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Modeling Investments in Tax Equity Partnerships: Solving the Puzzle in a Post-Treasury Grant World

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For large power projects in the United States, tax equity can be the difference in whether a project gets financed and becomes a reality or remains on the drawing board.

The concept at its core is simple enough but the modeling of tax equity is not. For most mortals, the exercise means journeying to unknown territory, i.e. the partnership rules of the U.S. tax code.

The challenge is especially daunting as the exercise involves navigating not only a complex part of the U.S. tax code but also finance and accounting. Our purpose here is to explain the underlying logic of tax equity, the required inputs of a typical tax equity partnership model, and how these inputs interrelate. To make the exercise more concrete, we use numerical values throughout. For the reader's benefit, many nuances will be glossed over or ignored altogether.

Let us review the basic idea behind tax equity.

Power projects, particularly renewable energy projects, are rich in tax incentives. For example, the owner of a solar project can claim a 30 percent tax credit and write off the cost of the project over five years (on an accelerated basis). However, developers of these projects typically do not have enough tax liabilities from their core businesses to use these incentives efficiently. So, a developer will barter these tax incentives for cash infusions from institutional and large corporate investors.

There are three common ways of bartering these benefits. The developer can form a partnership with an investor; the investor can buy and lease back the project to the developer; or the developer can lease the project to the investor.

We will focus on the partnership structure in this article.

The two parties enter into a partnership. In most cases, the developer contributes a project to a limited liability company. The investor, also referred to as the tax equity investor (TEI), then either buys an interest in the company or contributes cash in exchange for a membership interest.

The amount the investor will fund depends on its share of the company's net cash flow and taxable income, including tax benefits and liabilities. A financial model will project those items out through a target date. The investor's funding amount will equal the net present value of those items, discounted at a target yield.

The vast majority of the tax benefits and liabilities (usually 99 percent) are allocated to the investor until the investor achieves its target yield (typically projected at six to nine years out). This downward shift in allocations is called the ''flip.''

Besides tax benefits, the tax equity investor also often receives the lion's share of the project's cash flow during the early years.

The investor's allocation of the tax items reduces the investor's U.S. tax liabilities and includes a portion of a 30 percent investment tax credit, currently set to expire at the end of 2016. The credit is based on the cost of power generation equipment and construction at the site, which typically constitutes 90 percent to 95 percent of total project costs.

If we assume a total plant cost of $2,286, of which 90 percent qualifies for the ITC, a solar project would be entitled to an ITC of $617. If the investor gets 99 percent of that amount, its after-tax cash flow position improves by $611. If the investor contributes $1,300, the $611 is a very meaningful number. In fact, without the ITC, the TEI probably would not be able to meet the target returns it requires to participate in a solar project.

Besides the tax benefits mentioned above, the investor also often receives the lion's share of the project's cash flow during the early years.

The investor typically gives up blocking rights for major decisions after it achieves its target yield and, at some point, may decide to exit the partnership altogether.

Certain quirks of the U.S. tax code permit the investor to claim more cash, losses, and other benefits than the equity the investor initially puts into the partnership. This is only temporary; however, as the government is keen to get paid back this ephemeral overallocation.

While the idea behind tax equity may be simple to understand, a cash-rich corporation with tax liabilities can utilize a partnership structure to take advantage of another entity's taxable losses only if both parties adhere to a web of rules carefully laid down by the Internal

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Revenue Service over many decades. Most of these rules are hardly intuitive. But, with a little patience and diligence, you can understand the interplay of factors that drive tax equity investments, and decide whether tax equity may be feasible for a project you have in mind.

The Model: Getting Started

The best way to understand how these concepts affect the partners' returns is to build them out into an actual model.

In the first block of your spreadsheet lay out the financial drivers of the project, namely earnings before interest, taxes, depreciation, and amortization (EBITDA), cash interest expense, depreciation (book and tax), net income (book and tax), initial project debt, the expected repayment schedule, and the resulting cash available for distribution (''cash flow'') for the life of the project (by month, quarter, or year).

