Short Note: Effect of GASB Statement 68 on the Usefulness of Accounting Information of Government Entities Providing Defined Benefit Pensions through Cost-sharing in California

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ABSTRACT
The objective of this study is to examine the effect of Governmental Accounting Standards Board (GASB) Statement 68 (the statement hereafter) on usefulness of accounting information of governmental entities providing defined benefit pensions through cost-sharing plans (the reporting entities hereafter) in California. Since the statement requires the reporting entities to disclose entity specific net pension liability and pension expense in addition to plan wide information about them, more pension related information is available with the adoption of the statement, which is supposed to improve decision usefulness of the pension related information. Considering municipal bonds being major funding sources of many government entities, we examine the impacts of new pension related information on borrowing costs of municipal bonds. The sample includes municipal bonds issued by governmental entities providing defined benefits pensions through cost-sharing plans in the state of California from 2015 through 2016. Our empirical test results indicate that entity specific net pension liability and pension expense required by GASB 68 increase the ability of pension related information in explaining bond borrowing costs.

Key words: Information usefulness, Bond borrowing costs, Net pension liabilities, Pension expenses.
JEL: M4

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1. INTRODUCTION

For fiscal years beginning after June 14, 2014, Governmental Accounting Standards Board (GASB) Statement 68 (the statement hereafter) requires governmental entities providing defined benefit pensions through cost sharing plans to disclose entity specific net pension liability and pension expenses. Disclosure requirements of governmental entities for cost sharing defined benefit pension plans prior to adoption of the statement were reporting net pension liabilities of the cost sharing plan as a whole on the footnote of the reporting entity and reporting each entity's pension contribution to the cost sharing plan on its footnote. Thus, neither entity specific net pension liabilities nor entity specific pension expenses were reported prior to the adoption of the statement. A natural question arising with the adoption of the statement could be whether the disclosure of entity specific net pension liability and pension expense improve information content (i.e., information usefulness) of pension related information. Considering municipal bonds being major funding sources of many government entities, impacts of new pension related information on bond borrowing costs of municipal bonds are examined to find an answer to the study objective.

The sample used in this study includes municipal bonds issued by governmental entities providing defined benefits pensions through cost sharing plans (i.e., cost-sharing employers per GASB) in the state of California from 2015 through 2016.

The remainder of this paper is organized as follows. First, hypothesis is developed through a review of previous literatures and logical reasoning. Then, sample selection and measurement of variables are described. The empirical tests and their results are followed. In the final section, conclusions are addressed.

2. HYPOTHESIS DEVELOPMENT

Regarding information content or usefulness of accounting information, numerous researches were conducted using different capital markets, time periods, financial products, and methodologies. The results from these studies indicate that accounting information, in general, be useful for its user's decisions on trading of financial products.

Numerous studies in corporate accounting, including Ball and Brown (1967), Beaver (1968), Foster (1975), Beaver et. al. (2016), Jin (1992), Fischer and Verrecchia (1997), Khurana and Raman (2003), Howe (2001) and Strumeyer (2005), but not limited to, found significant evidence supporting the usefulness of accounting information for the information users' decisions on investments in financial products, which are reflected on the behaviors of marketable securities such as stocks and corporate bonds in terms of price changes, trading volume changes, or bid-ask spreads.

While fewer studies were conducted on the information content of accounting information in governmental accounting area, results from previous studies consistently support the usefulness of accounting information in determining bond ratings and bond borrowing costs as well (e.g., Callahan and Waymire (2015), Reck et. al. (2009 and 2014)). The results indicate that governmental accounting information also affects the information users' decisions and hence is reflected on bond ratings and bond borrowing costs of governmental entities. Thus, if entity specific net pension liabilities and pension expenses information available with adoption of the statement is useful as it was intended by GASB[i], then decision usefulness of pension related information by cost sharing government employers must improve with adoption of the statement.

