pension plan assets, scaled by lagged total assets. Previous studies (Rauh, 2006; Chang, Kang and Zhang, 2012; Cocco and Volpin, 2013) show that pension deficits significantly affect investment decisions.

Table 7 reports the result from multinomial model for investment choices with additional controls. The model is specified similarly to that for Panel B of Table 4. As the import/export data is available up to 2012 only and some of the variables have missing values for some firms or industries, the numbers of observations are lower than those reported in Table 4. The result indicates that after controlling for industry's international trading activity,

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[16] The classification data is available at http://acct.wharton.upenn.edu/faculty/bushee/IIclass.html. We thank Brian Bushee to make the data available free for academic use.

cross-border and diversifying acquisition activity as well as firm's tax rate and institutional ownership, DB plan coverage is still negatively related to the propensity of making a major investment (column 1). Besides, conditional to a major investment, firms are more likely to acquire firms abroad or in other industries than to invest in fixed assets or acquire a domestic firm in same industry (columns 2&3). Therefore, our main results in Table 4 are robust to the presence of additional controls.

[Insert Table 7]

5.2. Endogeneity of DB plan coverage

This subsection aims to account for endogeneity concerns in regressions for change in operating performance. In Table 5, we examine change in performance rather than the level of performance, which can eliminate omitted time-invariant firm characteristics that could cause a spurious relation between DB plan coverage and firm performance. However, some time-varying omitted firm or industry characteristics may still simultaneously affect DB plan coverage and firm performance. For example, technological development may affect a firm's relationship with labour unions as well as its investment opportunity set. While a firm's technological development can enlarge its investment opportunities by allowing it to expand its production capacity, it may also reduce its reliance on labour forces and its incentives to provide DB pension plans to retain workers. Similar effects exist when trade agreements are set up to reduce barriers for trading. Trade liberalization provides more economic motivations for cross-border investments but they also affect firms' incentives to retain workers and reduce the power of labour unions. Without controlling those unobserved firm-specific or market-wide heterogeneous factors, the estimation results might be biased and inconsistent.

To address the endogeneity concern for the relationship between DB plan coverage and change in operating performance after major investments, we re-run models for Table 5

Panel B using instrumental variable (IV) regressions. We further add firm fixed effects to the regressions to control for omitted time-invariant firm characteristics that could cause a spurious relation between DB plan coverage and firm performance. Adding firm fixed effects to the regressions can also control for firm-specific factors that affect the investment choices, as Table 4 shows that firms making one form of investment may be fundamentally different from firms making another form of investment.

We perform the IV regressions with following instruments: (1) the industry unionization rate; (2) the 5-year lagged value of the natural logarithm pension and postretirement expenses per employee, which is motivated by Bae, Kang and Wang (2011) who use it as an instrument for employee treatment index; and (3) the 5-year lagged value of the natural logarithm of number of employees. We expect lagged values of labour related variables are good instruments for current DB plan coverage for the following reason. Although a firm's investment decision could be affected by its existing labour policies, it is much less likely that it could be affected by its labour policies long time ago. Therefore, it is unlikely that a firm's labour policies long time ago affect its current investment decision beyond the correlation between past and current pension policies. The industry unionization rate is used as an instrument because labour unions are found to be associated with DB pension plans and many DB plans were collectively bargained when labour unions were strong. It is the most widely used proxy for labour bargaining power in previous studies (e.g. Klasa, Maxwell and Ortiz-Molina, 2009; Matsa, 2010; Shivdasani and Stefanescu, 2010; Chang, Kang and Zhang, 2012). Simple correlation analysis shows that the correlations between *DB_cover* and those instrumental variables are between 0.05 and 0.44 and significant at 1% level.

Table 8 report the IV regression results for change in performance with DB plan coverage and its interaction with indicator for cross-border or diversifying acquisitions

instrumented. The instruments include those listed above and their interaction with *Local* and *CBI*. The *J*-statistics of all models except the last column are statistically insignificant, suggesting that our IV models are well-specified. The IV regression results are generally consistent with those of the OLS regressions, except that the coefficients of *Local×DB_Cover* are still negative but insignificant for the regressions of $\Delta ROA_{t,t+2}$ and $\Delta OM_{t,t+2}$, while the coefficients of *Local×DB_Cover* and *CBI×DB_Cover* become statistically significant for the regression of $\Delta Pen\_Emp_{t,t+2}$.[17]

[Insert Table 8]

