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Estimating the Net Present Value of a Pay-Go Tax Increment Financing Development Incentive

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ABSTRACT

In this paper we derive a conservative estimator for the net present value of a pay-as-you-go tax increment financing development note. We show that calculating this value can be reduced to a simple fraction of increment generated. We further provide tables for likely parameters in practice and give several examples of it use.

1. Introduction

The use of tax increment financing (TIF) has become a staple in the economic developer's toolbox in that it is one of the only incentives local taxing authorities directly control. Historically, general obligation bonds issued by the municipality were the primary instrument used to monetize the proceeds of the tax increment and provide developers up-front incentives, often times before construction on a project even began. This left the municipality, and ultimately the taxpayer, at risk if the development failed or the tax increment was insufficient to cover the debt service on the bonds.

With the pay-as-you-go (PAY-GO) approach to TIF, a municipality will issue a municipal revenue obligation (or note) to the developer upon completion of agreed upon elements of a development project. The terms of the note can vary substantially across states and municipalities. Though likely the note will stipulate that any proceeds are contingent on the availability of sufficient tax increment revenues. Should a portion of the development not come to fruition, or should tax laws or assessment standards change such that the tax revenue is insufficient to cover the debt, the developer is simply out of that revenue with no recourse against the municipality. A developer can choose to monetize the TIF note through private financial institutions to achieve up-front financing. Some institutions are willing to lend against the TIF note itself, others will only lend against the TIF note as part of a larger overall financing package that also includes the development project itself as collateral. The former, lending solely against the TIF note, tends to carry higher interest rates than a lending package that includes the primary financing.

The PAY-GO approach also has the advantage of providing the ability to check the assumptions used to justify need and adjust incentive parameters to ensure investment returns are reasonably maintained at agreed upon levels. The look-back cause is a common mechanism written into development agreements or PAY-GO notes that places the requirement on the development team to document eligible expenses and project performance. If the actual performance of the project substantially differs from the original projections, the parameters of the PAY-GO note can be altered. PAY-GO deals may have one or more look-backs depending on the agreed upon length of the TIF. These look-backs can provide increased accountability and assurances that the general obligation bond approach may not afford.

Prior to The Federal Tax Reform Act of 1986, interest on any municipal general obligation bond was tax exempt. However this legislation made it such that any municipal general obligation bond used to finance private tax increment eligible expenses would no longer be tax exempt. Losing the tax exempt status resulted in higher interest rates charged to municipalities for these bonds. This made it more difficult to finance tax increment projects and mitigated much of the rationale for not using a PAY-GO approach in the first place given the interest rates developers were likely to receive in the private market were not substantially higher than municipal general obligation bond rates [1,2]. This, in combination with municipalities' desire to shift the risk to the developer, and the accountability the look-back can afford, has made the PAY-GO

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approach to financing TIF projects much more popular in recent years.

We proceed by first discussing the typical parameters of a PAY-GO note. Then we discuss the theory of valuation of future revenues and show how this can be simplified making a few conservative assumptions to arrive at a generalized formula for the value of a TIF PAY-GO note. We then utilize this formula under several common parameters and provide both a graphical summary and look-up table for easy reference. Finally, we discuss some of the common misconceptions municipalities and developers have in context of the results provided.

2. Parameterization and Valuation

The terms of the PAY-GO note can vary significantly across municipalities and even across different TIF projects within the same municipality. Specific limitations can be set by TIF policies of the local governing body and/or by state statute. Possibly more important than any specific policy, however, is the justification of need. The majority of states have some form of 'but-for' test as a requirement for the use of TIF [3]. In concept, the but-for test asserts that in order for a taxing authority to utilize a TIF incentive, a determination must be made that a project would not move forward without the TIF assistance. How this is determined can also vary significantly. Sometimes this is framed in the form of a gap, or the amount of money the development project is short before it could successfully move forward. Other times the but-for is framed in terms of an internal rate of return (IRR) on investment. Here one must show that the IRR is not large enough to proceed without the TIF assistance, and simultaneously, that the IRR is not so large with TIF that the public assistance creates a windfall for the development team. While the specific circumstances of the proposed development will dictate the potential need, the terms of the PAY-GO note are one means to ensure a windfall isn't created through the use of TIF.

