Understanding and Teaching Private Equity Structures: Modeling Real Estate Development Joint Venture Agreements

David E. Hutchison[1]

Abstract

Private equity investments in partnerships such as funds and joint ventures are more complex than the traditional residual interest common equity that we teach in corporate finance. Cash distribution rules between operating and investing partners incorporate proprietary returns on invested capital and equity IRR-dependent residual cash flow distributions. IRR is in turn impacted by management decisions over financial leverage and investment horizon, apart from investment performance. The economic consequences of these structures is complicated and often not well understood. Using simple models of real estate development, this paper is intended as a primer on the economics of private equity structures.

Introduction

Private equity as an alternative investment class has grown rapidly in recent years and the private equity industry has become a very popular destination for economics and finance students. Although most often associated with operating company or venture capital, private equity is extremely important in project finance, particularly in the real estate industry.[2] Academic work in this area has been geared primarily to private equity fund performance. There has been little work addressing the specifics of private equity structures and their implications for the operating and capital partners that invest in them. In private equity funds and joint ventures, operating agreements between equity partners employ cash distribution rules that are more complex than the simple residual interest common equity that we teach in corporate finance. The intricacies of these rules and the nature of their dependence on basic financial math are poorly understood, even among many practitioners. As a result, relationships between contractual components of private equity, investment objectives, and cash distribution outcomes often are poorly understood as well.

This paper is intended to serve as a "primer" on the structure of private equity using real estate development joint ventures as the investment vehicle. We lay out the basics of commonly used joint venture terms, comparing and contrasting with other private equity investment structures. We then develop and discuss simple models of real estate development equity using common joint venture cash flow distribution rules. Our models use project profitability standards based on feasibility metrics employed by practitioners. We examine the distribution of proceeds and investor's net present value under alternative market-based assumptions for key valuation parameters. We demonstrate that variables such as investment period length and financial leverage can impact the distribution of value-added between partners, independent of project success. Our results reinforce one of the most fundamental lessons we teach, which

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[1] David E. Hutchison is the Director of the Opus Group Real Estate Program in the Mendoza School of Business at the University of Notre Dame, Notre Dame, IN 46656.

[2] Public real estate equity (e.g., REIT stock) is popular with academics given their familiarity with securities trading and the wealth of transactions-based price data, yet historically private equity has been far more important than its public counterpart. As of year-end 2009, the total capitalization of public U.S. equity and hybrid REITs was approximately $250 billion, whereas the estimated capitalization of the NCREIF index alone, composed only of holdings of participating fiduciaries (primarily pension funds and fund managers), was nearly $240 billion.

is the need to distinguish between value-added and rate of return. We conclude with some teaching thoughts, including suggestions for case studies.

Private Equity Basics

The basics of private equity investments tend to be similar across investment types. In both private equity funds and joint ventures (JVs), a general or operating partner joins with one or more investing or capital partners to invest in operating companies or real assets such as real estate development/redevelopment projects. Most private equity funds are closed-end funds. At the inception of a closed-end fund investors commit to a given level of investment in assets meeting certain parameters, and funds are invested over a contractually determined horizon as profitable investments emerge. Although there are multiple potential exit strategies for fund investors, asset liquidation is very common particularly in real estate. Investment horizons in private equity are relatively short; 3-7 years is typical of the asset holding period.[3] Fund managers are often private equity firms, investment banking firms, or large development firms. Joint ventures are often associated with single project investments and most often involve one or a small number of capital partners and an operating partner. Master JV agreements are sometimes used to provide for multiple investments through the creation of a holding company for interests in project-specific joint ventures.[4] Funds, particularly when managed by non-development firms, often enter into project-specific joint venture agreements with developers and others, creating layers of private equity structures.[5]

Operating partners and investors enter into partnership agreements that assign management responsibilities and allocate profit and risk. Operating partners earn management fees that are considered costs to the partnership. In a private equity fund these fees are typically 1.5%-2% of all assets under management per year. In a real estate development joint venture, a developer will earn 3%-4% of qualifying costs, typically construction and land costs, for managing the development process and can earn other fees such as architectural and construction management fees.[6] These are also considered costs to the partnership. The terms governing the distribution of partnership cash flows net of costs are often somewhat complex, rendering the economics of the contract difficult to ascertain. Operating agreements require a proprietary or preferred return on invested capital, a portion of which is normally expected to be provided by the operating partner in order to have "skin in the game". In a joint venture in which the operating partner is a real estate developer, the investment requirement is often small, from 2.5% to 20% of the total project equity.[7] Relative to amounts invested, once the preferred return threshold has been met residual cash flow distributions typically favor the operating partner. In general, the portion of residual cash flow that accrues to the operating partner when the project is successful is considerably larger than that partner's portion of the equity investment, and it often increases as IRR hurdles are met. Private equity can be thought of as an investment in preferred equity and a residual or common equity position, where the operating partner's residual interest is larger than its preferred interest.[8] When the operating partner is a real estate developer, the difference between the size of the residual and preferred positions, called carried interest in private equity funds, is referred to as the developer's "promote" payment. The distribution of these residual cash flows, often referred to as the cash flow "waterfall", is driven by a host of factors including project performance, leverage, the relationship between market capitalization rates and preferred

[3] A good description of real estate private equity fund structure can be found in Andrae Kuzmicki and Daniel Simunac, "Private Equity Real Estate Funds: An Institutional Perspective," Real Property Association of Canada, 2008.

[4] Frequently this is used to incorporate the benefits of diversification into the terms of the equity investments, similar to a European waterfall structure in a venture capital fund. Under these structures, IRR requirements governing the distribution of profit are applied to the portfolio return rather than project-by-project.

[5] Experienced fund managers will often hire developers to manage the development process for a fee rather than as a venture partner.

