

Own, Lease, or Rent the Robot

Capital Structure for Assets With No Residual Value History

The third paper in the Applied Futures Research robotics deployment series. REA·004 established the humanoid as a capital asset; REA·005 mapped why deployments stall between pilot and production. This paper addresses the question that follows a committed deployment: how should the capital be structured when nobody — including the vendor — knows what the asset will be worth in three years?

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Executive Summary

Every equipment purchase a company has ever made rested on a number nobody talks about: what the asset will be worth when they are done with it. A tractor, a forklift, a CNC machine — each carries decades of auction data behind its residual value assumption. Lenders price against that history. Lessors set rates against it. CFOs approve capital against it. The number is boring because it is known.

For humanoid robots and the broader class of embodied-AI platforms, that number does not exist. There is no fleet of three-year-old humanoids trading hands, no auction results, no depreciation schedule grounded in transactions rather than accounting convention. The residual value of these assets is not merely uncertain — it is *unpriced*, and every capital structure decision in robotics is downstream of that fact.

This paper makes one central argument: **Robotics-as-a-Service pricing is not a financing convenience. It is an insurance product.** The vendor is selling protection against residual value uncertainty, and the premium is substantial — our decomposition puts it near a fifth of a typical monthly rate — because the underwriter cannot price the risk either. Whether that insurance is worth buying depends on deployment phase, holding period, tax appetite, and, critically, whether the insurer itself will survive the policy term. We model who should bear the residual risk under three scenarios and close with a staged capital structure that rents the uncertainty and owns the proven duty cycle.

-72% Decline in Unitree's average humanoid selling price, 2023–2025, per its own prospectus	≈20% Share of a representative RaaS monthly rate attributable to residual-risk premium and margin (analytic)	19–20 mo Typical RaaS-versus-purchase cost crossover reported for current humanoid platforms	0 Verified market transactions establishing what a three-year-old humanoid is worth
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How to read this paper. Statements are tagged by epistemic register: [GROUNDED] rests on published data or primary documents; [ANALYTIC] is our own modeling from stated assumptions; [PROJECTION] extends current trends forward; [SPECULATIVE] is flagged conjecture. The tags are there so the reader can disagree with precision.

1. The Missing Depreciation Curve

Capital structure for equipment is a solved problem — for equipment with a past. A Class-8 sleeper tractor has a resale market so deep and so continuously marked that a fleet can finance against a five-year residual with single-digit-percentage confidence bands. The same is true, to lesser degrees, of forklifts, machine tools, and mature six-axis industrial arms. The financing industry's entire machinery — lease rate factors, TRAC leases, balloon structures, secured lending advance rates — is built on residual curves derived from decades of transactions.

[GROUNDED] Mature industrial robots do have such a curve. The secondary market for six-axis arms is active and global; industry guidance puts typical depreciation at roughly 10–15% of value per year for established models, with a 20–30% first-year drop, and tier-one brands — FANUC, KUKA, ABB, Yaskawa — retaining more value than the field because parts, service, and programming talent are abundant. Even a dead arm retains parts and scrap value. An industrial robot is, in the resale trade's own framing, a global commodity.

[GROUNDED] No equivalent exists for humanoids or for most embodied-AI platforms. The oldest commercially deployed humanoid fleets are measured in months, not years. There are no auction results, no dealer books, no residual value insurance products, and no lender who will quote an advance rate against a humanoid as collateral on terms resembling those for a forklift. The asset class has a price when new and a question mark thereafter.

