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# Financing the AI Buildout: A Sponsor's Guide to Debt and Equity for Data Centres

*A stage-by-stage capital playbook for data-centre sponsors raising equity, credit and take-out financing in the Gulf*

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## ABSTRACT

**Background.** The AI-driven expansion of computing demand has made data centres one of the largest destinations for private capital, and the Gulf has emerged as a distinctive venue for that buildout by virtue of energy availability, land allocation and sovereign-anchored demand. Sponsors, however, frequently raise capital as if a data centre were a single asset with a single cost of capital. **Objective.** This paper asks how the capital structure of a data-centre project should map onto its sequence of risk states, what determines bankability at each state, and how Gulf-specific conditions alter that mapping. **Approach.** The paper develops a stage-and-instrument framework grounded in project finance theory, capital structure theory, the infrastructure asset-class literature and real options analysis. It applies the framework to a representative USD 500 million campus, with every base-case number recorded in a single calibration register drawn from market convention and the author's transaction experience. **Findings.** Each risk state, from land and power rights through development, construction, lease-up and stabilised operation, has a natural instrument and investor class. Sponsors who raise the wrong instrument for their current state either surrender equity at its most expensive point or carry refinancing risk they cannot price. Offtake quality and tenor, not physical asset quality, dominate debt sizing. Staged raising preserves the option value of information revealed between states. **Implications.** The paper provides sponsors with a sequencing playbook and term-sheet architecture, and provides infrastructure investors with a framework for locating their capital correctly along the project lifecycle.

### Highlights

- A data centre is a sequence of risk states, each with a natural capital instrument
- Offtake quality and tenor, not the building, drive bankability and debt sizing
- Staged raising preserves option value; one early raise prices all risk at its peak
- A USD 500m campus: 55 per cent LTC debt, blended capital cost near 12.5 per cent
- Gulf sovereign demand moves the binding risk from lease-up to execution and structure

**JEL Classification:** G32, G23, G24, L86, O18

**Keywords:** data centres, project finance, capital structure, digital infrastructure, private credit, Gulf Cooperation Council, real options, infrastructure investment

*This paper is an educational and structural analysis prepared for research purposes. It is not investment advice, an offer, or a solicitation. It contains no client information.*

# 1. INTRODUCTION

A sponsor who controls a plot of land, a grid connection application and a letter of interest from a prospective tenant faces a deceptively simple question: how much money to raise, in what form, and from whom. The question is deceptive because the asset the sponsor is building will pass through several economically distinct states before it becomes the stabilised, income-producing property that institutional capital recognises. At the outset it is a bundle of rights and options. During construction it is a contractor's liability wrapped in a financing structure. During lease-up it is an operating business with untested revenue. Only at stabilisation does it resemble the long-duration, contracted-cash-flow asset that appears in an infrastructure fund's pitch book. Each of these states carries a different risk profile, and each risk profile has a natural buyer.

The central claim of this paper is that a data centre is not one asset but a sequence of risk states, and that the sponsor's financing problem is a sequencing problem. The capital instrument that is cheap and appropriate in one state is expensive or unavailable in another. A sponsor who raises common equity to fund construction pays a development-stage cost of capital for construction-stage risk, surrendering ownership at precisely the point where the project's option value is greatest. A sponsor who raises term-style debt against uncontracted revenue imports refinancing risk that neither the sponsor nor the lender can price, because the collateral behind the loan does not yet exist in economic terms. Both errors are common, both are avoidable, and both follow from treating the project as a single asset with a single cost of capital.

The Gulf gives this argument particular force. The region's combination of available energy, allocable land, sovereign digital-infrastructure strategies and anchor demand from state-linked entities has made it one of the more active venues for data-centre development outside the established North American and European markets. Yet the regional capital market for digital infrastructure is younger than the pipeline it must fund. Sponsors in the Gulf therefore face a wider menu of potential capital providers, from international infrastructure funds and private credit managers to regional banks, sovereign-adjacent investors and family offices, with less settled convention about which instrument belongs at which stage. Where convention is unsettled, structure errors are cheap to make and expensive to unwind.

The paper addresses three research questions. **RQ1:** How should the capital structure of a data-centre project map onto its sequence of risk states, and what is the natural instrument and investor class for each state? **RQ2:** What determines bankability at each state, and how do lenders and equity investors size and price their commitments as the project moves between states? **RQ3:** How do Gulf-specific conditions, including sovereign-anchored demand, energy availability, land allocation and local partnership models, alter the mapping and the sequencing of a raise?

The paper makes four contributions. First, it formalises a stage-and-instrument mapping framework that treats the project lifecycle as a series of risk states and assigns to each state the instrument whose payoff profile matches the state's risk. Second, it calibrates the framework on a representative project, a USD 500 million campus, so that every number in the paper traces to a single register of base-case calibrations grounded in market convention. Third, it converts the framework into a raise playbook: the order in which a sponsor should approach investor classes, the term-sheet architecture appropriate to each stage, the negotiation priorities that matter most, and the failure modes that recur. Fourth, it adapts the framework to the Gulf, identifying where regional conditions change the answer relative to the North American and European patterns that dominate the practitioner literature.

The remainder of the paper proceeds as follows. Section 2 reviews four strands of literature and derives five propositions. Section 3 sets out the institutional and market context, qualitatively. Section 4 defines the framework formally and records its base-case calibrations. Section 5 presents the core analysis, the capital stack by stage. Section 6 develops the raise playbook. Section 7 examines sensitivity and robustness, including

a named worst case and the conditions under which the paper's claims would be falsified. Section 8 discusses implications for sponsors and for investors, with an international comparison. Section 9 states limitations and future research, and Section 10 concludes.

## 2. LITERATURE REVIEW AND PROPOSITIONS

The financing of data centres sits at the intersection of four established literatures: the theory of project finance, capital structure theory applied to real assets, the study of infrastructure as an institutional asset class, and real options analysis of staged investment. This section reviews each strand and draws out what it implies for Gulf data centres, before stating five propositions that the rest of the paper develops.

### 2.1 Project Finance Theory and the Economics of Non-Recourse Structures

Project finance separates a single large asset from its sponsor's balance sheet and finances it through a special purpose vehicle whose creditors have recourse only to the project's cash flows and contracts. Esty (2004) frames the field's central puzzle: why sponsors incur the substantial transaction costs of structuring stand-alone vehicles rather than financing projects on corporate balance sheets. The answers the literature has settled on are directly relevant here. Non-recourse structures mitigate the underinvestment problem that Myers (1977) identified, because a project financed at the vehicle level does not compete with the sponsor's other assets for debt capacity, and the debt overhang of one project does not contaminate the sponsor's next one. They discipline cash flow in the manner Jensen (1986) described, because the waterfall, the covenant package and the distribution tests leave managers little discretion over free cash flow. And they allocate specific risks to the parties best able to bear them through a web of contracts: the construction contract to the contractor, the supply contract to the supplier, the offtake contract to the purchaser. Brealey, Cooper and Habib (1996) make the risk-allocation logic explicit: project finance is best understood as a mechanism for assigning risks to the parties with the greatest comparative advantage in controlling them. Esty and Megginson (2003) add the creditor-structure dimension, showing that lenders adjust syndicate structure to the enforcement environment, holding more concentrated positions where creditor rights are weaker. Gatti (2018) provides the standard practitioner synthesis of these structures.

For Gulf data centres the implications are threefold. First, the non-recourse template fits: a data-centre campus is a large, discrete, contract-wrapped asset of exactly the kind the project finance literature studies, and the sponsor's scarce balance sheet is better preserved for the next campus than consumed by the current one. Second, the risk-allocation web is the true collateral. A lender to a data-centre vehicle is lending against the offtake contract, the construction wrap and the power arrangements far more than against the building. Third, the enforcement point from Esty and Megginson (2003) matters regionally: where creditor-rights regimes are less tested for this asset class, lenders will hold tighter structures, demand more sponsor involvement, and price documentation risk, which a sponsor should anticipate rather than resent.

### 2.2 Capital Structure Theory Applied to Real Assets

The corporate finance canon begins with the irrelevance benchmark of Modigliani and Miller (1958), extended for taxes in Modigliani and Miller (1963), and proceeds through the frictions that make structure matter. Three frictions matter most for a data-centre vehicle. Agency costs, in the tradition of Jensen and Meckling (1976), imply that outside equity is expensive where the sponsor's effort and private information dominate value creation, which is precisely the condition at the development stage. Information asymmetry, in the pecking-order tradition of Myers (1984) and Myers and Majluf (1984), implies that sponsors will prefer instruments whose value is least sensitive to the sponsor's private information, and that the market will read a large early sale of common equity as a signal. Debt capacity, in the tradition of Shleifer and Vishny (1992), depends on

the liquidation value of the assets to the next-best user: a shell with power is worth more to an alternative operator than a half-built site, and a stabilised campus with a creditworthy tenant is worth more still, which is why leverage capacity rises monotonically across the lifecycle. Diamond (1991) supplies the maturity dimension: borrowers with strong expected news prefer short maturities to capture repricing, but short maturities expose them to liquidity risk if refinancing markets close, a trade-off that maps exactly onto the mini-perm structures common in this asset class. Holmstrom and Tirole (1997) formalise why sponsor capital cannot be fully substituted: monitored intermediary finance requires the borrower to retain a stake large enough to preserve incentives, which is the theoretical basis for the minimum sponsor equity that every lender demands. Williamson (1988) reaches a complementary conclusion from transaction-cost economics: redeployable assets support debt, while specific assets require equity-like governance.

