

**RESOLUTION NO. 2020-21-13**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF MORROW COUNTY SCHOOL DISTRICT NO. 1, MORROW COUNTY, OREGON, AUTHORIZING PARTICIPATION IN THE OREGON EDUCATION DISTRICTS PENSION BOND PROGRAM; AUTHORIZING A FULL FAITH AND CREDIT PENSION BOND AND RELATED FULL FAITH AND CREDIT PENSION OBLIGATIONS, TO BE ISSUED IN ONE OR MORE SERIES.**

WHEREAS, the Board of Directors of Morrow County School District No. 1, Morrow County, Oregon, is authorized by Oregon Revised Statutes (“ORS”) 238.692 to 238.698, including any amendments thereto (the “Act”), to issue revenue bonds under ORS Chapter 287A to finance its pension liability;

WHEREAS, the Act and ORS 287A.315 permit the District to pledge its full faith and credit and taxing power within the limitations of Sections 11 and 11b of Article XI of the Oregon Constitution to pay those bonds;

WHEREAS, school districts and education service districts have a pooled unfunded pension liability to the Oregon Public Employees Retirement System (“OPERS”) and, based on the District’s portion of the total school district and education service district payroll, the District’s allocated portion of the unfunded pension liability (the “Pension Liability”) is estimated to be \$23,580,067 as of December 31, 2019;

WHEREAS, ORS 238.697 requires that the District (1) obtain a statistically based assessment from an independent economic or financial consulting firm regarding the likelihood that investment returns on bond proceeds will exceed the interest cost of the bonds under various market conditions and (2) make a report (the “Report”) available to the general public that describes (a) the result of the assessment and (b) discloses whether the District has retained the services of an independent SEC-registered advisor;

WHEREAS the Report is attached hereto as Exhibit A and the District has obtained an assessment (the “Assessment”), dated January 21, 2021 and further updated on April 15, 2021, from ECONorthwest, an independent economic consulting firm, which is attached to the Report;

WHEREAS, the District understands that the Assessment is based on facts and assumptions that are subject to change, including market projections that are anticipated to be updated by the Oregon Investment Council in June, 2021 and that in order to help evaluate the potential risk in the absence of updated market information, the Assessment was revised to include higher borrowing rate assumptions to approximate less-favorable future market conditions;

WHEREAS, current interest rates in the bond market are below 4.50 percent, creating the opportunity for the District to finance all or a portion of its unfunded pension liability and potentially reduce its costs;

WHEREAS, the Oregon Education Districts Full Faith and Credit Pension Bond Program (the “Program”) is a structure whereby Oregon public school districts and education service districts electing to participate in the Program (the “Participating Districts”) may simultaneously issue their full faith and credit pension bonds and, collectively, provide for the issuance, sale and delivery of Full Faith and Credit Pension Obligations, Series 2021 (the “Program Obligations”) representing proportionate interests of the

registered owners of the Program Obligations in the aggregate amount of full faith and credit pension bonds of the Participating Districts; and

WHEREAS, the Program provides that each Participating District will be responsible solely for its obligations under its pension bond and/or bonds, and not for the obligations of any other Participating District under any other pension bond and/or bonds, except to the extent assumed as a surviving district; now therefore,

THE BOARD OF DIRECTORS OF MORROW COUNTY SCHOOL DISTRICT NO. 1, MORROW COUNTY, OREGON RESOLVES:

**Section 1. Definitions.**

Unless the context clearly requires otherwise, the following terms shall have the following meanings:

“Additional Charges” means the fees and other charges of the Program Trustee, as defined in the Program Trust Agreement and any indemnity payments due under Section 6(3) hereof.

“Bond” means the District’s Full Faith and Credit Pension Bond, Series 2021 that is authorized by Section 2 of this Resolution.

“Bond Payment Date” means a date on which a Bond Payment is due.

“Bond Payments” means the principal and interest payments, including accreted interest under any deferred interest bond, due under the Bond, and any prepayment premium which is due if Bond principal is prepaid.

“Business Day” means any day other than a Saturday, Sunday or a day on which the Trustee is authorized by law to remain closed.

“District” means Morrow County School District No. 1, Morrow County, Oregon, or its successors.

“Event of Default” refers to an Event of Default listed in Section 9(1) of this Resolution.

“Government Obligations” means direct noncallable obligations of the United States of America or noncallable obligations the principal of and interest on which are unconditionally guaranteed by the United States of America.

“Intercept Agreement” means the Intercept Agreement dated as of October 31, 2002, as amended and supplemented.

“Intercept Payment” means the amount paid by the State to the Program Trustee on behalf of the District under the Intercept Agreement.

“Participants” or “Participating Districts” means school districts and education service districts that participate in the Program.

“Program Obligations” means the Full Faith and Credit Pension Obligations issued by the Program Trustee under the Program Trust Agreement which represent proportionate and undivided

interest into right to receive Bond Payments and similar pension bond payments made by the other Participants in the Program.

“Program Trust Agreement” means a trust agreement between the Program Trustee and the Participants, in which the Program Trustee agrees to hold the Bond and distribute the Bond Payments to the owners of Program Obligations.

“Program Trustee” means U.S. Bank National Association, as trustee under the Program Trust Agreement, or its successors.

“Qualified Consultant” means an independent certified public accountant, an independent municipal advisor, and having experience and expertise in the analysis of defeasance escrows, who is selected by the District.

“Resolution” means this Resolution, including any amendments made in accordance with Section 7 of this Resolution.

“School District Official” means the Superintendent or the Superintendent’s designee.

“Security Payments” means the payments defined in the Program Trust Agreement and referenced in Section 4(3) of this Resolution.

“Special Counsel” means Hawkins Delafield & Wood LLP, Portland, Oregon

“State” means the State of Oregon, or any agency thereof.

“State Education Revenues” means any state funding for school districts and education service districts legally available to pay debt service on the pension bonds. Currently, such funds are appropriated each biennium and designated as the “State School Fund”.

“Underwriter” means Piper Sandler & Co., Portland, Oregon and any co-managers to be determined at their discretion.

## **Section 2. Bond Authorized.**

(1) The District hereby authorizes the issuance, sale and delivery of its Bond, in accordance with this Resolution and in an amount which does not exceed the amount necessary to produce net proceeds equal to the District’s Pension Liability as reported by the OPERS’s actuary as of the expected date of the lump sum payment, plus the costs of issuing and selling the Bond and the District’s allocated share of the costs of issuing and selling the Program Obligations.