6. Conclusion

Using a sample of 27,883 firm-years, we examine the US manufacturing firms in 1990-2013 and find that DB-plan coverage is negatively associated with the propensity of making a major investment defined as a large capital expenditure or an acquisition of firm. However, subject to a major investment decision, a firm with higher DB-plan coverage is more likely to acquire other firms than to invest in fixed assets. More interestingly, we find that among acquisitions, a firm with high DB-plan coverage prefers diversifying acquisitions (cross-border or cross-industry) to non-diversifying (domestic horizontal) acquisitions or capital expenditures. The findings are consistent with both the bargaining motive and conforming motive of investments for DB plan offering firms. However, further evidence shows that although firms with higher DB-plan coverage experience a greater improvement in operating profitability and asset turnover after diversifying acquisitions. Besides, in those

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[17] A potential concern for using industry unionization rate as an instrument is that industry unionization rate is found to be correlated with corporate financing decisions (Matsa, 2010) and cash holding (Klasa, Maxwell and Ortiz-Molina, 2009) by previous studies. It is possible that industry unionization rate also affects change in operating performance directly rather than via DB plan coverage. In an unreported test, we re-run regressions for Table 5 Panel B with industry unionization rate and firm-fixed effects. We found that industry unionization rate is uncorrelated with $\Delta ROA_{t,t+2}$, $\Delta OM_{t,t+2}$ and $\Delta ATO_{t,t+2}$, but it is negatively correlated with $\Delta Pen\_Emp_{t,t+2}$. In other words, industry unionization rate fulfills the exclusion restriction for regressions for $\Delta ROA_{t,t+2}$, $\Delta OM_{t,t+2}$ and $\Delta ATO_{t,t+2}$.

investments, they tend to invest in countries or industries with stronger unionized workforce. Therefore, their investments are likely to be driven by the conforming motive rather than the bargaining motive. In contrast, firms with higher DB-plan coverage experience a greater reduction in operating profitability and profit margin after large capital expenditures or non-diversifying acquisitions and an increase in pension expense. The finding suggests that cost cutting is difficult after investing in existing businesses especially when existing employees are strongly unionized. As a result, firms tend to under-invest in existing businesses to avoid more assets being exposed to labour bargaining.

Our results suggest that DB plan sponsoring firms have multiple considerations in their investment decisions. On one hand, most of their employees are unionized and have strong ability and incentives to bargain. As suggested by theoretical predictions from previous studies (Lommerud, Straume and Sorgard, 2003, 2006; Eckel and Egger, 2009), when firms face strong labour bargaining power, they may under-invest or prefer investing in areas less subject to labour scrutiny. On the other hand, they have to respect and accept the presence of labour unions in order to gain their supports for major decisions. They signal their acceptance of unionized workforce by investing in countries or industries with strong unionized workforce. Our findings on their choices of location and industry in cross-border acquisitions and cross-industry acquisitions support this view.

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Table 1 Distribution of sample and summary statistics of key variables

The sample consists of all manufacturing firms (SIC 2000-3999) that files IRS Form 5500 for their eligible pension plans with over 100 participants and are covered by CRSP/Compustat Merged Database from 1990 to 2013. Firms with missing variables for key regressions are also excluded.

Panel A reports the sample distribution, and summary statistics for DB-plan coverage (*DB_Cover*) and variables for major investment decisions. Mean values by year and overall are reported. *DB_Cover* is the ratio of DB-plan assets to total pension-plan assets based on information in IRS Form 5000 filings. *Acquire* equals one if a firm acquires at least one firm in the year. *CrossBorder* equals one if a firm acquires at least one firm outside the United States in the year, *CrossIndustry* equals one if a firm acquires at least one firm in other industry, i.e. belonging to a different 4-digit SIC code, and *CBI* equals one if *CrossBorder* equals one or *CrossIndustry* equals one.

Panel B reports the summary statistics for explanatory variables. *DB_Cover* is defined above. *CashFlow* is the sum of net income and depreciation minus dividends, divided by lagged total assets. *Q* is the market-to-book ratio of assets. *Size* is the natural logarithm of total assets in 2005 constant value. *Tang* is net property, plant and equipment scaled by total assets. *WC* is net working capital less cash, divided by total assets. *Div* is cash dividend divided by lagged total assets. *CumRet* is the 12-month cumulative stock return in fiscal year. $\Delta ROA_{t,t+2}$ is change in earnings before interest, taxes and depreciation, scaled by lagged total assets, from *t* to *t*+2; $\Delta OM_{t,t+2}$ is change in earnings before interest, taxes and depreciation, scaled by net sales, $\Delta ATO_{t,t+2}$ is the change in net sales scaled by lagged total assets from *t* to *t*+2; and $\Delta Pen\_Emp_{t,t+2}$ is the change in pension and post-retirement expense per employees (in thousands dollars) from *t* to *t*+2. The variables are winsorized at 1st and 99th percentiles of respective distributions.

Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Year	N	DB_Cover	Acquire	CrossBorder	CrossIndustry	CBI
1990	1,071	0.306				
1991	1,092	0.307	0.047	0.008	0.036	0.038
1992	1,139	0.276	0.069	0.016	0.052	0.055
1993	1,222	0.255	0.084	0.021	0.061	0.070
1994	1,364	0.241	0.087	0.024	0.068	0.074
1995	1,441	0.225	0.122	0.037	0.090	0.102
1996	1,472	0.211	0.133	0.040	0.099	0.109
1997	1,466	0.197	0.135	0.041	0.101	0.111
1998	1,405	0.193	0.141	0.052	0.107	0.116
1999	1,062	0.197	0.143	0.038	0.107	0.116
2000	1,079	0.182	0.142	0.039	0.102	0.106
2001	1,263	0.160	0.115	0.026	0.082	0.090
2002	1,231	0.155	0.080	0.021	0.057	0.063
2003	1,234	0.162	0.079	0.018	0.057	0.060
2004	1,158	0.149	0.121	0.043	0.088	0.100
2005	1,161	0.164	0.113	0.036	0.076	0.090
2006	1,103	0.148	0.120	0.044	0.086	0.099
2007	1,079	0.145	0.135	0.046	0.091	0.101
2008	1,095	0.152	0.105	0.034	0.074	0.082
2009	1,011	0.146	0.073	0.022	0.045	0.051
2010	977	0.162	0.110	0.051	0.075	0.093
2011	946	0.169	0.113	0.046	0.089	0.098
2012	922	0.165	0.101	0.035	0.071	0.081
2013	890	0.161	0.098	0.041	0.067	0.081
2014			0.113	0.044	0.081	0.093
Total	27,883	0.194	0.109	0.034	0.079	0.088

Panel B	(1) Mean	(2) Median	(3) Minimum	(4) Maximum	(5) Standard deviation	(6) N
DB_Cover	0.194	0	0	1	0.297	27,883
CashFlow	0.059	0.091	-0.704	0.399	0.170	27,883
Q	1.898	1.466	0.584	8.292	1.339	27,883
Size	5.956	5.769	2.677	10.584	1.804	27,883
Tang	0.241	0.209	0.015	0.717	0.158	27,883
WC	0.145	0.141	-0.318	0.553	0.163	27,883
Div	0.011	0	0	0.107	0.019	27,883
CumRet	0.167	0.066	-0.809	3.179	0.634	27,883
$\triangle ROA_{t,t+2}$	-0.008	-0.004	-0.472	0.437	0.129	25,185
$\triangle OM_{t,t+2}$	0.006	0.002	-2.145	2.421	0.391	25,077
$\triangle ATO_{t,t+2}$	-0.033	-0.010	-1.460	1.200	0.403	25,115
$\triangle Pen\_Emp_{t,t+2}$	0.186	0.047	-4.181	6.437	1.301	20,853

Table 2 DB plans and major investment decision

$$Prob(InvDum_{t+1} = 1) = \Psi(\alpha_0 + \alpha_1 DB\_Cover_t + \alpha_2 CashFlow_t + \alpha_3 Q_t + \alpha_4 Size_t + \alpha_5 Tang_t +$$
$$\alpha_6 WC_t + \alpha_7 Div_t + \alpha_8 CumRet_t + \sum_{i=1991}^{2013} \alpha_{yr,i} Yrdum_{i,t} + \sum_{j=21}^{39} \alpha_{ind,j} SIC2_{j,t})$$

The dependent variable is an indicator for major investment decision at $t+1$. In column 1, the indicator equals one if a firm completes at least one acquisition at $t+1$. In column 2, the indicator equals one if capital expenditure-to-assets ratio in year $t+1$ is above 90th percentile of sample firms in the year. The explanatory variables include *DB_Cover*, *CashFlow*, *Q*, *Size*, *Tang*, *WC*, *Div*, and *CumRet*. All explanatory variables are defined in Table 1 and are measured as of time t.