Applied to Gulf data centres, this strand implies that the observed pattern, thin sponsor equity plus deep co-investment plus staged debt, is not a market fashion but the equilibrium response to measurable frictions. It also implies a warning: because the region's demand is sovereign-anchored, sponsors may be tempted to treat quasi-sovereign offtake as a substitute for their own retained stake. The Holmstrom and Tirole (1997) logic says lenders will not accept that substitution, because the sponsor's stake disciplines execution, not demand.

### 2.3 Infrastructure as an Asset Class and Institutional Investment

A distinct literature examines infrastructure as a destination for institutional capital. Andonov, Kraussl and Rauh (2021) document that institutional investors' infrastructure allocations have grown substantially while the delivered cash-flow profile of many infrastructure funds resembles private equity more than the long-duration, inflation-linked annuity the asset class promises. The finding matters here because data centres are the current frontier of that ambiguity: a stabilised, hyperscale-leased campus behaves like core infrastructure, while a development-stage AI-compute project behaves like venture-adjacent private equity. The same physical asset can sit at either end of the risk spectrum depending on its state and its contracts. Kaplan and Stromberg (2003) provide the contracting lens: real-world financial contracts allocate cash-flow rights and control rights separately and state-contingently, with control shifting toward investors in bad states. Aghion and Bolton (1992) supply the underlying theory of contingent control allocation, and Hart and Moore (1994) explain why creditors value the right to seize redeployable collateral. Grossman and Hart (1986) ground the ownership question: residual control rights should sit with the party whose investment is most essential.

For Gulf data centres the implication is that the sponsor must market different states of the same project to different investor constituencies, using contracts that move control rights as the state changes. An infrastructure fund buying at stabilisation is buying a bond-like exposure and will demand bond-like protections; a co-investor entering at development is buying an option and must accept option-like governance, with the sponsor retaining operational control while milestones are being created.

### 2.4 Real Options in Staged Development

The final strand treats investment under uncertainty. Dixit and Pindyck (1994) establish that when investment is irreversible and information arrives over time, the ability to delay or stage commitment is valuable, and naive net-present-value rules that ignore this option value systematically mis-time investment. McDonald and Siegel (1986) derive the value of waiting formally. Trigeorgis (1996) catalogues the compound options embedded in staged projects: the option to expand, to abandon, to switch use, and to sequence. A data-centre development is a textbook compound option. Securing land and power creates the option to develop; development creates the option to build; each pre-let signed during construction resolves uncertainty that was priced into every earlier instrument. The financing corollary is the heart of this paper: capital raised before an option is exercised is priced on the pre-exercise risk. Raising the entire capitalisation at the land stage prices

construction capital, lease-up capital and stabilised capital all at land-stage risk, which is the most expensive risk in the sequence. Staged raising lets each tranche be priced on the risk that actually remains.

For Gulf data centres, the real options lens carries one regional twist. Where demand is sovereign-anchored and energy is available, the demand option resolves early, sometimes before construction begins. The options that remain valuable in the Gulf are execution options, grid timing, contractor capacity, and the option to expand on adjacent allocated land, and the financing sequence should be built around when those particular uncertainties resolve.

### 2.5 Propositions

The four strands combine into five propositions that Sections 5 to 8 develop and test against the representative campus.

**Proposition 1 (state-contingent instruments).** Each risk state of a data-centre project has a natural capital instrument and investor class, defined by matching the instrument's payoff profile to the state's residual risk. Mismatches destroy value in predictable directions: equity raised too early dilutes the sponsor at peak cost of capital, and debt raised too early creates refinancing risk that cannot be priced.

**Proposition 2 (offtake as collateral).** Bankability is determined primarily by the credit quality and tenor of the offtake and by the contractual wrap around construction and power, not by the physical asset. A leased data centre is economically a corporate credit exposure delivered through real estate, and debt sizing follows the tenant covenant, not the concrete.

**Proposition 3 (staged raising as option preservation).** Sequential raising, with each tranche sized to reach the next risk state plus a buffer, dominates a single up-front raise for the sponsor, because it prices each tranche on remaining rather than total risk. The benefit is largest where inter-state information revelation is largest.

**Proposition 4 (the Gulf inversion).** Sovereign-anchored demand and energy availability in the Gulf shift the binding constraint from demand risk to execution and structure risk. This compresses the lease-up state, raises the relative value of construction-stage competence, and changes which investor classes clear at each stage relative to merchant-market patterns.

**Proposition 5 (control rights migrate with risk).** Control rights should transfer gradually from sponsor to capital providers as risk states resolve, in the state-contingent manner of Kaplan and Stromberg (2003). Granting stabilised-style creditor or investor controls at the development stage produces deadlock at exactly the moments when speed matters most.

## 3. INSTITUTIONAL AND MARKET CONTEXT

This section characterises the environment in structural terms, establishing the features that the framework must accommodate.

### 3.1 The AI Demand Shock

Three features of the AI-driven demand shock matter for financing structure. First, scale and speed: the training and inference workloads associated with large AI models require facilities that are larger, more power-dense and more capital-intensive per megawatt than the enterprise and cloud facilities of the previous cycle, and hyperscale tenants are contracting capacity earlier in the development cycle than historical practice. Second, tenant stratification: demand now arrives from at least three distinct tenant classes, the global hyperscalers with investment-grade balance sheets, colocation aggregators with diversified but shorter-tenor rent rolls, and AI-compute specialists whose creditworthiness is often venture-backed and unseasoned. These

classes support very different debt structures, a point Section 5 develops. Third, technological uncertainty: cooling architectures, rack densities and chip generations are evolving quickly enough that a facility designed today faces genuine specification risk over a long lease term. This uncertainty does not prevent financing, but it pushes lenders toward structures where the tenant, not the vehicle, bears obsolescence risk, and it strengthens the case for shell-and-power strategies in which the most technology-exposed fit-out is funded by the tenant.

### 3.2 The Gulf's Position

The Gulf's attractiveness as a data-centre venue rests on four structural features. Energy availability: the region combines existing generation capacity, expanding renewable programmes and, in several jurisdictions, the ability to allocate power at sovereign discretion, which shortens the single longest lead item in most markets, the grid connection. Land allocation: industrial land is frequently allocated through government or free-zone channels rather than through competitive private markets, which reduces acquisition cost and time but embeds the state in the project's foundational rights. Sovereign strategy: national AI and digital-economy strategies across the Gulf treat compute capacity as strategic infrastructure, producing anchor demand from government entities, sovereign-linked telecommunications operators and national AI initiatives, and producing sovereign-adjacent equity that seeks exposure to the sector. Local partnership models: foreign sponsors commonly build with a local partner, whether a mandated joint-venture arrangement, a free-zone structure, or a commercial partnership adopted for market access, and the partnership choice interacts with every layer of the capital stack because it determines whose consent is required at each stage.

Two consequences follow. First, in the Gulf the scarce inputs are sequenced differently: power and land, the long poles elsewhere, can arrive early, while deep, tested project-debt markets and specialised operating talent are the scarcer inputs. Second, the involvement of sovereign-linked counterparties on both sides of the market, as tenant and as investor, makes counterparty governance and documentation the load-bearing elements of bankability, which is where the Esty and Megginson (2003) insight about enforcement environments becomes practical rather than academic.

### 3.3 The Capital Supply Side

The investor landscape facing a Gulf sponsor divides into recognisable classes. International infrastructure funds, increasingly with dedicated digital-infrastructure strategies, supply co-investment equity from development through stabilisation, with return targets that fall as the state advances. Private credit managers supply construction and mezzanine debt where bank appetite is constrained, at wider pricing but with greater structural flexibility. Regional and international banks supply construction and term facilities, with regional banks often anchored by relationship considerations and international banks by portfolio diversification into the region. Sovereign-adjacent investors and family offices supply flexible capital across the stack, sometimes motivated by strategic as well as financial returns. Finally, the global take-out market, including the securitisation-style refinancing structures described qualitatively in Section 5.6, stands at the end of the sequence, converting stabilised, contracted cash flows into the cheapest available capital. The sponsor's task is not to find capital, which the current cycle supplies in abundance, but to admit each class at the stage where its pricing is competitive and its control demands are tolerable.

## 4. DATA AND METHODOLOGY

### 4.1 The Stage-and-Instrument Mapping Framework

The framework treats a data-centre project as a finite sequence of risk states. Formally, let the project occupy one of five states: S0, land and power rights; S1, development; S2, construction; S3, lease-up; and S4, stabilised operation. Each state s is characterised by three elements. First, a residual risk set R(s): the

uncertainties that remain unresolved while the project occupies that state. Second, a resolution event E(s): the milestone whose achievement moves the project to the next state and permanently extinguishes part of R(s). Third, an instrument set I(s): the capital instruments whose payoff structure, security position, tenor and control rights are compatible with R(s).