2.1. Common PAY-GO Note Terms

Often times a municipality will incur ongoing administrative expenses throughout the life of a TIF project, or may have other public improvements or costs within the tax increment district (TID). These costs can be allocated to the TIF project and thus municipalities may limit the allocation of the total annual increment revenue generated that can be paid out to the developer in the TIF note. Sometimes this may take the form of a stipulation that simply states the annual payment to the developer will be the total increment generated minus the actual municipal expense incurred for any given year. More often though, this shows up as a percentage of the increment allocated that is paid out annually through the note. At the extreme, a municipality might only be willing to pay out 50% of the increment. The remaining 50% then is held by the municipality in an account over time from which they might draw upon to cover eligible TIF expenses. More common limits range from 75% to 95% of the increment be allocated for the development incentive.

Some PAY-GO notes will be structured to pay off an initial principle amount over time and will apply an interest rate payable from the increment proceeds to the developer who is funding the eligible costs up front. In this case, the original principle of the note, along with the agreed upon interest rate and annual increment proceeds will determine the length of time needed for the TIF to pay back the note to the developer. In other cases, the deal may be structured without interest, but rather simply specify a predetermined amount of time the TIF increment proceeds are returned back to the developer. In extreme cases, for example with some historic rehabilitation projects where historic tax credits are involved, it is possible that the extraordinary costs involved in refurbishing a building up to the standards of the Secretary of the Interior makes it such that the project's resultant IRR does not justify a typical investment, even after the Tax Credits are factored into the analysis along with TIF assistance. In this case the TIF may get extended out to the maximum allowable time period defined by statutes.

2.2. Valuation of Future Payments

The classical approach for finding a valuation of a series of future revenues (and possible losses) was popularized by economist Irving Fisher in his 1907 work on rates of interest [4]. Here he formalized what he termed the net present value (NPV) taking into account the future time value of money by discounting progressive years by an interest rate. Assuming discrete time periods of revenue or losses we define $t = 0, 1, 2, \ldots, n$, to represent the n time periods. Here $t = 0$ might represent an initial transaction at the starting point of an investment. We define R_t as the cash flow at time t. Then the formula to calculate value is given by

$$NPV = \sum_{t=0}^{n} \frac{R_t}{(1+i)^t} \tag{1}$$

where i is the fixed interest rate.

In the setting of monetizing a PAY-GO note, by definition there is no increment generated at $t = 0$. Rather, the value of the property is set at the baseline valuation from which any increment is calculated. Moreover, the typical sequence of events of a TIF project would have the developer build out the project in the first year. Once complete, the assessor would place an assessment on the new development. However, the development would not see this new assessment reflected in their tax bill until the end of the year following the new assessment. It is common place for state tax authorities to oversee and validate the TIF increments reported by municipalities. This process can further delay payment such that a developer may not actually receive the proceeds of the increment until late fall. For this reason, it is common for a PAY-GO TIF to not generate any increment the first two years. We define d as the number of years of delay where the PAY-GO note generates no revenue.

If we define I_t as the total increment in valuation generated in the project at time t, ρ as the proportion of tax increment agreed upon in the note to provide as the incentive, and μ_t as the tax rate in the district at time t, then the cash flow of the note is given by

$$R_t = I_t \times \rho \times \mu_t. \tag{2}$$

Given some PAY-GO notes can cover a span of up to 27 years, it is quite likely that the increment in valuation will change

