Midwest Economy

ILLINOIS, PUBLIC FINANCE

How Should the State of Illinois Pay for its Unfunded Pension Liability? The Case for a Statewide Residential Property Tax

MAY 7, 2018 | THOMAS HAASL | RICK MATTOON | THOMAS WALSTRUM | LEAVE A COMMENT

Note: This post is based on previous work presented by the same authors at the forum "Navigating Pension Reform in Illinois: What Lies Ahead", held on April 17, 2018 at the Chicago Fed. The original presentation is available here.

The State of Illinois has a very large unfunded pension liability and will likely have to pay much of it off by raising taxes. The Illinois Commission on Government Forecasting and Accountability estimated the state's unfunded liability at $129.1 billion in mid-2017,[1] which was about 19% of state personal income.[2] Benefits to public employees are protected under the Illinois Constitution, and a recent attempt to reduce the unfunded liability by reducing retirees' benefits was struck down by the Illinois Supreme Court.[3] So, assuming that the state can't reduce its current pension obligations and that it wants to maintain its current level of services, Illinois residents are going to have to pay higher taxes. What's the best way to do it?

Because the debt is so large, it's unrealistic to think that new taxes (such as a tax on legalized marijuana or financial transactions) or increases that affect only a narrow segment of the population will be enough.

Illinois will have to find additional revenues from already existing tax bases, either by increasing rates, expanding the definition of what is taxable, or a combination of the two.[4] Illinois state and local governments have three primary tax revenue sources—income, sales, and property—and each presents a unique set of tradeoffs in terms of how it affects the economy and who pays it.

In our view, Illinois's best option is to impose a statewide residential property tax that expires when its unfunded pension liability is paid off. In our baseline scenario, we es-

timate that the tax rate required to pay off the pension debt over 30 years would be about 1%. This means that homeowners with homes worth $250,000 would pay an additional $2,500 per year in property taxes, those with homes worth $500,000 would pay an additional $5,000, and those with homes worth $1 million would pay an additional $10,000.

Perhaps the best counterargument to adding a statewide property tax is that Illinois homeowners already pay higher local property taxes compared to the national average.[5] But remember that Illinois residents will be paying higher taxes one way or another. Would you rather pay your higher taxes through a higher sales, income, or property tax? At the very least, higher property taxes should be part of the solution, perhaps in addition to the solutions proposed by the Civic Federation.

There are several good reasons to pay off Illinois's pension debt through a statewide residential property tax:

- *Fairness:* Illinois residents who have benefited most from the past services of governmental employees are more likely to be homeowners, so it seems reasonable that they should pay a larger share of the costs.
- *Efficiency:* Standard economic theory predicts that home values go down in response to new property taxes (that is, they are "capitalized" into home values). Current homeowners would not be happy about this, but it would be a good result for the Illinois economy. That's because the new taxes wouldn't affect people thinking of moving to Illinois. While they would have to pay higher property taxes, that would be offset by not having to pay as much for their new homes. In addition, current homeowners would not be able to avoid the new tax by selling their homes and moving because home prices should reflect the new tax burden quickly. (We included this "tax penalty" effect in our calculations below.)
- *Transparency:* The payment amounts and duration of the tax would be known in advance.
- *Certainty:* The property tax would be dedicated solely to paying for the state's unfunded pension liability.
- *Equity:* Wealthier people would pay more. The plan could also be modified so that the tax rate is graduated rather than flat (for example, by exempting the first $50,000 of home value or exempting households with incomes below a certain threshold).

Do Illinois homeowners have the ability to pay these larger tax bills? Our calculations suggest that, even under the best-case scenario, the additional tax bill is quite high, and some households would certainly struggle to pay it. But given the choice between paying off the debt via higher income, sales, or property taxes, we maintain that the

property tax is the best of three painful options.

A model of the property tax rate required to pay the pension debt

We calculated what the fixed statewide residential property tax rate would have to be in order to pay off the pension debt in 40 or fewer years.

First we must understand how the unfunded liability is calculated and how it changes over time. The unfunded liability is the discounted present value of all future payments made to pensioners and it's calculated using a discount rate equal to the expected return on the assets in the pension system's portfolio. This means that the higher the expected return, the lower the value of the unfunded liability. It also means that if the unfunded liability is not paid down, it grows every year at the pension system's expected rate of return. For our scenarios, we assume that going forward, the state of Illinois fully pays the new normal costs of the pension system from other funding sources, so that the value of the unfunded liability is a function solely of the pension system's expected returns and payments made to reduce the liability. Equation (1) in figure 1 shows that the liability at time is the liability from the previous year times the pension fund's expected rate of return, less any payments made to reduce the liability.