(2) Bond proceeds shall be used to pay all or a portion of the District’s unfunded pension liability to OPERS and to pay costs of issuing and selling the Bond and the District’s allocated share of the costs of issuing and selling the Program Obligations. The District may direct that a portion of the Bond proceeds be directly paid to OPERS after closing and a portion be retained by the Program Trustee for payment to OPERS over time as directed by the School District Official. The issuance of the Bond and participation in the Program shall not obligate the District to pay any portion of another school district’s liability.

(3) The Bond shall be a “federally taxable bond” which bears interest that is not excludable from gross income under Section 103(a) of the Internal Revenue Code of 1986, as amended. Interest will, however, be exempt from Oregon personal income taxation.

(4) OPERS currently charges the District a rate of 7.20 percent per annum on its unfunded liability because that is the assumed rate of return that OPERS expects, over the long term, to earn on its investments. Issuing Bonds at a lower rate of interest and depositing proceeds at OPERS in a Side Account (“Side Account”) may reduce costs for the District if the rate of return on the Bond proceeds deposited in the Side Account exceeds the borrowing costs. To maximize the potential for the rate of return on the OPERS fund to exceed the rate of interest on the Bond, the Bond shall not be sold at a true interest cost of more than 4.50% per annum.

(5) The School District Official shall compare the cash flows required to pay the Bond to the payroll rate credit currently estimated from the Side Account and determine a Bond structure which the School District Official estimates will be advantageous to the District.

(6) The School District Official is authorized to execute a letter to be sent to OPERS requesting the necessary payoff figures and to pay any fees required in connection therewith or, if such letter has been executed prior hereto, the Board hereby ratifies such action.

### **Section 3. Delegation.**

The School District Official may, on behalf of the District, and without further action by the Board:

(1) Participate in the preparation of, authorize the distribution of, and deem final any official statement or other disclosure documents relating to the Bond or the Program Obligations.

(2) Establish the final principal amount, Bond Payment schedule, interest rates, sale price and discount, prepayment terms, payment terms and dates, and other terms of the Bond.

(3) Negotiate the terms of, and enter into a bond purchase agreement which provides for the acquisition of the Bond by the Program Trustee and, if required, execute a letter of intent prior to the sale.

(4) Execute and deliver the Program Trust Agreement, which authorizes the Program Trustee to issue the Program Obligations, and any other agreements or documents which may be required for participation in the pension bond program.

(5) Execute and deliver the Bond to the Program Trustee, provided the Bond shall also be executed with the facsimile signature of the Chair of the Board of Directors of the District.

(6) Undertake to provide continuing disclosure for the Bond and the Program Obligations in accordance with Rule 15c2-12 of the United States Securities and Exchange Commission.

(7) Apply for ratings on the Bond or the Program Obligations and purchase municipal bond insurance or obtain other forms of credit enhancements for the Bond or the Program Obligations, enter into agreements with the providers of credit enhancement, and execute and deliver related documents.

(8) Execute and deliver the Intercept Agreement and any related documents, including a certificate demonstrating that the State Education Revenues distributed to the District in each of the three

most recently completed fiscal years are not less than two (2.0) times the average annual debt service on the Bond and any other outstanding pension bonds issued under the Intercept Agreement.

(9) Execute and deliver any agreements or certificates and take any other action in connection with the Bond, the Program Obligations, the Intercept Agreement and OPERS administrative rules which the School District Official finds is desirable to permit the sale and issuance of the Bond and the Program Obligations in accordance with this Resolution.

#### **Section 4. Security for Bond.**

(1) The District shall pay the amounts due under the Bond from any and all of its legally available taxes, revenues and other funds as authorized by the Act. The District hereby pledges its full faith and credit and taxing power within the limitations of Sections 11 and 11b of Article XI of the Oregon Constitution to pay the amounts due under the Bond pursuant to ORS 287A.315.

(2) To provide additional security for the Bond, the District agrees to enter into the Intercept Agreement.

(3) In the event funds under the Intercept Agreement are insufficient or unavailable or the Intercept Agreement is not in full force and effect for any reason, the District shall make Security Payments to the Program Trustee in accordance with the terms of the Program Trust Agreement.

(4) This Resolution shall constitute a contract with the Program Trustee, and the owners of the Program Obligations shall be third-party beneficiaries of that contract.

#### **Section 5. Prepayment.**

The principal component of Bond Payments shall be subject to prepayment on the dates and at the prices established by the School District Official pursuant to Section 3(2) and in accordance with the Program Trust Agreement.

#### **Section 6. Covenants.**

The District hereby covenants and agrees with the Program Trustee for the benefit of the owners of the Program Obligations as follows:

(1) The District shall promptly cause Security Payments and the principal, premium, if any, and interest on the Bond to be paid as they become due in accordance with the provisions of this Resolution and the Bond.

(2) The District covenants for the benefit of the Program Trustee to pay the Additional Charges reasonably allocated to it by the Program Trustee, in accordance with the invoices for such Additional Charges which are provided by the Program Trustee.

(3) To the extent permitted by law, the District covenants and agrees to indemnify and save the Program Trustee harmless against any loss, expense or liability which is reasonably allocable to the District and which the Program Trustee may incur arising out of or in the exercise or performance of its duties and powers under the Program Trust Agreement relating to the Bond, including the costs and expenses of defending against any claim or liability, or enforcing any of the rights or remedies granted to it under the terms of the Program Trust Agreement in connection with the Bond, excluding any losses or expenses which are due to the Trustee's breach of fiduciary duties, negligence or willful misconduct. The

obligations of the District under this Section 6(3) shall survive the resignation or removal of the Program Trustee under the Program Trust Agreement and the payment of the Program Obligations and discharge under the Program Trust Agreement. The damages claimed against the District shall not exceed the damages which may be allowed under the Oregon Tort Claims Act, Oregon Revised Statutes Section 30.260, et seq., unless the provisions and limitations of such act are preempted by federal law, including, but not limited to the federal securities laws.

(4) The District covenants not to merge, consolidate or dissolve unless the District's Bond has been defeased or the obligation for payment of the Bond has been assumed by the successor entity.

**Section 7. Amendment of Resolution.**

The District may amend this Resolution only with the consent of the Program Trustee.

**Section 8. State Intercept Agreement.**

The School District Official is hereby authorized to negotiate and enter into the Intercept Agreement with the State whereby appropriations from the State that would otherwise be paid to the District are diverted to the Program Trustee for the purpose of payment of debt service on the Bond. Any such agreement with the State does not relieve the District of its liability to make payments on the Bond.