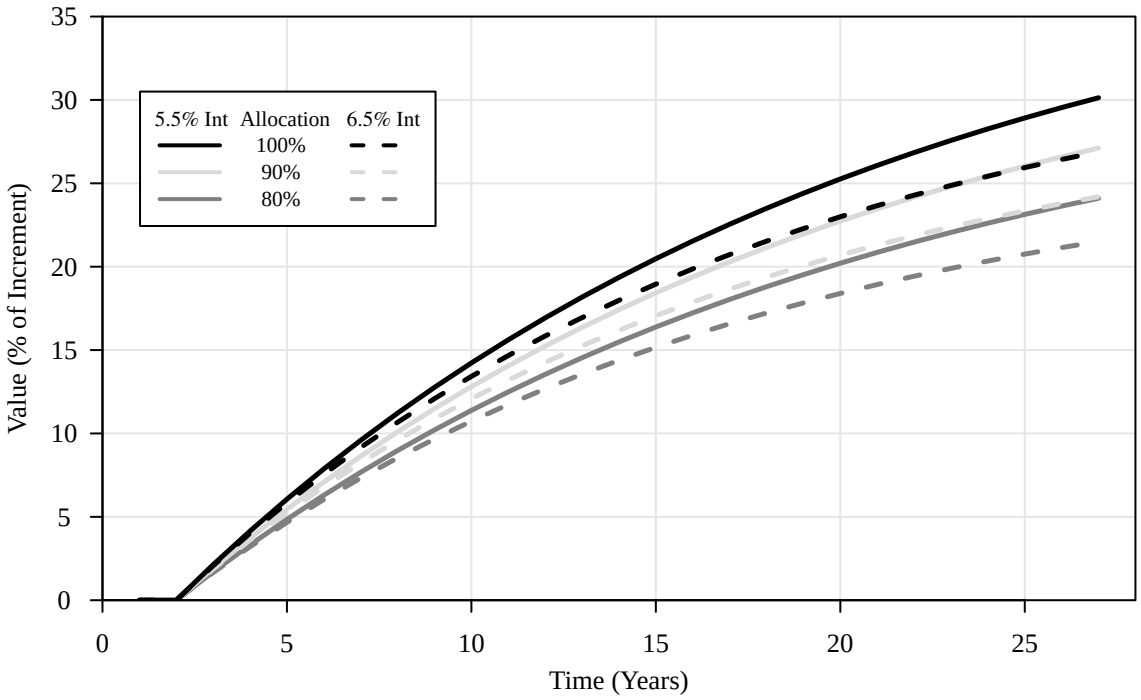

Figure 1: Fractional value of PAG-GO note for various time periods, percent increment allocation, and interest rates assuming 2 year delay of payment ($d = 2$) and fixed tax rate of 2.5% ($\mu = 0.025$).

over the note's existence. Barring acts of god, this fluctuation is likely to be an increase in value. Thus, for planning purposes, and from a conservative standpoint, one might assume the increment will stay fixed. In addition, while tax rates can fluctuate each year, it is also not unreasonable to use an expected mean tax rate across the time period of the note. Under these assumptions, R_t becomes constant that we will denote as R. We can factor R out of the sum in (1) to arrive at an estimate of value as

$$N\ddot{P}V = R \sum_{t=d+1}^{n} \frac{1}{(1+i)^t}. \tag{3}$$

We observe that the summation in (3) is a familiar sum of a geometric sequence and can show that this is in fact equivalent to calculating what amount R would support in a loan over n-d years, but then discounting this value for the first d years where no payment would be made. Thus in closed form we can show that (3) can be expressed as

$$N\ddot{P}V = R\frac{\left(1-(1+i)^{-(n-d)}\right)}{i(1+i)^d}. \tag{4}$$

We note then that the value of the PAY-GO note under the assumption of fixed increment and fixed tax rate over time can be expressed as a relative fraction of the incremental value generated. Specifically if we define

$$Fr = \frac{\rho\mu\left(1-(1+i)^{-(n-d)}\right)}{i(1+i)^d}, \tag{5}$$

where μ is the average tax rate over the n years of the note, we can write (4) as

$$N\ddot{P}V = I \times Fr, \tag{6}$$

where I is the presumed fixed increment generated. We next take advantage of this fact to generate a reference table for the fractional percentage of increment (Fr) one can use to estimate the value of any PAY-GO incentive given the parameters of their note and financing package.