Next we must calculate what the payment should be in each year. To do this, we allowed the size of the payment to change over time, while holding the tax rate constant. As shown in equation (2) of figure 1, the payment is the fixed tax rate times the size of the tax base at time , which in our case is the total market value of all residential property in Illinois.

While the tax rate is fixed, the value of the tax base can change over time, for two reasons: 1) home values (adjusted for inflation) tend to rise over time; and 2) property taxes reduce home values. Equation (3) of figure 1 shows that we assume a constant growth rate of home values in Illinois and that we apply a property tax penalty to the value of the base. The penalty has a complex formula (shown in equation (4)) that is a function of the tax rate and the real interest rate and represents the discounted present value of the future property tax liabilities.[6] The penalty is largest when the property tax is first implemented and declines as the end of the property tax gets closer.

Figure 1. Model of Tax Rates Used to Pay Off the Unfunded Pension Liability

$$Liability_t = Liability_{t-1} \cdot (1 + Expected\ Return) - \text{Pay}_t \quad (1)$$

$$Pay_t = Tax\ Rate \cdot Base_t \quad (2)$$

$$Base_t = Base_0 \cdot (1 + Growth\ Rate)^t \cdot Tax\ Penalty_t \quad (3)$$

$$Tax\ Penalty_t = \left(1 + \frac{1-(1+r)^{-(T-t+1)}}{r} \cdot Tax\ Rate\right)^{-1} \quad (4)$$

To derive the required tax rate, we must make assumptions about each of the parameters in our model. And since we are forecasting many years into the future, there is substantial uncertainty about what these parameters should be. For example, we do not know whether the expected return assumed by the pension funds is right or what the growth rate of the property tax base will be. To account for the uncertainty, we calculate rates for three scenarios—baseline, low, and high. In these scenarios, we vary two of the parameters: the number of years it takes to pay off the pension debt and the secular growth rate of the tax base.

Figure 2 shows the assumptions for the parameters in our model and the rates that result from our baseline, low, and high rate scenarios. In the baseline scenario, the unfunded liability is paid off over 30 years, and we assume that property values grow at an inflation-adjusted rate of 1% per year, which is close to the average growth rate of property values in Illinois since 1990. In the low rate scenario, we assume property values grow at 2% and allow for the unfunded liability to be paid off over 40 years. And in the high rate scenario, we assume no secular growth in real property values and that the liability must be paid off in 20 years. The resulting tax rates required to pay off the liability are 1.04% (baseline), 0.77% (low), and 1.45% (high). See the appendix for more details on how the tax base, payments, and unpaid liability evolve over time under the three scenarios.

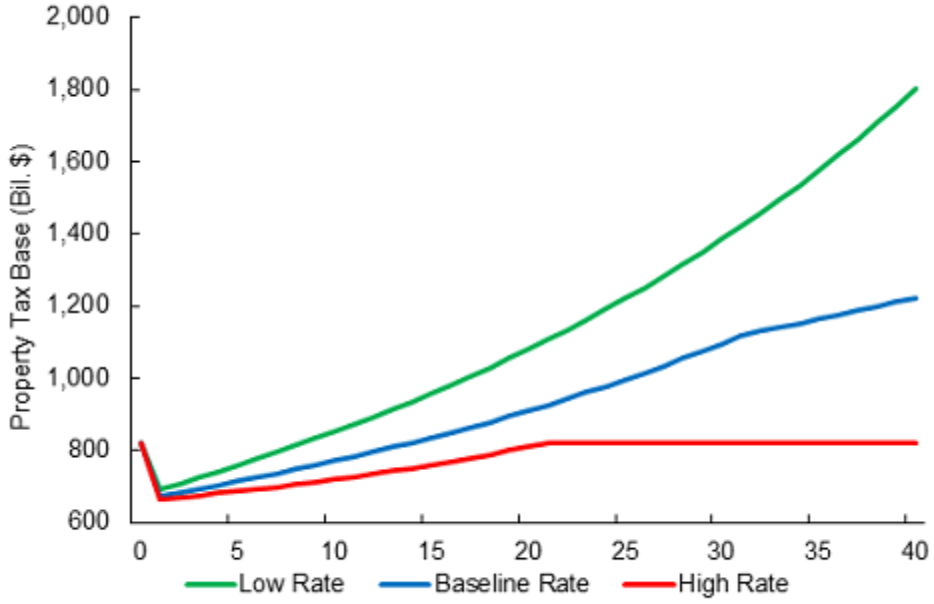
Figure 2. Model Assumptions and Tax Rates by Scenario