[6] See David Robinson and Berk Sensoy "Do Private Equity Managers Earn Their Fees? Compensation, Ownership, and Cash Flow performance," NBER Working Paper Number 17942, March 2012. Also see William Brueggeman and Jeffrey Fisher, Real Estate Finance and Investments, fourteenth edition, chapter 18.

[7] This observation and others in this section are based on the author's experience as the CFO of a small real estate development company as well as numerous conversations with developers and real estate investors. Special thanks go to Dan Murphy of Continuum Partners and Ed Fitzpatrick of the Shopoff Group.

[8] Similarly, in venture capital markets, private equity investments in operating companies often take the form of convertible preferred stock.

returns, IRR cash distribution rules, and the investment holding period. [9,10] Under an American waterfall, fund and master JV IRR waterfall rules are applied to the equity investment in each project sequentially, whereas under a European waterfall they are applied to the total equity investment in the portfolio.

Cash Flow Waterfall Rules

Cash distribution or waterfall rules in private equity structures employ performance-based standards under which distribution percentages change once a performance threshold has been met. However, the waterfall rules vary. Perhaps the simplest rule and the one most common in real estate development allocates project cash flow "pari pasu" (in proportion to invested capital) until a preferred IRR target has been met, at which time cash flow percentages between the operating partner and capital partner(s) shift toward the operating partner, i.e., the operating partner receives carried interest or promote payments. Under this rule, carried interest or promote payments are earned only after the return of and preferred return on invested equity capital. Consider a very simple illustration. Suppose that a project is financed entirely with $1 of equity, $.90 provided by a capital partner and $.10 provided by the operating partner. Further suppose that the project takes 24 months to complete, during the 24 months there is no cash flow, and the project is liquidated at the end of the 24 months for $1.40. The cash distribution rule might specify pari pasu cash distributions (90% capital partner/10% operating partner) until the partners have earned a 12% annually compounded IRR, and a 75% capital partner/25% operating partner distribution thereafter. In this case the operating partner is said to receive a 15% carried interest or promote payment. In order to determine the payments necessary to satisfy the preferred return requirement, it is convenient to create an "account" with an initial balance equal to the equity investment and which grows at 12% per year, net of payments received. In our simple example the equity investors receive no cash until the end of the 24 month project life, thus the $1 initial account balance grows to $1 x $(1.12)^2$ = $1.2544. $1.2544 of the $1.40 received on project liquidation is paid out pari pasu (90%/10%) to satisfy the preferred return requirement, leaving .1456 to be split 75%/25%. The capital partner's total cash flow is (.90)(1.2544) + (.75)(.1456) = 1.2382 and the operating partner's total cash flow is (.10)(1.2544) + (.25)(.1456) = .1618. (Please see the appendix for further illustration of the mechanics of this cash distribution rule.)

Other private equity distribution rules are similar, except that fund waterfalls are frequently more liberal in the payment of carried interest. For instance, fund distribution rules often call for the payment of carried interest on all profit, as defined in accountancy, subject to the requirement that the capital partners meet their preferred return hurdle. This is essentially a requirement that cash distributions be paid pari pasu until all invested equity capital is returned, at which time carried interest or promote payments are received by the operating partner. In our simple example, under this rule $1 of the $1.40 available is distributed 90%/10% and the remaining $.40 is distributed 75%/25%, subject to the requirement that in the aggregate the capital partner(s) earns at least a 12% IRR. In this case the capital partner's share of the total cash flow is (.90)($1) + (.75)(.40) = $1.20 and the operating partner's share is $.20.[11] Note the significant positive impact of this rule on the operating partner's performance.

Alternatively, distribution rules may require pari pasu splits until the preferred return hurdle has been met, but then a much higher "catch-up" operating partner split until a targeted percentage of the total profit has been reached. For instance, the cash flow waterfall might require that cash be distributed 80% operating partner/20% capital partner(s) post preferred return until the operating partner has reached 25% of all profit. Any remaining cash flow would then be split 75% capital partner/25% operating partner. Other more complex structures used in real estate development draw somewhat artificial distinctions between operating cash flow and cash flow from capital events (refinance or sale), and have separate rules

[9] Other factors include equity multiple requirements, under which a minimum multiple of the initial equity investment must be earned before promote is paid, and "look-back" provisions, under which investors can claim previous developer cash flows in order to satisfy minimum return requirements.

[10] Yasuda (2007) finds that fund general managers earn approximately 60% of compensation from fees and the remaining 40% from carried interest.

[11] The capital partner's IRR is 15.5%, satisfying the preferred return requirement.

for each class of cash flow.[12] Under these waterfall rules developer capital is often subordinate to investor capital.

A Simple Real Estate Development Framework and the Math of IRR

In concept, real estate development can range from the re-letting or redevelopment of existing properties to the creation of real estate assets from the ground up. Ground-up development is a multi-faceted process involving site evaluation, land acquisition, entitlement (permitting), construction, leasing, and conceivably property and asset management. In the context of a partnership, the development process is often defined to begin with land acquisition and the majority of development costs are incurred with land acquisition and construction. Some relatively modest costs such as legal fees and costs related to controlling a building site prior to acquisition are considered pre-development and may or may not be included as costs to the partnership. The development process is financed with equity and construction debt, which is a credit line drawn on over the construction process. Under the terms of construction loans, the required equity investment is made prior to any draw down of the credit line and is invested early in the process in land acquisition and related costs. Construction debt is typically shorter-term debt that comes due at the end of the development process. On maturity it is refinanced with longer-term mortgage debt referred to as "perm" debt. Because ground-up development is not cash producing until well into the development process, interest on construction debt is capitalized and paid with the rest of the construction loan balance at maturity. Perm debt interest is paid in cash.