No amount of tax equity engineering will change a project's EBITDA, and depreciation schedules are relatively fixed. All the other parameters are knobs that can be dialed up or down in the model later to reconcile various project and market realities, as well as the competing objectives of tax equity investors, sponsors, banks, and engineering/construction companies.

Below the main financial drivers, include a section to input the percentage split among the partners of taxable income and distributable cash. Remember that the investor—or TEI—contributes a sizeable chunk of risk capital (equity) in return for a share of the project's forecast taxable income (losses) and cash flow. A key purpose of the model is to determine the period-by-period partnership split of taxable income (losses) and cash flow that will satisfy both parties.

For purposes of starting your model, assume initially an arbitrary partnership percentage split for taxable income and cash flow. Keep in mind however that the tax equity investor cannot exit the project or have its share of profits reduced by more than one-third before the end of the fifth year of operation. Otherwise, the partners may have to unwind all or part of the losses and tax credits, which explains why the partnership ''flip'' is never scheduled to occur sooner than Year 5.

The Big Picture: Capital Accounts and Outside Basis

Next, we lay out two central blocks for each partner in the model, one for the partner's capital account and the other for the partner's basis in its partnership interest, which is commonly referred to as its ''outside basis.'' Think of these as tax accounting statements—every partnership has them. The modeling challenge is to capture the rules that govern the capital account and outside basis (discussed further below).

A partner's capital account starts at the sum of the cash and property (by value) that the partner contributes to the partnership. A partner's outside basis starts with the sum of the cash and property (by cost) that the partner contributes to the partnership. If the partnership has nonrecourse debt, then the partner's share of this debt is added to his outside basis.

Both go up (by income allocated to the partner) and down (by cash distributed or losses allocated to the partner) during the life of the partnership.

A partner's capital account is its claim on partnership assets at liquidation. A partner's outside basis will determine how much gain it has if it sells its partnership interest. Both restrict the amount of losses that the partnership may allocate to a partner to the equity that the partner has contributed to the partnership, with a few notable exceptions.

One major exception (and a key driver of tax equity partnerships) is that a partner may claim losses in excess of its equity investment in the partnership to the extent the losses are funded by nonrecourse debt. The government permits this because it knows that it will get repaid later as the debt is repaid (more on this later).

The partnership tracks the amount of losses taken in excess of its partners' equity investments through a concept called ''minimum gain.''

Imagine two parties form a partnership to purchase an asset valued at $100. Assume the partners contribute only $10 of their own money, leaving another $90 to come from nonrecourse debt. Assume the partnership depreciates the asset by $20 in the first year and the debt stays constant. The first $10 of the depreciation is funded by partner equity. The next $10 essentially is debt-funded. If the partnership sells the asset at the end of the first year for the balance of the debt, there will be a gain of $10 ($90 debt outstanding minus $80 of depreciated asset basis).

Considering that the partners contributed only $10 of their own money yet took advantage of $20 in depreciation deductions to reduce their taxable income (whether from the partnership or from other sources), it makes economic—or at least accounting—sense that the partners now face a potential taxable gain equal to their share of the debt-funded depreciation (i.e., $10). That potential gain is called ''minimum gain'' and a partner may claim losses in excess of its investment in the partnership only to the extent of its share of this potential gain (more on this below).

Partner Capital Accounts: The Details

The principles for increasing and decreasing the partners' capital accounts may seem at first counterintuitive if you think of losses as a bad thing and income as a good thing. However, because the capital account serves as a measure of the partner's stake in the partnership, think of distributions and losses as reducing the partner's stake in the partnership's equity, while profits and contributions increase it.

One thing to keep in mind is that the income and loss figures reflected in the capital accounts are not necessarily the same as those reported on the profit and loss statement (P&L). Neither are they the same as net taxable income that gets reported on tax returns. Rather, it is the income or loss computed at the partnership level, computed in the same way as the taxable income that the partnership reports to IRS, except that the project is depreciated by starting with the fair market value when the investor funds rather than the actual costs incurred by the project owners.

Calculating Minimum Gain

As described above, minimum gain is a mechanism that permits a partner to claim losses beyond its equity investment in the partnership. It is also used to track

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when the government will get ''repaid'' for those extra losses by forcing an income shift to that partner.

So what does all this have to do with tax equity?