The residual risk sets are ordered by inclusion: each transition removes risk and adds contracted certainty. In S0 the risk set contains everything: site risk, power risk, permitting risk, design risk, demand risk, construction risk, operating risk and market risk. E(S0) is the securing of land rights and a bankable power arrangement. In S1 the remaining risks are design, permitting, procurement, demand and everything downstream; E(S1) is a full permit set, a fixed-price construction arrangement and, in the modern market, at least one anchor pre-let. In S2 the risks are construction cost and schedule, commissioning and residual leasing; E(S2) is practical completion and commissioning. In S3 the risks are the pace and pricing of remaining capacity absorption; E(S3) is the achievement of stabilised, contracted occupancy. In S4 the residual risks are tenant credit, operating performance and refinancing conditions.

The matching principle is then stated simply. An instrument is natural for state s when three conditions hold together: its expected return prices R(s) and not the risks already extinguished; its seniority and security are enforceable against the collateral that exists in state s; and its control rights bind only the decisions that remain open in state s. Common equity is natural in S0 and S1 because in those states the collateral is a set of rights and the open decisions are everything, so only an instrument with full residual claim and full governance participation prices correctly. Senior construction debt becomes natural in S2 once a fixed-price wrap, a completion support package and an anchor lease convert the project into a definable credit. Long-tenor senior debt becomes natural only in S4, because only there does the contracted cash flow exist against which a fixed debt service can be sized. Preferred and mezzanine instruments occupy the transitions, bridging the gap between what senior lenders will advance and what common equity should efficiently fund.

Two corollaries drive the rest of the paper. The mispricing corollary: capital raised in state s is priced on R(s), so raising in an earlier state than necessary means paying for risks the project would have shed by waiting, while raising a longer-tenor or more senior instrument than the state supports means transferring unresolved risk to a holder who has not priced it, which resurfaces later as refinancing risk or covenant conflict. The control corollary: because control rights should bind only open decisions, instruments imported from later states carry governance packages that are dysfunctional in earlier states, a point Section 6 develops through term-sheet architecture.

### 4.2 Base-Case Calibrations

The exhibits in Sections 5 to 7 run the framework on a representative project: a USD 500 million Gulf campus of approximately 60 megawatts of IT load, developed over twelve months, built over twenty-four months, and reaching stabilised occupancy within twelve months of completion. The calibrations, summarised in Table 1 and recorded in full in Appendix A, reflect market convention for contracted data-centre credits and the author's transaction experience in the region. Construction facilities for well-contracted campuses typically fund 50 to 60 per cent of cost; term facilities against stabilised, hyperscale-anchored cash flow typically advance 60 to 65 per cent of value and are sized to debt service coverage of around 1.30 times on contracted revenue; development-stage equity prices in the low-to-mid twenties, construction-entry co-investment in the mid-to-high teens, and stabilised levered equity in the low teens. The base case adopts the midpoints of these ranges.

Table 1. Base-case calibrations for the representative USD 500 million campus

| Parameter | Base case | Market range |
|---|---|---|

| | | |
|---|---|---|
| Total project cost | USD 500m | n/a |
| IT load | 60 MW | n/a |
| Construction facility, loan to cost | 55% | 50-60% |
| Construction facility, all-in cost | 8.0% | 7.5-8.5% |
| Term facility, loan to value | 60% | 60-65% |
| Term facility, all-in cost | 6.5% | 6.25-6.75% |
| Securitisation-style take-out, all-in cost | 5.75% | 5.5-6.0% |
| Sizing DSCR, hyperscale contracted revenue | 1.30x | 1.25-1.35x |
| Sizing DSCR, colocation revenue | 1.45x | 1.40-1.55x |
| Sizing DSCR, AI-compute-weighted revenue | 1.60x plus sweep | 1.50-1.75x |
| Sponsor equity target IRR, development entry | 25% | 22-28% |
| Co-investment equity target IRR, development entry | 20% | 18-22% |
| Co-investment equity target IRR, construction entry | 17% | 15-18% |
| Preferred equity target return | 13% | 12-14% |
| Mezzanine coupon | 12% | 11-13% |
| Stabilised levered equity target IRR | 11% | 10-12% |
| Stabilised NOI yield on cost | 11% | 10-12% |
| Stabilised capitalisation rate | 7.25% | 7.0-7.75% |

*Source: author's analysis.*

Three derived quantities recur through the paper. Stabilised net operating income on the base case is USD 55 million, being 11 per cent yield on the USD 500 million cost. Stabilised value at a 7.25 per cent capitalisation rate is approximately USD 760 million. The term facility at 60 per cent of that value is approximately USD 455 million, which at a 6.5 per cent all-in cost and a twenty-year amortisation profile produces debt service of roughly USD 41 million and coverage of approximately 1.33 times, consistent with the 1.30 times sizing convention.

### 4.3 What the Framework Does and Does Not Do

The framework is a structuring map, not a valuation model. It identifies which instrument belongs at which stage, how sizing and pricing move across stages, and in what order a sponsor should raise; it does not forecast demand, model a specific market's supply balance, or price a specific credit. The calibrations define a coherent base case for a well-located, well-contracted Gulf campus; individual transactions will sit inside or outside the stated ranges according to tenant mix, jurisdiction and sponsorship, and Section 7 shows how the conclusions move as the key calibrations move. The framework also deliberately abstracts from tax, zakat, free-zone incentives and withholding structures, which matter to net returns but not to the ordering logic that is the paper's subject.

## 5. THE CAPITAL STACK BY STAGE

This section runs the framework across the five states, identifying at each state the natural instruments, the investor classes that supply them, the sizing and pricing logic, and the Gulf-specific variations. Figure 1 summarises the lifecycle.

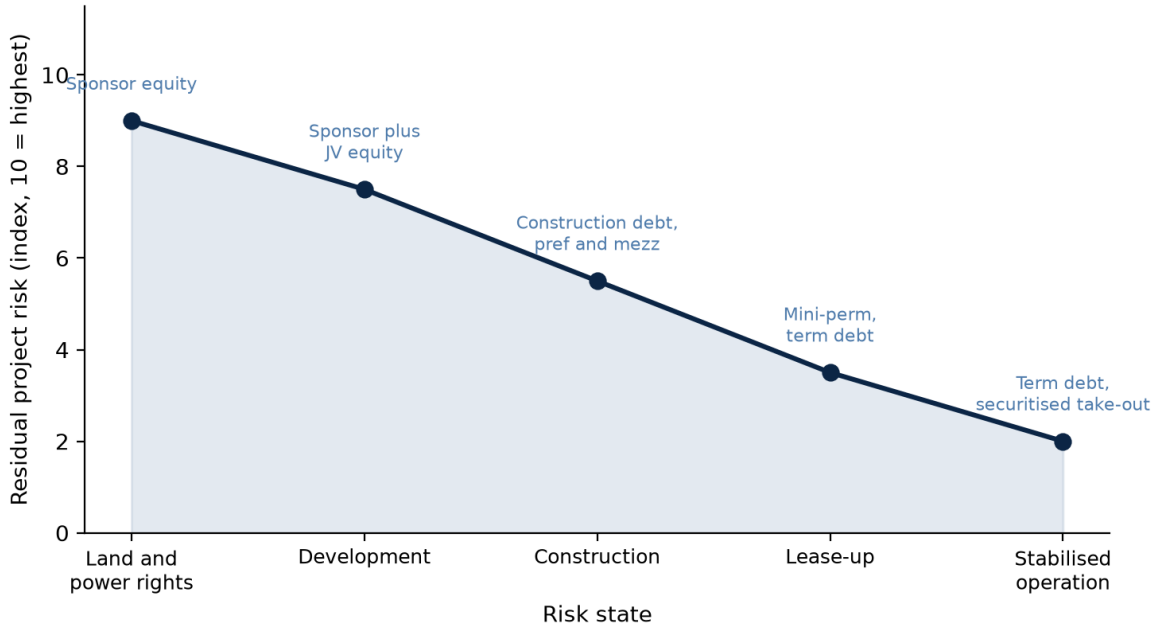


Figure 1. Risk states, residual risk and the natural instrument across the data-centre lifecycle

*Source: author's analysis.*

### 5.1 State S0: Land and Power Rights

In S0 the project is a bundle of rights: site control, a power allocation or grid connection pathway, and preliminary zoning or free-zone approvals. Nothing about the project is contracted, and the collateral, such as it is, consists of rights whose value is almost entirely contingent on the sponsor's ability to execute the next four states. The natural instrument is sponsor common equity, occasionally supplemented by a land seller's deferred consideration or, in the Gulf, by government land made available on long lease or against milestone commitments rather than up-front payment. On the base case, S0 absorbs the USD 40 million of land and power rights plus the early portion of development spend.

The financing error characteristic of S0 is external capital of any structured kind. Debt is unavailable on sensible terms because there is no cash flow and no completed collateral; equity from institutional co-investors is available but prices at or above development-stage returns while demanding governance that the sponsor will regret. The correct posture in S0 is to spend as little as possible to secure the rights that create the option, in the sense of Dixit and Pindyck (1994), and to fund that spend from the sponsor's own balance sheet or from partners whose claims are simple.