In real estate development, the most commonly used metric for the evaluation of a project's economic viability is the unlevered yield on cost, or development cap rate, defined to be forecasted "stabilized" (post-development period) annual net operating income (NOI) expressed as a percentage of forecasted total project cost including capitalized interest.[13] The economic feasibility of a development project is based on the relationship between the development cap rate and the post-development expected market cap rate, defined as net operating income as a percentage of market price. The market cap rate is the required cash return on investment in stabilized real estate based on observed prices. The market cap rate is forward looking in the sense that NOI is defined in terms of next period's expected net operating income. Because real estate development is riskier than investment is stabilized real estate assets, the development cap hurdle rate is the market cap rate plus a spread of roughly 2%-3% depending on asset type. Since (development cap)/(market cap) = (NOI/cost)/(NOI/price) = price/cost = 1+ (price-cost)/cost, the hurdle spread defines a percentage capital gain (value-added) requirement. For instance, if the market cap rate is 7% and the development cap/market cap spread requirement is 2%, the development cap rate requirement is 9% and the required capital gain is 9%/7% -1 = 2/7 = 28.6%. Since project cost is assumed to include capitalized interest on construction debt, the entire gain accrues to the equity partners. With simple assumptions about leverage and the timing of investment and revenues (if any) over the development period, it is straight forward to compute both asset and total equity IRR values for any given holding period.[14] Illustrations can be found in the appendix.

IRR and Holding Period

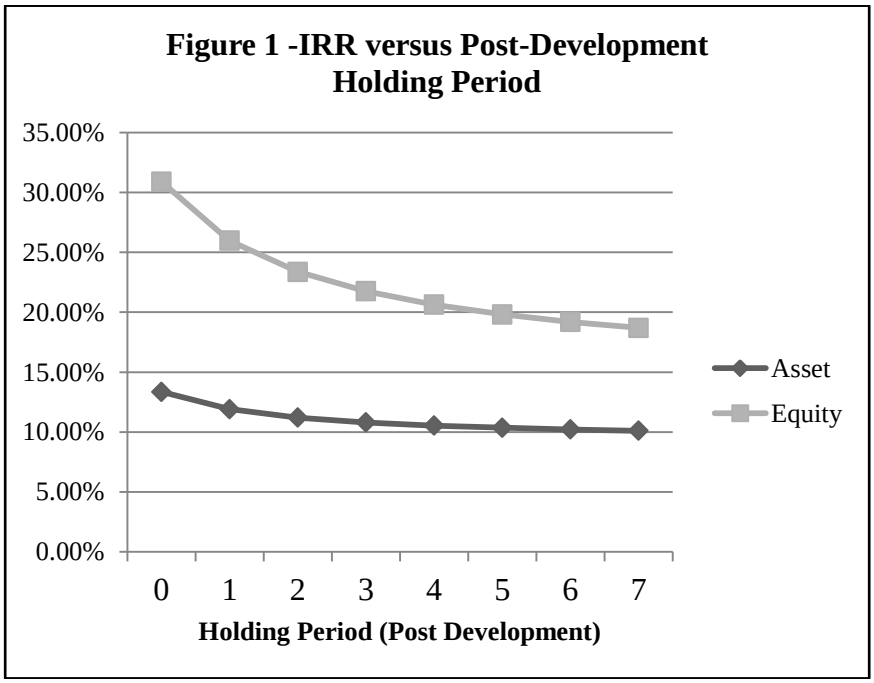
Consider a project with an estimated 24 month development period, a market cap rate of 7%, and development cap rate spread requirement of 200 bps. For simplicity, assume that all joint venture equity

[12] In these structures, the capital partner's preferred return is often senior to the operating partner's. In some circles these funding structures are considered mezzanine finance. Distinct waterfalls applied to operating cash flow and capital events are occasionally but not commonly found in private equity fund agreements as well.

[13] NOI is essentially rent revenues and other ancillary income net of operating costs but prior to interest expense. Depending on the exact definition employed, NOI may or may not include "capital costs" such as physical investment expenses, leasing commissions, or tenant improvement allowances. Because many of these costs occur infrequently, they are often annualized and included in NOI as a "reserve".

[14] Assume that the development cap rate is 9%, the market cap is 7%, the project is to be liquidated at completion, and that there is no revenue prior to completion. Since the asset is liquidated for $1.286 per $1 in cost, the asset IRR is found from $1 = $1.286/(1+IRR)^2$. If the construction loan to cost ratio is 60%, on liquidation the equity investors receive the value of the asset net of debt repayment, which is $1.286 - $.60 = .686 per $1 of total cost. Since the equity investment is $.40, equity IRR is found from $.40 = $.686/(1+IRR)^2$.

is invested at the beginning of the development period, defined to be at land acquisition, pre-development costs are negligible, and that there is no project revenue until stabilization. Let post-development period NOI growth be 2%. In Figure 1 we illustrate the development asset IRR, as well as the total equity IRR as a function of the length of the holding period based on a 60% loan-to-cost (LTC) construction loan, a 60% loan-to-value (LTV) perm loan, and a 6% borrowing rate. [15]



The relationship between IRR and holding period is clear: IRR declines as the holding period increases. Economically, we can think of IRR as capturing the results of two separate investment decisions, one the decision to invest in real estate development, which over the 2 year development horizon generates a healthy project return of 13.29%, and the second the decision to hold and therefore to invest $1.286, the end of development period project value per $1 of cost, in the project post-development. Under our constant NOI growth assumption the post development rate of return is the sum of the cap rate (cash yield) and the growth rate, or 7% + 2% = 9%.[16] The end result is a project IRR that is an "average" of the two that depends upon the length on the post development holding period.