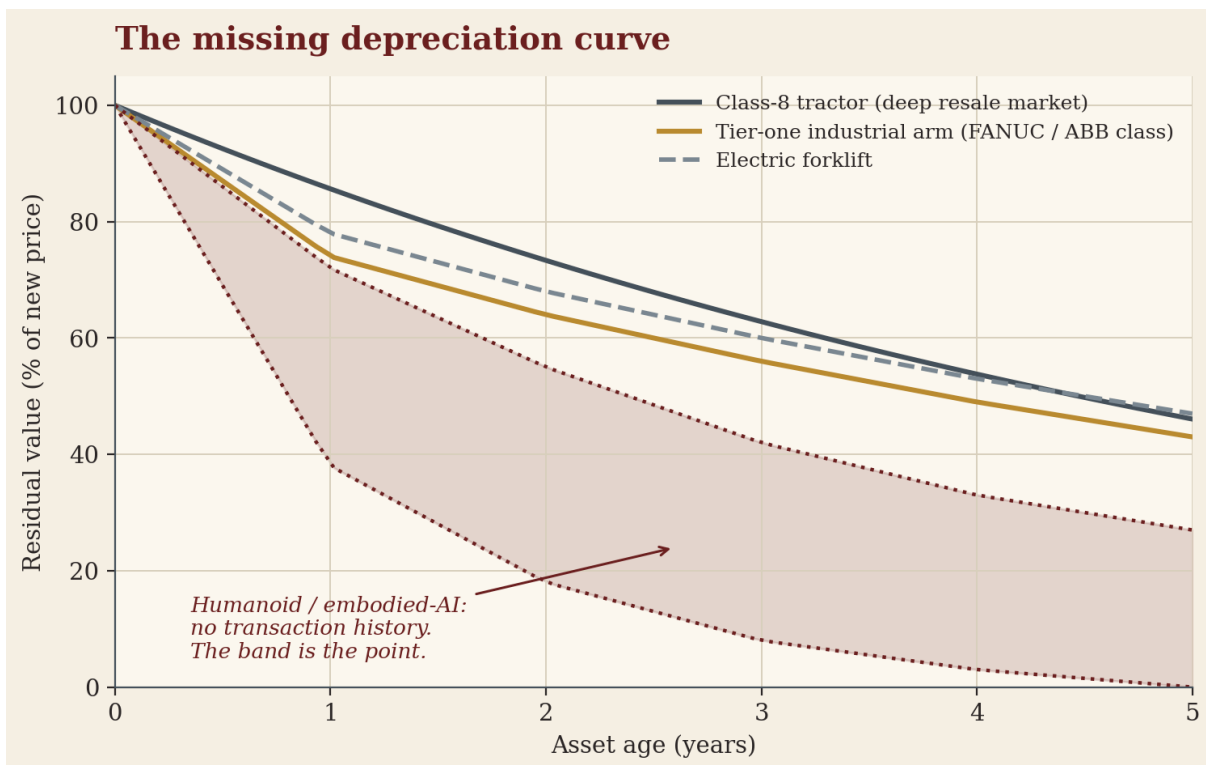


Figure 1 — Residual curves for adjacent asset classes are tight and well-documented. For embodied-AI platforms the honest representation is a band running from 'holds value like a tier-one arm' to 'worthless in three years.' [GROUNDED for named classes; band is ANALYTIC]

The width of that band is not a data problem waiting on more data. It is a structural feature of what the asset is, and Section 3 explains why.

What a residual estimate requires	Status for mature industrial arms	Status for humanoid / embodied-AI platforms
Transaction history at multiple ages	Decades; global dealer and auction network	None. First volume cohorts still in first service life
Parts and service independent of OEM survival	Deep third-party ecosystem	Vendor-locked; parts, autonomy stack, and updates die with the vendor
Value concentrated in durable mechanicals	Yes — castings, reducers, motors	No — value majority sits in software, models, and cloud services
Stable technology generations	Multi-decade platform lives	Generational capability jumps every 12–24 months
Price stability of new units	Gradual, predictable	Steep deflation; new prices falling 30%+ annually in leading segments

Table 1 — Why the standard residual toolkit fails for this asset class. [GROUNDED / ANALYTIC]

2. What Adjacent Assets Teach — and Where the Analogy Breaks

The instinct of every finance team confronting a new asset class is to reason by analogy: treat the humanoid like a cobot, the cobot like an arm, the arm like a machine tool. The analogy holds exactly as far as the *determinants* of residual value hold — and no further. Four determinants decide whether a used asset is worth anything, and they are worth stating plainly because they double as a procurement checklist.

- **Installed base scale.** Residual value is a liquidity phenomenon. A used FANUC arm is worth something because thousands of buyers run identical units and can absorb one more. An orphaned platform with four hundred units in the field has no bid.
- **Independence from the OEM.** Value survives when parts, service, and operating software outlive the manufacturer's interest — or existence. The third-party ecosystem around tier-one arms is precisely what a used buyer is paying for.
- **Mechanical share of value.** Castings, reducers, and motors depreciate on physics. Software depreciates on a release calendar. The larger the software share of an asset's utility, the faster its value can go to zero on a decision made in a vendor's boardroom.
- **Generational stability.** A 2015 six-axis arm and a 2025 six-axis arm do substantially the same job. When each hardware generation obsoletes the last on capability — not merely on efficiency — used units compete against new units that are simultaneously better *and* cheaper.