The Gulf variation is material. Where land arrives through sovereign allocation and power through a sovereign utility's commitment, part of S0's risk is extinguished by the state rather than purchased by the sponsor. This is a genuine subsidy to the capital structure, but it embeds obligations, development timelines, local participation, employment or localisation conditions, that function economically as covenants senior to the entire stack. A sponsor should read an allocation letter the way a lender reads an intercreditor agreement: it is the most senior document in the project.

### 5.2 State S1: Development

Development converts rights into a financeable package: full design, permits, a fixed-price or guaranteed-maximum-price construction arrangement with a credible contractor, long-lead equipment procurement, and, decisively, anchor offtake. The natural instruments are sponsor equity and, for the first time, external joint-

venture or co-investment equity from parties who underwrite development risk, typically digital-infrastructure funds with development mandates, regional investors with strategic interest, and, in the Gulf, sovereign-adjacent vehicles. Development-entry co-investment prices around a 20 per cent target IRR on the base case, against the sponsor's own 25 per cent target, the difference reflecting the sponsor's promote and the co-investor's structural protections.

Sizing in S1 is driven backwards from the construction close. The development budget on the base case, USD 35 million of development and soft costs on top of the S0 spend, must carry the project to a state in which the construction facility, the preferred tranche and the balance of equity can close simultaneously. The single most valuable output of S1 is the anchor lease, because it converts every later conversation. A pre-let to a hyperscale tenant of investment-grade credit, on a fifteen-year term with strong assignment and escalation provisions, does more for the cost of the entire stack than any other document the sponsor will ever sign. Proposition 2 begins here: the lease is the collateral.

The characteristic S1 failure is premature scale. Sponsors who raise the full project capitalisation at development entry, whether from enthusiasm or from an anchor investor's insistence, price the construction and stabilisation phases at development risk. On the base case, funding the full USD 500 million at a blended development-stage cost of around 23 per cent, rather than staging as Section 6 describes, transfers value from sponsor to early investors on the order of the entire promote. Proposition 3 is not a nicety; it is most of the sponsor's economics.

### 5.3 State S2: Construction

The construction close is the structural centre of the project. On the base case the stack at close comprises USD 50 million of sponsor equity, USD 125 million of co-investment equity, USD 50 million of preferred or mezzanine capital, and a USD 275 million construction facility at 55 per cent loan to cost, an all-in cost near 8 per cent, and a tenor of three to four years with extension options. Equity funds first, the preferred funds alongside or immediately after, and the facility funds last, the standard sequencing that keeps the lender's exposure junior in time to everyone else's money.

What makes the facility available at all is the wrap: a fixed-price construction arrangement with liquidated damages and a completion guarantee or contingent equity commitment from the sponsor group; an anchor lease that commences on completion; power arrangements executed rather than promised; and an interest reserve inside the facility, part of the USD 45 million of financing costs and interest during construction in the uses. Lenders size to loan-to-cost inside 50 to 60 per cent and stress the schedule; they lend to the completion package, not to the building. Bank lenders dominate where the anchor tenant is hyperscale and the wrap is strong; private credit takes the transactions where the rent roll is colocation or AI-compute weighted, at 100 to 200 basis points wider and looser completion tests.

The preferred and mezzanine layer deserves comment because it is the most commonly misused instrument in the stack. Its correct function is to bridge a specific, temporary gap, between the facility's advance rate and the equity the sponsor wishes to commit, at a price, 12 to 14 per cent, between debt and equity. Its incorrect function is as disguised common equity: preferred capital with accruing returns and hard redemption dates behaves like debt in a downside, and a sponsor who fills a permanent equity hole with preferred capital has simply written a forward contract on a refinancing that may not arrive. Kaplan and Stromberg (2003) describe exactly this design space: the instrument's conversion and control features should be written against defined states, not left as generalised protection.

### 5.4 State S3: Lease-Up

Between practical completion and stabilisation the project is an operating business with partly contracted revenue. Where the anchor pre-let covers most of the capacity, S3 is short and the construction facility simply runs to its term or converts under a pre-agreed mini-perm mechanism. Where meaningful capacity remains merchant, S3 is the state in which structure errors made earlier become visible: a construction facility maturing into an unleased building is the defining distress pattern of this asset class.

The natural instrument for S3 is the mini-perm: a facility of three to five years, sized initially to the contracted component of revenue with margin step-downs and advance-rate increases as additional leases sign. In the terms of Diamond (1991), the mini-perm is the rational maturity choice for a borrower expecting good news, priced with a liquidity backstop for the case where the news is late. In the Gulf, where anchor demand is frequently sovereign-linked and pre-let ratios high, S3 compresses, sometimes to the point where sponsors can close construction and term financing in a single dual-tranche structure. That is Proposition 4 operating: the region's demand profile removes the state in which merchant risk lives, and the capital stack should claim the benefit explicitly by negotiating the conversion mechanics at construction close rather than re-opening the file two years later.

### 5.5 State S4: Stabilised Operation

At stabilisation the project is a contracted cash-flow asset. On the base case it produces USD 55 million of net operating income, is worth approximately USD 760 million at a 7.25 per cent capitalisation rate, and supports a term facility of approximately USD 455 million at 60 per cent loan to value, 6.5 per cent all-in, sized at 1.33 times coverage on a twenty-year amortisation profile. The refinancing repays the USD 275 million construction facility and the USD 50 million preferred layer and returns approximately USD 130 million to the equity, roughly three quarters of the equity's original cash, while the equity retains an asset with approximately USD 305 million of residual value. The stabilised levered equity now prices at an 11 per cent target IRR, and the natural holders change accordingly: core and core-plus infrastructure funds, insurance capital and sovereign wealth vehicles replace the development investors, whether by secondary sale of the co-investment position or by recapitalisation.

Debt sizing at S4 follows the rent roll, not the building, which is Proposition 2 in its mature form. A hyperscale-leased campus with fifteen-year weighted average lease term is underwritten to 1.30 times coverage at 60 to 65 per cent of value. A colocation rent roll of three-to-five-year terms across dozens of tenants is sized to 1.45 times and a lower advance rate. A rent roll weighted to AI-compute specialists, whose covenants are young and whose demand is itself derivative of a fast-moving market, is sized to 1.60 times or better, with cash sweeps, shorter tenor and, in many cases, a private credit rather than bank lender. Identical buildings; different bonds.

Table 2. The capital stack by risk state: instruments, providers, sizing and pricing

| Risk state | Natural instrument | Typical provider | Sizing basis | Base-case pricing | Typical tenor |
|---|---|---|---|---|---|
| S0 Land and power | Sponsor equity | Sponsor, land partner | Minimum to secure rights | 25% target IRR | Open |
| S1 Development | Sponsor plus JV equity | Digital-infra funds, sovereign-adjacent | Budget to construction close | 20-25% target IRR | Open |
| S2 Construction | Construction facility plus pref/mezz | Banks, private credit | 50-60% LTC; wrap-dependent | 8.0% debt; 12-13% pref/mezz | 3-4 years |
| S3 Lease-up | Mini-perm | Banks, private | Contracted | 7.0-7.5% | 3-5 years |

| | | | | | |
|---|---|---|---|---|---|
| | | credit | revenue, step-ups | | |
| S4 Stabilised | Term debt; take-out | Banks, institutional, securitisation-style | 60-65% LTV; 1.30x DSCR | 6.5%; 5.75% take-out | 5-7 years; longer for take-out |

*Source: author's analysis. Pricing reflects the base-case calibrations of Table 1.*

Table 3. Sources, uses and cost of capital at construction close, representative USD 500 million campus

| Item | USD m | % of total | Cost of capital |
|---|---|---|---|
| Uses: land and power rights | 40 | 8% | n/a |
| Uses: development and soft costs | 35 | 7% | n/a |
| Uses: construction hard costs | 330 | 66% | n/a |
| Uses: contingency | 25 | 5% | n/a |
| Uses: financing costs and construction-period interest | 45 | 9% | n/a |
| Uses: ramp-up working capital | 25 | 5% | n/a |
| Total uses | 500 | 100% | n/a |
| Sources: sponsor equity | 50 | 10% | 25% |
| Sources: JV co-investment equity | 125 | 25% | 17% |
| Sources: preferred / mezzanine | 50 | 10% | 13% |
| Sources: construction facility | 275 | 55% | 8.0% |
| Total sources and blended cost | 500 | 100% | 12.5% |

*Source: author's analysis. Blended cost is the commitment-weighted average of the stated costs.*

### 5.6 The Take-Out: Securitisation-Style Refinancing

The final structural move available to a stabilised campus is the securitisation-style take-out: a refinancing in which the contracted lease cash flows are conveyed into a financing vehicle that issues rated notes against them, typically with a five-to-seven-year expected term, an anticipated repayment date rather than a hard bullet, and structural features, reserve accounts, cash-trap triggers tied to coverage, and management-transition provisions, in place of the covenant package of a loan. Described functionally rather than by any named programme, the take-out completes the transformation this paper has been tracking: the asset that began as a bundle of rights ends as an instrument that fixed-income capital can buy. Advance rates run to around 70 per cent of value on hyperscale-anchored pools, at all-in costs near 5.75 per cent on the base case, inside the term-loan market by 50 to 100 basis points, which is the reward for delivering the cash flows in rated, structured form.