The Role of Leverage

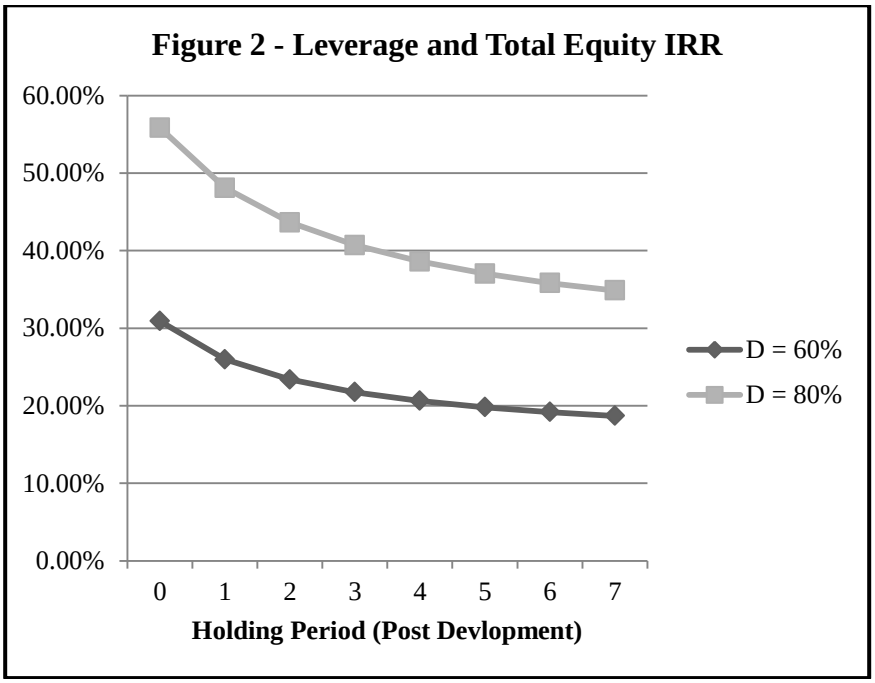
Equity IRR, which in part determines the distribution of partnership cash flows under the IRR waterfall, is driven by asset performance and financial leverage. Most development is financed with debt, ranging from 50% to 80% or more during the height of the "bull" market in the mid to late 2000s. Leverage impacts the distribution of profit or value-added between developer and capital partner in two ways. The first is the traditional effect of leverage on equity risk and expected return in conjunction with the IRR waterfall. The second effect of leverage on value distribution is due to the impact of project refinancing on

[15] LTC is the total debt outstanding at project completion as a percentage of total cost including capitalized interest. LTV is loan principal as a percentage of the asset's market value.

[16] In the simple constant cash flow growth model, the post-development price (P) of the asset is the present value of future net operating income, which is NOI/(R-g), where NOI is 1 period ahead operating income, R is the market return, and g is the NOI growth rate. Thus, P/NOI = cap rate = R-g and the market return R = cap rate + g.

the timing of the extraction of project profit. Depending on the relationship between construction debt LTC and permanent debt loan-to-value LTV ratios, the refinancing of development debt at the end of the development period allows the partnership to extract value-added prior to the final disposition of the project, which will increase the project's equity IRR. Assuming that perm debt LTV is at least as high as construction loan LTC, the degree of "value extraction" depends on the LTV of the permanent loan. If LTV and LTC are 70%, then 70% of the value-added is extracted on refinance. If perm loan LTV is higher than construction loan LTC, then in addition to extraction of value-added, the joint venture can extract a portion of its invested capital. The greater the extraction of cash on project completion, the greater will be the equity IRR, apart from total project IRR.

Figure 2 captures Equity IRR as a function of the holding period for 60% and 80% debt ratios based on the project parameters used in Figure 1 (a 9% development cap rate, 7% market cap rate, 2% annual NOI growth, and 6% borrowing rate).



The 80% debt ratio equity IRR curve is considerably higher and somewhat steeper than the 60% curve, in part a consequence of the fact that the return on equity is essentially the return on assets plus the product of the debt to equity ratio and the asset return/debt yield spread. Although financial leverage most often presents a value-neutral, risk-return tradeoff at the total equity level, to the extent that cash distribution rules do not address leverage explicitly higher degrees of leverage could raise expected equity returns and positively impact the developer's share of equity cash and thus total wealth.

Risk, Return, and the Cash Flow Waterfall

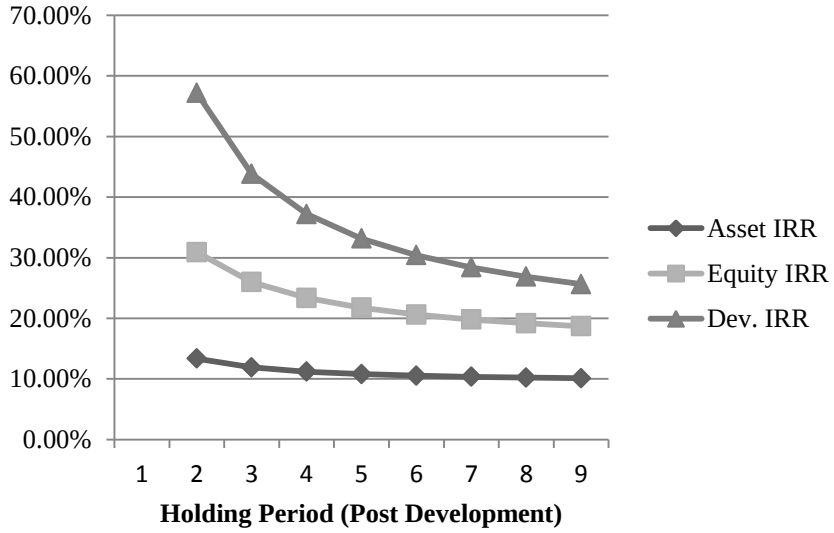
As Kane (2001) points out, there is a spectrum of risk/return expectations across the universe of capital partners. Opportunity funds pursue higher risks and returns than pension funds, and many other investors lie in between. Investors use several mechanisms to manage risks. Obvious candidates include project type and the degree of financial leverage employed. Alternative combinations of pref rates and promote distribution parameters can be used to allocate risks between partners. Perhaps less obvious is the investment holding period. Holding a development asset beyond the stabilization period is the equivalent of investing in development, liquidating the asset and investing in a lower risk stabilized asset. The longer the capital is invested in the stabilized asset, the lower the risk and return associated with the strategy over