3. Empirical Results

We considered parameter values commonly found in TIF PAY-GO note deals. We employed a real property tax rate of 2.5% and 1.75%. The former is close to the national average, while the later may represent a lower rate found in townships that offer fewer services. We assume the typical two year delay in increment generation. For interest rates on the notes, we considered values of 4.5%, 5.5% and 6.5% respectively. The 4.5% rate might be an interest rate that a municipality expects to get on a non-tax-exempt general obligation revenue bond for TID eligible expenditures. Alternatively, this may be the rate a developer receives if financing the PAY-GO note in combination with the overall financing package of the entire development with real property collateral and excellent credit history. The 5.5% interest rate is what one might expect a developer with excellent credit history to receive if financing the PAY-GO note separate from the primary financing of the development. Finally, the 6.5% interest rate might represent a rate where either the development team credit history is new or not exemplary, or the project itself may pose a relatively high level of risk.

We considered allocation percentages of 100%, 90% and 80%. More often than not, the allocation a municipality will allow is based off of an estimate of actual expenses that the taxing authority is likely to incur over the TID's existence. Projects with no other

Table 1: Multiplication Factor for NPV of PAY-GO Note where Tax Rate is 2.5% and Delay is 2 Years.

ρ - Allocation (%)	100			90			80		
i - Interest Rate (%)	4.5	5.5	6.5	4.5	5.5	6.5	4.5	5.5	6.5
Year 3	2.19	2.13	2.07	1.97	1.92	1.86	1.75	1.70	1.66
4	4.29	4.15	4.01	3.86	3.73	3.61	3.43	3.32	3.21
5	6.29	6.06	5.84	5.66	5.45	5.25	5.03	4.85	4.67
6	8.21	7.87	7.55	7.39	7.09	6.80	6.57	6.30	6.04
7	10.05	9.59	9.16	9.05	8.63	8.24	8.04	7.67	7.33
8	11.81	11.22	10.67	10.63	10.10	9.60	9.45	8.98	8.54
9	13.49	12.76	12.09	12.14	11.49	10.88	10.79	10.21	9.67
10	15.10	14.23	13.42	13.59	12.81	12.08	12.08	11.38	10.74
11	16.64	15.62	14.67	14.98	14.05	13.20	13.31	12.49	11.74
12	18.11	16.93	15.85	16.30	15.24	14.26	14.49	13.54	12.68
13	19.53	18.18	16.95	17.57	16.36	15.25	15.62	14.54	13.56
14	20.88	19.36	17.98	18.79	17.42	16.18	16.70	15.49	14.39
15	22.17	20.48	18.96	19.95	18.43	17.06	17.73	16.38	15.16
16	23.40	21.54	19.87	21.06	19.39	17.88	18.72	17.23	15.89
17	24.59	22.55	20.72	22.13	20.29	18.65	19.67	18.04	16.58
18	25.72	23.50	21.53	23.15	21.15	19.38	20.57	18.80	17.22
19	26.80	24.40	22.29	24.12	21.96	20.06	21.44	19.52	17.83
20	27.84	25.26	22.99	25.05	22.73	20.70	22.27	20.21	18.40
21	28.83	26.07	23.66	25.95	23.47	21.29	23.06	20.86	18.93
22	29.78	26.84	24.29	26.80	24.16	21.86	23.82	21.47	19.43
23	30.69	27.57	24.87	27.62	24.81	22.39	24.55	22.06	19.90
24	31.56	28.26	25.43	28.40	25.44	22.88	25.25	22.61	20.34
25	32.39	28.92	25.94	29.15	26.03	23.35	25.91	23.14	20.75
26	33.18	29.54	26.43	29.87	26.59	23.79	26.55	23.63	21.14
27	33.95	30.13	26.89	30.55	27.12	24.20	27.16	24.10	21.51

prospective public improvement costs might only incur a minimal administrative fee and thus be close to the 100%. Likely a more typical allocation would be 90%, while a conservative allocation might be 80%.

The fractional percentage of increment value of the PAY-GO note under the aforementioned conditions are displayed graphically in Figure 1 and in tabular form in Table 1 assuming a tax rate of 2.5%. Under the best conditions considered here, the 10 year note, with 8 actual years of payback, will be valued at 15.10% of increment, where, with a high interest rate and only 80% allocation, the note might only be valued at 10.74% of the increment generated. At 20 years, we see the relative value of the note ranges between 18.4% of the increment up to 27.84% of the incremental value. The maximum net present value a PAY-GO note could achieve over a 27 year payback is 33.95% of the increment with 100% allocation and a 4.5% interest rate. This falls to 21.51% with an 80% allocation and 6.5% interest rate after 27 years. Table 2 summarizes the same conditions but with a tax rate of 1.75%.

