PORTRAIT OF A COMPANY: DEFINED BENEFIT PENSION PLAN SPONSORS

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ABSTRACT

This study describes firms that sponsor defined benefit pension plans (DBPP) based on firm specific characteristics, financial and operating performance. Firms are classified into portfolios based on their funding levels and described accordingly. The results suggest that firms in the most underfunded portfolio are on average smaller and value firms, with negative stock returns, poor financial and operating performance, lower profitability, invest smaller amounts in advertising, research and development and capital assets and are more indebted with higher probabilities of bankruptcy. The opposite is seen for the least and overfunded firms. The portrayal of these characteristics can help regulators in the effective identification of firms that may confront funding problems before it is too late. The detection of risk behavior or tendencies in terms of firm characteristics can help regulators in establishing policies to decelerate and improve pension plan funding levels and to protect the public interest.

JEL: G11, G23, M48

KEYWORDS – Defined benefit, pension plans, pension management, pension regulation

INTRODUCTION

How do firms that sponsor pension plans look? Do they all look alike? Firms that sponsor pension plans can be described based on their funding levels, size, financial and operating performance, to mention a few. Most importantly, they can be described based on the type of plan they sponsor. A pension plan is defined as an arrangement whereby an employer provides benefits (payments) to retired employees for services provided in their working years. Employers fund pension plans by making payments to a funding agency. The two most common types of pension plans are defined contribution (DC) plans and DBPP. In a DC plan, the employer agrees to contribute to a pension trust a certain sum each period, based on a formula. A company usually turns over to an independent third-party trustee the amounts originally contributed. The trustee, acting on behalf of the beneficiaries, assumes ownership of the pension assets and is accountable for their investment and distribution. The trust is separate and distinct from the employer. In terms of risk, the employee gets the benefit of gain (or the risk of loss) from the assets contributed to the plan.

In contrast, DBPP delineates the benefits that employees will receive when they retire. To meet the DB commitments that will start at retirement, a company must determine what the contribution should be today. Companies may use many different contribution approaches. However, the funding method should provide enough money at retirement to meet the benefits defined by the plan. The employees are the beneficiaries of a DC trust, but the employer is the beneficiary of a DB trust. Under a DB plan, the trust's primary purpose is to preserve and invest assets so that there will be enough to pay the employer's commitment to employees. The trust is a separate entity but the trust assets and the liabilities belong to the employer. That is, as long as the plan continues, the employer is responsible for the payment of the defined benefits (DB) (without regard to what happens in the trust). The employer must make up any deficit in the accumulated assets held by the trust. On the other hand, the employer can recapture any excess accumulated in the trust, either through reduced future funding or through a reversion of funds.

For years, firms that sponsor DBPP have been hard-pressed by regulators, government and employees to meet their pension funding obligations. As a result of these pressures, laws and regulations have arisen in

past years. For an employer the cost of sponsoring retirement benefits sometimes is steep. The need to properly administer and account for pension funds becomes apparent when the size of these funds is understood. For example, consider General Motors Corporation. The size of the pension fund for 2004 is $99,909 million, the pension expense is $2,456 per employee and its pension expense as a percentage of pre-tax income is 52.27 percent. Consider Hewlett-Packard, the size of the pension fund is $9,168 million, the pension expense is $594 million, and the pension expense as a percentage of pre-tax income is 14.16 percent. The size of Coca Cola's pension fund is $2,800 million, the pension expense is $122 million and its pension expense as a percentage of pre-tax income is 1.96 percent. These are a few examples to show the magnitude and impact of pension plans expense and obligation with respect to a firm's income. An overview of the impact of regulations on firms' pension plan accounting is also important to assess.

Efforts to improve information disclosure, pension contribution patterns and protection to employees include the enactment of ERISA (Employee Retirement Income System Act of 1974), the Pension Protection Act of 2006 and the Financial Accounting Standards Board (FASB) changes in accounting rules. Regulations like ERISA establish rules as to the way employers comply with the responsibilities related to pension plans they sponsor. For example that employers, in computing the funding status, should compare the market value of plan assets to the present value of future pension obligations, and, if a company has a pension plan that is less than 90 percent funded, it is required to make an additional contribution to the plan to reduce the funding deficiency within three to five years. This requirement impacts immediately earnings and cash flows of the sponsor.