time. To the extent that the market for stabilized real estate assets is competitive, the degree of financial leverage or the decision to hold the development asset beyond the development period will have little impact on wealth creation. Yet both will impact equity IRR and potentially the shares of project cash flow to the partners. Clearly, it is important to understand the relationships between strategic variables such as investment horizon and the rules governing cash distribution, even when some of those strategic variables, e.g., investment horizon, cannot be incorporated into the joint venture contract definitively. A corollary is that the partners should understand each other's strategic interests and those interests should be reflected in the terms of the joint venture. Yet, based on observation developers are often unfamiliar with IRR math and in many joint venture term sheets cash flow waterfall terms are free of any reference to either degree of financial leverage or investment holding period.

Preferred Returns and IRR Thresholds

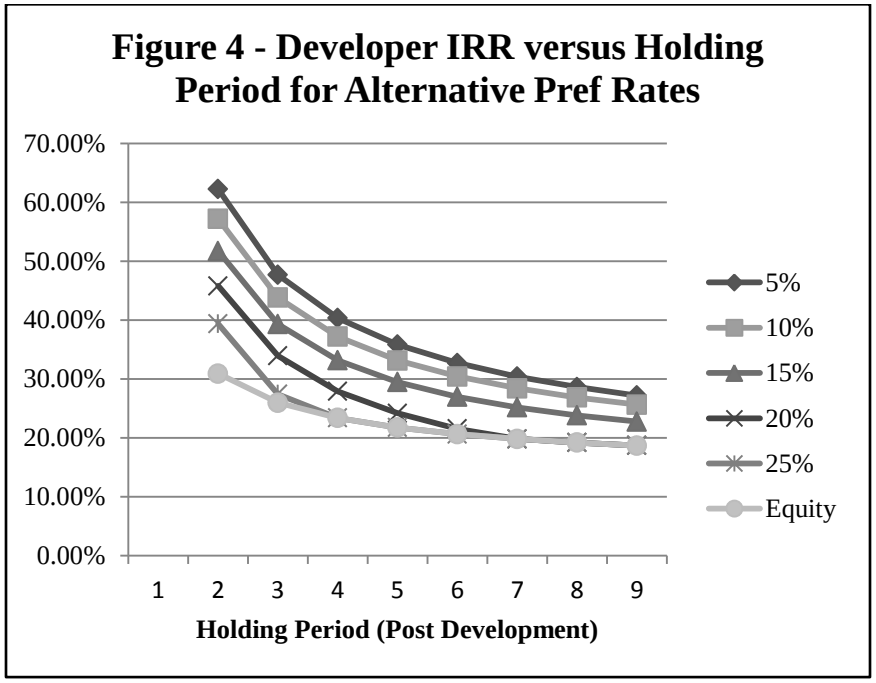
A defining characteristic of private capital markets is a lack of contract standardization. Although real estate private equity investors often talk about "the" market preferred return ("pref") rate, in practice there are many. Pref rates under a standard pari pasu preferred return payment structure typically range from 7%-8% up to as much as 15%. Promote payment structures vary in degree of complexity. Payment rules may involve one or several IRR thresholds. Contract terms will vary dependent on the experience of the developer and the relative bargaining positions of the developer and capital partner. Common development cap/market cap spread requirements of 200 bps.- 300 bps. tend to yield holding-period-dependent asset IRRs of 10%-15% which when levered yield 20%-35% equity IRRs. Thus, preferred return requirements are typically much lower than equity IRR based on spread targets, and developer promote is significant when targets have been met. Figure 3 captures total equity IRR, developer IRR, and capital partner IRR rates under a simple promote structure using the project assumptions of Figure 1. We assume that the developer's percentage of the equity investment is 10%, that 10% is the preferred return requirement, and that residual cash flows are split 25%/75% developer/capital partner, i.e., a 15% promote after 10% pref.

Figure 3 - Developer and Capital Partner IRR and Post-Development Holding Period



Not surprisingly, developer IRR diverges significantly from capital partner IRR. Promote is very important to developer returns, as one would expect. Under pari pasu preferred IRR cash distribution rules,

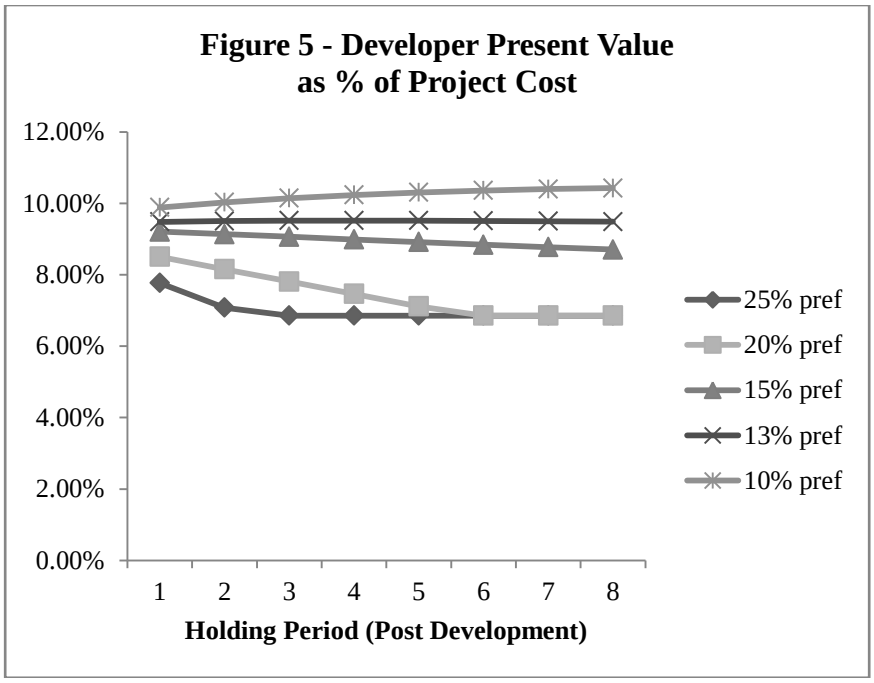
developer and capital partner IRR will diverge as long as levered total equity IRR is above the pref rate, that is when the developer earns promote. Note that the relatively low IRR threshold for promote payments afford a degree of protection to developers relative to project performance as well as the potentially negative effects of holding period on promote payments. Figure 4 illustrates developer (operating partner) IRR and total equity IRR as a function of post-development holding period over a range of alternative preferred return rates. Debt, equity contribution, project performance assumptions, and cash distribution rules (other than preferred return rate) are the same as in Figure 3.