Regressions are estimated with logit. Ψ is the logistic transformation of the linear combination of the explanatory variables. Therefore, the probability that firm k makes major investment in year $t+1$ is modelled as,

$$Prob(InvDum_{kt+1} = 1|w_{kt}) = \frac{\exp(w_{kt}'\beta)}{1+\exp(w_{kt}'\beta)}.$$

where w_{kt} is a set of explanatory variables for firm k at year t as defined above, and β is the set of estimated coefficients of the model. Year fixed effects and 2-digit SIC industry fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

Indicator	(1) Acquisition	(2) Large capital expenditure
DB_Cover	-0.214**	-0.942***
	(0.095)	(0.146)
CashFlow	1.432***	2.788***
	(0.210)	(0.288)
Q	0.098***	0.382***
	(0.019)	(0.023)
Size	0.408***	-0.125***
	(0.018)	(0.027)
Tang	-1.709***	6.802***
	(0.215)	(0.250)
WC	0.051	-0.190
	(0.183)	(0.267)
Div	-1.426	-8.242***
	(1.357)	(1.871)
CumRet	0.127***	0.272***
	(0.035)	(0.035)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Pseudo R-sq	0.098	0.198
N	27,883	27,883

Table 3 DB plans and the choice between capital expenditure and mergers

The dependent variable is an indicator (*InvType*) that equals zero (0) if a firm neither makes large capital expenditure nor completes an acquisition at *t*+1, one (1) if a firm makes a large capital expenditure but does not complete an acquisition at t+1, and two (2) if a firm completes at least one acquisition at *t*+1. A capital expenditure is large if the capital expenditure-to-assets ratio is above 90th percentile of the sample firms in the year.

All explanatory variables are measured as of time *t*. Regression models are estimated with multinomial logit, with case (1) as the base case. The probability that firm *k* choose *j* in year *t*+1 is modelled as,

$$Prob(InvType_{kt+1} = j|w_{kt}) = \frac{\exp(w_{kt}'\beta_j)}{\sum_{j=0}^{N}\exp(w_{kt}'\beta_j)}, \text{ where } j = 0, 1, 2.$$

w_{kt} is a set of explanatory variables for firm k at year *t*, which include *DB_Cover*, *CashFlow*, *Q*, *Size*, *Tang*, *WC*, *Div*, and *CumRet*, as defined in Table 1. β_j is the set of estimated coefficients for choice *j*. As case (1) is the base case, the set of coefficients β_1 are set to zeros.

Result for case (0) versus case (1) is reported in column 1, result for case (2) versus case (1) is reported in column 2. Year fixed effects and 2-digit SIC industry fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

	(1) No major investment (0) vs large CAPX (1, base)	(2) Acquisition (2) vs large CAPX (1, base)
DB_Cover	0.959***	0.661***
	(0.149)	(0.168)
CashFlow	-2.775***	-1.071***
	(0.293)	(0.340)
Q	-0.389***	-0.232***
	(0.024)	(0.026)
Size	0.122***	0.518***
	(0.028)	(0.032)
Tang	-6.626***	-7.555***
	(0.248)	(0.302)
WC	0.278	0.267
	(0.273)	(0.305)
Div	7.053***	4.332**
	(1.874)	(2.151)
CumRet	-0.273***	-0.106**
	(0.036)	(0.047)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Pseudo R-sq		0.143
N		27,883

Table 4 DB plans and type of acquisition

Panel A reports the multinomial logit regressions for the choice between different types of acquisition. In column 1, the dependent variable is an indicator that equals zero (0) if a firm does not complete an acquisition at $t+1$, one (1) if a firm completes at least one domestic acquisition but no cross-border acquisition at $t+1$, and two (2) if a firm completes at least one cross-border acquisition at $t+1$. In column 2, the dependent variable is an indicator that equals zero (0) if a firm does not complete an acquisition at $t+1$, one (1) if a firm completes at least one horizontal acquisition but no cross-industry acquisition at $t+1$, and two (2) if a firm completes at least one cross-industry acquisition at $t+1$. In column 3, the dependent variable is an indicator that equals zero (0) if a firm does not complete an acquisition at $t+1$, one (1) if a firm completes at least one domestic horizontal (i.e. non-diversifying) acquisition but no cross-border or cross-industry (i.e. diversifying) acquisition at $t+1$, and two (2) if a firm completes at least one cross-border or cross-industry acquisition at $t+1$. Case (1) as the base case. Result for case (2) versus case (1) is reported.