	Baseline Rate	Low Rate	High Rate
Unfunded liability	$129bn	$129bn	$129bn
Expected return on pension assets	5%	5%	5%
Residential property base	$828bn	$828bn	$828bn
Duration of the tax	30	40	20
Real secular growth rate of home values	1%	2%	0%
Real interest rate	2%	2%	2%
Property tax rate	1.04%	0.77%	1.45%

Notes: Our assumptions about the value of the liability and the expected return on assets are what the pension funds themselves assume. See Commission on Government Forecasting and Accountability. (2018). Report on the Financial Condition of the Illinois State Retirement Systems FY 2017. Retrieved from: http://cgfa.ilga.gov/Resource.aspx?id=5#. For Cook County, we use estimates of the market value of residential property calculated by the Civic Federation as of 2015. Outside of Cook County, we use assessed values from the Illinois Department of Revenue multiplied by three, because homes are assessed at one-third of market value in these areas. We then inflate our estimate of the total market value in 2015 by the growth rate of the FHFA House Price Index for Illinois for 2015–17 to arrive at a total market value for 2017.
Sources: Authors' calculations based on data from the Civic Federation, Illinois Department of Revenue, and Federal Housing Finance Agency accessed via Haver Analytics.

Figure 3 shows the tax base paths for our three scenarios. Initially, in all three scenarios, the value of the base declines by nearly 20% as home values adjust to reflect the new higher property tax liability that homeowners must pay. This tax penalty gradually goes away as the unfunded liability is paid off. In the high rate scenario, the value of the base is solely a function of the tax penalty since we assume that there is no secular increase in home values. Consequently, the base returns to its initial value once the liability is completely paid off. In contrast, under the baseline and low rate scenarios, the base rises at a fixed rate, so that the base returns to its initial value after eight years (high rate) or 14 years (baseline).

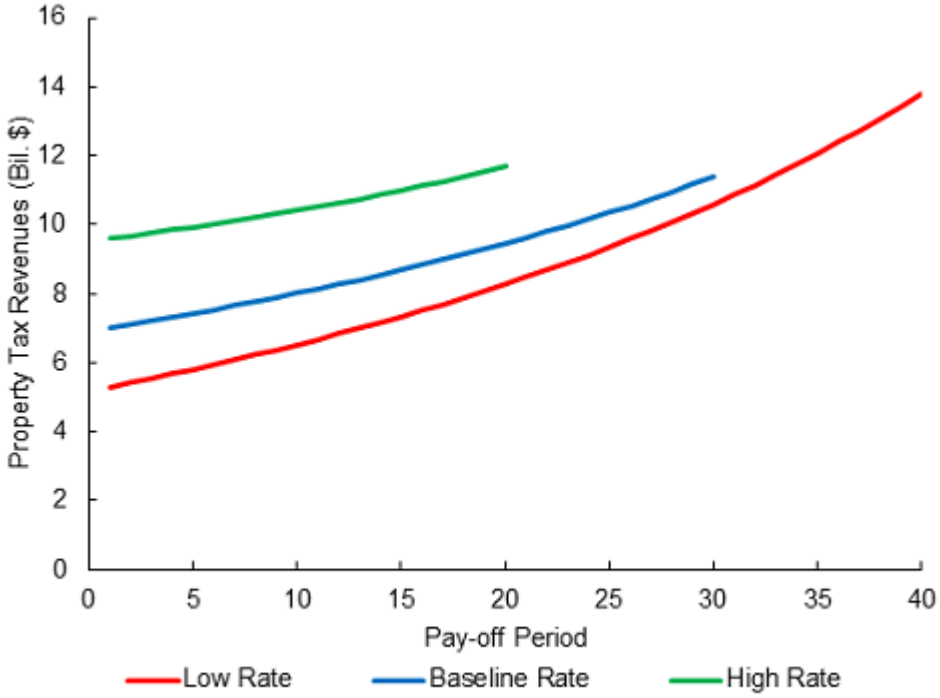
Figure 3. Tax Base by Scenario



Sources: Authors' calculations based on data from the Civic Federation and Illinois Department of Revenue.