Spreads between developer, capital partner, and total equity IRR decline as the holding period extends, as one would expect. However, when pref rates are low developer IRR remains reasonably well above total equity IRR over the entire modeled range. Under the pari pasu structure, when developer IRR and capital partner IRR converge, developer promote must be zero. Since it is fair to assume that the decision to hold the investment beyond the development period is essentially a zero NPV decision, the equity IRR curve represents constant NPV values of IRR. The convergence of developer and equity IRR in high pref environments signals a loss of net present value to the developer associated with extending the investment horizon.

However, when pref requirements are relatively low developer IRR does not converge on equity IRR over our hypothetical investment horizon. Therefore, we can't conclude that developer NPV declines over time based on IRR alone. In order to directly estimate the effects of the investment horizon on developer NPV, we compute the present value of the developer's position as a function of the post-development holding period under alternative pref values. We use the same compensation structure as the model above. The model assumes a constant 2% NOI growth rate and that the completed project is priced to a 7% cap rate, thus the required return on the asset is 9%. At a 60% initial loan-to-value ratio and 6% permanent debt rate, the initial required (market) equity return is .09 + (.6/.4) x (.09-.06) = 13.5% . Note that under the constant cash flow growth model asset value grows at 2% per year and the leverage ratio and discount rate decline marginally over time.

Figure 5 illustrates the relationship between developer wealth and post-development investment horizon over a range of pref rates from 10% to 25%.

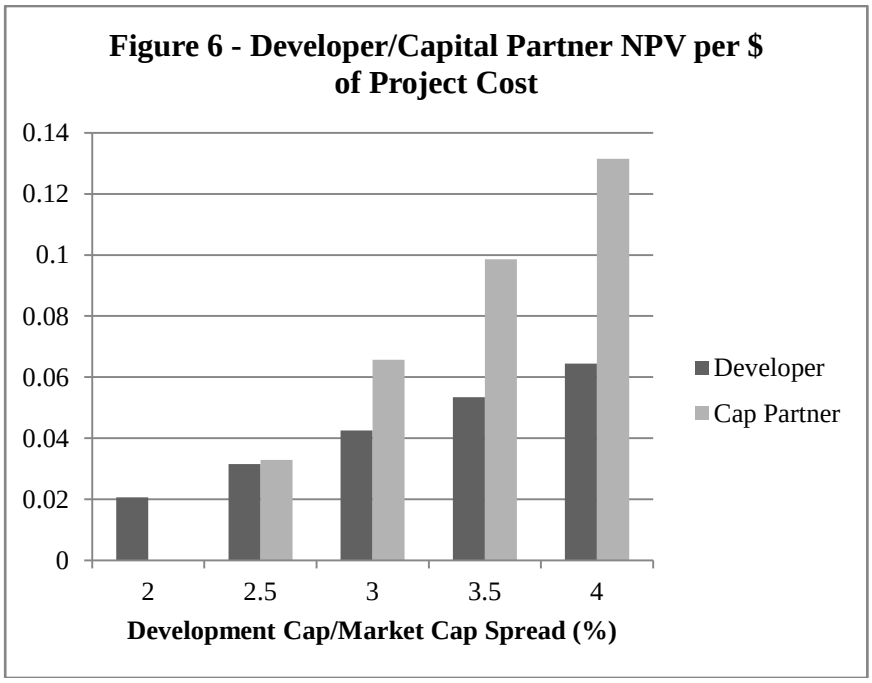


As expected, at high pref rates developer wealth declines with the length of the investment horizon, and the effect is meaningful. At 20% pref, the developer's loss of value over the investment horizon is more than 20%. Surprisingly, at low pref rates developer wealth is marginally increasing in the investment horizon, despite the general effects of investment horizon on equity IRR. Pref rates are applied to cash equity investment. Given the relatively high required returns on total development equity, the carrying value of equity (investment plus accrued preferred returns over the development period) is much smaller than the market value of that equity at successful completion of the project. In addition, pref rates are often smaller than the required equity return in the post development period. In these lower pref rate environments operating cash flows and price appreciation, which are just sufficient to provide the required return on the market value of equity, are much higher than necessary to meet the preferred return on the carrying value of equity. Distributions are skewed toward higher promote payments that increase the present value of the developer's position.

Distribution of Development Value-Added

So far we have considered the effects of post-development investment horizon on wealth distribution. Apart from the impact of the investment horizon, it is useful to understand how the IRR waterfall distributes total development project net present value. Unfortunately, there is no perfect way to answer this because we have no price data with which to estimate the required return on real estate development. Indirectly, we can use development cap/market cap spreads to estimate required asset IRR for a given development period. The hybrid nature of real estate private equity and the differential residual positions held by the developer and the capital partner make the required equity return more difficult. For typical pref rates and required spreads, significant promote payments will result in a divergence between developer IRR, capital partner IRR, and the total equity IRR. This divergence will be driven by the specifics of the waterfall, which are likely to be at least somewhat independent of the risks of the project. As a starting point, we take the capital partner's IRR at the required spread and given waterfall structure as the required equity return. As before, assume a 2% spread (7% market cap, 9% development cap) and 24 month development period, 10% equity investment by the developer, and 10% pref with 75%/25% cash flow splits after pref. We compute developer/capital partner NPV for a range of realized development cap/market cap spreads as of the end of the development period. Figure 6 captures developer/capital

partner net present value for spreads ranging from 2%-4%. By definition, the capital partner's NPV is 0 when the spread is 2%.