Panel B reports the multinomial logit regression for the choice between large capital expenditure and different types of acquisition. The dependent variable is an indicator that equals zero (0) if a firm neither makes large capital expenditure nor completes an acquisition at $t+1$, one (1) if a firm makes a large capital expenditure but does not complete an acquisition at $t+1$, two (2) if a firm completes at least one non-diversifying acquisition but no diversifying acquisition at $t+1$, and three (3) if a firm completes at least one diversifying acquisition at $t+1$. Case (1) as the base case. Result for case (2) versus case (1) is reported in column 1 and result for case (3) versus case (1) is reported in column 2.

The explanatory variables include *DB_Cover*, *CashFlow*, *Q*, *Size*, *Tang*, *WC*, *Div*, and *CumRet*. All explanatory variables are defined in Table 1 and are measured as of time *t*. Year fixed effects and 2-digit SIC industry fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

Panel A	(1) Cross-border (2) vs Domestic (1, base)	(2) Cross-industry (2) vs Horizontal (1, base)	(3) Diversifying (2) vs Non-diversifying (1, base)
DB_Cover	0.425**	0.424**	0.568**
	(0.171)	(0.192)	(0.230)
CashFlow	-0.292	0.202	0.190
	(0.405)	(0.378)	(0.416)
Q	0.003	-0.008	-0.015
	(0.035)	(0.033)	(0.034)
Size	0.208***	0.089***	0.139***
	(0.031)	(0.032)	(0.034)
Tang	1.018**	-1.082***	-1.002**
	(0.419)	(0.412)	(0.457)
WC	1.201***	0.963***	1.167***
	(0.348)	(0.355)	(0.379)
Div	-1.768	2.201	3.537
	(2.564)	(3.005)	(3.109)
CumRet	0.137**	0.010	0.046
	(0.069)	(0.072)	(0.082)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Pseudo R-sq	0.093	0.089	0.094
N	27,883	27,883	27,883

Panel B	(1) Non-diversifying (2) vs large CAPX (1, base)	(2) Diversifying (3) vs large CAPX (1, base)
DB_Cover	0.179	0.762***
	(0.251)	(0.174)
CashFlow	-1.123**	-0.986***
	(0.460)	(0.357)
Q	-0.218***	-0.239***
	(0.035)	(0.028)
Size	0.407***	0.548***
	(0.042)	(0.033)
Tang	-6.655***	-7.791***
	(0.493)	(0.312)
WC	-0.661	0.530*
	(0.429)	(0.314)
Div	1.333	5.102**
	(3.386)	(2.215)
CumRet	-0.136*	-0.097**
	(0.081)	(0.049)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Pseudo R-sq	0.136	
N	27,883	

Table 5 The Effects of large capital expenditures and domestic horizontal acquisitions on operating performance

$$\Delta Performance_{t,t+2} = \beta_0 + \beta_1 Local_{t+1} + \beta_{1a} CBI_{t+1} + \beta_2 DB\_Cover_t + \beta_3 DB\_Cover_t \times Local_{t+1} + \beta_{3a} DB\_Cover_t \times CBI_{t+1} + \beta_4' Firm_t + \beta_{4a}' \Delta Firm_{t,t+2} + \sum_{i=1991}^{2013} \beta_{yr,i} Yrdum_{i,t} + \sum_{j=21}^{39} \beta_{ind,j} SIC2_{j,t} + \varepsilon_t$$

The dependent variable, $\Delta Performance_{t,t+2}$, is one of the following variables. $\Delta ROA_{t,t+2}$ is change in earnings before interest, taxes and depreciation, scaled by lagged total assets, from t to $t+2$; $\Delta OM_{t,t+2}$ is change in earnings before interest, taxes and depreciation, scaled by net sales, from t to $t+2$; $\Delta ATO_{t,t+2}$ is the change in net sales scaled by lagged total assets from t to $t+2$; and $\Delta Pen\_Emp_{t,t+2}$ is the change in pension and retirement expense scaled by number of employees (in thousands of dollars per employee).