[ANALYTIC] Score the humanoid against those four determinants and the analogy to industrial arms collapses on every axis at once. Installed bases are small and fragmented across more than a hundred manufacturers. Nearly every platform is vendor-locked from actuator firmware to autonomy stack. The value majority sits in models and software, not metal. And generational turnover is running at consumer-electronics cadence. The correct adjacent asset is not the forklift. It is closer to the smartphone — an asset whose secondary market only emerged years later, once volumes were enormous and platforms had standardized — with the difference that a phone still makes calls when its maker exits the business, while a cloud-dependent robot may not do anything at all.

The forklift analogy fails on all four determinants at once. The honest comparable is the smartphone — except a phone still works when its maker dies.

None of this means the residual will *be* zero. It means the residual is currently a bet on which vendors survive, which platforms standardize, and how fast new prices fall. That last variable deserves its own section, because it is the one moving fastest.

3. The Deflation Engine

Used values do not exist in isolation; they are anchored to new prices. Nobody pays \$40,000 for a used robot when a better new one costs \$30,000. So the single most important input to any residual forecast for this asset class is the trajectory of new prices — and that trajectory is nearly vertical, downward.

[GROUNDED] The clearest primary evidence comes from Unitree's own IPO prospectus filings: the company's average humanoid selling price fell from roughly ¥593,400 in 2023 to roughly ¥166,400 in 2025 — a 72% decline in two years — while gross margin *expanded* from 44% to about 60%. This is not distress pricing. It is vertical integration working as designed: teardown analysis put the G1's bill of materials near \$9,000 against a then-prevailing price implying roughly two-thirds gross margin, and externally sourced components account for well under a fifth of BOM cost. The price cuts are funded by manufacturing economics, which means they are durable.

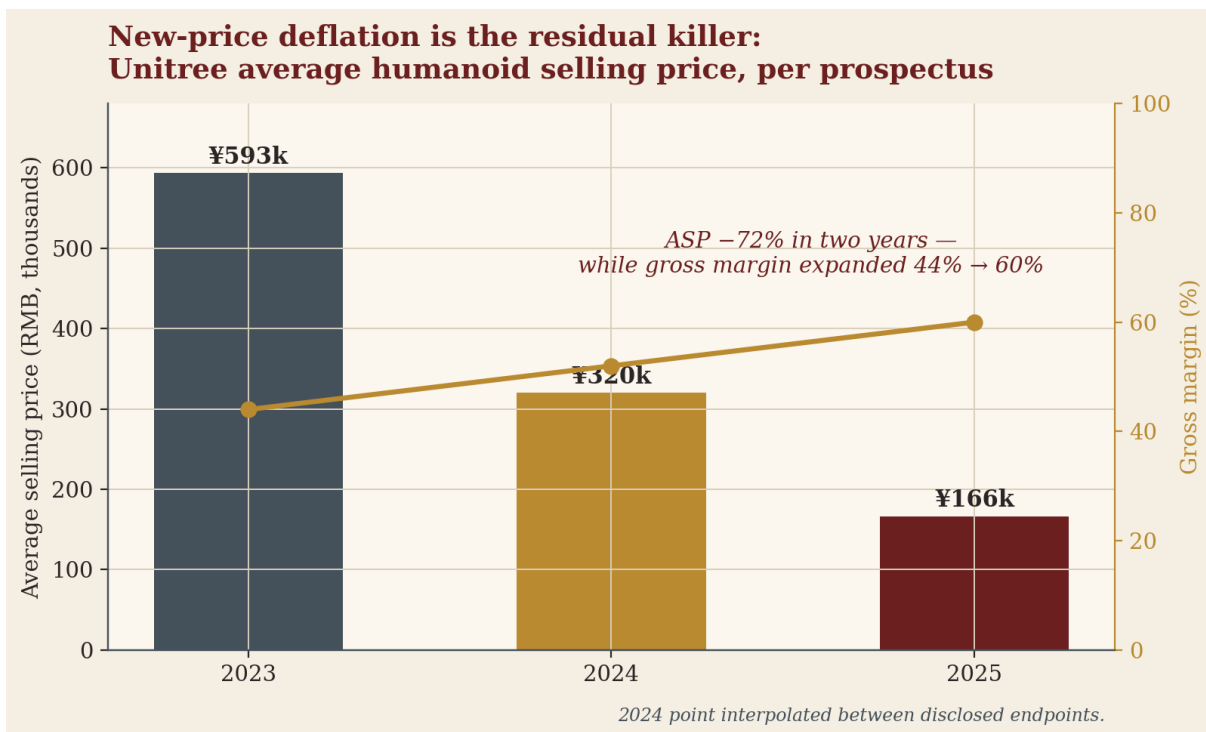


Figure 2 — Deflation with expanding margins is the signature of a structural cost decline, not a promotion. [GROUNDED; 2024 interpolated]

[GROUNDED] The floor keeps moving. Unitree's R1 line was repriced to ¥29,900 (about \$4,150) in mid-2026, in stock with immediate fulfillment; multiple vendors have converged at or below the ¥30,000 mark; and Unitree's founder has stated a long-run target of ¥3,000–4,000 per unit — smartphone territory. Industry trackers report most industrial-grade humanoid models now clustering at \$20,000–\$30,000, down 40–60% from 2023–24 prototype pricing, with global shipment forecasts crossing 50,000–100,000 units in 2026.