The take-out is where the lifecycle's blended cost of capital reaches its floor. On the base case the stack's blended cost falls from approximately 23 per cent at development entry to 12.5 per cent at construction close, 8.3 per cent at stabilisation, and approximately 7.0 per cent post take-out. Figure 2 shows the stack's composition across the states; the cost path itself, and the strategies that fail to achieve it, are the subject of Section 6 and Figure 3.

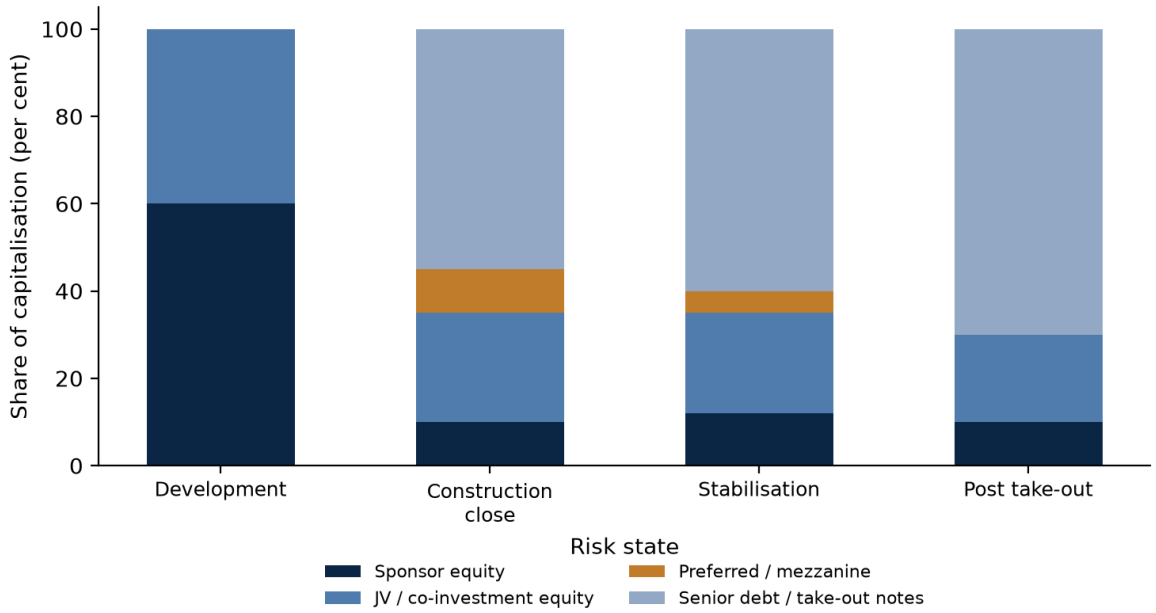


Figure 2. Capital stack composition by risk state, per cent of capitalisation

*Source: author's analysis. Base-case calibrations of Table 1.*

## 6. THE RAISE PLAYBOOK

Section 5 established what belongs where. This section converts the mapping into a playbook: the sequence of raises, the term-sheet architecture appropriate to each, the negotiation priorities that deserve the sponsor's scarce attention, and the failure modes that recur across transactions.

### 6.1 Sequencing the Raise

The base-case sequence has four raises, each sized to reach the next resolution event plus a buffer. Raise one, at or shortly after S0, is sponsor capital plus at most one aligned partner, sized to secure land, power and the development budget's first tranche: on the base case, roughly USD 50 to 60 million of exposure before any external institutional money. Raise two, at development entry, brings the co-investment equity, on the base case USD 125 million committed, drawn against milestones, alongside the sponsor's remaining commitment. The commitment is negotiated at development entry, but drawn capital, and therefore the co-investor's money at risk, scales with progress, which is how the staging benefit of Proposition 3 is captured contractually rather than by running four separate processes. Raise three is the construction close: the USD 275 million facility and the USD 50 million preferred layer close against the completed development package. Raise four is the stabilisation refinancing and, where the pool qualifies, the securitisation-style take-out, at which point the original equity chooses between recapitalisation, secondary sale and continued hold.

Figure 3 quantifies why the sequence matters, comparing the base-case staged strategy with the two dominant errors. The equity-heavy path, raising the full capitalisation as equity at development entry and refinancing only at stabilisation, carries a blended cost above 20 per cent through construction: on USD 500 million over a two-to-three-year construction period, an excess capital charge in the tens of millions, all of it paid by the sponsor's promote. The debt-early path, forcing maximum leverage at construction close against a partly merchant rent roll, looks cheapest through construction and then reprices violently at stabilisation when the refinancing market applies merchant sizing to the uncontracted revenue: coverage-based proceeds fall short of

the maturing facility, and the gap is filled by rescue capital at development-stage pricing. The staged path is not the cheapest at every point; it is the cheapest path that is actually available at every point.

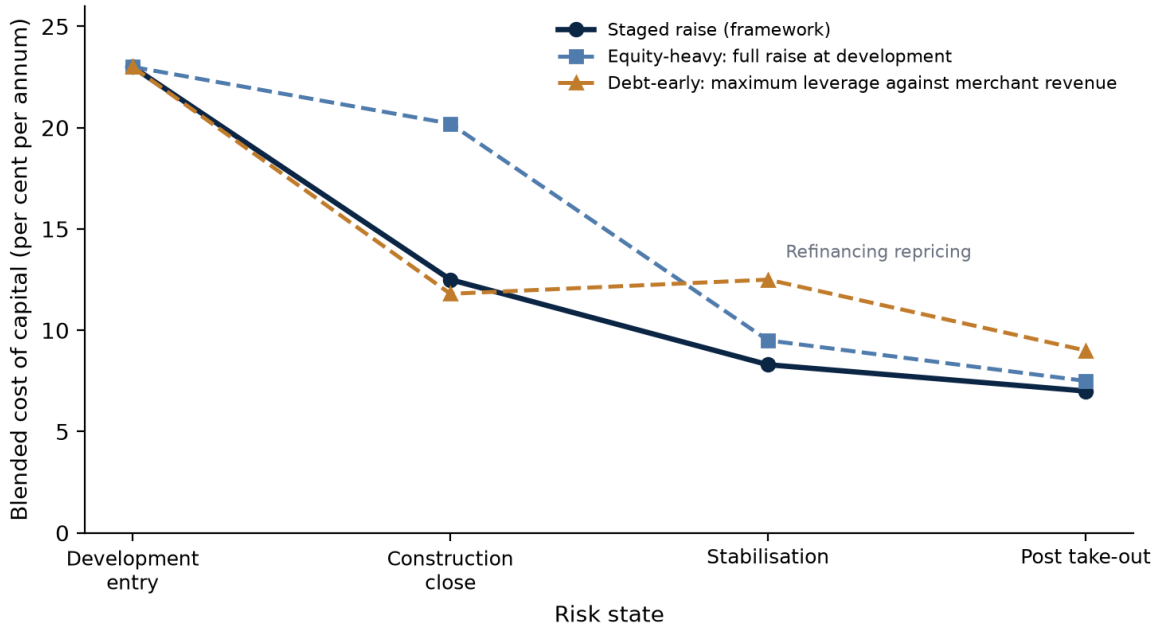


Figure 3. Blended cost of capital across the lifecycle under three raise strategies

*Source: author's analysis. Base-case calibrations of Table 1.*

### 6.2 Term-Sheet Architecture by Stage

**Development-entry co-investment.** The instrument is common or lightly structured equity in the project vehicle, with the sponsor's promote layered above a preferred return. The load-bearing terms are five. First, the waterfall: a preferred return to all capital in the range of 8 to 10 per cent, then a catch-up, then promote tiers that on market convention run from 15 to 20 per cent above the preferred return to 25 to 30 per cent above higher hurdles. Second, milestone-based drawdowns with defined cure and dilution mechanics for a missed milestone, which is where Proposition 3 lives contractually. Third, governance: a short reserved-matters list, budget approval above tolerances, debt incurrence, affiliate transactions, change of the anchor lease, and sponsor day-to-day control of everything else; Proposition 5 is won or lost in this clause. Fourth, exclusivity and pipeline: whether the co-investor has rights over the sponsor's next site, which is frequently worth more than the promote. Fifth, transfer and exit: tag and drag provisions, a defined marketing window at stabilisation and a fair-value mechanism that does not hand either side a free option.

**The preferred or mezzanine layer.** The instrument is sized to the gap between senior proceeds and efficient equity, on the base case USD 50 million, with a 12 to 14 per cent return split between current pay and accrual. The terms that matter are the redemption trigger, which should be the stabilisation refinancing and not a hard calendar date inside the construction period; the accrual mechanics in a delay scenario; whether the holder takes board observation or consent rights, which should be narrower than the equity's; and the intercreditor position, in particular standstill terms that private credit holders will negotiate hard and banks will insist upon.