Regressions are estimated with ordinary least squares (OLS) method. *Local* is an indicator for large capital expenditure or non-diversifying acquisition, and *CBI* is an indicator for diversifying acquisition. *Firm* is a vector of firm characteristics including *Q*, *Size*, *Tang*, *WC* and *Div* as defined in Table 1, in year t. $\Delta Firm$ is the change in *Firm* from t to $t+2$. Year fixed effects and 2-digit SIC industry fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

Panel A	(1) ΔROA	(2) ΔOM	(3) ΔATO	(4) ΔPen_Emp
Local	-0.017***	0.005	-0.108***	0.028
	(0.004)	(0.009)	(0.010)	(0.027)
CBI	-0.013***	-0.005	-0.048***	-0.134***
	(0.004)	(0.009)	(0.012)	(0.033)
DB_Cover	0.010***	0.012**	0.013	0.164***
	(0.003)	(0.005)	(0.009)	(0.042)
Local×DB_Cover	-0.016**	-0.034**	-0.031	0.208*
	(0.008)	(0.014)	(0.028)	(0.120)
CBI×DB_Cover	0.017**	0.013	0.070***	-0.175
	(0.007)	(0.015)	(0.026)	(0.120)
Q	-0.003***	0.015***	-0.023***	0.000
	(0.001)	(0.004)	(0.003)	(0.008)
Size	-0.003***	-0.006***	-0.021***	0.041***
	(0.001)	(0.002)	(0.002)	(0.007)
Tang	0.058***	0.055**	0.204***	-0.071
	(0.007)	(0.024)	(0.020)	(0.081)
WC	-0.075***	-0.133***	-0.263***	0.083
	(0.007)	(0.025)	(0.020)	(0.064)
Div	-0.071	-0.390***	-0.066	0.733
	(0.049)	(0.139)	(0.148)	(0.522)
CumRet	-0.011***	-0.034***	-0.080***	0.023
	(0.002)	(0.006)	(0.005)	(0.015)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Adj. R-sq	0.05	0.01	0.10	0.05
N	25,185	25,077	25,115	20,853

Panel B	(1)	(2)	(3)	(4)
	ΔROA	ΔOM	ΔATO	ΔPen_Emp
Local	-0.023***	-0.004	-0.124***	0.101***
	(0.003)	(0.010)	(0.010)	(0.030)
CBI	-0.026***	-0.015	-0.068***	-0.108***
	(0.004)	(0.009)	(0.012)	(0.034)
DB_Cover	0.014***	0.015***	0.024***	0.168***
	(0.002)	(0.005)	(0.009)	(0.042)
Local×DB_Cover	-0.012*	-0.031**	-0.025	0.188
	(0.007)	(0.014)	(0.028)	(0.121)
CBI×DB_Cover	0.023***	0.019	0.078***	-0.194
	(0.007)	(0.015)	(0.026)	(0.120)
ΔQ	0.029***	0.030***	0.090***	-0.021**
	(0.001)	(0.006)	(0.003)	(0.009)
$\Delta Size$	0.074***	0.062***	0.149***	-0.178***
	(0.004)	(0.013)	(0.010)	(0.033)
$\Delta Tang$	-0.132***	-0.023	-0.071	-0.823***
	(0.017)	(0.070)	(0.051)	(0.204)
ΔWC	0.130***	0.156***	0.302***	-0.186**
	(0.010)	(0.036)	(0.027)	(0.078)
ΔDiv	-0.078	-0.074	0.040	0.265
	(0.048)	(0.156)	(0.102)	(0.253)
Q	0.002	0.023***	-0.002	0.001
	(0.001)	(0.005)	(0.003)	(0.009)
Size	-0.002***	-0.005**	-0.018***	0.040***
	(0.001)	(0.002)	(0.002)	(0.007)
Tang	0.037***	0.049*	0.200***	-0.200**
	(0.007)	(0.025)	(0.020)	(0.086)
WC	-0.037***	-0.086***	-0.148***	0.055
	(0.007)	(0.027)	(0.021)	(0.067)
Div	-0.161***	-0.515***	-0.243	0.886*
	(0.050)	(0.155)	(0.149)	(0.525)
CumRet	-0.013***	-0.035***	-0.076***	0.036**
	(0.002)	(0.006)	(0.005)	(0.016)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Adj. R-sq	0.16	0.02	0.17	0.05
N	24,488	24,388	24,400	20,783