Results from previous research on GASB rules on pension related information indicate th at GASP rules not only change disclosure of accounting information but also have real economic consequences. For example, Naughton et. Al. (2015) found that a negative association between a

state fiscal condition and the use of discretion in applying GASB rules to understate pension fund ing gaps (i.e., underfunding). Hallman and Khurana (2015) found that the discount rate adjustme nt (i.e., adjustment for inflated discount rate) increases pension liabilities and hence associates wi th lower credit ratings and higher interest costs. Gallagher and Gallagher (2016) and Munnell and Aubry (2016) found that there was significant increase in net pension liabilities revealed with ado ption of the statement. Anantharaman and Chuk (2023) found that governments increase pension contributions significantly upon applying the statement. Furthermore, this funding response is str onger for the governments likely to disclose prominent pension deficits by the statement. Thus, e ntity specific net pension liabilities and pension expense disclosed with adoption of the statement should affect bond borrowing costs of cost sharing government employers. Thus, a testable hypot hesis could be:

Hypothesis: Information content of accounting information by cost-sharing employers improves with the adoption of the statement.

This hypothesis means that more of bond borrowing cost behaviors can be explained by pension related information of cost-sharing employers with the adoption of the GASB statement.

3. SAMPLE SELECTION

In considerations of relevance to the research objectives of this study and its availability, sample data for this study were selected using the following criteria.

1. Sufficient data for dependent variable, true interest costs, should be available.
2. Sufficient data for testing variables, net pension liabilities and pension expenses of each reporting entity, should be available on respective governmental reporting entity's website or cost sharing plans' websites.
3. Sufficient data for control variables such as bond buyer index, year to maturity, debt to tax revenue ratio, own source revenue, per capital income, financial position (as measured by general fund balance over general fund revenues), population, and unemployment rate should be available.
4. Governmental entities in the sample should be cost-sharing employers in the state of California.
5. Bond issue and related market data should be available on the Thomson Municipal Market Monitor (TM3) primary market database, a proprietary service of Thomson Reuters.

As shown on Table 1, the final sample consists of 245 municipal bonds issued by 99 cost-sharing pension employers in California from 2015 through 2016. Out of 99 governmental entities in the sample, 98 are school districts and 1 is a city. All sample entities belong to either CALPERS or CALSTRS.

Table 1. Sample descriptions

Number of school districts	98

Number of cities	1
Toal number of government entities	99
Total number of entity-year-bond issuances	245
Cost-sharing defined benefit pension plans	CALPERS & CALSTRS

4. MEASUREMENT OF VARIABLES

Dependent variable, bond borrowing cost, was measured by true interest costs (TIC) and net interest costs (NIC). NIC of a serial bond is the weighted average interest cost across all maturities adjusted for premiums or discounts. TIC is the internal rate of return that discounts the future interest and principal payments of a new bond issue to the underwriter's purchase price. We choose to use TIC as a measure of bond borrowing cost because it is not only more accurate and popular measure, but also easily calculable as a result of advanced technology.

The testing variables in this study are net pension liability and pension expense. Net pension liability is each cost-sharing employer's liability for its proportionate share of the net pension liability of the entire cost-sharing plan. Pension expense is each cost-sharing employer's proportionate share of collective pension expense and collective deferred net flows of resources related to a pension (i.e., inflows – outflows).

The variables used as dependent variable, testing variables, and control variables are described in Table 2.

Table 2. Description of Variables

Variables	Description
Dependent Variable	
IntCost	Net interest cost (or true interest cost, if available) on new bond issues. IntCost is calculated as the average net interest cost across all maturities of the serial bond issue, weighted by the dollar amount maturing each year.
Control Variables	
Byield	Bond Buyer 20-Year Bond Average Yield Index for the week of the new issue. (Source: The Bond Buyer).
Time TM	Average term to maturity for each issue of serial bonds (year).
Brating	Bond rating of each bond issue by Moody's or S&P
Debt	Ratio of general obligation debt to total governmental activities revenues, government wide.
FP	Financial position measured as general fund balance over general fund revenues

PCI	Per capita income
PCGDP	Per capita real GDP
URATE	Annual average unemployment rate
Testing Variables	
NPL	Net pension liabilities
PE	Pension expense.