[ANALYTIC] Now run the used-value arithmetic. A buyer who paid \$60,000 for a capable platform in 2025 faces a 2028 market in which a new unit — two hardware generations better, with current models and full warranty — may list below \$25,000. The used unit's ceiling is set by that new price less the buyer's discount for age, battery degradation, no warranty, and software uncertainty. Deflation of this speed does not merely lower residuals; it can pin them near the parts floor regardless of the unit's condition. This is the same mechanism that made three-year-old consumer electronics nearly worthless during their steepest cost-decline years, and it is the mechanism the pricing war guarantees for early humanoid cohorts.

[GROUNDED] There is a second, subtler deflation at work: generational capability gaps. Unitree's trajectory from the industrial H1 (¥650,000, 2023) to the G1 (from ¥99,000, 2024) to the R1 (from ¥29,900, 2025–26) was not one product discounted — it was successive tiers with different capability envelopes, each resetting the market's price anchor. When the anchor resets, premium positioning for *used* prior-generation hardware becomes untenable.

Nobody pays \$40,000 for a used robot when a better new one costs \$30,000. New-price deflation is the residual killer — and it is being funded by margin, not desperation.

4. Decomposing the RaaS Rate

Against that backdrop, Robotics-as-a-Service looks less like a payment plan and more like what it economically is: a transfer of residual and obsolescence risk from the customer to the vendor, priced into the rate. The market has grown precisely because that transfer is valuable — estimates put global RaaS in the tens of billions of dollars and compounding at 25–40% annually, with the model now standard across warehouse robotics, cleaning, welding, and machine tending.

[GROUNDED] Published price points give the model texture. Machine-tending cobot subscriptions run about \$2,100 per month all-inclusive on short minimum terms. Cobot welding is offered hourly at \$8–24 per hour with billing tied to runtime. Enterprise robot-orchestration contracts run \$5,000–15,000 per month on 12–24 month minimums. In the humanoid segment, 1X lists its NEO at \$20,000 to purchase or \$499 per month — with reported one-time implementation fees near \$10,000 and security deposits of \$12,000 or more on some industrial programs. Delivery and cleaning robots span roughly \$335 to \$2,000 per month depending on class. The rates are real, current, and comparable.

The rate, taken apart

[ANALYTIC] Decompose a representative \$2,100/month all-inclusive machine-tending subscription against the vendor's own economics: hardware amortized over a conservative fleet life, cost of capital on the deployed asset, field service and maintenance reserves, and software/support delivery. On defensible assumptions those components sum to roughly \$1,680 — leaving on the order of \$420 per month, about 20% of the rate, as the combined residual-risk premium and vendor margin. That residual line is not padding; it is the actuarially honest price of promising the customer they can walk away and leave the vendor holding an asset of unknown worth.