Figure 4 shows the revenue collection paths. While the tax rate is constant, because property values rise over time, a greater share of the pension debt is paid off in later years (unlike a mortgage, where the amortized payment is constant over time). This is ideal because higher property values mean homeowners are wealthier and can afford to pay more.

Figure 4. Tax Revenues by Scenario



Sources: Authors' calculations based on data from the Civic Federation and Illinois Department of Revenue.

Costs to homeowners

What would these rates mean for Illinois homeowners in terms of an *initial* yearly tax burden increase? We picked a handful of representative cities in Illinois and calculated how the new property tax would affect each city's median-value homeowner. Figure 5 shows the results. As an example, the median home in Chicago is worth $200,000 and its current property tax bill is $3,320. Under the baseline scenario, the median Chicago homeowner would pay an additional $2,079 in the first year of the new tax. Under the low rate scenario, the tax bill would be $1,531 higher, and under the high rate scenario, it would be $2,890 higher.

Current property tax rates vary substantially across these five cities. For the median Chicago and Lake Forest homeowner, it is 1.7%, versus 4.4% for the median Waukegan homeowner. In our calculations, the rate goes up by the same amount regardless of a homeowner's current effective rate, so in percentage terms, homeowners in Chicago and Lake Forest would experience a much larger increase in their tax bills. Under the baseline scenario, the tax rate would rise by 62% for the median Lake Forest homeowner, compared with 24% for the median Waukegan homeowner.

On the one hand, our effective rate calculations suggest that the median Waukegan homeowner would have a smaller property tax increase. But on the other hand, our calculations suggest that the median Waukegan homeowner is already substantially more tax-burdened than the median Lake Forest homeowner. And in terms of housing wealth, Waukegan homeowners are much less well off than Lake Forest homeowners and likely less able to pay the additional property taxes. So it may make sense for a statewide property tax to be progressive. One way to do this would be to exempt the first $50,000 of home value from the tax (we will explore this and other possibilities in future work).

5. Current and Initial Additional Tax Burdens by City and Scenario

	Median Home Value ($)	Current Tax Bill ($)	Additional Taxes ($)		
			Low	Baseline	High
Waukegan	119,000	5,212	911	1,237	1,720
Elgin	185,000	5,754	1,416	1,923	2,673
Chicago	200,000	3,320	1,531	2,079	2,890
Oak Park	431,000	12,758	3,300	4,480	6,228
Lake Forest	832,000	13,894	6,370	8,648	12,023
	Median Home Value ($)	Current Effective Rate	Percent Increase in Effective Rate		
			Low	Baseline	High
Waukegan	119,000	4.4%	17%	24%	33%
Elgin	185,000	3.1%	25%	33%	46%
Chicago	200,000	1.7%	46%	63%	87%
Oak Park	431,000	3.0%	26%	35%	49%
Lake Forest	832,000	1.7%	46%	62%	87%

Notes: Median home values were estimated by Zillow for January 2018 using data collected through February 28, 2018. Data were retrieved April 5, 2018.
Sources: Authors' calculations based on data from Zillow, the Civic Federation and Illinois Department of Revenue.

Conclusion

Taxes will almost certainly have to go up to pay for Illinois's pension debt. What's the best way to raise them? We argue that a statewide residential property tax that expires once the debt is repaid is the most fair, efficient, and transparent of all available options. When we calculated how much taxes would have to go up, we found that the increases would be substantial even in the rosiest of scenarios. In future work, we will explore additional options for spreading the pain, including expanding the base to cover rental and commercial properties, and options for making the tax progressive.

Appendix: Scenario Tables

A1. Residential Property Tax Base and Revenues (Bil. $): Low Rate Scenario

Period	Tax Base	Payment	Unfunded Liability
0	822		129.1
1	693	5.3	130.2
2	709	5.4	131.3
3	725	5.6	132.3
4	742	5.7	133.3
5	759	5.8	134.1
6	777	5.9	134.9
7	795	6.1	135.6
8	813	6.2	136.1
9	833	6.4	136.5
10	852	6.5	136.8
11	872	6.7	137.0
12	893	6.8	137.0
13	914	7.0	136.9
14	936	7.2	136.5
15	958	7.3	136.0
16	981	7.5	135.3
17	1,005	7.7	134.4
18	1,030	7.9	133.2
19	1,055	8.1	131.8
20	1,080	8.3	130.1
21	1,107	8.5	128.2
22	1,134	8.7	125.9
23	1,162	8.9	123.3
24	1,191	9.1	120.3
25	1,221	9.4	117.0
26	1,252	9.6	113.3
27	1,284	9.8	109.1
28	1,316	10.1	104.5
29	1,350	10.3	99.4
30	1,385	10.6	93.7
31	1,421	10.9	87.5
32	1,458	11.2	80.8
33	1,496	11.5	73.3
34	1,535	11.8	65.3
35	1,576	12.1	56.4
36	1,618	12.4	46.9
37	1,661	12.7	36.5
38	1,706	13.1	25.3
39	1,753	13.4	13.1
40	1,801	13.8	0.0