3.1. Three Examples of Use

We proceed by demonstrating three examples of how the above tables can be used.

- A municipality agrees to provide a 10 year PAY-GO note to a developer with a 90% allocation rate. The developer anticipates putting $3.2 million on increment in the TID and has been quoted an interest rate of 5.5%. In this case the increment multiplication factor is 12.81%. Multiplying the $3.2 million by 0.1281 results in a NPV of $409,920.
- A developer needs $85,000 in incentives to cover public improvements to make a project likely to provide $600,000 in increment work. If a municipality has a policy of providing 80% allocation to a PAY-GO note, and the developer was quoted a 6.5% interest rate, we look at the last column of Table 1. In this case, the developer is looking for 14.16% of the increment as incentive. The first year where we see a multiplication factor greater than 14.16% is at year 14. Thus the PAY-GO note would need to be at least 14 years to provide enough present value.
- A developer and municipality has come to an agreement such that the developer will receive a 12 year PAY-GO note with 100% allocation so long as they create $5 million of increment. The developer is going to receive a 4.5% interest rate, however the municipality has a relatively low tax rate at 2.1%. The multiplication factor in table 1 is 18.11%. However, table 1 is for a tax rate of 2.5%. Given the 2.1% tax rate is 84% of the 2.5% tax rate, we find the NPV by multiplying $5 million by 0.1811 and then multiplying by 0.84 to get a value of $760,620.

4. Discussion

The use of the PAY-GO note to monetize the tax increment generated in a TID continues to gain favor because the risk gets placed, arguably more appropriately, onto the developer and yet still provides considerable incentive. We have demonstrated that the PAY-GO approach under normal conditions can achieve upwards of 10 to 15% of incremental value within 10 years, and up to 20% of incremental value within 15 years. In cases where the increment equals the cost, it is possible that a development team might achieve a 20% down payment required for an 80% loan-to-value simply by getting a municipality to agree to a 15 year PAY-GO TIF incentive. More common practice is the development team

Table 2: Multiplication Factor for NPV of PAY-GO Note when Tax Rate is 1.75% and Delay is 2 Years.

ρ - Allocation (%)		100			90			80	
i - Interest Rate (%)	4.5	5.5	6.5	4.5	5.5	6.5	4.5	5.5	6.5
Year 3	1.53	1.49	1.45	1.38	1.34	1.30	1.23	1.19	1.16
4	3.00	2.90	2.81	2.70	2.61	2.53	2.40	2.32	2.25
5	4.41	4.24	4.09	3.96	3.82	3.68	3.52	3.39	3.27
6	5.75	5.51	5.29	5.17	4.96	4.76	4.60	4.41	4.23
7	7.04	6.71	6.41	6.33	6.04	5.77	5.63	5.37	5.13
8	8.27	7.85	7.47	7.44	7.07	6.72	6.61	6.28	5.98
9	9.44	8.94	8.46	8.50	8.04	7.62	7.55	7.15	6.77
10	10.57	9.96	9.39	9.51	8.96	8.45	8.46	7.97	7.52
11	11.65	10.93	10.27	10.48	9.84	9.24	9.32	8.74	8.22
12	12.68	11.85	11.09	11.41	10.67	9.98	10.14	9.48	8.87
13	13.67	12.72	11.86	12.30	11.45	10.68	10.93	10.18	9.49
14	14.61	13.55	12.59	13.15	12.20	11.33	11.69	10.84	10.07
15	15.52	14.33	13.27	13.97	12.90	11.94	12.41	11.47	10.61
16	16.38	15.08	13.91	14.74	13.57	12.52	13.11	12.06	11.13
17	17.21	15.78	14.51	15.49	14.20	13.06	13.77	12.63	11.61
18	18.00	16.45	15.07	16.20	14.80	13.56	14.40	13.16	12.06
19	18.76	17.08	15.60	16.88	15.37	14.04	15.01	13.67	12.48
20	19.49	17.68	16.10	17.54	15.91	14.49	15.59	14.15	12.88
21	20.18	18.25	16.56	18.16	16.43	14.91	16.14	14.60	13.25
22	20.85	18.79	17.00	18.76	16.91	15.30	16.68	15.03	13.60
23	21.48	19.3.0	17.41	19.33	17.37	15.67	17.19	15.44	13.93
24	22.09	19.78	17.80	19.88	17.81	16.02	17.67	15.83	14.24
25	22.67	20.24	18.16	20.40	18.22	16.34	18.14	16.19	14.53
26	23.23	20.68	18.50	20.91	18.61	16.65	18.58	16.54	14.80
27	23.76	21.09	18.82	21.39	18.98	16.94	19.01	16.87	15.06