Using the capital partner's IRR at the 2% spread as the discount rate results in positive NPV for the developer given the yield differentials created by promote payments, which accrue when projects are breakeven for the capital partner. Relative to total project costs capital partner NPV grows more rapidly as performance improves, reflecting the capital partner's much larger investment. However, it can be shown that NPV per dollar invested in much higher for the developer across the range, reflecting the developer's large relative residual interest.

Teaching Joint Venture Economics

Real estate development private equity can be covered in an upper level undergraduate or graduate real estate capital markets course. Some students will have been exposed to private equity structures, however many will not. We begin with the basics of private equity funds and then move to joint ventures. Because the nature of private equity is much different than public common equity, the mechanics of cash distribution rules will be foreign to most and it is a good idea to provide a number of relatively simple examples. We start with private equity distribution rules in one-period investment horizons. As noted, funds often pay carried interest on accounting profit subject to the requirement that investors earn at least their preferred return. Some funds are more restrictive and pay carried interest only on residual cash flow after pref and return of capital, essentially the pari pasu rule most commonly used in joint ventures. An intermediate position requires pari pasu splits until the preferred return hurdle has been met, but then a much higher "catch-up" operating promote split until a the targeted percentage of the total profit has been reached. Single period investment examples, analogous to the 24 month example found in the discussion of cash distribution rules above, are easy to produce. For instance, when comparing the hard IRR requirement before promote against the accounting profit standard, all that is required is a one-period project that earns significantly above the pref rate.

In addition, illustrations involving American versus European waterfall structures within a fund can be used to illustrate cash flow timing issues and the impact of diversification. Under the hard preferred IRR standard, promote/carried interest is paid only after the preferred IRR has been met. When there are multiple projects, one or more of which fail to meet the preferred IRR, the poorly performing do not

impact promote/carried interest payments on successful projects under an American waterfall, in which the distribution rule is applied to each project sequentially. However, in applying the rule to the aggregate investment under the European structure some of the "excess" IRR from the successful projects has to be allocated to the unsuccessful projects before any promote/carried interest is paid. A one-period, two project fund with differential project IRRs which when aggregated earn exactly the pref rate on total equity can be used to illustrate this. Consider simultaneous 24 month development projects each with $60 million in total costs (including capitalized interest) financed with $20 million in equity. Both projects are initially forecast to earn a 10% development cap rate (yield on cost) at completion. The market cap rate is assumed to be 8.5%. Let one project reach its 10% development cap, but suppose that the other project earns 8.44% on cost and thus falls marginally short of the market cap rate. Assume that the projects are liquidated on completion and that no cash is received before liquidation. The sales proceeds from the liquidation of the 10% development cap project are $60 x (.10/.085) = $70.59. Net of $40 in debt the equity investors receive $30.59. For the lower yielding project, sale proceeds are $60 x (.0844/.085) = $59.59. Net of debt, equity holders receive $19.59. Total equity cash flow = $50.18. Let the equity investment percentages be 10% operating partner, 90% capital partner. Consider a cash distribution rule with pari pasu payments until a 12% IRR has been reached and 25%/75% operating partner/capital partner distribution thereafter. Under a European waterfall the cash distribution rule is applied to total equity investment of $40 million. The preferred IRR requirement = $40 x $(1.12)^2$ = $50.18. Thus proceeds are just sufficient to meet the preferred return requirement and all cash flow is distributed pari pasu. The operating partner will receive 10% or $5.018. Under an American waterfall, the cash distribution rule is applied sequentially. For each project, $20 x $(1.12)^2$ = $25.09 is the preferred return requirement. Cash flow from the higher yielding project is split 90/10 until the first $25.09 has been paid out, and then promote payments are earned on the remaining $5.50. Thus the operating partner receives $25.09 x .10 + $5.50 x .25 = $3.884. The second project does not pay out enough cash to reach the IRR requirement, and thus the entire distribution is pari pasu so that the operating partner receives $19.59 x .1 = $1.959 from this investment. The operating partner receives $5.843 in total. Relative to the European waterfall, the operating partner receives an extra amount corresponding to the promote payment on the higher yielding project, .15 x ($5.50) = $.825, at the expense of the capital partner.

We then consider cash flows over multiple period investments under the common pari pasu/promote cash distribution structure that, as described, is equivalent to the restrictive fund waterfall. One of the advantages of this structure is that the pref requirements under these cash distribution rules behave as cumulating preferred stock. Spreadsheets are invaluable in these exercises, and in order to determine which cash flows are required to pay pref before splits change, we would recommend creating a basic template in which you track equity investment inclusive of cumulating preferred return and net of equity cash flows received. (See the appendix.) In order to talk about joint ventures in real estate development, it is best to introduce the development cap and the spread as the set of project feasibility metrics early and to connect them to IRR with illustrations. The risk-return profile of real estate development can be illustrated with exercises in which shocks to the development cap rate or the development horizon are translated into IRR. For instance, a simple example might involve a development project originally forecast to reach stabilization (construction completion and lease-up) in 24 months for which lease-up takes 36 months. Under these circumstances, the construction loan will need to be extended by twelve months, and total project costs, will increase by a year's worth of interest. If we assume that cash inflows are lagged by 12 months but that NOI and the market cap rate are otherwise consistent with the original forecast, we can compute IRR simply as in the examples above. The impact of this sort of project risk on realized return is usually quite significant.