Management has to be aware of the many implications of sponsoring pension plans. They should consider how to effectively deal with a DBPP in order to maintain a strong financial position and comply with regulations. Most importantly, they have to make sure that the pension plan trust managers protect the best interests of their employers and employees. Past studies describe companies that sponsor DBPP based on stock price relation to funding level, earnings and operating performance and level of capital expenditures. But few describe firms that sponsor DBPP in general. The purpose of this study is to describe these firms so regulators can help sponsors in identifying their problems, risks and courses of action in funding their plans.The paper proceeds as follows. The first section discusses the relevant prior literature, followed by hypotheses development and research methodology. Then, the sample selection procedure and data analysis are presented. Finally, the empirical findings and the conclusion are discussed.

RELATED LITERATURE

Past studies about companies that sponsor pension plans focus on different aspects related to the impact of these schemes. Some focus on price or returns, earnings and growth. Some like Franzoni and Marín (2006) focus on the impact of DBPP information on price. They find that the most underfunded firms earn low raw returns relative to firms with healthier pension plans. They interpret this result as being due to investors not paying enough attention to the implications of the current underfunding for future earnings and cash flows. Lakonishok, Shleifer, and Vishny (1994) argue that the value premium and the growth discount are explained by overreaction to past operating performance. Chan, Jegadeesh, and Lakonishok (1996) find that firms with negative past operating performance continue to earn low returns within a six month period. Jegadeesh and Titman (1993) propose that return momentum is at least partly due to underreaction to news in earnings. Sloan (1996), Chan, Chan, Jegadeesh and Lakonishok (2006) show evidence that the market does not understand that the part of earnings due to accruals tends to reverse itself. Other studies focus on the restrictions in expenses and investments that may arise from pension plan underfunding. Blackburn (2006) suggests that sometimes firms postpone the funding of employee's pension plans in order to finance capital expenditures and the growth of the enterprise. In other words, employees are financing the projects of their employers. He offers no empirical evidence

that suggests that this could be true. However, Rauh (2006) examines the effects of mandatory contributions to DBPP on capital and research and development expenditures. The author finds that pension sponsors decrease spending on capital expenditures in response to a reduction in internal resources caused by required pension contributions. The author also shows results for firms that do not sponsor DBPP. The evidence suggests that when required contributions are high DB sponsoring firms do not undertake capital investments, and non-sponsoring firms undertake in approximately 12 percent of total capital investment that those firms leave.

When it comes to credit aspects, some studies show that firms with financing problems may choose to delay payments to fund their plans. Ippolito (1986) finds evidence that suggests that firms in financial distress have incentives to underfund their pension plans. Phillips and Moody (2003) examine the relationship between pension plan funding levels and capital structure and provide statistically significant empirical support for the pecking order theory of capital structure. Results suggest that more highly levered firms experience lower profitability and are constrained by a larger dividend payout. In addition, these firms have exhausted their internal resources of financing by underfunding their pension plans, most likely to the extent legally possible. The study shows that underfunding occurs mainly due to a firms' incapacity to fully fund.Other studies consider the impact of taxes on the decision to fund adequately the plan. Thomas (1988) study rejects the view that pension funding status and tax status are unrelated. The results of empirical tests, time-series and cross-sectional, suggest that tax status is an important determinant of pension funding. Firms with relatively higher tax status are frequently overfunded, relative to the accrued liability; 4) low tax status firms are less likely to select DBPP. Tepper and Affleck (1974), Black (1980) and Tepper (1981) find that firms with tax advantages have great or strong incentives to fully fund their pension plans.

Recently, regulators have been focusing on changing the way DBPP information is disclosed. In a recent study, Shaw (2008) argues that SFAS 158 significantly changes the balance sheet reporting for DBPP. Coronado, Mitchell, Sharpe and Nesbitt (2008) state, that since the appearance of SFAS 158 and the increased attention to pension disclosures misuse, investors evaluation of pensions may have changed and so, their investment decisions. Boylan and Houmes (2010) evaluate the impact of SFAS 158 and find that companies use higher discount rates to lower the pension benefit obligations and pension liabilities with the intention of portraying a better financial position. Chen et al. (2010) find that there is a direct relation between the use of pension disclosures and the level of sophistication of users. Castro-González (2011) shows that investors inefficiently value firms that sponsor DBPP even when changes in accounting rules required additional disclosures.Is more regulation about accounting disclosures going to solve the problem about pension plans underfunding? Or is it necessary to identify the symptoms and find solutions before it is too late? The results of these studies show the characteristics of firms that sponsor DBPP and how the funding status is related to financial and operating characteristics. Moreover, how companies manipulate DBPP information to influence the accounting information that is available to the public. The motivation of this study is to describe firms that sponsor DBPP and to create awareness of the impact of different funding levels.