**Section 9. Default and Remedies.**

(1) The occurrence of one or more of the following shall constitute an Event of Default under this Resolution:

(A) Failure by the District to pay Bond principal, interest or premium when due (whether at maturity, or upon prepayment after principal components of Bond Payments have been properly called for prepayment);

(B) Except as provided in Section 9(1)(A) above, failure by the District to observe and perform any other covenant, condition or agreement which this Resolution requires the District to observe or perform for the benefit of Program Trustee, which failure continues for a period of 60 days after written notice to the District by the Program Trustee specifying such failure and requesting that it be remedied; provided however, that if the failure stated in the notice cannot be corrected within such 60 day period, it shall not constitute an Event of Default so long as corrective action is instituted by the District within the 60 day period and diligently pursued, and the default is corrected as promptly as practicable after the written notice referred to in this Section 9(1)(B); or,

(C) The District is adjudged insolvent by a court of competent jurisdiction, admits in writing its inability to pay its debts generally as they become due, files a petition in bankruptcy, or consents to the appointment of a receiver for the installment payments.

(2) The District's failure to make Bond Payments or Security Payments constitutes an Event of Default as set forth above independently of whether or not the State complies with the provisions of the Intercept Agreement.

(3) The Program Trustee may waive any Event of Default and its consequences, except an Event of Default described in Section 9(1)(A).

(4) If an Event of Default occurs and is continuing the Program Trustee may exercise any remedy available at law or in equity; however, the Bond Payments shall not be subject to acceleration, and the District shall be responsible solely for its Bond Payments and any Additional Charges reasonably allocated to it.

(5) No remedy in this Resolution conferred upon or reserved to the Program Trustee is intended to be exclusive and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Resolution or now or hereafter existing at law or in equity, including allowing the State to withhold future payments. No delay or omission to exercise any right or power accruing upon any default shall be construed to be a waiver thereof, but any such right and power may be exercised from time to time and as often as may be deemed expedient. To entitle the Program Trustee to exercise any remedy reserved to it, it shall not be necessary to give any notice other than such notice as may be required by this Resolution or by law.

#### **Section 10. Defeasance.**

(1) The District may defease all or any portion of the Bond Payments in accordance with this Section 10. The District shall be obligated to pay any Bond Payments that are defeased in accordance with this Section 10 solely from the money and Government Obligations which are deposited in escrow pursuant to this Section 10, unless the amounts available in escrow are insufficient to make the Bond Payments. Bond Payments shall be deemed defeased if the District:

(A) irrevocably deposits money or noncallable Government Obligations in escrow:

(i) with an independent trustee or escrow agent which mature and pay interest in amounts which are calculated to be sufficient, without reinvestment, to make all the Security Payments associated with the Bond Payments which are to be defeased on their maturity dates, and to make any prepayments of Bond Payments described in Section 5 on the dates those prepayments are required to be made if any principal components of defeased Bond Payments are to be prepaid; or

(ii) with the Program Trustee, which mature and pay interest in amounts which are calculated to be sufficient, without reinvestment, to make when due all the Bond Payments which are to be defeased on their maturity or prepayment dates; and,

(B) provides irrevocable notice of any prepayments which are to occur in connection with the defeasance to the Program Trustee at least 50 days prior to the prepayment; and,

(C) files with the escrow agent or trustee an opinion from a Qualified Consultant to the effect that the money and the principal and interest to be received from the Government Obligations are calculated to be sufficient, without further reinvestment, to pay the Security Payments and prepayments of Bond Payments described in Section 10(1)(A).

(2) The District shall notify the Program Trustee promptly of any defeasance of Bond Payments.

#### **Section 11. Rules of Construction.**

In determining the meaning of provisions of this Resolution, the following rules shall apply unless the context clearly requires application of a different meaning:

(1) References to section numbers shall be construed as references to sections of this Resolution.

(2) References to one gender shall include all genders.

(3) References to the singular shall include the plural, and references to the plural shall include the singular.

**Section 12. Effective Date.**

This resolution shall take effect on the date of its passage by the District.

ADOPTED by the Board of Directors of Morrow County School District No. 1, located in Morrow County, Oregon this 11<sup>th</sup> day of May, 2021.

**Morrow County School District No. 1  
Morrow County, Oregon**

By: \_\_\_\_\_  
Becky Kindle, Chair

**ATTEST:**

By: \_\_\_\_\_  
Dirk Dirksen, Superintendent



## **Exhibit A**

### **Report on Pension Bonds**

Prior to the issuance of pension obligation bonds, the Morrow County School District No. 1 (the “District”) has obtained a statistically based assessment from ECONorthwest entitled “Issuance of Pension Obligation Bonds – A Risk/Reward Analysis” updated as of April 15, 2021 (the “Assessment”) pursuant to ORS 238.697(1)(a). The Assessment was updated in order to include a fourth assumed pension bond true interest cost to help evaluate the potential risk associated with less-favorable future market conditions that may be projected in updated market information (anticipated to be available from the Oregon Investment Council in June, 2021).

The District has prepared this report pursuant to ORS 238.697(1)(b) (the “Report”).

In connection with the issuance of pension obligation bonds, the District has retained the services of SDAO Advisory Services LLC, an independent municipal advisor registered with the Securities and Exchange Commission.

The Assessment is attached to this Report as Exhibit 1. Results of the Assessment are as follows:

DATE: April 15, 2021  
TO: Angie Peterman, Oregon Association of School Board Officials  
FROM: ECONorthwest  
SUBJECT: Pension Obligation Bond Analysis Executive Summary

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## Introduction

ECONorthwest recently conducted an analysis to evaluate the risks and rewards of issuance of Pension Obligation Bonds (POBs) by public employers that are part of the Oregon Public Employee Retirement System (OPERS).<sup>1</sup> For this analysis, we assumed that officials of governmental entities receiving our report are in a position to finance such bonds. Proceeds from the POBs would be added to, or used to create, side account balances to be managed in the same way as other PERS assets, by the Investment Division of the Oregon Treasury under the guidance of the Oregon Investment Council (OIC). This executive summary outlines the motivation for issuing POBs, our analytic methodology, and findings from our analysis. Additional details about the analysis are presented in our main report.