**The construction facility.** Sizing at 50 to 60 per cent of cost, pricing near 8 per cent all-in, tenor of three to four years plus extensions. The sponsor's negotiation priorities, in order: the completion support definition, because an uncapped completion guarantee converts non-recourse finance back into recourse; the pre-let condition, the share of capacity that must be contracted at close and at each drawdown; the interest reserve and

contingency sizing, which determine whether a six-month delay is a workout or a non-event; extension conditions expressed as objective tests rather than lender discretion; and the conversion mechanics into a mini-perm or term facility, negotiated at close per Section 5.4. Margin is the least important major term; sponsors routinely trade 25 basis points for a covenant that later costs them the project.

**Stabilisation and take-out.** The term facility's architecture is conventional, coverage-sized proceeds, cash-trap and cash-sweep triggers, permitted-distribution tests. The sponsor's priorities are prepayment flexibility, because the securitisation-style take-out is only valuable if the term facility can be exited economically, and the treatment of expansion land and future phases, which should sit outside the collateral so that the next project is not hostage to the first. On the take-out itself, the sponsor should treat the anticipated-repayment-date structure with respect: post-ARD step-ups and full cash sweeps are designed to force refinancing, and a sponsor who reads the ARD as a soft date has mispriced the tail exactly as the debt-early strategy misprices the front.

### 6.3 Negotiation Priorities and the Order of Battle

Across stages, three principles organise the sponsor's negotiation effort. First, sequence the anchor lease before the anchor cheque wherever possible: every instrument in the stack prices off the offtake, so a month spent improving lease credit, tenor or assignment terms is worth more than a quarter spent shopping capital providers. Second, sell risk, not upside: the cheapest stack is built by transferring defined risks to parties paid to hold them, the contractor through the wrap, the tenant through the lease, the lender through priced credit exposure, while retaining the undefined upside in the sponsor's promote; a sponsor who gives upside away to buy risk transfer has run the machine backwards. Third, protect the next project: pipeline rights, cross-default provisions, completion guarantees that reach the sponsor's other vehicles, and collateral packages that sweep in expansion land all convert one project's financing into a platform-level encumbrance, and platform value is where sponsors are ultimately paid.

### 6.4 Failure Modes

Four failure modes account for most of the distress observable in this asset class, and each is a mismatch in the sense of Proposition 1. **Term debt against merchant risk:** leverage sized to hoped-for leases rather than signed ones, resolving as a refinancing shortfall at the facility's maturity; the debt-early path of Figure 3. **Equity raised too early:** the full capitalisation priced at development risk, resolving not as distress but as a sponsor who owns a fraction of what execution earned; the equity-heavy path. **Control rights granted too early:** stabilised-style consent lists imported into development-stage documents, resolving as deadlock during construction, when weekly decisions meet monthly investor committees; the violation of Proposition 5. **Mismatched tenor:** construction facilities without realistic extension or conversion mechanics, preferred instruments with redemption dates inside the construction period, or reliance on a take-out market that reprices; each a maturity structure that assumes the state transition happens on schedule, which is precisely the assumption the capital structure exists to survive.

Table 4. Structure comparison: the four principal external instruments

| Feature | JV co-investment | Preferred equity | Mezzanine | Construction facility |
|---|---|---|---|---|
| Position | Common equity, pari passu | Behind all debt, ahead of common | Behind senior, secured junior | Senior secured |
| Base-case pricing | 17-20% target IRR | 13% target | 12% coupon, part accrual | 8.0% all-in |
| Sizing basis | Share of equity requirement | Gap to efficient equity | Advance above senior LTC | 50-60% LTC |

| | | | | |
|---|---|---|---|---|
| Control rights | Reserved matters, board seat | Consent list, observer | Intercreditor, standstill | Full covenant package |
| Natural entry | S1 development | S2 construction close | S2 construction close | S2 construction close |
| Natural exit | Stabilisation sale or recap | Refinanced at S4 | Refinanced at S4 | Term or mini-perm take-out |

*Source: author's analysis.*

## 7. SENSITIVITY AND ROBUSTNESS

The base case describes a well-contracted campus that transitions on schedule. This section moves the four calibrations that carry the most weight, utilisation, power cost, interest rates and construction delay, and examines what survives.

### 7.1 Utilisation

The base case reaches 90 per cent contracted utilisation at stabilisation. At 70 per cent, net operating income falls from USD 55 million toward USD 40 million, and the consequences cascade: value at an unchanged capitalisation rate falls toward USD 550 million, but the capitalisation rate does not stay unchanged for a partly merchant asset, so realistic value is lower still; term proceeds sized at 1.30 times coverage fall toward USD 330 million, well short of the USD 325 million of maturing construction facility and preferred capital plus accrued returns, leaving the refinancing at best knife-edged; and the equity's stabilisation distribution disappears. The lesson is not that utilisation matters, which is obvious, but where it must be secured: the utilisation sensitivity is resolved in S1, in the anchor lease, before the heavy capital is drawn. A sponsor entering construction 85 per cent pre-let has already run this table; a sponsor entering 40 per cent pre-let is carrying the whole column on the equity.

### 7.2 Power Cost

Where power cost passes through to tenants under the lease, as hyperscale leases generally provide, power price movements pass around the capital structure rather than through it, and the stack is insensitive. Where the vehicle holds merchant power exposure, whether by selling power-inclusive colocation contracts or by an unhedged utility tariff, a sustained 25 per cent rise in power cost compresses margin enough to move coverage by more than the entire cushion between 1.33 times and default triggers. The structural conclusion is that power procurement belongs with the offtake, not with the financing: fix the pass-through in the lease, or fix the tariff with the utility, and let the capital structure remain a stranger to the electricity market. In the Gulf, administered tariffs and sovereign utility counterparties make the fix more available than in merchant power markets, which is part of Proposition 4's content.

### 7.3 Interest Rates

A 200 basis point parallel rise moves the construction facility toward 10 per cent all-in and the term market toward 8.5 per cent. Three effects follow. The interest reserve inside the construction facility exhausts sooner, which is a funding event during construction unless the reserve was sized with headroom. Term proceeds at unchanged coverage fall by roughly the ratio of debt-service factors, on the base case from USD 455 million toward USD 390 million, which narrows the refinancing but does not break it, the difference between this and the utilisation shock being that rate risk is hedgeable and lease escalators claw part of it back over time. And capitalisation rates drift upward with the risk-free curve, compressing the equity's terminal value. The structural response is conventional and adequate: hedge the construction period at close, size the reserve to a stressed curve, and treat the take-out window as an option to be exercised when the market is open rather than a birthright.

### 7.4 Construction Delay

A six-month delay adds construction-period interest of roughly USD 10 to 15 million on the base case, consumes contingency, defers revenue and, if the anchor lease carries a long-stop date, threatens the offtake itself. The stack absorbs a six-month delay by design: that is what the USD 25 million contingency, the interest reserve headroom and the facility extensions are for. An eighteen-month delay is a different object, because it exhausts the priced buffers and reaches the unpriced ones, the completion guarantee and the co-investor's patience. The design principle is that buffers should be sized to the delay distribution's fat tail in the relevant market, and in fast-growing markets the binding constraints are grid energisation and specialised commissioning talent rather than civil works, a specifically Gulf-relevant reweighting of the delay risk.

### 7.5 The Worst Case: The Stranded Shell

The named worst case combines the columns: an anchor tenant lost after construction close, an eighteen-month energisation delay, and a 200 basis point rate rise, producing a completed but largely empty shell with a maturing facility in a repriced market, the stranded shell. Under the base-case structure the outcome is painful but bounded: the facility's extensions and the completion package carry the vehicle while the shell, which in a supply-constrained market retains substantial value precisely because powered shells are the scarce commodity, is re-let at market. Under the debt-early structure the same facts produce a foreclosure. The worst case thus discriminates between structures rather than merely between markets, which is the point of carrying it.

### 7.6 What Would Falsify the Framework

Three observations would falsify the paper's central claims. If senior lenders were observed routinely to size and price uncontracted AI-compute revenue on the same terms as contracted hyperscale revenue, Proposition 2 would fail, and with it the paper's account of bankability. If single up-front raises systematically delivered better sponsor outcomes than staged raises after adjusting for project quality, Proposition 3 would fail; the natural test is the dispersion of sponsor promotes across financing patterns. And if Gulf projects were observed to spend as long in merchant lease-up as comparable merchant-market projects despite sovereign-anchored demand, Proposition 4 would fail. The propositions are, in this sense, empirical claims awaiting a transaction dataset, a point Section 9 returns to.

## 8. DISCUSSION

### 8.1 Implications for the Sponsor

For the sponsor, the framework reduces to a small number of operating rules. Know which state you are in, and raise only what carries you to the next resolution event plus a stressed buffer; the register of Appendix A is, in effect, a map of what each additional month of delay or each additional point of pre-letting is worth to the stack. Spend negotiating capital on the offtake before spending it on the financing, because every instrument prices off the lease; the anchor lease is the one document that improves all the others. Match control rights to open decisions, resisting stabilised-style governance in development-stage documents even at the cost of a wider promote hurdle, because deadlock during construction destroys more value than any hurdle. Treat the preferred layer as a bridge with a defined far bank, never as disguised permanent capital. And defend the platform: the individual project's financing should be walled off from pipeline rights, cross-defaults and expansion collateral, because the sponsor's terminal value is the platform, not the project.