5. EMPIRICAL TESTS AND RESULTS

As a preliminary analysis of data, Pearson correlation coefficients were computed to find multicollinearity issues among independent variables used in the study. The results presented on Table 3 show that there is one pair of independent variables with extremely high correlation coefficients (i.e., higher than 0.60). They are NPL and PE with the correlation coefficient of 0.907764, which may cause multicollinearity problems and hence need some corrective measures in empirical tests.

To investigate the collective effect of the statement and entity-specific net pension liability and entity-specific pension expense on TIC, the following multivariate regression models were used, where interest costs measured by TIC are used as the dependent variable in both models:

Table 3. Correlation coefficients among independent variables

	NPL	*PE0*	*Byield*	*TimeTM*	*Rating*	*Debt*	*Ownrev*	*FP*	*PCGDP*	*UEMPLOY*
NPL	1									
PE0	**0.90776**	1								
Byield	-0.0072	-0.0222	1							
TimeTM	-0.0653	-0.0895	-0.0961	1						
Rating	-0.1172	-0.2173	-0.0537	0.3489	1					
Debt	-0.2234	-0.1612	0.1160	0.0157	0.03884	1				
Ownrev	-0.1758	-0.3234	0.1045	-0.0027	0.13007	0.14402	1			
FP	0.01016	-0.0493	0.0460	0.02965	0.10175	-0.0754	0.07756	1		
PCGDP	0.15587	0.07588	0.1132	-0.1013	0.10489	0.21915	0.10729	0.0578	1	
UEMPLOY	0.14067	0.15281	-0.5354	0.06852	0.014	-0.0408	0.04956	-0.0279	-0.1166	1

Reduced Model: a basic model that includes only control variables as independent variables.

$$IntCost_{jt} = \alpha_0 + \alpha_1 * Byield_{jt} + \alpha_2 * TimeTM_{jt} + \alpha_3 * Brating_{jt} + \alpha_4 * Debt_{jt} + \alpha_5 * Ownrev_{jt} + \alpha_6 * FP_{jt} + \alpha_7 * PCGDP_{jt} + \alpha_8 * Uemploy_{jt} + \varepsilon_{jt}$$

Full Model: a full model that includes all control variables, net pension liability, and pension expense as independent variables.

$$IntCost_{jt} = \alpha_0 + \alpha_1 * NPL_{jt} + \alpha_2 * PE_{jt} + \alpha_3 * Byield_{jt} + \alpha_4 * TimeTM_{jt} + \alpha_5 * Brating_{jt} + \alpha_6 * Debt_{jt} + \alpha_7 * Ownrev_{jt} + \alpha_8 * FP_{jt} + \alpha_9 * PCGDP_{jt} + \alpha_{10} * Uemploy_{jt} + \alpha_{11} * NPL_{jt} * PE_{jt} + \varepsilon_{jt}$$

,where NPL_{jt} * PE_{jt} is included as a control variable to prevent a potential multicollinearity issue between NPL and PE.

Results for the reduced model are presented in Table 4. The reduced model without testing variables (NPL and PE) produces F-value of 82.63995 with corresponding p-value of 9.8E-68. This indicates that the independent variables do explain significantly the behavior of the dependent variable, bond borrowing costs.

Table 4. Summary output of the reduced model

Regression Statistics	
Multiple R	0.871723
R Square	0.7599
Adjusted R Square	0.750705
Standard Error	0.439808
Observations	245

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	9	143.8664	15.98516	82.63995	9.8E-68
Residual	235	45.45636	0.193431		
Total	244	189.3228			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	10.26932	4.46046	2.302302	0.022193
Byield	-0.0513	0.028979	-1.77021	0.077989
TimeTM	0.089307	0.003769	23.69398	3.22E-64
Rating	0.014975	0.008819	1.698032	0.090825
Debt	0.054855	0.032469	1.689461	0.092457
Ownrev	-0.36367	0.148903	-2.44234	0.01533
FP	0.041968	0.134629	0.311734	0.755519
PCI	-1.8E-06	1.57E-06	-1.14011	0.255401
PCGDP	-0.00016	7.51E-05	-2.11491	0.03549
UEMPLOY	0.043933	0.022491	1.953381	0.051961

Results from the full model are presented in Table 5 below. The full model with testing variables (NPL and PE) produces F-value of 59.74684 with corresponding p-value of 2.8E-66 indicating that the independent variables do explain the behavior of the dependent variable, bond borrowing costs significantly as in the reduced model.