## Background

Like many other states, Oregon's PERS has seen a growing gap between the cost of PERS benefits promised to participating public employees and the funding available for those benefits, resulting in an unfunded actuarial liability (UAL). Resolving the UAL will require increasing contributions from participating public employers over a long period of time. Pension obligation bonds, if issued in an economical manner and invested in a higher yielding portfolio, can potentially improve the ability of employers to pay their share of PERS obligations to the OPERS fund. Whether or not issuance of POBs makes sense in this setting will depend upon the likely evolution of side account returns relative to true interest cost (TIC) of the POBs.

Employers may benefit if the TIC of a bond issue is low relative to the potential return opportunities of a PERS side account over the same future period as the bond issues. However, this outcome is by no means assured. The true interest cost of carrying the POB debt would be known, but the employer also has to consider the risks associated

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<sup>1</sup> The analysis provided in this document was developed by ECONorthwest for informational purposes only. All possible professional care was taken to prepare a realistic emulation of the likely POB side account behavior, and the OPERS procedures for accommodating POBs. State of the art modeling and statistical software was employed in this exercise. It should be recognized, however, that there are practical limits to the precision with which market and agency behavior can be modeled. The generic nature of the modeling performed may or may not be relevant to the circumstances of any one public employer. Additionally, nothing herein should be construed as offering investment advice or fairness opinions for the purpose of issuing securities. For this, interested parties should seek out professional counsel.

with committing future revenue paying to the POB debt. In addition, the future rate of returns to side account deposits are not known with certainty.

Portfolio allocation and other decisions made by the OIC influence the performance of the OPERS assets, as can the timing of the issuance of POBs. The primary determinants of the risk to POB issuers are (1) uncertainty in the performance of the asset classes that comprise the side account, (2) asset allocation choices made by the trustees of that account, and (3) the interactions of these factors with the POB strategy of the public employer(s).

To quantify these risks, our analysis models side account performance over time under various market conditions and bond issuance scenarios. The results quantify the potential risks and rewards of POBs under the assumed conditions.

## Methodology

The model simulates side account performance using portfolio allocation targets obtained from OIC documents, and on forecasts of anticipated asset returns, based on reports from Oregon Treasury Investment Division staff, their consultants, and OPERS actuaries. We combine this information with assumptions about side account management. Specifically, we assume:

1. Side account balances are amortized at a constant share of payroll over the remaining life of the side account (assumed to expire on 12/31/2039, during fiscal year 2040).
2. Funds equal to the relevant percent of payroll are removed from the account as employer rate relief.
3. Earnings on side account deposits are credited annually.

To characterize the distribution of potential benefits to employers of POB issuance, we conduct 20,000 simulations of side account performance over the life of the account for each of four assumed POB TICs (2.5 percent, 3.5 percent, 4.5 percent, and 5.5 percent).<sup>2</sup> Each simulation represents a different, potential future path of account returns over time. For each simulation, we compare the benefits provided to employers in the form of rate relief to the cost of bond repayment. In doing so, we quantify two important measures of risk and reward:

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<sup>2</sup> The fourth TIC of 5.5% was not modeled in our original report. In lieu of updated market projections (anticipated to be available from OIC in June, 2021), the additional scenario provides an alternative means to evaluate the potential risk of less-favorable future market conditions relative to those anticipated in our original report.

- **The present value (PV) of POB issuance.** This measure identifies the current value to employers of future benefits of POB issuance (the extent to which rate relief obtained exceeds bond repayments).
- **The probability that PV is greater than zero.** This measure of risk identifies the likelihood, given the assumptions in the model, that the current value of POB issuance would prove beneficial to the employer (if PV falls below zero, POB issuance is more costly to the employer than not issuing bonds).

## Summary of findings

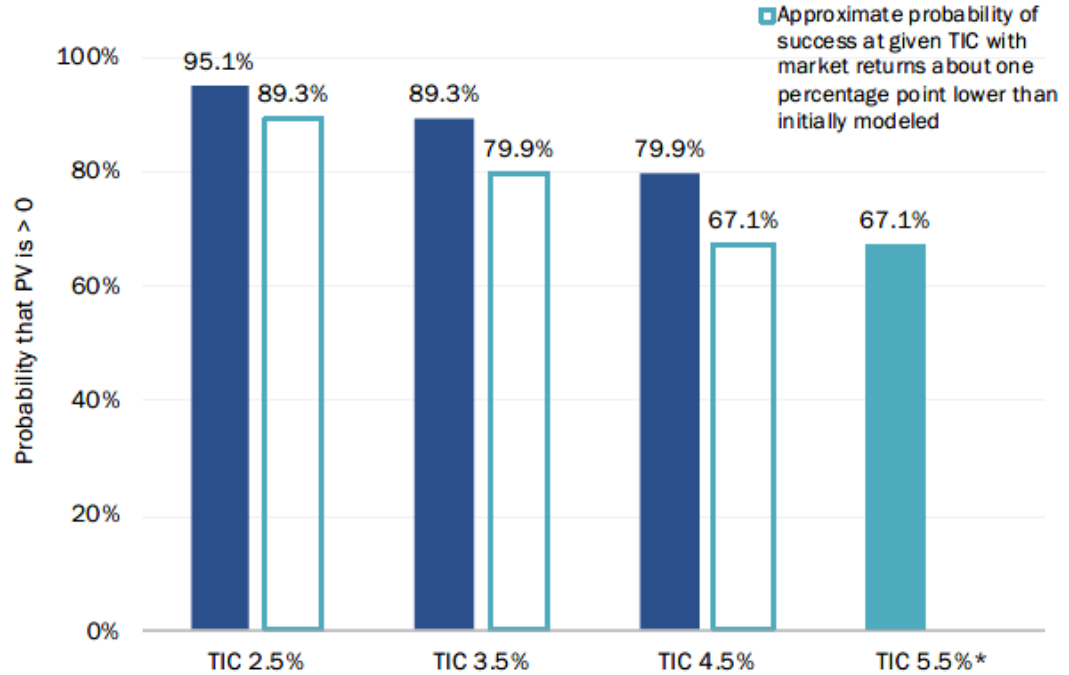
The findings presented below refer to an initial side account deposit of \$1 million. The results can be scaled to approximate the potential risks and rewards of larger or smaller deposits. For example, a \$2 million deposit would generate a benefit or loss of two times the dollar amounts shown in the charts and tables below. The probability that the PV is greater than zero depends on the TIC, not on the size of the initial deposit.

We added a fourth TIC of 5.5% to the analysis to help evaluate the potential risk associated with less-favorable future market conditions that may be projected in updated market information (anticipated to be available from OIC in June, 2021) relative to those anticipated in our original report. Output from the new scenario provides an approximate characterization of the potential risk inherent in less favorable market conditions than those modeled in the original report. For example, the 5.5% TIC scenario output is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output.