Many large infrastructure projects are funded with nonrecourse debt, which means that we have the scenario described above in which partners wish to take depreciation deductions well beyond their equity exposure. Under current U.S. tax partnership accounting rules, partners may in fact take depreciation charges beyond their initial equity investment. But like our imaginary partners above, they must track and accept their minimum gain liabilities.

Because of the repayment obligation, we may think of minimum gain as deferred equity of the partners.

If a project's maximum minimum gain liability is $825 million, the partnership must later book, and pay taxes on, a cumulative total of $825 million of income referred to as ''minimum gain chargeback income.'' In this way, the U.S. Treasury will collect its fair share of taxes from partners who in prior periods benefited from depreciation deductions on assets that they did not fully fund. As explained later, this amount is not charged in one year but spread over many years as the nonrecourse debt is repaid.

Because of this repayment obligation, we may think of minimum gain as deferred equity of the partners. The partners will not be contributing cash to the partnership later on but paying cash taxes on their individual shares of the minimum gain chargeback. For this article, we will call this ''chargeback income.''

So how do we calculate minimum gain? Think of minimum gain as MinGain = Outstanding Debt minus Book Value of Assets. Minimum gain will start at zero, because the book value of the assets (before we start to depreciate) will be higher than the debt outstanding, and cannot be less than zero.

Assume that a solar power plant project begins with a ''book basis'' of partnership assets equal to $2.3 billion, and with total nonrecourse debt of $900 million. The partnership's assets are clearly greater than the debt outstanding. As long as accumulated depreciation is less than $1.4 billion, minimum gain will be zero by definition: MinGain = MAX [0, 900 – (2,300 – Accumulated Book Depreciation)].

Increases in minimum gain mean that the partnership's outstanding nonrecourse debt has begun to exceed the book value of the partnership's assets, which can occur due to an increase in nonrecourse debt (unlikely but possible) or depreciation deductions. Once depreciation charges are depleted (and assuming no further increases in nonrecourse debt), minimum gain will be at its maximum point. Thereafter, it will decrease each period in lock-step with any debt principal repayments, and this is where the tables turn for the partners.

For every dollar decrease in minimum gain, there must be a dollar of chargeback income allocated to the partners. For example, if minimum gain decreases in a period by $50 owing to $50 repayment of principal, the partnership will reallocate the first $50 of its net income to the partners in the ratio of that minimum built up for each partner (generally the pre-flip point allocation sharing ratio). Any remaining net income will be shared in the ratio that the partnership agreement sets out for the period. Once the project debt is completely repaid, there will be no minimum gain remaining and no additional chargeback income.

As a check on the model, make certain that each partner's accumulated sum of minimum gain increments and decrements sum to zero after project debt is repaid. In the model, you may wish to create a separate block that calculates minimum gain and chargeback income.

Remember that unlike the general income and cash-sharing ratios that change once the partners ''flip'' control positions some time after Year 5, the chargeback income is always shared in the ratio that the partners claimed the depreciation that gave rise to the minimum gain.

Now that we understand minimum gain and chargeback income, we can see the concept in action in the step-by-step calculation of the partners' capital accounts. Minimum gain also plays an indirect role in the calculation of each partner's outside basis (as discussed below).

The Capital Account: Step by Step

Let us now look at the steps involved in calculating the tax equity investor's (TEI) capital account. To make the logic (and modeling) as transparent as possible, we will break the process into the following steps:

1. Beginning Balance. Start with $0 in Year 1. For subsequent periods, the Beginning Balance is the Ending Balance of the prior period.

2. Investor Contribution. Remember that the capital account measures the partner's equity, so the investor's contribution must be one of the first entries: As above, assume $1,300 (positive number) for Year 1. No contribution for subsequent periods.

3. ITC Basis Reduction. The tax rules reduce each partner's capital accounts and basis by 50 percent of its share of the ITC (the share of the ITC is the same as the partner's share of profits). Assume total project costs of $2,286. Assume only 90 percent of those costs are ITC eligible ($2,057). Multiply the eligible costs by 30 percent (ITC = $617) and then 50 percent (ITC Basis Reduction = $309). If the allocation percentages are 99:1 in favor of the investor, then the investor's share of this reduction is $305. Make that number negative for the spreadsheet. Enter zero for subsequent periods.