The framework also clarifies what the sponsor's equity is for. Sponsor capital is not a residual filler; it is the instrument that carries the risks no one else will price, S0 and early S1, and the signal, in the sense of

Holmstrom and Tirole (1997) and Myers and Majluf (1984), that makes every junior and senior instrument after it cheaper. The sponsor who minimises their own cash at the front of the sequence economises on the one input the rest of the stack is priced against.

### 8.2 Implications for the Infrastructure Investor

For the investor, the framework is a placement guide. The question an allocator should ask of any data-centre opportunity is not whether the asset is attractive but which state's risk the instrument on offer actually holds, and whether its pricing corresponds. Development-entry equity offered at stabilised-equity pricing is the most common mispricing in the market; construction-period preferred instruments with equity-style upside claims are the second. The stratification of Section 5.5 supplies the credit discipline: an allocation described as core infrastructure should be tested against the rent roll, because a campus is only as core as its weakest major lease, and an AI-compute-weighted rent roll is growth risk wearing infrastructure clothing. The finding of Andonov, Kraussl and Rauh (2021), that infrastructure portfolios often deliver private-equity cash-flow profiles under infrastructure labels, is repeating itself in this sector in real time, and the state framework is the instrument-level test that prevents it at underwriting.

The staging logic also implies where the durable investor franchises will be built. Capital that can enter at S1 and underwrite development risk earns the sequence's highest returns but requires genuine development competence to evaluate milestones; capital that specialises in the S2 to S4 transitions, construction credit, mini-perms and pre-take-out positions, earns structuring returns on shorter duration; capital that waits for S4 buys clean duration at the sequence's floor pricing. The investor's strategic choice is which resolution events it is equipped to underwrite, and the honest answer determines its place in the stack more reliably than its return target does.

### 8.3 International Comparison: The Gulf against the US and Europe

The North American pattern is the reference case: deep bank and institutional term markets, an established securitisation-style take-out channel, a large colocation sector with tested workout precedents, and land and power acquired in competitive private markets, with grid connection now the binding constraint in most major hubs. Sponsors there face the framework's problems in their canonical form, long S0 and S1 states dominated by power procurement, and a rich instrument menu thereafter. The European pattern shares the institutional depth but adds planning and energy constraints that lengthen S1 further, moratoria and grid queues in several major markets, energy-efficiency regulation shaping design, and a more fragmented lease market, with the result that European stacks often carry more development risk per unit of eventual asset than either the US or the Gulf.

The Gulf inverts the sequence, as Proposition 4 states. Land and power, the long poles elsewhere, can arrive early and by allocation; demand is frequently anchored by sovereign-linked tenants before construction begins; and the states that dominate elsewhere, merchant lease-up above all, compress or vanish. What the Gulf lacks, relatively, is the back of the sequence: term-debt depth for this asset class is still building, the securitisation-style take-out channel for regional collateral remains largely prospective, and workout precedent is thin, which is why lenders hold tighter structures in the manner Esty and Megginson (2003) would predict. The practical consequence for a Gulf sponsor is a barbell: the front of the lifecycle is easier than anywhere in the world, and the back of the lifecycle prices a premium for novelty. Structures should therefore be built to travel, documentation, reporting and collateral conventions aligned with international take-out standards from the construction close onward, so that when the regional take-out channel matures, or when the asset is refinanced into international markets, the project arrives already in the right shape. The sponsors who internalise this earliest will capture a refinancing gain that later entrants will regard as having been obvious.

## 9. LIMITATIONS AND FUTURE RESEARCH

Four limitations bound the paper's claims. First, the analysis is structural rather than empirical: the propositions are calibrated from market convention and transaction experience rather than estimated from a systematic dataset, because no comprehensive, public transaction-level dataset of data-centre financings yet exists. Assembling one, even at the level of stage, instrument, sizing and pricing without counterparty identity, is the most valuable next step, and Section 7.6 specifies the tests such a dataset would enable. Second, the representative project is a single archetype: a campus of one scale, one tenant profile and one jurisdiction-neutral Gulf setting. Portfolio-level financing, platform-level capital raising and the very largest single-site projects raise additional questions, cross-collateralisation, holdco leverage, partnership with hyperscalers at the equity level, that the single-asset framework does not reach. Third, the paper abstracts from tax, zakat, free-zone and withholding considerations, and from Sharia-compliant structures, ijara and istisna-based project financings and sukuk take-outs, which are natural instruments for regional capital and deserve a dedicated treatment; the mapping logic extends to them, but the paper has not done the work. Fourth, the technology itself is the deepest uncertainty: the framework prices specification risk into leases and buffers, but a genuine discontinuity in compute architecture would move value across the states in ways no calibration anticipates. Future research should also examine the political economy of sovereign-anchored demand, how allocation-based land and power, and state-linked offtake, reshape bargaining over the stack, and the emerging secondary market in development-stage data-centre positions, which will supply the price discovery this paper has had to construct.

## 10. CONCLUSION

This paper set out to answer a sponsor's question: how to finance a data centre in the Gulf without giving away the project's economics or importing risks the structure cannot survive. The answer developed across Sections 4 to 7 is that the question is a sequencing problem. A data centre is not one asset but five, a bundle of rights, a development, a construction credit, a leasing business and a stabilised bond-like cash flow, and each of these assets has a natural buyer and a natural instrument. The sponsor's task is to sell each risk state to the capital that prices it best, and to refuse the two tempting shortcuts: the single early raise that prices everything at the riskiest state's cost, and the early leverage that mortgages states that do not yet exist.

The propositions of Section 2 organise the argument. Instruments are state-contingent, and mismatches fail in predictable directions. The offtake is the collateral: debt follows the lease, not the building, and the same campus is core infrastructure or growth risk according to its rent roll. Staged raising preserves the option value that the development process itself creates, and on the representative USD 500 million campus the difference between the staged path and its alternatives is measured in blended-cost terms from development-entry pricing near 23 per cent down to a post-take-out floor near 7 per cent. The Gulf inverts the usual sequence, resolving demand and power early and pricing a premium at the back of the lifecycle, so regional structures should be built from the outset to the standards of the international take-out markets they will eventually meet. And control rights should migrate with risk, so that governance never binds decisions that are no longer open, nor frees decisions that still are.

For sponsors, the playbook of Section 6 is the operational core: four raises, each sized to the next resolution event, with negotiation effort concentrated on the offtake, the completion package and the conversion mechanics rather than on margin. For investors, the framework is a discipline for locating capital honestly along the lifecycle. For both, the sensitivity analysis of Section 7 carries the final lesson: the structures that survive the stranded shell are distinguishable from those that do not at the moment of signing, not at the moment of stress. Capital structure, in this asset class as in the theory it draws on, is not an afterthought to the engineering; it is the second engineering discipline the buildout requires.

## DECLARATIONS

Funding. The author received no external funding for this research.

Conflicts of interest. The author is the managing partner of an independent capital advisory firm that advises managers and allocators on transactions of the type discussed in this paper. No client information has been used, and no live mandate is referenced.

Data availability. The paper uses no proprietary dataset. The base-case calibrations used in the exhibits are recorded in Section 4 and Appendix A.

Disclaimer. This paper is an educational and structural analysis. It is not investment advice, an offer, or a solicitation of any kind.

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## ABOUT THE AUTHOR

Chennakeshav (CK) Adya is an independent researcher and corporate-finance practitioner with more than twenty-five years of experience as both an operator and an investor across capital markets, private capital and cross-border transactions. His research focuses on capital structure, private markets, fund formation and the financing of high-growth ecosystems in the Gulf and beyond. He writes to make the mechanics of private capital legible to managers and allocators alike, combining a practitioner's view of how funds are actually raised and structured with the discipline of a structured, evidence-aware framework.

## APPENDIX A. BASE-CASE CALIBRATIONS

The table below records the base-case calibrations used in the exhibits, drawn from market convention for contracted data-centre credits and the author's transaction experience in the region. Every number appearing in Tables 1 to 4 and Figures 1 to 3 traces to this register.