Our analysis assumes a maturity date for the bonds in fiscal year 2040. The projected annualized geometric mean return over the term of the bonds is 7.1, with a 5<sup>th</sup> percentile annualized return of 3.9 percent and a 95<sup>th</sup> percentile annualized return of 10.6 percent.

Figure 1 shows the probability that the present value of POB issuance is greater than zero. As the chart demonstrates, this probability declines as TIC increases. The solid bars show this probability for each TIC as initially modeled. The outlined bars show these probabilities based on our approximation of less favorable market conditions (e.g., at a TIC of 3.5%, the probability of a present value greater than zero is approximated by the modeled probability for a TIC of 4.5%).

**Figure 1: Probability that the present value of POB issuance is greater than zero, various TICs**



Source: ECONorthwest

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.

Figure 2 illustrates the range (5<sup>th</sup> percentile, median, and 95<sup>th</sup> percentile) of present values obtained from the simulations for each TIC. This distribution shifts downward as TIC increases. At 2.5 percent TIC, the 5<sup>th</sup> percentile present value is close to zero. At 4.5 percent TIC the 5<sup>th</sup> percentile outcome is below zero and equal in magnitude to 16 percent of the initial deposit. For the additional 5.5 percent TIC scenario, at the 5<sup>th</sup> percentile the outcome is below zero and equal in magnitude to 22 percent of the initial deposit. These values, in combination with the probabilities described above, quantify some of the financial risks of POB issuance.

**Figure 2: 5<sup>th</sup> percentile, mean, and 95<sup>th</sup> percentile present value, various TICs**



Source: ECONorthwest

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.

Figure 3 provides additional detail about the distribution of outcomes. As illustrated in earlier figures, outcomes at every point in the distribution are more positive at lower TICs. Present values are also somewhat more volatile at lower TICs, as evidenced by the higher standard deviations.

**Figure 3: Distribution of present value and probability of a positive present value, various TICs**

Rate (TIC)	2.5%	3.5%	4.5%	5.5%*
Mean	\$548,932	\$402,262	\$274,215	\$162,064
Std Deviation	\$419,122	\$370,750	\$329,071	\$293,051
Maximum	\$3,393,617	\$2,967,149	\$2,592,638	\$2,262,810
Minimum	\$(336,091)	\$(385,105)	\$(428,435)	\$(466,879)
95th Perc	\$1,322,700	\$1,088,074	\$882,791	\$703,077
90th Perc	\$1,104,226	\$893,399	\$709,810	\$548,797
75th Perc	\$770,245	\$599,774	\$450,156	\$320,087
50th Perc	\$480,961	\$342,299	\$220,903	\$114,852
25th Perc	\$248,540	\$136,280	\$38,418	\$(47,779)
10th Perc	\$85,882	\$(8,851)	\$(91,354)	\$(163,865)
5th Perc (VaR)	\$2,913	\$(82,433)	\$(157,047)	\$(222,771)
<b>Zero Bound Perc</b>	<b>95.1%</b>	<b>89.3%</b>	<b>79.9%</b>	<b>67.1%</b>

Source: ECONorthwest

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.

**Exhibit 1**  
**Assessment**

**Issuance of Pension  
Obligation Bonds**  
*A Risk/Reward Analysis*

Update

April 15, 2021

**Randall J. Pozdena, PhD**  
**Andrew Dyke, PhD**

**ECONorthwest**  
ECONOMICS • FINANCE • PLANNING



# Introduction



## Outline of Our Remarks

- Introduction
  - Basics of Pension Obligation Bonds (POBs)
  - Purpose of this Analysis
- Approach
  - Monte Carlo Methodology
  - Asset Return and Allocation Assumptions
  - Alternative Scenarios Modeled
- Model Findings
  - Side Account Performance and the Potential Benefits of POBs to Employers
- Implications
- Acknowledgements, Caveats and Disclaimers

This analysis was prepared to assist issuers of POBs in understanding the risks and returns of POBs under hypothetical conditions. Individuals should seek professional guidance concerning the relevance of this analysis to their circumstances.

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## Basics of POBs

- POBs are bonds issued by state or local governments to fund public employee pension obligations
  - First issued by City of Oakland in 1986 to arbitrage between tax-exempt borrowing rates and higher market investment yields of pension assets
- The Tax Reform Act of 1986 eliminated tax exemption for POBs
  - Higher yields of diversified portfolios relative to borrowing costs revived POB arbitrage opportunities in 1990s
- Still seen as a potential way to lower cost of pension funding
  - Use is heaviest by high-UAL plans (CA, IL, and OR)

This analysis was prepared to assist issuers of POBs in understanding the risks and returns of POBs under hypothetical conditions. Individuals should seek professional guidance concerning the relevance of this analysis to their circumstances.

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## Purpose of this Analysis

- Measure the potential risks and rewards of POBs
- The potential advantages of POBs to public employers depend upon the relative performance of the investment vehicle (“side account”) and POB issuance costs
  - Issuance of POBs may reduce employer costs of pension funding
  - However, high side account yields are not achieved without risk
- Key measures of POB performance
  - The mean expected net present value (PV) of side account returns relative to POB total interest costs
  - The risk profile of the PV given uncertainty about side account returns
- This update includes a fourth TIC of 5.5% that was not modeled in the original report. In lieu of updated market projections (anticipated to be available from OIC in June, 2021), the additional scenario provides an alternative means to evaluate the potential risk of less-favorable future market conditions relative to those anticipated in our original report.

This analysis was prepared to assist issuers of POBs in understanding the risks and returns of POBs under hypothetical conditions. Individuals should seek professional guidance concerning the relevance of this analysis to their circumstances.

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# Approach



## Approach: Monte Carlo Simulation

- Quantifying advantages to issuers is complex
  - The future path of asset yields is not known precisely
  - Side account management and actuarial treatment of POB contributions must be emulated
- ECONorthwest uses Monte Carlo techniques to simulate uncertainty in side account performance
  - Individual asset class returns are stochastic
  - Rebalancing behaviors are linked to asset returns paths
- ECONorthwest POB model also emulates POB and Plan features
  - Alternative Total Interest Cost (TIC) of the POB issue
  - Actuarial treatment of POB contributions

This analysis was prepared to assist issuers of POBs in understanding the risks and returns of POBs under hypothetical conditions. Individuals should seek professional guidance concerning the relevance of this analysis to their circumstances.