4. Non-Chargeback Income. Add TEI's share of non-chargeback income. In Year 1, add an assumed project EBITDA of positive $20 and book depreciation (depreciation starting with FMV) of ($398), resulting in non-chargeback income of ($378) x 99 percent = ($375). Expect large negative values during the ''pre-flip'' period, as TEI is absorbing the lion's share of Taxable Income (Losses). Make certain that you exclude any chargeback income here (discussed next).

5. Chargeback Income. Add TEI's share of chargeback income, $0 for Year 1. Recall that Chargeback Income sets in only once minimum gain has reached its peak and starts to decline. There is no minimum gain in

Year 1, since the partnership has not ''depreciated'' the equity yet.

6. Cash Distributions. Subtract any cash distributed. Remember that distributions are always negative entries in the capital account since the partner, by definition, is taking equity out of the partnership. In our example, we will not distribute cash to the TEI in Year 1. We will assume that TEI is entitled to 99 percent of cash flow for Years 2 through Year 7, and 25 percent of cash flow from Year 8 onwards. You may assume a different split. Tax rules do not require any particular cash-sharing ratio.

7. Interim Capital Account Balance. Create a formula that sums the steps above: $1,300 + ($305) + ($375) + $0 + $0 = $620.

8. Changes in Minimum Gain. Create a formula that pulls in any change in TEI's share of MinGain (see discussion above on calculation of MinGain). In Year 1 and Year 2, the MinGain balance is zero since the book value of the project's assets remains higher than the project debt of $900. In subsequent periods there is considerable movement in the account. Remember the minimum gain balance rises with each decrement in the book value of project assets once that book value declines to the same level as the project nonrecourse debt and decreases once the nonrecourse debt begins to be paid down faster than the book depreciation (based on FMV) is claimed. In the early years, increases in minimum gain serve to neutralize the depreciation deductions that otherwise would quickly wipe out the capital account balance and thus prevent the partner from taking on additional taxable losses. Later, the decreases in minimum gain neutralize the phantom chargeback income that otherwise would overstate the magnitude of the capital account balance.

9. Adjusted Interim Capital Account Balance. Add here any Changes in Minimum Gain (Step 8) to Interim Capital Account Balance (Step 7). For Year 1: $620 + $0 = $620. In Year 3, based on various assumptions, TEI's Interim Capital Account Balance is negative $379, but an increase in TEI's minimum gain from $0 to $323 offsets most of this negative amount, leaving TEI in Year 3 with an Adjusted Interim Capital Account Balance deficit of ($55).

10. Stop Loss Reallocations. In the event that TEI's Adjusted Interim Capital Account Balance (Step 9) shows a deficit, such as in Year 3 ($55), that loss would be ''reallocated'' to the other partner. A positive $55 would be posted in TEI's capital account, whereas a negative $55 would be posted in the sponsor's capital account. On a related note, the reallocated losses are also taken into account in determining each partner's share of taxable income, which flows through the calculation of the partners' outside bases. In our example, there are no reallocations in Year 1.

11. Excess Distributions Over Basis Step-Up. Whenever a partner receives a distribution that would exceed its outside basis (see Step 6 below), the partners' capital accounts are increased in the ratio that the partners would share gain on the sale of a notional new asset in the same amount (usually 100 percent to the partner that received the distribution). For the sake of simplicity, create a formula that pulls in the absolute value of any negative number in Outside Basis, Step 6.

12. Ending Balance. Create a formula that sums the values in Steps 9, 10, and 11. For TEI, that means an Ending Balance for Year 1 of $620.

To create a capital account for the sponsor (developer), repeat the steps outlined above.

Once you have created the formulas for Year 1, move on to Year 2 and subsequent periods, double-checking that the formulas still capture the intended logic.

Deficits in the Capital Account

Before proceeding to how we typically model the partners' outside bases, we should underscore that the partners' capital account Ending Balances in any given period should not dip below zero, as adjusted to account for minimum gain. The purpose of the capital account is to make certain that the partners are not taking out more losses than the partners have ''equity'' to cover, by which we mean ''equity already committed'' or ''equity obligations deemed to exist due to minimum gain.''