Table 6 Choice of locations in cross-border acquisitions and industries in diversifying acquisitions

$$Avg\_cUnion_{t+1} \ (or \ Avg\_iUnion_{t+1}) = \gamma_0 + \gamma_1 DB\_Cover_t + \gamma_2 CashFlow_t + \gamma_3 Q_t + \\ \gamma_4 Size_t + \gamma_5 Tang_t + \gamma_6 WC_t + \gamma_7 Div_t + \gamma_8 CumRet_t + \\ \sum_{i=1991}^{2013} \gamma_{yr,i} Yrdum_{i,t} + \sum_{j=21}^{39} \gamma_{ind,j} SIC2_{j,t} + \varepsilon_t$$

The dependent variables are average collective relations law index of target countries (*Avg_cUnion*, column 1) and average industry unionization rate (*Avg_iUnion*, column 2). The collective relations law index is provided by Botero et al. (2004) and the industry unionization rate is provided by Barry Hirsch and David Macpherson. For each firm-year, we calculate the average collective relations law index for target countries of all cross-border acquisitions and the average unionization rate for target industries of all cross-industry acquisitions, if any. Other explanatory variables are defined in Table 1 and measured as of time *t*.

Regressions are estimated with ordinary least squares (OLS) model. For column 1, only firms that acquire foreign firms are included, and for column 2, only firms that make cross-industry acquisitions in the domestic market. Year fixed effects and 2-digit SIC industry fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

	(1) Avg_cUnion	(2) Avg_iUnion
DB_Cover	0.051**	0.025***
	(0.023)	(0.009)
CashFlow	-0.016	-0.010
	(0.054)	(0.019)
Q	0.005	-0.004***
	(0.005)	(0.001)
Size	0.006	-0.002*
	(0.004)	(0.001)
Tang	0.103**	0.111***
	(0.050)	(0.021)
WC	0.012	0.011
	(0.056)	(0.018)
Div	0.289	-0.118
	(0.363)	(0.106)
CumRet	-0.009	0.003
	(0.012)	(0.003)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Adj. R-sq	0.04	0.22
N	951	1,629

Table 7 Robustness check: DB plan coverage and investment choice

The table reports the multinomial logit regression for the choice between large capital expenditure and different types of acquisitions. Industry's share of import (export) is defined as its import (export) value divided by the total import (export) value. After-interest marginal tax rate comes from Blouin, Core and Guay (2010). Intensity of cross-border (cross-industry) acquisitions is the number of cross-border (cross-industry) acquisitions divided by the total number of acquisitions in the industry. Dedicated (Transient) ownership is the number of shares held by dedicated (transient) investors divided by the total number of shares outstanding. Pension deficits is pension benefit obligation minus fair value of pension plan assets, scaled by lagged total assets. A firm's pension deficits is set to be zero if it has no pension data reported by Compustat. *DB_Cover*, *CashFlow*, *Q*, *Size*, *Tang*, *WC*, *Div*, and *CumRet* are defined in Table 1 and are measured as of time *t*. Year fixed effects and 2-digit SIC industry fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

Investment choice	(1) No major investment (0) vs large CAPX (1, base)	(2) Non-diversifying (2) vs large CAPX (1, base)	(3) Diversifying (3) vs large CAPX (1, base)
DB_Cover	0.874***	0.285	0.765***
	(0.158)	(0.268)	(0.184)
CashFlow	-1.880***	-1.007*	-0.607
	(0.316)	(0.515)	(0.399)
Q	-0.351***	-0.211***	-0.202***
	(0.025)	(0.038)	(0.031)
Size	0.214***	0.442***	0.617***
	(0.036)	(0.053)	(0.042)
Tang	-6.831***	-7.068***	-8.008***
	(0.261)	(0.533)	(0.337)
WC	0.342	-0.404	0.472
	(0.307)	(0.481)	(0.351)
Div	4.896**	1.012	3.474
	(2.019)	(3.666)	(2.508)
CumRet	-0.285***	-0.199**	-0.115**
	(0.039)	(0.086)	(0.053)
Pension deficits	0.413	-1.352	0.316
	(0.839)	(1.335)	(1.033)
Industry's share of import	-4.433	-16.014*	-0.210
	(4.480)	(9.487)	(5.083)
Industry's share of export	-9.212**	19.818**	-11.253**
	(4.493)	(7.929)	(5.036)
After-interest marginal tax rate	-1.900***	-0.102	-0.840
	(0.454)	(0.817)	(0.586)
Intensity of cross-border acquisitions	0.652***	0.138	0.996***
	(0.246)	(0.519)	(0.313)
Intensity of cross-industry acquisitions	-0.220	-1.487***	0.238
	(0.188)	(0.355)	(0.272)
Dedicated ownership	0.067	-0.019	-0.954*
	(0.426)	(0.774)	(0.533)
Transient ownership	-2.127***	-0.430	-1.048**
	(0.362)	(0.599)	(0.464)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Pseudo R-sq		0.144	
N		24,364	