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## Model Assumptions

- Four issuance cost (TIC) assumptions: 2.5%, 3.5%, 4.5%, 5.5%\*
- Our analysis uses the portfolio target and asset returns characteristics forecast for the OIC/OST in February 2020 by Callan, an investment consultant to OST.
- Current allocation based on OPERF valuation as of 10/31/2020.
- All analyses assume a \$1 m. total POB contribution to facilitate scaling.
- Present value calculations include calculated earnings through December 2039 (assumed end of the side account) and bond costs through 2040.

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report.

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# Asset Return and Allocation Assumptions

Asset Class	Future Returns and Volatility		Portfolio Allocation		
	Mean	St. Dev.	Range	Target	Current*
All Public Equity	--	--	27.5 - 37.5%	32.5%	29.3%
Broad U.S. Equity	7.2%	18.0%	--	16.3%	14.7%†
Global ex-U.S. Equity	7.3%	20.5%	--	16.3%	14.7%†
Illiquid alternatives	7.4%	12.5%	7.5 - 17.5%	15.0%	10.6%
Diversifying Strategies	6.0%	11.0%	0 - 5.0%	0.0%	2.1%
Fixed Income	2.8%	3.8%	15.0 - 25.0%	20.0%	20.2%
Private Equity	9.2%	26.3%	13.5 - 21.5%	17.5%	24.8%
Real Estate	7.0%	12.2%	9.5 - 15.5%	12.5%	11.0%
Risk Parity	6.3%	11.0%	0.0 - 2.5%	2.5%	2.0%

Source: ECONorthwest from Callan and OST data.

Notes:

\* Current allocation is based on 10/31/2020 valuation.

† Values have been imputed using target allocations.



# Asset Return and Allocation Assumptions

**Asset Class Returns Correlation over Time**

Asset Class	Broad US Equity	Global Ex-US Equity	Private Equity	Fixed Income	Real Estate	Illiquid Alternatives	Diversifying Strategies	Risk Parity
Broad US Equity	1.00	0.85	0.92	-0.11	0.69	0.43	0.23	0.55
Global Ex-US Equity	0.85	1.00	0.88	-0.14	0.66	0.40	0.20	0.55
Private Equity	0.92	0.88	1.00	-0.23	0.77	0.55	0.15	0.40
Fixed Income	-0.11	-0.14	-0.23	1.00	-0.06	0.02	0.15	0.45
Real Estate	0.69	0.66	0.77	-0.06	1.00	0.56	0.20	0.54
Illiquid Alternatives	0.43	0.40	0.55	0.02	0.56	1.00	0.17	0.29
Diversifying Strategies	0.23	0.20	0.15	0.15	0.20	0.17	1.00	0.33
Risk Parity	0.55	0.55	0.40	0.45	0.54	0.29	0.33	1.00

## Amortization Assumptions

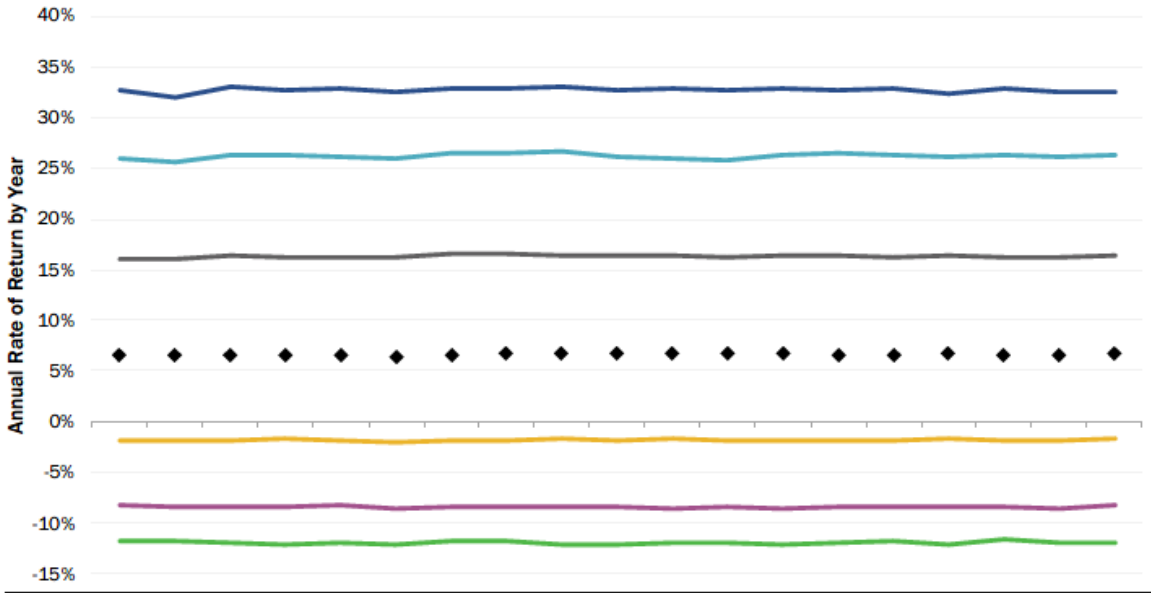
- Side account balances are influenced by amortization procedures
  - Balances amortized as a constant percent of payroll over remaining life of the side account (the account is assumed to end on 12/31/2039)
  - Each year, the percent of payroll that is determined by the amortization is taken out of the modeled side account balance for employer rate relief
  - Assumed earnings rate of 7.2% and 3.50% payroll growth rate are used in amortization
- Current plan procedures are incorporated:
  - Credited earnings and deducted transfers to the Employer Reserve for rate relief are accommodated
- Earnings are credited annually at the simulated portfolio rate of return
  - Applied to the beginning balance for the year minus one half of the amount taken out for rate relief