Given that from time to time the Interim Capital Balance (described above) could be in deficit, steps must be taken so that the Ending Balance is always restored to a positive number by the end of each year.

One way of dealing with a negative balance (or to avoid the reallocation in Step 10 (above) is for the partners to agree to a ''deficit restoration obligation,'' or DRO. A partner that agrees to a DRO will have to contribute cash to the partnership if it has a negative capital account when the partnership liquidates. This is because a partner that dips below the line essentially ''borrows'' equity from the other partner.

A DRO is a real obligation but it will not require the partner to post any collateral. Typically, the capital account deficit represents the amount of cash that the partner would be obligated to contribute to the partnership upon liquidation. An investor typically caps the DRO it is willing to step into at a fixed dollar amount, generally no greater than 10 percent to 20 percent of its total investment, although some investors refuse to step up to any DRO.

To the extent a partner's capital account is negative at the end of a year (after taking into account the partner's share of minimum gain and any DRO it has agreed to), the partner's Adjusted Interim Capital Account (Step 9 above) must be corrected through reallocations of losses or cash away from that partner to the other partners (Step 10, above, reallocates losses). When this happens, the reallocation is generally from the TEI to the sponsor or cash equity investor (CEI), as discussed above in Stop-Loss Reallocation (Step 10). This should bring the partner's Ending Balance to zero.

Outside Basis Account: Background

The modeling of a partner's outside basis account can be challenging. On the positive side, many capital account maintenance principles apply here as well. Contributions to the partnership increase a partner's outside basis, just as they do with the partner's capital account; distributions decrease both as well. Any share of project income assigned to the partners is recorded as an increase in the two accounts, and any project loss is recorded as a decrease in both accounts.

A partner's outside basis can never go into negative territory. A distribution in excess of a partner's basis

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does not drag the outside basis below zero. The tradeoff is that the partner reports a taxable gain to the extent of the excess.

No allocation of losses will drag the partner's outside basis below zero either. Unlike for capital accounts, these excess losses are not reallocated to the other partner. They are merely suspended to be claimed in a later period when the partner's outside basis is positive.

Finally, remember that assets are recorded in a partner's capital account at FMV, but at the partner's cost for outside basis purposes.

The last difference to highlight between a partner's capital account and basis is that a partner's share of partnership liabilities is added to its outside basis, but not the partner's capital account. Any increase or decrease in a partner's allocable share of partnership liabilities will cause the outside basis of his partnership interest to increase or decrease. For modeling, this has important implications. It means that any changes in the amount of project debt must be reflected in the outside basis of each partner in real time.

To determine a partner's share of debt, one has to walk through a waterfall. Recall we assumed initial project debt of $900 in the example in the minimum gain discussion. To calculate TEI's share of this debt, we start with the total outstanding liabilities. The first step is to pull out the project's built-in gain, which we assume accrued to the sponsor's benefit. The built-in gain initially is the difference between the FMV of project assets ($2,300) and the partnership's basis in those assets immediately after the partnership is formed. If we assume the inside basis is $2,286, then the built-in gain is $14. The second step is to pull out the sponsor's share of minimum gain. The TEI's share of debt is equal to its share of minimum gain plus 99 percent (TEI's profit-sharing percentage) of any remaining debt.

The calculation of the partners' shares of debt for subsequent years follows the same logic.

Outside Basis: Step by Step

Let us walk through the following steps to calculate the outside basis account for TEI:

1. Starting Point. Start with TEI's equity contribution ($1,300), add share of debt (assume $877), and deduct the ITC reduction calculated earlier ($305—see Step 3 of the step-by-step capital account calculation) to arrive at $1,872 ($1,300 + $877 – $305).

2. Beginning Outside Basis. $1,872 for Year 1. For subsequent periods, use Ending Balance of prior period.

3. (Reduction) Increase in TEI Share of Debt. Record increases (decreases) in the partner's share of debt from prior period. Year 1 = 0.