Sources: Authors' calculations based on data from the Civic Federation, Illinois Department of Revenue, and Federal Housing Finance Agency accessed via Haver Analytics.

A2. Residential Property Tax Base and Revenues (Bil. $): Baseline Rate Scenario

Period	Tax Base	Payment	Unfunded Liability
0	822		129.1
1	673	7.0	128.6
2	683	7.1	127.9
3	693	7.2	127.1
4	704	7.3	126.1
5	714	7.4	125.0
6	725	7.5	123.7
7	736	7.7	122.2
8	748	7.8	120.6
9	759	7.9	118.7
10	771	8.0	116.6
11	784	8.1	114.3
12	796	8.3	111.8
13	809	8.4	108.9
14	822	8.5	105.8
15	836	8.7	102.4
16	850	8.8	98.7
17	864	9.0	94.7
18	879	9.1	90.3
19	895	9.3	85.5
20	910	9.5	80.3
21	926	9.6	74.7
22	943	9.8	68.6
23	960	10.0	62.1
24	978	10.2	55.0
25	996	10.4	47.4
26	1,015	10.5	39.2
27	1,034	10.7	30.4
28	1,054	11.0	21.0
29	1,075	11.2	10.9
30	1,096	11.4	0.0
31	1,119		
32	1,130		
33	1,141		
34	1,153		
35	1,164		
36	1,176		
37	1,188		
38	1,199		
39	1,211		
40	1,224		

Sources: Authors' calculations based on data from the Civic Federation, Illinois Department of Revenue, and Federal Housing Finance Agency accessed via Haver Analytics.

A3. Residential Property Tax Base and Revenues (Bil. $): High Rate Scenario

Period	Tax Base	Payment	Unfunded Liability
0	822		129.1
1	665	9.6	125.9
2	670	9.7	122.6
3	675	9.8	118.9
4	681	9.8	115.0
5	687	9.9	110.9
6	693	10.0	106.4
7	699	10.1	101.6
8	706	10.2	96.5
9	713	10.3	91.0
10	720	10.4	85.1
11	727	10.5	78.9
12	735	10.6	72.2
13	743	10.7	65.1
14	752	10.9	57.5
15	760	11.0	49.4
16	769	11.1	40.7
17	779	11.3	31.5
18	789	11.4	21.7
19	799	11.6	11.2
20	810	11.7	0.0
21	822		
22	822		
23	822		
24	822		
25	822		
26	822		
27	822		
28	822		
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33	822		
34	822		
35	822		
36	822		
37	822		
38	822		
39	822		
40	822		

Sources: Authors' calculations based on data from the Civic Federation, Illinois Department of Revenue, and Federal Housing Finance Agency accessed via Haver Analytics.

Endnotes

[1] See Commission on Government Forecasting and Accountability. (2018). Report on the Financial Condition of the Illinois State Retirement Systems FY 2017. Retrieved

from: http://cgfa.ilga.gov/Resource.aspx?id=5#.

[2] Personal income includes an individual's income from all sources, such as salaries and wages, investments, rental income, and other sources.

[3] Pearson, R., & Geiger, K. (2015, May 8). Illinois Supreme Court rules landmark pension law unconstitutional. Retrieved from: http://www.chicagotribune.com/ct-illinois-pension-law-court-ruling-20150508-story.html.

[4] For example, in July of last year Illinois increased its individual income tax rate from 3.75% to 4.95% and its corporate income tax rate from 5.25% to 7%.

[5] Property taxes are currently levied only by local governments. One way the State could effectively raise local property taxes is by reducing aid to local governments for services that primarily rely on property taxes, such as education.

[6] For more information see Yinger, J. (2018). Property Tax Capitalization. In *Housing and commuting: The theory of urban residential structure: A textbook in urban economics*. Hackensack, NJ: World Scientific Publishing Co. Pte. Ltd.