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# Model Results



# Mean Annual Side Account Return and Range

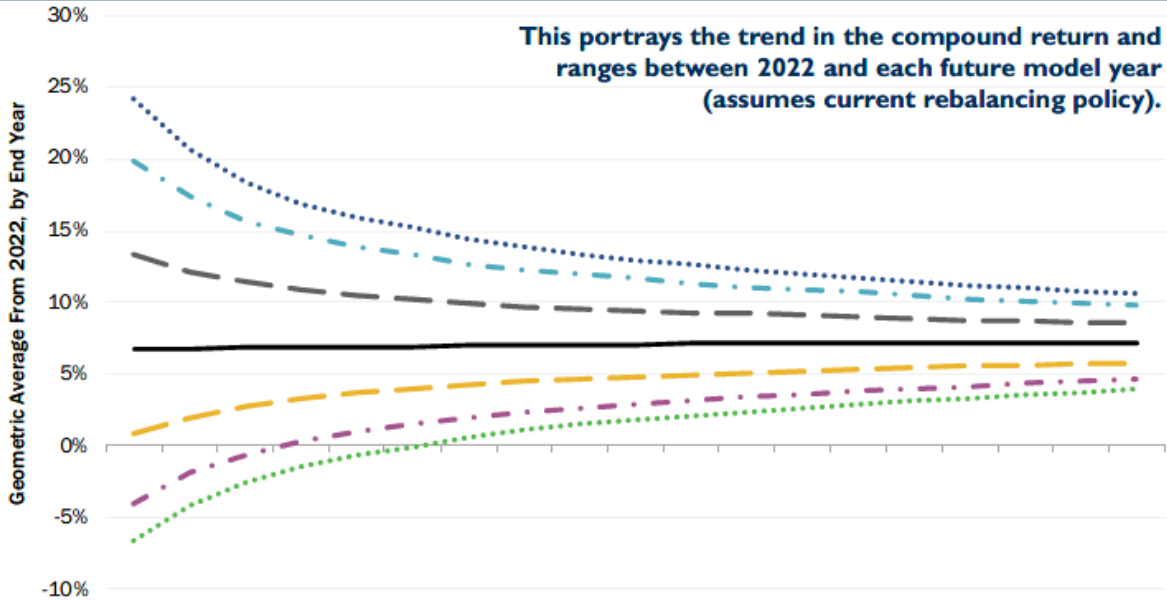


Percentile	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
95th	32.7%	32.0%	33.0%	32.8%	32.8%	32.5%	32.9%	32.9%	33.0%	32.7%	32.8%	32.7%	33.0%	32.7%	32.8%	32.4%	32.9%	32.5%	32.5%
90th	25.9%	25.6%	26.3%	26.2%	26.1%	25.9%	26.4%	26.5%	26.7%	26.1%	25.9%	25.8%	26.3%	26.4%	26.3%	26.1%	26.3%	26.2%	26.4%
75th	16.1%	16.0%	16.3%	16.3%	16.3%	16.2%	16.5%	16.5%	16.5%	16.4%	16.4%	16.3%	16.5%	16.3%	16.2%	16.4%	16.2%	16.2%	16.4%
50th	6.6%	6.5%	6.5%	6.6%	6.6%	6.3%	6.6%	6.7%	6.8%	6.7%	6.7%	6.7%	6.7%	6.6%	6.6%	6.7%	6.6%	6.6%	6.7%
25th	-1.8%	-1.8%	-1.9%	-1.7%	-1.8%	-2.0%	-1.8%	-1.8%	-1.7%	-1.8%	-1.7%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%	-1.8%	-1.7%
10th	-8.3%	-8.4%	-8.3%	-8.5%	-8.3%	-8.5%	-8.4%	-8.4%	-8.4%	-8.4%	-8.5%	-8.4%	-8.5%	-8.3%	-8.4%	-8.4%	-8.4%	-8.5%	-8.2%
5th	-11.7%	-11.8%	-12.0%	-12.1%	-12.0%	-12.1%	-11.8%	-11.8%	-12.1%	-12.2%	-12.0%	-12.0%	-12.1%	-11.9%	-11.8%	-12.0%	-11.6%	-11.9%	-11.9%

## Mean Annual Side Account Returns (cont.)

- The forecast extends to fiscal year 2040, the last year the side account exists
  - Trend in mean annual return
    - Increase from 6.6% in 2022 to 6.7% as of the 2040 forecast horizon
  - Trend in 95<sup>th</sup> percentile return
    - Decreases from 32.7% in 2022 to 32.5% as of the 2040 forecast horizon
  - Trend in 5<sup>th</sup> percentile return
    - Decreases from -11.7% in 2022 to -11.9% as of the 2040 forecast horizon
- Trends are similar to recent forecasts by consultants to OIC/OST and OPERS

# Geometric Mean Returns from 2022, by Year



Percentile	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
95th	24.2%	20.6%	18.4%	16.9%	15.9%	15.2%	14.4%	13.8%	13.4%	13.0%	12.6%	12.3%	12.0%	11.7%	11.4%	11.2%	11.0%	10.8%	10.6%
90th	19.8%	17.4%	15.7%	14.6%	13.9%	13.3%	12.7%	12.3%	11.9%	11.7%	11.3%	11.1%	10.9%	10.7%	10.5%	10.2%	10.1%	9.9%	9.8%
75th	13.3%	12.1%	11.4%	10.9%	10.5%	10.2%	10.0%	9.7%	9.6%	9.4%	9.3%	9.2%	9.1%	8.9%	8.9%	8.8%	8.7%	8.6%	8.5%
50th	6.7%	6.8%	6.8%	6.9%	6.9%	6.9%	7.0%	7.0%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%
25th	0.8%	2.0%	2.7%	3.3%	3.7%	4.0%	4.2%	4.5%	4.6%	4.8%	4.9%	5.1%	5.2%	5.3%	5.4%	5.5%	5.6%	5.7%	5.8%
10th	-4.0%	-1.9%	-0.6%	0.3%	1.0%	1.5%	1.9%	2.3%	2.6%	2.9%	3.2%	3.4%	3.6%	3.8%	4.0%	4.1%	4.3%	4.4%	4.6%
5th	-6.7%	-4.1%	-2.5%	-1.5%	-0.6%	0.0%	0.6%	1.1%	1.5%	1.8%	2.1%	2.4%	2.6%	2.9%	3.1%	3.3%	3.5%	3.7%	3.9%

## Geometric Mean Returns (cont.)

- Fiscal year 2040 is the assumed final year of bonds
  - The projected annualized geometric mean return over the term of the bonds is 7.1%
  - The 95<sup>th</sup> percentile return is 10.6%
  - The 5<sup>th</sup> percentile return is 3.9%
- Again, the forecast returns are similar to those derived by other consultants to OIC and OPERS

## The Effect of Issuance TIC on PV of POBs

- The PV of the POB strategy varies inversely with TIC
  - Expected value of POB policy is \$548,932, \$402,262, \$274,215, and \$162,064 (per million dollars) for TICs of 2.5%, 3.5%, 4.5%, and 5.5%, respectively.
- Also, 5<sup>th</sup> percentile VaR increases with TIC
  - VaR per million dollars is \$(2,913), \$82,433, \$157,047, and \$222,771 (per million dollars) for TICs of 2.5%, 3.5%, 4.5%, and 5.5%, respectively.
- We added a fourth TIC of 5.5% to the analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report.
- Output from the new scenario provides an approximate characterization of the potential risk inherent in less favorable market conditions than those modeled in the original report.
- For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.