4. Less Cash Distributions. Subtract here any cash distributions to the partner per the agreed percentage split of cash flow. In our example, assume Year 1 cash flow of $20 is distributed to the sponsor or CEI, not the TEI.

5. Plus Taxable Income Allocated to Tax Equity. Add here only positive taxable income figures. Given the high depreciation deductions and interest deductions, there is no expected positive project taxable income in Years 1 through 6, so the formula should show zeros for those years.

6. Excess Distributions Over Basis. Remember that a major goal in calculating the outside basis account is to ensure partners show a tax liability whenever a distribution exceeds this basis. Create a formula here that checks whether the values in Steps 2 through 5 would sum to a negative number and, if so, records the deficit. If no deficit, the entry is zero.

7. First Positive Interim Balance. Create a formula that checks the sign of the preceding values (Step 2 through Step 6). If the value is positive, have the formula return the value. Otherwise have the formula return zero. In our example, post $1,872 for Year 1.

8. Less Project Taxable Losses Allocated to TEI (Exogenous). Create a formula that pulls in any project taxable losses or returns zero. Keep in mind that taxable income and taxable losses for the outside basis account are based on tax depreciation. Project taxable losses for Year 1: $20 EBITDA minus interest expense minus $395 of tax depreciation = ($375). (To keep matters simple, assume Year 1 interest expense is paid in cash in Year 2.) TEI's share of project taxable losses for Year 1: Project taxable losses ($375) x TEI share (99 percent) = ($372).

9. Less Remedial Depreciation (Exogenous). Import here remedial depreciation amounts: ($3) for Year 1; ($5) for Year 2; etc. Remedial depreciation is essentially a check that makes the TEI's share of tax depreciation equal to its book depreciation. Take tax depreciation from the sponsor to close any gap. If that is not enough, create a notional plug that increases the TEI's tax depreciation and a corresponding item of income for the sponsor.

10. (Losses Allowed) Taxable Income. Create a formula in this row that checks whether the absolute value of the sum of Project Taxable Losses Allocated to TEI (Step 8) and Remedial Depreciation (Step 9) is less than the value from First Interim Balance (Step 7). The formula should be constructed such that the result is zero, if there is insufficient basis to cover any losses; a negative number, if there is sufficient basis to cover any losses; or a positive number pulled directly from Taxable Income Allocated to Tax Equity (Step 5). In our example, Year 1, there is sufficient basis, $1,872, to cover the losses, so the formula returns ($372) + ($3) = ($375).

11. Second Positive Interim Balance. Create a formula to check whether the value in (Losses Allowed) Taxable Income (Step 10) is negative or positive. If negative, check whether the value in First Positive Interim Balance (Step 7) is greater than the absolute value in (Losses Allowed) Taxable Income (Step 10). If so, have the formula return the sum of the two values. If positive, sum this positive value with the value in First Positive Interim Balance (Step 7), assuming Step 7 is not zero. Otherwise, the outside basis balance here should be zero. For TEI, Year 1: $1,872 + ($375) = $1,497.

12. Loss Disallowed (Taxable Income). Create a formula that suspends any losses taken in Step 8 and Step 9 if there was insufficient outside basis to cover these negative amounts. Recall that the partner's outside basis is not permitted to fall below zero. Therefore, to the extent the current period losses exceed the partner's outside basis, the excess must be suspended until a period when the partner has a positive outside basis.

13. Suspended Losses Recovered. Create a formula that recovers any suspended losses to the extent there is a positive Second Interim Balance in subsequent periods.

14. Suspended Loss Balance. Create a formula that tracks the balance of suspended losses from which losses can be recovered in future periods should it be possible to absorb these.

15. Total Tax (Benefits) Detriments to Partner. This step summarizes the net tax position of the partner for the period. Create a formula that sums the value recorded in (Losses Allowed) Taxable Income (Step 10) and the absolute values of any negative numbers recorded in Excess Distributions Over Basis (Step 6). A negative number indicates a tax benefit for the partner; a positive number indicates a tax detriment. A negative number is a benefit because the partner can use the loss to shield taxable income of a profitable business elsewhere. By the same logic, a positive number acts as a detriment because the partner must now report more income on its income tax return and pay taxes on that additional amount. In our example, Year 1, the Tax Equity Investor has a tax benefit of ($375).