Although students are exposed to the distinction between wealth creation and rate of return typically in their first finance class, it often does not fully register. Unfortunately, the issues related to cash distribution rules, pref rates, IRR, and NPV are difficult, and the deeper ones are likely to be beyond many undergraduates, so that pursuing them may be counterproductive. None the less, we have found that having students work through the mechanics of the distribution rules and interpreting the results is a good exercise. We do this in the context of a case study involving a developer that during the height of the commercial real estate boom was pursued by 2 potential capital partners for the opportunity to invest in a Hawaiian retail development. The term sheets for the two potential joint ventures were markedly different, one offering a considerably more developer-friendly waterfall and the other offering a considerably more seasoned capital partner, which was significant given that the development firm was reasonable inexperienced. Students are asked to model the developer's position under each structure for a "good" and

"bad" project scenario (defined in terms of development cap/market cap spreads), and to choose a capital partner based on the economics of the respective joint ventures as well as the risks associated with inexperience. An in-class discussion of results can be illuminating and is recommended.[17]

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[17] A summary of the case study and a short solution key are available from the author upon request.

Appendix - Cash Flow/IRR Computations

Asset Cash Flow and IRR

Consider a 24 month real estate development project whose development cap rate, NOI/cost, is forecast to be 9% and for which NOI grows at 2% post development. Let the current and near-term forecasted market cap rate, (NOI)/(market price), be 7%. For simplicity assume that all project costs are incurred at the beginning of the project, no revenue is received until the end of the development period, and that cash receipts happen at the end of each year. Per $1 of cost, $1 is invested immediately and operating cash flow forecasts are $.09 in year 3, growing at 2% each year thereafter. The forecasted market value of the development asset at the end of each period can be found from the market cap rate. Since the market cap is NOI/price, price = NOI/(market cap). If the market cap forecast is fixed at 7%, the value of the development per $1 of project cost at the end of the development period is $.09/.07 = $1.286 and it grows at 2% per year. Table 1 captures total cash flow per $1 of project cost and IRR for project holding periods of 2-5 years.

Table 1 – Cash Flow per $1 Cost and Project IRR

Year	0	1	2	3	4	5	
Investment	-1	0	0	0	0	0	
Oper.Income				0.09	0.0918	0.093636	
Market Value			1.285714	1.311429	1.337657	1.36441	
CF							IRR
2 Yrs.	-1	0	1.285714	0	0	0	13.39%
3 Yrs.	-1	0	0	1.401429	0	0	11.91%
4 Yrs.	-1	0	0	0.09	1.429457	0	11.21%
5 Yrs.	-1	0	0	0.09	0.0918	1.458046	10.80%

Total Equity Cash Flow and IRR

Suppose that our simple project is financed with construction debt and that the loan-to-cost ratio, defined as end of project loan balance relative to total costs including capitalized interest, is 60%. In the event the real estate asset is held beyond the development period, assume that the development loan is refinanced with perm debt and that the loan-to-value ratio of the perm loan is also 60%. Note that a successful project will generate significant value-added (market value net of total cost), and that refinance is an avenue for extracting a portion of that value-added. In our illustration project market value post development is $1.286 (approx.) per $1 of cost. A 60% loan-to-value perm loan generates $1.286 x .60 = $.772, leaving $.172 (60% of value-added) after paying off the construction loan balance. In contrast to construction debt, perm debt interest is paid in cash rather than capitalized. Table 2 represents total end-of-period equity cash flow and IRR based on a perm debt interest rate of 6%:

Table 2 – Total Equity Cash Flow and IRR

Year	0	1	2	3	4	5	
Equity Inv.	-0.400	0.000	0.000	0.000	0.000	0.000	
Oper.Income				0.090	0.092	0.094	
Interest				0.077	0.077	0.077	
Market Value			1.286	1.311	1.338	1.364	
Debt			0.771	0.771	0.771	0.771	
Residual Value			0.514	0.540	0.566	0.593	
Refinance CF			0.171				
Equity CF							IRR
2 Yrs.	-0.400	0.000	0.686				31%
3 Yrs.	-0.400	0.000	0.171	0.540			23%
4 Yrs.	-0.400	0.000	0.171	0.013	0.566		20%

Residual value in Table 2 is simply asset market value net of debt and is the equity portion of asset sales proceeds. Total equity cash flow in any period is operating income net of interest payments, net refinance cash flow, and residual value in the last year of the holding period.

Equity Cash Flow Splits

Let 10% of the equity investment in our simple project come from the developer/operating partner and the remaining 90% from a capital partner. The cash flow waterfall is assumed to be pari pasu distribution until a 12% IRR has been earned on equity capital, with 75% capital partner/25% operating partner splits thereafter. Table 3 provides these cash splits and investor IRRs assumed a 5 year total project life (3 year post development holding period).

Table 3 Equity Cash Flow Splits – 3 Year Post-Development Holding Period

Year	0	1	2	3	4	5	
Acct. Bal.	0.400	0.448	0.502	0.370	0.400	0.432	
Cash Flow		0.000	0.171	0.013	0.015	0.593	
Net Bal.		0.448	0.330	0.357	0.385	-0.161	
Cash Splits							IRR
Op. Partner	-0.040	0.000	0.017	0.001	0.001	0.084	25%
Cap. Partner	-0.360	0.000	0.154	0.012	0.013	0.509	17%

The top line in Table 3 in the prior period's equity (net) balance plus that period's 12% preferred return. Equity cash flow is netted from this line to give the net preferred account balance to be carried forward. Cash flow is distributed pari pasu until the net balance is ≤ 0, that is until the preferred IRR has been met. A negative net balance represents cash flow that is distributed 25%/75%, i.e., cash flow over which the operating partner receives promote payments.