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# The Effect of TIC on PV of POBs

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.



## POB Probability of Success: $PV > \$0$

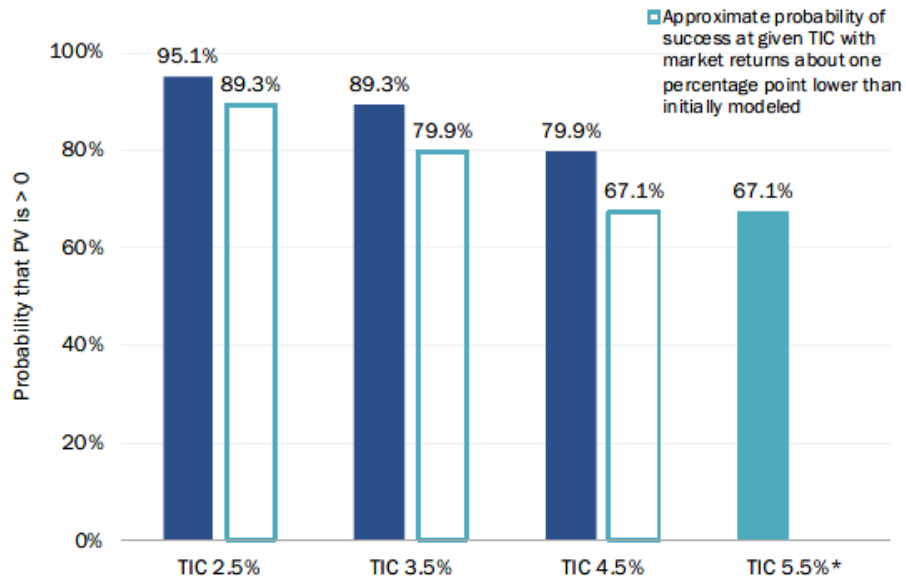
- This is another perspective on risk
  - The VaR measures the 5<sup>th</sup> percentile dollar value at risk
  - The zero bound measures the overall probability of the dollar value of the PV benefit being more than zero (i.e., success)
  
- Model results
  - The probability of a positive PV is lower for higher TICs
  - Probabilities of being above zero range from 67% (TIC 5.5%\*) to 95% (TIC 2.5%)

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.

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# Probability that PV is More than \$0

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.



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## Summary PV Statistics, by Scenario

\*The fourth TIC of 5.5% was added to our analysis to help evaluate the potential risk associated with less-favorable future market conditions relative to those anticipated in our original report. For example, the 5.5% TIC scenario provides output that is roughly analogous to a 4.5% TIC bond issue with market returns approximately one percentage point below those anticipated in our original analysis. The 4.5% TIC scenario can be similarly compared to the 3.5% TIC scenario output, and so on.

No. of Tranches	1	1	1	1
Rate (TIC)	2.5%	3.5%	4.5%	5.5%*
Mean	\$548,932	\$402,262	\$274,215	\$162,064
Std Deviation	\$419,122	\$370,750	\$329,071	\$293,051
Maximum	\$3,393,617	\$2,967,149	\$2,592,638	\$2,262,810
Minimum	\$(336,091)	\$(385,105)	\$(428,435)	\$(466,879)
95th Perc	\$1,322,700	\$1,088,074	\$882,791	\$703,077
90th Perc	\$1,104,226	\$893,399	\$709,810	\$548,797
75th Perc	\$770,245	\$599,774	\$450,156	\$320,087
50th Perc	\$480,961	\$342,299	\$220,903	\$114,852
25th Perc	\$248,540	\$136,280	\$38,418	\$(47,779)
10th Perc	\$85,882	\$(8,851)	\$(91,354)	\$(163,865)
5th Perc (VaR)	\$2,913	\$(82,433)	\$(157,047)	\$(222,771)
Zero Bound Perc	95.1%	89.3%	79.9%	67.1%

**This table summarizes the simulations of the present value of potential gains from implementing a POB strategy. All dollar amounts are per \$1 million of POB funding.**

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## Conclusions

- The expected value to employers of a POB strategy is positive (in present value terms)
  - The expected value is non-trivial proportion of POB funding under the scenarios modeled
  - The 5<sup>th</sup> percentile VaR is less than the expected PV in all of the scenarios modeled except for the 2.5% TIC scenario.
- However, there is a non-trivial probability that the present value of POBs is zero or less, and the probability increases with TIC
- Important considerations for individual employers
  - The issuance TIC
  - Some issuance costs are not included in TIC
  - Whether the employer's payroll growth rate is the same as currently assumed by the PERS actuary

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## Acknowledgements, Caveats, and Disclaimers

The authors wish to acknowledge the kind assistance of Mike G Mueller of the Oregon State Treasury, Investment Division for their kind assistance, and for Callan and Associates staff's generous provision of capital market assumptions. We also wish to thank Carol Samuels of Piper Sandler & Co. for her assistance in providing insight into muni market conditions. Finally, a note of gratitude to Carl Batten, original developer of the ECONorthwest POB model, for his ongoing assistance with subsequent iterations of the model, including the version used in this analysis. None of the statements or analysis herein should be attributed to anyone other than ECONorthwest staff.

The analysis provided in this document was developed by ECONorthwest for informational purposes only. All possible professional care was taken to prepare a realistic emulation of the likely POB side account behavior, and the OPERS procedures for accommodating POBs. State of the art modeling and statistical software was employed in this exercise. It should be recognized, however, that there are practical limits to the precision with which market and agency behavior can be modeled. The generic nature of the modeling performed may or may not be relevant to the circumstances of any one public employer. Additionally, nothing herein should be construed as offering investment advice or fairness opinions for the purpose of issuing securities. For this, interested parties should seek out professional counsel.

This analysis takes the narrow perspective of measuring the potential benefits of POB issuance to current employers and taxpayers. Whether use of pension obligation bonds is good public policy is a matter of professional debate and is not addressed herein.

This analysis was prepared to assist issuers of POBs in understanding the risks and returns of POBs under hypothetical conditions. Individuals should seek professional guidance concerning the relevance of this analysis to their circumstances.

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