DATA AND METHODOLOGY

In order to describe firms that sponsor DBPP data from different sources was obtained. The sample includes all firm years with available data on the Compustat Annual Industrial and Research files for NYSE, AMEX, and NASDAQ firms. The sample period is the end of fiscal year 1980 to the end of fiscal year 2006. Firms' monthly returns were obtained from the Center for Research and Security Prices (CRSP), Monthly Stock database.

The variables of interest correspond to different accounting items over the years. Consequently, this accounting data is constructed differently for different periods in the time span that is studied. There are

two breaks in the way Compustat informs the data related to pension plans. These breaks result from changes in accounting standards. The first break is caused by the accounting standard SFAS 87. It affects the way pension data is presented starting fiscal years beginning after December 15, 1986. The second break, effective for fiscal years beginning after December 15, 1997, is caused by SFAS 132. In order to measure the funding status of the pension plans, the procedure used by Franzoni and Marín (2006) is used. Funding status is defined as the difference between the fair value of pension assets (*FVPA*) and the pension benefit obligation (*PBO*). They choose to divide the funding status by market capitalization (*Mkt Cap*) at the end of the fiscal year when the pension items are measured to control for size. As them, this variable is labeled funding ratio (*FR*). This variable is computed as follows:

$$FR_{t-1} = FVPA_{t-1} - PBO_{t-1} / Mkt\ Cap_{t-1} \qquad\qquad (1)$$

Initially, there were 52,018 observations (firm-years). To correct for the effect of outliers, observations for each year in which the *FR* variable is more than five standard deviations away from the annual mean, were dropped from the sample. As a result, there are 51,515 observations (firm-years) that satisfy these criteria. Firms are included if they have at least two years of accounting data in order to correct for the survival bias (Banz and Breen 1986 and Franzoni and Marín 2006). Firms that do not have at least two years of accounting data were excluded. Finally, 51,441 observations were used in this study.

Portfolio Formation Procedure

The characteristics of firms with different levels of pension plan funding are important to design a sketch of firms that sponsor DBPP. Accordingly, firms are divided into deciles or portfolios. In order to include a company in a portfolio, it has to satisfy selection criteria. To be included in the *FR* portfolios in year *t* - 1, a firm needs to have non-missing value for *FR*. In the fourth month, after the end of fiscal year *t* − 1, the selected companies are allocated to ten groups according to their *FR* at the end of fiscal year *t* − 1. First, ten portfolios are formed using deciles of the distribution of *FR* for underfunded firms (*FR*<0), while the eleventh portfolio includes all the overfunded firms (*FR*≥0). For the underfunded portfolios, the first portfolio contains the most underfunded firms and the tenth portfolio contains the least underfunded firms. As for the overfunded portfolio, it contains all overfunded firms.

Companies' Characteristics

Companies can be described in different ways. As for this study, firms are described based on size of the plan, operating and financial performance, spending behavior, ability to meet obligations and probability of bankruptcy, number of employees and tax advantages. Penman (2010) describes financial statements as the 'lens on a business' and its analysis as the 'calibrator' of the lens to get the business into focus. First, firms are described based on the funding level as described by *FR*. Then firms are described based on size and book to market ratio (B/M). These two characteristics may have a role on the way market value firms. Smaller firms tend to be less exposed and scrutinized by analysts. Quality and quantity of information available may have an impact in the way the market evaluates them. Financial and operating performance is also measured for these firms. First, average stock returns (AR) are measured to observe if the stocks of the firms in each portfolio have positive or negative returns. Then, cash flows to total assets (CF/TA), net income to total assets (NI/TA), sales to total assets (Sales/TA) and sales to net income (Sales/NI) ratios are calculated at the end of fiscal year t – 1.

Franzoni and Marín (2006) find that it appears that the two most underfunded portfolios tend to have poorest operating performance before and after formation. Interestingly, they found that, both earnings and cash flows ratios are lower in the first year after formation for the most underfunded firms, while this was not necessarily the case for the other firms. These findings are important because it may be a signal that poor past performance is the reason why these firms did not timely fund their pension liability and

developed a large underfunding. They also argue that the fact that the operating performance worsens in the first year after formation is consistent with pension liability negatively impacting earnings and cash flows, and that it corroborates their explanation of the observed low returns for underfunded firms.