16. Ending Outside Basis. Create a formula that pulls the values from Second Positive Interim Balance (Step 11). Typically, the Ending Outside Basis will be at is maximum in the very first period and decline thereafter until it reaches zero, driven mostly by the high (accelerated) depreciation deductions.

Getting the outside basis formulas to work properly is a challenge, so be patient if you find yourself reworking formulas many times. Once you have created the outside basis for the TEI, replicate the same structure for the sponsor.

Summary Cash Flows

Having worked out the mechanics of the two accounts, we can finally turn our attention to the internal rate of return (IRR) for each partner. To do this, however, we must first determine each partner's stream of after-tax cash flows, especially TEI's.

What items impact after-tax cash flow? Recall that the TEI makes a big equity contribution at the beginning of the project. To calculate the investor's rate of return, we show this as a negative number. Recall also that the TEI receives every period an agreed percentage of cash flow from the project. TEI's share of project cash flow feeds directly into TEI's period-by-period summary cash flow line.

Besides actual cash distributions/contributions, the other major item that impacts after-tax cash flow is a partner's taxable benefits and detriments (see outside basis, Step 15). If the TEI normally sits in a tax bracket of 35 percent, that means for every $100 of taxable losses that the TEI receives, it saves $35 in cash taxes. The investor's share of the 30 percent tax investment credit is a dollar-for-dollar reduction in the TEI's taxes due.

Given that the TEI typically would be looking for ways to shield taxable income from other unrelated businesses, it makes sense to assign the preponderance of the investment tax credit and the project's Taxable Income in the early years of the project (taxable losses predominately) to the TEI. Once the project's taxable losses are exhausted, the TEI would prefer not to receive Taxable Income, as this will only increase its cash outlay in the form of taxes. This explains why the ''flip'' typically is projected to take place as soon after tax benefits are exhausted as possible, typically in Year 6, if the project can support it.

In the ''post-flip'' period, the TEI typically will require enough cash (from partnership distributions) to ensure its yield does not degrade due to taxable income allocations. During this time, the TEI's share of taxable income per the sharing ratios is set out in the partnership agreement. However, remember that as minimum gain decreases, a portion of the partnership's taxable income will be reallocated to the partners in the ratio that they claimed losses against ''phantom'' equity. Any income above the decrease in minimum gain will be shared in the base income allocation ratio.

As an example, assume the partnership has $10 of taxable income and a $2 decrease in minimum gain ($2 in chargeback income). $8 will be allocated according to the agreed sharing ratios and the $2 will be allocated in the ratio the partners claimed losses once their equity was depreciated away.

Internal Rate of Return

Assuming that the TEI's summary cash flow line in our model accurately captures all the cash impacts on the TEI, we can finally turn to the fun part, i.e. calibrating the returns of the tax equity investment. For this, we use conventional IRR formulas. But unlike most projects, you will want to calculate the running or cumulative IRR returns for each period. We do this to figure out when the TEI's target return has been met. Once we know how the TEI's cumulative returns behave over time, we can figure which levers to pull so the TEI is projected to reach its target IRR by a goal date.

Each tax equity investor has its own after-tax return threshold. Given the uncertainty in the market and the limited data points for ITC transactions, it is hard to put returns in a ballpark. Pre-tax yields generally must be above 2 percent through the term of the power contract, based on certain tax constraints, although some investors require a higher or lower pre-tax yield (generally through Year 20).

Once the model calculates the TEI's running pre-tax and after-tax returns, you are at the final step of the modeling process. You can now start dialing up and down the knobs (input parameters) in your model. Chances are, your initial assumptions will not magically yield the TEI's target return in the time horizon expected. Chances are, you are giving the TEI too much cash, or not enough, too much taxable income, or not enough. Your project debt/equity split may not be sustainable. The TEI/sponsor equity split may not work.

But that is the fun part of modeling—figuring out the optimal combination of the dozens of input parameters on your dashboard. The model works, and with that model you can now determine whether a tax equity investment in principle makes sense and, if so, how that investment should be structured so that the project gets financed and becomes a reality.

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