Table 8 Robustness check: Instrumental variable model for change in operating performance

A two-stage firm fixed-effects model is estimated for change in performance from year *t* to *t*+2. In first stage DB_Cover_t, $DB\_Cover_t \times Local_{t+1}$, and $DB\_Cover_t \times CBI_{t+1}$ are respectively regressed on (1) industry unionization rate, (2) the 5-year lagged value of pension and postretirement expenses per employee, (3) the 5-year lagged value of the natural logarithm of number of employees, and their interaction terms with *Local* and *CBI*, together with other exogenous variables and year dummies. The predicted values of the three variables are then included in the second-stage regression as follows:

$$\Delta Performance_{t,t+2} = \beta_0 + \beta_1 Local_{t+1} + \beta_{1a} CBI_{t+1} + \beta_2\, Inst.DB\_Cover_t + \\ \beta_3 Inst.(DB\_Cover_t \times Local_{t+1}) + \beta_{3a} Inst.(DB\_Cover_t \times CBI_{t+1}) + \\ \beta_4' Firm_t + \beta_{4a}' \Delta Firm_{t,t+2} + \sum_{i=1991}^{2013} \beta_{yr,i} Yrdum_{i,t} + Firm\ fixed\ effects + \\ \varepsilon_t$$

Firm is a vector of firm characteristics including *Q*, *Size*, *Tang*, *WC* and *Div* as defined in Table 1, in year *t*. Δ*Firm* is the change in *Firm* from *t* to *t*+2. Year-fixed effects and firm-fixed effects are added but not reported. The standard errors are reported in the parentheses. *,**,*** represent 10%, 5% and 1% significant levels respectively.

	(1)	(2)	(3)	(4)
	ΔROA	ΔOM	ΔATO	ΔPen_Emp
Local	-0.005	0.030*	-0.083*	-0.089
	(0.011)	(0.018)	(0.044)	(0.098)
CBI	-0.047***	-0.023	-0.134**	0.074
	(0.014)	(0.022)	(0.052)	(0.120)
DB_Cover	1.395***	1.133**	5.538***	-8.539***
	(0.360)	(0.565)	(1.378)	(3.181)
Local × DB_Cover	-0.030	-0.094	-0.025	0.743**
	(0.041)	(0.064)	(0.157)	(0.344)
CBI × DB_Cover	0.139***	0.088	0.448**	-0.961**
	(0.046)	(0.072)	(0.176)	(0.398)
Δ*Q*	0.035***	0.029***	0.106***	-0.071***
	(0.003)	(0.005)	(0.011)	(0.025)
Δ*Size*	0.069***	0.046***	0.193***	-0.345***
	(0.007)	(0.012)	(0.028)	(0.063)
Δ*Tang*	-0.053	-0.004	0.342**	-1.571***
	(0.040)	(0.063)	(0.153)	(0.343)
Δ*WC*	0.136***	0.135***	0.374***	-0.334**
	(0.019)	(0.030)	(0.074)	(0.159)
Δ*Div*	-0.007	-0.006	-0.113	0.039
	(0.053)	(0.092)	(0.224)	(0.443)
Q	0.014***	0.029***	0.028*	-0.073**
	(0.004)	(0.007)	(0.016)	(0.037)
Size	0.004	0.006	-0.019	-0.250***
	(0.009)	(0.015)	(0.036)	(0.085)
Tang	0.190***	0.221***	0.898***	-1.895***
	(0.050)	(0.079)	(0.192)	(0.429)
WC	0.035	0.008	0.125	-0.458
	(0.037)	(0.058)	(0.142)	(0.299)
Div	-0.561***	-0.414	-1.676***	-0.154
	(0.166)	(0.265)	(0.645)	(1.405)
CumRet	-0.014***	-0.032***	-0.070***	0.022
	(0.003)	(0.005)	(0.013)	(0.029)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Wald chi-2 (p-value)	0.00	0.00	0.00	0.00
Over-identification *J*-stat (p-value)	0.18	0.97	0.11	0.00
N	16,920	16,868	16,875	16,209