Table 5. Summary output of the full Model

Regression Statistics	
Multiple R	0.877933
R Square	0.770767
Adjusted R Square	0.757867
Standard Error	0.433445
Observations	245

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	13	145.9238	11.22491	59.74684	2.8E-66
Residual	231	43.399	0.187874		
Total	244	189.3228			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2.299995	9.871375	0.232996	0.815971
NPL	-0.00152	0.000468	-3.24066	0.001368
PE	0.003123	0.002596	1.203072	0.23018
Byield	-0.0511	0.028805	-1.77415	0.077356
TimeTM	0.090512	0.003738	24.21316	2.57E-65
Rating	0.013063	0.009042	1.444765	0.149879
Debt	0.026538	0.034238	0.775102	0.439072
Ownrev	-0.39141	0.166055	-2.35713	0.019252
FP	0.032027	0.13393	0.239131	0.811216
PCGDP	-5.8E-07	2.11E-06	-0.2749	0.783638
UEMPLOY	-2E-05	0.000169	-0.11881	0.905525
*NPL * PE*	1.548671	2.616807	0.591817	0.554552
*PCGDP*UEMPLOY*	1.04E-05	3.46E-06	3.01878	0.002823
	-2.6E-05	4.53E-05	-0.56788	0.570668

To examine which model (reduced versus full model) explains the dependent variable better, we calculate F-VALUE of the difference between the reduce model and the full model as below:

F-value = [SSE(R)-SSE(F)]/[DF(R)-DF(F)] ÷ SSE(F)/DF(F)
= (45.45636 - 43.399)/ (235-231) ÷ (43.399/231) = 2.737679,
where
SSE(R) = square sum of residuals of the reduced model,
SSE(F) = square sum of residuals of the full model,
DF(R) = degree of freedom of residuals in the reduced model,
DF(F) = degree of freedom of residuals in the full model,

Since F-value of the difference of 2.737679 is higher than 2.72901 which is F-value at 3 confidence level), the independent variables in the full model explain the dependent variable sigr the independent variables in the reduced model with 97 % confidence level. Furthermore, entity liability and pension expense are the only independent variables that are in the full model bu model. Thus, it is reasonable to conclude that entity specific net pension liability and pension e ability of pension related information to explain bond borrowing costs. These results support *information content of accounting information by cost-sharing employers improves with the adopt*

6. CONCLUSION

We investigate whether the GASB statement 68 improves the decision usefulness of pension related information by using pension related data and bond cost data of government entities providing defined benefit pensions through cost sharing plans in the state of California during 2015 and 2016. Our sample includes 99 entities, 98 school districts and 1 city, and total number of entity-year-bond issuances is 245. Using both the reduce regression model without entity specific net pension liability and pension expense required by GASB 68 as independent variables and full regression model with entity specific net pension liability and pension expense as independent variables, we examine the incremental explanatory power of new pension related information on bond borrowing costs. Our results indicate that entity specific net pension liability and pension expense required by GASB 68 increase the ability of pension related information in explaining bond borrowing costs. In other words, the results support the hypothesis that *information content of pension related information by cost-sharing employers improve with the adoption of the statement.*

It is absolutely necessary to expand this study to different states and different time periods to reach a more solid conclusion about the research question of whether GASB 68 improve the usefulness of pension related information. Another research avenue is to identify 'bad news entities' and 'good news entities' after the adoption of GASB 68 in terms of disclosing more or less net pension liabilities and pension expenses than expected, and to investigate whether market responds differently to these groups by comparing bond borrowing costs, for example.

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Per GASB "The primary objective of this statement 68 is to improve accounting and financial reporting by state and local governments for pensions. It also improves information provided by state and local governmental employers about financial support for pensions that is provided by other entities." "The requirements of this Statement will improve the decision-usefulness of information in employer and governmental non-employer contributing entity financial reports and will enhance its value for assessing accountability and inter-period equity by requiring recognition of the entire net pension liability and a more comprehensive measure of pension expense."