bringing in their own capital making its equity position more desirable from the financier's perspective and potentially significantly improving the rate of investment return.

One potential factor, however, that might inhibit more frequent consideration of the use of the PAY-GO TIF is the perceived relative complexity of the financial calculations involved in understanding the value of the incentive. We have sought to relieve this burden to some extent by deriving a closed form formula to easily calculate value based off of simple to understand parameters. Moreover, we have provided a table to make this calculation even easier by having only to multiply the increment by a look-up value in a table to find the value of the incentive. Our hope would be that this might facilitate an increased understanding and use of PAY-GO TIF financing for appropriate development projects.

We fully acknowledge that while we have focused almost exclusively on valuation of the PAY-GO note, our work here does very little to shed light on the appropriateness of the usage of TIF incentive for any particular project. In most states this is framed under the guise of the 'but for' test. Meeting this threshold can be approached from a financial perspective, possibly in the form of a rate of return, but can also be viewed from more qualitative approaches like the perceived benefit to the community in bringing quality-of-life experiences and/or economic opportunity that may not be so easily quantified. While the valuation plays a role in appropriateness, it should not be viewed as an ends itself.

It is also apparent that the allocation percentage that a municipality is willing to provide can have a significant impact on the NPV and thus on the time frame that that it takes to achieve a particular value. Take for example the results in Table 1. Assuming a 5.5% interest rate, a 24% of the incremental value can be achieved in 19 years when the allocation is 100%. If the allocation is 80%, it would take the full 27 years to achieve at least a 24% incremental value. This increases the length of time to achieve the same amount of value by 8 years. One can appreciate that a municipality is likely to incur legitimate TIF eligible expenses or have other public improvements within the TID in which the municipality is better positioned to complete. An argument can be made that the allocation percentage should reflect the maximum amount possible that would still be able to cover the municipal obligations. Anything less would have all excess proceeds sit in a municipal account. It has been our experience that municipalities that set allocation rates at 80% or less typically do so as a remnant of a policy employed when the general obligation bond approach was their common practice and thus set this allocation in an effort to be conservative to the point where there was less risk of requiring tax payers foot the bill. It would seem apparent that municipal officials are obligated to utilize any funding in the most efficient means possible and that rather than allowing funds to build up unused, it would be better to pay the note down earlier and thus get the full benefit of the increase in value to the taxpayers as quickly as possible.

On a cautionary note, we point out that in many cases, the increment in value can be less than the cost to complete the project. This is often the case with redevelopment projects of existing buildings, especially historic preservation projects. This can happen for a variety of reasons including an inflated baseline assessment, the difference between the cost approach verses income approach to valuation, or potentially paying for large portions of public improvements that do not substantially impact the value of the development. If in the planning stages of development one mistakenly uses the cost rather than the increment, this could have a devastating effect on the rate of investment return, especially if the cost differs substantially from the increment.

5. Conclusion

We anticipate the PAY-GO approach to monetizing TIF incentives will continue to increase in popularity given all the advantages we have discussed. Moreover, it is our hope that developers, municipal staff, and local governing bodies continue to educate themselves in the strategies and benefits of PAY-GO financing and gain general financial literacy such that all parties have sufficient understanding of the benefits and risks involved in these and other public financing structures. We look forward to future advances in the field to assist in this goal.

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