Spending behavior indicators are also presented. The advertising expenses to sales (AE/Sales), capital expenditures to total assets (CE/TA) and research and development (R&D/TA) ratios are calculated in order to verify if there are differences among portfolios. Rauh (2006) suggests that an inverse relation exists between capital expenditures and contributions to the plan.In order to verify the level of debt, the ability to meet obligations and the probability of bankruptcy, the long-term debt ratio (LTDR), interest coverage ratio and the Altman Z-score are calculated. The balance in long-term debt for each firm is normalized using total assets. The interest coverage ratio (IntCov) is calculated to observe if firms included in different portfolios can cover their interest expenses with their current earnings.

 The Altman Z-score is included as a measure of company distress. Altman's Z-score (Altman Z) is used as an ex-ante measure of the likelihood of default. Altman's Z-score is calculated as Z = 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings before Interest and Taxes/Total Assets) + 0.6 (Market Value of Equity/Book Value of Liabilities) + 0.999 (Net Sales/Total Assets). Altman (1977) documents that firms having a Z-score less than 1.81 are highly likely to become bankrupt.

The average number of employees is also calculated for each portfolio decile. This is obtained as a means to evaluate the size of the pension plan for the firms in the deciles. Firms with more employees may have higher pension costs because of the number of employees covered by the plan.Lastly, the average annual tax rate (AATR) is calculated. It is calculated in order to verify the magnitude of the tax advantages that firms can obtain from recognizing interest expenses and pension and retirement expenses. Thomas (1988) study rejects the view that pension funding status and tax status are unrelated.

Descriptive Statistics

Table 1 provides summary statistics on the main pension items and the *FR*. Panel A displays summary statistics for the whole sample period. The average *FVPA* is about $645 million in the whole sample and the average *PBO* is about $664 million. The average *PBO* corresponds to about 103% of the *FVPA* in the sample period. The average funding level, as measured by *FR* is -17%, in contrast to the median which is almost 0%. These figure results from combining highly overfunded and highly underfunded firms. The minimum *FR* is -5940%, while the maximum is 154%. The average *PRE* is about $22.3 million, while the median is about $2.18 million. The minimum *PRE* is -$3.489 billion and the maximum is $3.435 billion.

Panel B, C and D present summary statistics for the different accounting related periods described earlier. These periods differ in various ways. The most important differences are observed in the relationship between the average PBO and the average *FVPA*. For the period between 1980 and 1986, the average *PBO* represents about 76% of the *FVPA*. This is reflected in average the *FR* for firms in this period. On average, they portray a positive *FR*. Circumstances change, and start to deteriorate, for the next period. This period corresponds to the years between 1987 and 1997. Required accounting disclosures are broader for this period. In contrast, the *PBO-FVPA* relationship weakens. The average *PBO* represents about 95% of the average *FVPA* and the average *FR* is negative. As for the last period, years between 1998 and 2005, a worse scenario is observed as the gap between the average *PBO* and the average *FVPA* widens. The average *PBO* represents about 106% of the average *FVPA*. As a consequence, the average *FR* worsens and continues to be negative.   As observed from this description, the DBPP position looks gloomier as years pass.

Table 1: Pension Plan Funding over Time

Panel A: 1980-2006				
	FVPA	**PBO**	**FR**	**PRE**
Mean	645.69	664.03	-0.172	22.292
Median	38.71	38.55	0	2.181
SD	3332	3412	29.100	129.74
Min.	0	0	-5940	-3,489
Max.	112,898	109,774	154.05	5,290
Panel B: 1980-1986				
	FVPA	**PBO**	**FR**	**PRE**
Mean	155.97	117.748	0.044	13.046
Median	9.012	6.372	0.02	1.135
SD	993.046	700.465	1.464	78.352
Min.	0	0	-32.827	-258
Max.	46380.313	26161.305	133.543	3,516.400
Panel C: 1987-1997				
	FVPA	**PBO**	**FR**	**PRE**
Mean	505.855	482.722	-0.018	13.379
Median	43.914	42.555	0.0002	1.682
SD	2521	2454	2.414	81.843
Min.	0	0	-245.273	-709
Max.	78,360	83,390	90.4	4,300
Panel D: 1998-2006				
	FVPA	**PBO**	**FR**	**PRE**
Mean	1164.616	1274.331	-0.516	39.851
Median	85.761	102.314	-0.008	4.814
SD	4866	5086.500	49.867	190.955
Min.	0	0	-5940.34	-3,490
Max.	112,898	109,770	154.055	5,290

The table reports the mean, median, standard deviation, minimum and maximum for the pension and retirement expenses (PRE), and pension and retirement expenses ratio (PRER), the fair value of plan assets (FVPA), the projected benefit obligation (PBO), and the funding ratio (FR). The results are presented for the complete sample period, for the period between 1980 and 1986 (before SFAS No. 87), for the period between 1987 and 1997 (the period after SFAS No. 87) and for the period between 1998 and 2006 (after SFAS No. 132). These amounts are expressed in millions and percentages for the ratios.