Table A1. Register of base-case calibrations

| Parameter | Value | Used in |
|---|---|---|
| Total project cost | USD 500m | Tables 1, 3; Sections 4-7 |
| IT load | 60 MW | Table 1; Section 4.2 |
| Development period | 12 months | Section 4.2 |
| Construction period | 24 months | Sections 4.2, 6.1 |
| Lease-up to stabilisation | 12 months | Section 4.2 |
| Uses: land and power rights | USD 40m | Table 3; Section 5.1 |
| Uses: development and soft costs | USD 35m | Table 3; Section 5.2 |
| Uses: construction hard costs | USD 330m | Table 3 |
| Uses: contingency | USD 25m | Table 3; Section 7.4 |
| Uses: financing costs and construction-period interest | USD 45m | Table 3; Section 5.3 |
| Uses: ramp-up working capital | USD 25m | Table 3 |
| Sources: sponsor equity | USD 50m (10%) | Tables 2, 3; Figure 2 |
| Sources: JV co-investment equity | USD 125m (25%) | Tables 2, 3; Figure 2 |
| Sources: preferred / mezzanine | USD 50m (10%) | Tables 2, 3; Figure 2 |
| Sources: construction facility | USD 275m (55% LTC) | Tables 1-3; Figure 2 |
| Construction facility all-in cost | 8.0% (range 7.5-8.5%) | Tables 1-3; Figure 3 |
| Construction facility tenor | 3-4 years plus extensions | Table 2; Section 6.2 |
| Mini-perm pricing | 7.0-7.5% | Table 2; Section 5.4 |
| Term facility LTV | 60% (range 60-65%) | Tables 1, 2; Section 5.5 |
| Term facility all-in cost | 6.5% (range 6.25-6.75%) | Tables 1, 2; Figure 3 |
| Term facility amortisation profile | 20 years | Sections 4.2, 5.5 |
| Take-out advance rate | up to 70% of value | Section 5.6; Figure 2 |

| | | |
|---|---|---|
| Take-out all-in cost | 5.75% (range 5.5-6.0%) | Tables 1, 2; Figure 3 |
| Sizing DSCR, hyperscale contracted | 1.30x (range 1.25-1.35x) | Tables 1, 2; Section 5.5 |
| Sizing DSCR, colocation | 1.45x (range 1.40-1.55x) | Table 1; Section 5.5 |
| Sizing DSCR, AI-compute-weighted | 1.60x plus cash sweep | Table 1; Section 5.5 |
| Sponsor equity target IRR (development entry) | 25% (range 22-28%) | Tables 1-3 |
| Co-investment target IRR (development entry) | 20% (range 18-22%) | Tables 1, 4; Section 5.2 |
| Co-investment target IRR (construction entry) | 17% (range 15-18%) | Tables 1, 3, 4 |
| Preferred equity target return | 13% (range 12-14%) | Tables 1, 3, 4 |
| Mezzanine coupon | 12% (range 11-13%) | Tables 1, 4 |
| Stabilised levered equity target IRR | 11% (range 10-12%) | Table 1; Section 5.5 |
| Preferred return in equity waterfall | 8-10% | Section 6.2 |
| Stabilised NOI | USD 55m (11% yield on cost) | Sections 4.2, 5.5, 7.1 |
| Stabilised capitalisation rate | 7.25% (range 7.0-7.75%) | Table 1; Section 5.5 |
| Stabilised value | approx. USD 760m | Sections 4.2, 5.5 |
| Term facility proceeds | approx. USD 455m | Sections 4.2, 5.5, 7.3 |
| Annual debt service at base case | approx. USD 41m; DSCR 1.33x | Section 4.2 |
| Equity distribution at refinancing | approx. USD 130m | Section 5.5 |
| Residual equity value at stabilisation | approx. USD 305m | Section 5.5 |
| Blended cost, development entry | 23.0% | Figure 3; Sections 5.2, 5.6 |
| Blended cost, construction close | 12.5% | Table 3; Figure 3 |
| Blended cost, stabilisation | 8.3% | Figure 3; Section 5.6 |
| Blended cost, post take-out | 7.0% | Figure 3; Section 5.6 |
| Equity-heavy strategy blended path | 23.0 / 20.2 / 9.5 / 7.5% | Figure 3 |
| Debt-early strategy blended path | 23.0 / 11.8 / 12.5 / 9.0% | Figure 3 |
| Utilisation at stabilisation, base and downside | 90% base; 70% downside | Section 7.1 |
| Downside NOI at 70% utilisation | approx. USD 40m | Section 7.1 |
| Downside term proceeds at 70% utilisation | approx. USD 330m | Section 7.1 |
| Power-cost stress | +25% sustained | Section 7.2 |
| Rate stress | +200 basis points parallel | Section 7.3 |
| Term proceeds under rate stress | approx. USD 390m | Section 7.3 |
| Construction delay, absorbed and stress cases | 6 months; 18 months | Sections 7.4, 7.5 |
| Additional interest from 6-month delay | USD 10-15m | Section 7.4 |
| Risk index values, Figure 1 | 9.0 / 7.5 / 5.5 / 3.5 / 2.0 | Figure 1 |
| Stack shares by state, Figure 2 | per Figure 2 data | Figure 2 |

*Source: author's analysis.*

## APPENDIX B. SPONSOR RAISE CHECKLIST

The checklist below records what a sponsor should have ready, complete and defensible before approaching each investor class. Arriving without the relevant items does not merely slow the process; it reprices it, because gaps are underwritten as risk.

**Before approaching development-entry co-investors (S1):**

- Site control documented: title, long lease or allocation letter, with all conditions and milestone obligations extracted into a single schedule.

- Power pathway evidenced: utility allocation, connection agreement or bankable letter, with energisation timeline and counterparty named.
- Development budget to construction close, with contingency and a milestone plan tied to the drawdown schedule being proposed.
- Demand evidence: anchor tenant dialogue documented, letters of intent in hand, and a credible account of the target rent roll by tenant class.
- The sponsor's own capital committed and visible in the structure, with the promote and waterfall proposal drafted.
- Team and track record: named delivery leadership, contractor relationships, and the operating arrangement intended for S4.

**Before approaching preferred and mezzanine providers (S2):**

- The senior facility's term sheet or near-final terms, so the gap being bridged is defined in size and duration.
- The intercreditor position the senior lender will accept, established before the junior capital prices it.
- A redemption path tied to the stabilisation refinancing, with the accrual mechanics in a delay scenario worked through.

**Before approaching construction lenders (S2):**

- Executed anchor pre-let, or pre-lets, with credit summaries of each tenant and the key lease terms abstracted.
- Fixed-price or guaranteed-maximum-price construction arrangement with a credible contractor, liquidated damages and the completion support package defined.
- Full permit set and power arrangements executed, not promised.
- A funding model showing the interest reserve, contingency and equity-first funding sequence, stressed for a six-month delay and a 200 basis point rate rise.
- The conversion mechanics being requested for the mini-perm or term phase, drafted into the ask rather than deferred.

**Before approaching term lenders and take-out markets (S3-S4):**

- Twelve months or more of operating history at stabilised occupancy, or contracted equivalence.
- The rent roll in underwritable form: tenancy schedule, lease abstracts, escalation and pass-through terms, tenant credit files.
- Operating cost history and the pass-through reconciliation, demonstrating the margin the coverage will be sized against.
- Reporting, collateral and documentation conventions aligned with international take-out standards, per Section 8.3.
- A prepayment and hedging position in the existing facility that permits an economic exit.

## APPENDIX C. GLOSSARY OF KEY TERMS

**Offtake agreement.** The contract under which a tenant commits to lease capacity in the facility, in this asset class a lease or capacity agreement. The offtake's credit quality and tenor determine the debt capacity of the entire structure.

**Hyperscaler.** A global cloud or platform operator that leases data-centre capacity at large scale on long terms, typically with an investment-grade balance sheet. Hyperscale leases anchor the strongest financing structures.

**Colocation.** A business model in which the operator leases capacity to many tenants on shorter terms. Diversified but shorter-tenor rent rolls are sized more conservatively by lenders.

**AI-compute tenant.** A specialist provider of GPU or accelerator capacity, frequently venture-backed with a short credit history. Rent rolls weighted to this class are underwritten as growth risk rather than infrastructure.

**Loan to cost (LTC).** Debt commitments as a proportion of total project cost, the sizing convention for construction facilities.

**Loan to value (LTV).** Debt as a proportion of appraised asset value, the sizing convention for stabilised facilities.

**Debt service coverage ratio (DSCR).** Net operating income divided by scheduled debt service. Lenders size proceeds so that coverage meets a floor appropriate to the rent roll's quality.

**Mini-perm.** A medium-term facility, typically three to five years, that bridges completed construction to a long-term refinancing, often with margin step-downs as leasing milestones are met.

**Preferred equity.** Capital ranking behind all debt but ahead of common equity, with a defined target return and limited governance. In this framework, a bridge between senior proceeds and efficient common equity.

**Mezzanine.** Junior secured or structurally subordinated debt sitting between the senior facility and the equity, governed by an intercreditor agreement with the senior lender.

**EPC wrap.** A fixed-price or guaranteed-maximum-price engineering, procurement and construction arrangement, with liquidated damages, that transfers cost and schedule risk to the contractor.

**Completion support.** The sponsor-side undertakings, completion guarantees or contingent equity commitments, that assure lenders the project will reach completion.

**Interest during construction (IDC).** Financing costs accrued through the construction period and funded within the project budget, commonly through a dedicated interest reserve.

**Merchant risk.** Exposure to uncontracted revenue, capacity that must be leased, or power that must be bought or sold, at future market prices.

**Cash sweep.** A structural feature applying surplus cash flow to debt reduction, used where rent-roll quality or a passed trigger warrants accelerated deleveraging.

**Non-recourse financing.** Debt with claims limited to the project vehicle's assets and cash flows, without recourse to the sponsor's wider balance sheet beyond defined support obligations.

**Securitisation-style take-out.** A refinancing in which contracted lease cash flows support rated notes issued by a financing vehicle, with reserve accounts and coverage-based cash-trap triggers in place of loan-style covenants.

**Anticipated repayment date (ARD).** The expected refinancing date in a securitisation-style structure; beyond it, margin step-ups and full cash sweeps apply, making refinancing economically compulsory.