EMPIRICAL RESULTS

Portfolio Characteristics

Table 2 reports the characteristics of the eleven portfolios created according to *FR*. The characteristics in Panel A are measured at the end of fiscal year $t - 1$ relative to portfolio formation. The difference in the level of average *FR* between the most underfunded portfolio and the least underfunded is noticeable. For the most underfunded firms (portfolio one) the average *FR* is about -515%. In contrast, for the least underfunded firms (portfolio 10) the average *FR* is about -0.1%. The average *FR* for the portfolio that contains overfunded firms (portfolio eleven) is about 8.8%.

Table 2: FR Portfolios Characteristics

Measure	Most under 1	2	3	4	5	6	7	8	9	Least under 10	Over 11
FR	-5.150	-0.119	-0.062	-0.039	-0.025	-0.017	-0.011	-0.007	-0.004	-0.001	0.088
Size	2,506	3,319	3,417	3,418	5,195	4,376	4,791	5,396	5,226	7,865	3,137
B/M	21.091	0.830	0.786	0.806	0.721	0.679	0.620	0.605	0.562	0.500	2.003
AR	-0.003	0.008	0.010	0.010	0.013	0.013	0.015	0.016	0.017	0.020	0.013
AR St Dev	0.197	0.140	0.122	0.119	0.118	0.111	0.108	0.117	0.114	0.123	0.111
CF/TA	-0.004	0.005	0.006	0.005	0.014	0.010	0.006	0.009	0.010	0.026	0.003
NI/TA	-0.073	0.005	0.029	0.031	0.025	0.057	0.071	0.069	0.082	0.062	0.044
Sales/TA	1.490	1.439	1.398	1.416	1.396	1.259	1.296	1.337	1.241	1.140	1.332
Sales/NI	0.063	0.110	0.128	0.133	0.137	0.152	0.172	0.176	0.181	0.163	0.146
AE/Sales	0.032	0.021	0.023	0.025	0.029	0.037	0.038	0.034	0.034	0.037	0.037
CE/TA	0.048	0.045	0.046	0.049	0.048	0.048	0.053	0.052	0.056	0.063	0.071
R&D/Sales	0.018	0.019	0.022	0.024	0.028	0.040	0.033	0.035	0.058	0.066	0.030
LTDR	63.69	1.128	0.889	0.698	0.595	0.503	0.434	0.437	0.430	0.394	1.908
Altman Z	1.520	2.436	3.146	3.419	3.612	4.070	4.387	4.770	5.520	5.663	3.656
IntCov	5.60	6.08	10.24	17.30	42.06	40.31	58.26	109.31	361.56	60.79	24.31
Employees	16,808	37,000	17,039	24,166	23,523	27,374	27,810	23,269	18,272	37,893	17,262
AATR	0.348	0.221	0.217	0.294	0.359	0.300	0.342	0.207	0.396	0.479	0.369
Firms	1,668	2,007	2,057	2,072	2,106	2,141	2,133	2,159	2,151	2,149	22,197

In the fourth month after the end of fiscal year t, firms with available data at the end of fiscal year t-1 are divided in deciles according to FR. The stocks in the first portfolio are the most underfunded and the stocks in the tenth portfolio are the least underfunded. Firms with positive FR are assigned to portfolio eleven. The sample period is from the fourth month after the end of fiscal year 1980 to 2006.

As for the average size of firms in each portfolio, size almost consistently increases as the underfunding decreases. Smaller firms are concentrated in the most underfunded portfolio. Interestingly, firms in portfolio eleven have the second smallest average size of all the portfolios. In terms of B/M, value firms are concentrated in the most underfunded portfolio. Portfolio eleven also has value firms but to a much lesser degree. Means and standard deviations for the excess returns of the portfolios are also reported. AR increase as you move from portfolio one through ten. Portfolio eleven has AR equal to firms in portfolio five and six. Portfolio one has negative returns with the highest standard deviation and portfolio ten has the highest AR and a low standard deviation.

This table also reports the ratios that measure operating and financial performance. First, it shows the results for the average change in cash flows to total assets ratio. As Franzoni and Marín (2006) the most underfunded portfolio shows the lowest levels for this ratio. In concurrence to these findings, the results in this study reveal that, on average, at the end of fiscal year before portfolio formation, the most underfunded portfolio shows the most negative change in cash flows. In addition, this portfolio shows that on average these firms reported net losses to total assets. Also, the sales to net income ratio reveals the poor operating performance of these firms. In contrast, for the least underfunded portfolios (portfolios nine and ten) that the cash flow to total assets, net income to total assets and the profitability ratios are higher.The spending behavior measures are also presented in Table 2. The reported results show that, on average, the most underfunded portfolios report lower advertising, research and development and capital expenditures at the end of fiscal year before portfolio formation. These results could be related to a stringent financial situation. As Rauh (2006) explains, it can also be attributed to the firms' response to a reduction in internal resources caused by required pension contributions.

Measures of company distress and paying ability are also presented. The most underfunded firms have the highest levels of *LTDR*. A consistent decrease in *LTDR* is observed through portfolio ten. The firms with highest levels of pension plan related debt have also the highest levels of long-term debt. As a measure of financial distress, Altman's Z-score is presented for all portfolios. The results show that the most underfunded portfolio contains firms that on average have a higher risk of bankruptcy. In concurrence with these results, the IntCov ratio results show that the most underfunded portfolios (portfolios one and two) are less able to cover their interest expenses at their current earnings levels.

As a means to describe these firms as labor or capital intensive, the average number of employees per portfolio is shown. The most underfunded portfolios have on average fewer employees than the least underfunded portfolios; the least underfunded portfolios have, on average more employees. Finally, the AATR is calculated for each portfolio. The magnitude in tax advantages and the financial position of the firm may have influence in the way firms choose to fund their pension plans. At no surprise the firms with the least underfunded and overfunded firms have higher average tax rates than the others. In these cases management may be benefiting from pension related tax advantages.

CONCLUSIONS

Financial statements reveal the financial history of companies. Financial information may become more useful when relationships among numbers, accounts or pieces of information are made and compared to past years ratios, to competitors or to industry averages. But sometimes financial amounts reflect the symptoms of a current of future negative situation. The goal of this study was to describe firms that sponsor defined benefit pension plans (DBPP) based on firm specific characteristics, financial and operating performance. To accomplish this goal firms were classified into portfolios based on their funding levels and described accordingly. As for firms that sponsor DBPP and the relationships observed in this study, portraits can be drawn. For example, firms in the most underfunded portfolio are on average smaller and value firms, with negative stock returns, poor financial and operating performance, lower profitability, invest smaller amounts in advertising, research and development and capital assets and are more indebted with higher probabilities of bankruptcy. The opposite is seen for the least and overfunded firms. These differences may have an explanation.

Usually, smaller firms may have less access to different sources of financing (for example bond markets). Analysts do not follow smaller firms as closer as they do with bigger firms. This may happen because of less availability of information and less news coverage. Because of their lessen ability to raise funds, smaller firms may be more inclined to underfund their pension plans. Higher underfunding levels may be accompanied by high levels of long-term debt in order to finance the operations and the pension plans.

The observed characteristics are consistent with the results in previous studies. Franzoni and Marín (2006) find evidence of overvaluation for firms with severely underfunded pension plans; Rauh (2006) finds that pension sponsors decrease spending on capital expenditures in response to a reduction in internal resources caused by required pension contributions; Phillips and Moody (2003) argue that POT explains that firms will borrow, rather than issuing equity, when internal cash flow is not sufficient to fund capital expenditures. It may be possible that firms in portfolio one choose to underfund their plans in order to compensate (use the funds in other activities) for their poor financial performance. As for tax related issues, Thomas (1988) study rejects the view that pension funding status and tax status are unrelated. The results reveal that firms with higher levels of average tax rates have lower levels of underfunding. This phenomenon may occur because firms identify tax advantages for contributions made to fund their pension plans. Although this study uses a sample of US public companies with available DBPP information from 1980 to 2005 and does not include pension data under the new accounting rules (SFAS No. 158) the results appear to be dramatic. Future studies may focus on periods after the issuance of this new accounting rule. By comparing the results in both studies, regulators may be able to verify if

changes in this accounting rule prove to attain its objective. By examining pension funding levels regulators may identify more effectively firms that confront or may confront funding problems before it is too late. The detection of risk behavior or tendencies can help regulators in establishing policies to decelerate and improve pension plan funding levels to protect the public interest.

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