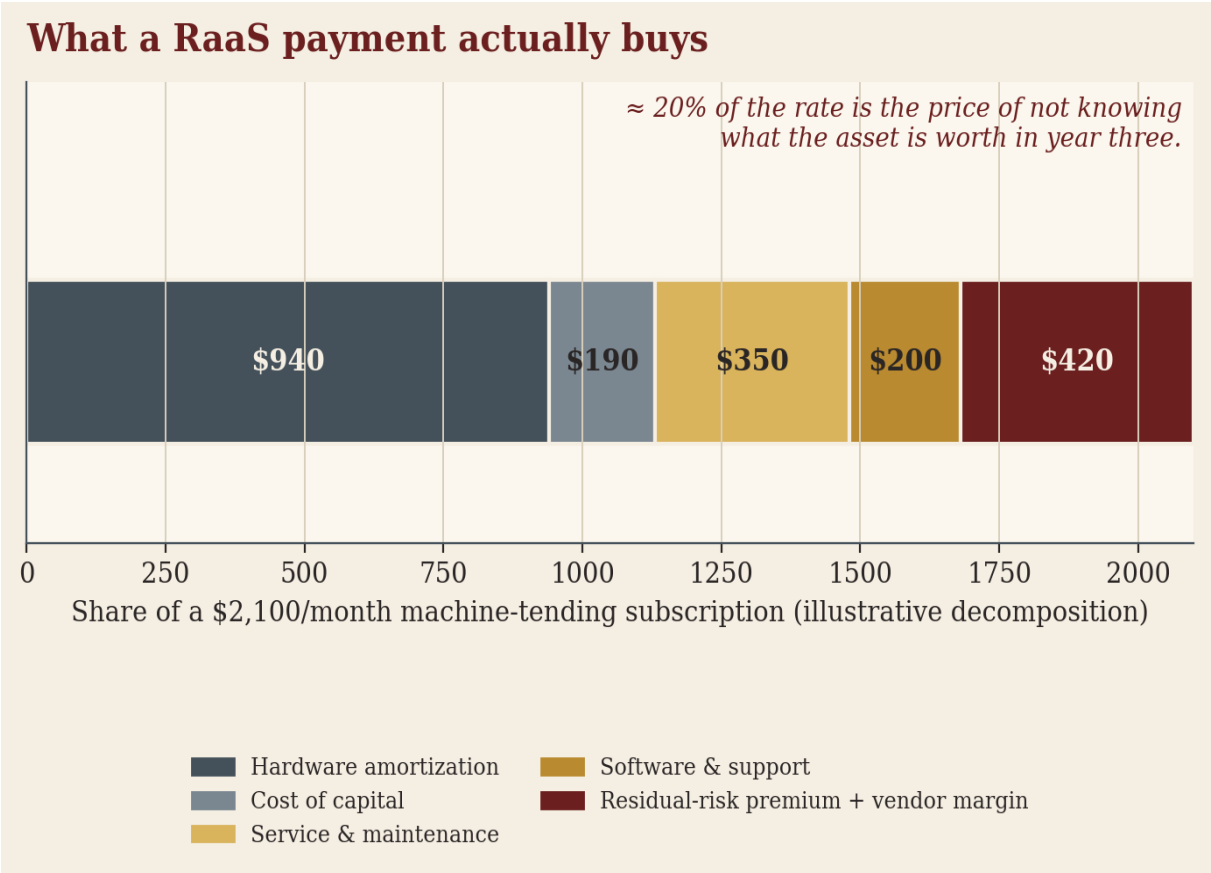


Figure 3 — An illustrative decomposition of a published \$2,100/month all-inclusive rate. Assumptions: \$45k hardware amortized over 48 months, 10% cost of capital, \$350/month service reserve, \$200/month software and support. **[ANALYTIC]**

Component	Monthly	What it actually is
Hardware amortization	\$940	Return of the vendor's capital over an assumed fleet life
Cost of capital	\$190	Return on that capital at ~10%
Service & maintenance	\$350	Field labor, spares, backup-unit reserve
Software & support	\$200	Autonomy stack, fleet software, remote monitoring
Residual-risk premium + margin	\$420	The insurance policy. Payment for bearing obsolescence, redeployment, and end-of-term value risk the vendor cannot price either

Table 2 — What a RaaS payment buys. The last line is the subject of this paper. **[ANALYTIC]**

Two things follow from the decomposition, and they cut in opposite directions. First: the customer paying that premium every month should be conscious that they are buying insurance and should price it as insurance — against their actual ability to absorb a residual loss, their deployment horizon, and their redeployment options. A twenty-robot pilot that might be dead in a year should happily pay the premium. A proven hundred-robot production line paying for it for five years is over-insured.

Second, and less comfortably: **the insurer cannot price the risk either.** The vendor setting that premium has no more residual history than the customer does. Some vendors are underpricing the risk to win deployments — which is a subsidy while it lasts and a solvency problem when the returned fleet's true value is discovered. That leads directly to the counterparty question in Section 7.

5. The Crossover: Where Owning Beats Renting

[GROUNDED] For current humanoid platforms, published buy-versus-subscribe analyses put the crossover at roughly 19–20 months — beyond that point, cumulative subscription cost exceeds the all-in cost of ownership, and by month 36 ownership is reported to save on the order of 35%.

[ANALYTIC] Our own model, built on the machine-tending price points above, is deliberately harsher on ownership than those analyses: we charge the owner the full service and software reserves from the Figure 3 decomposition (\$550/month) rather than assuming warranty coverage. Even so — with a \$57,000 installed purchase against a \$10,000 implementation fee and \$2,100 monthly rate — cumulative costs cross near month 30. Strip the self-carried service assumption (service parity between owner and subscriber) and the crossover moves to roughly month 22, bracketing the published humanoid figures. Under any defensible assumption set, a deployment expected to run three years or longer pays a substantial premium to remain a subscriber.

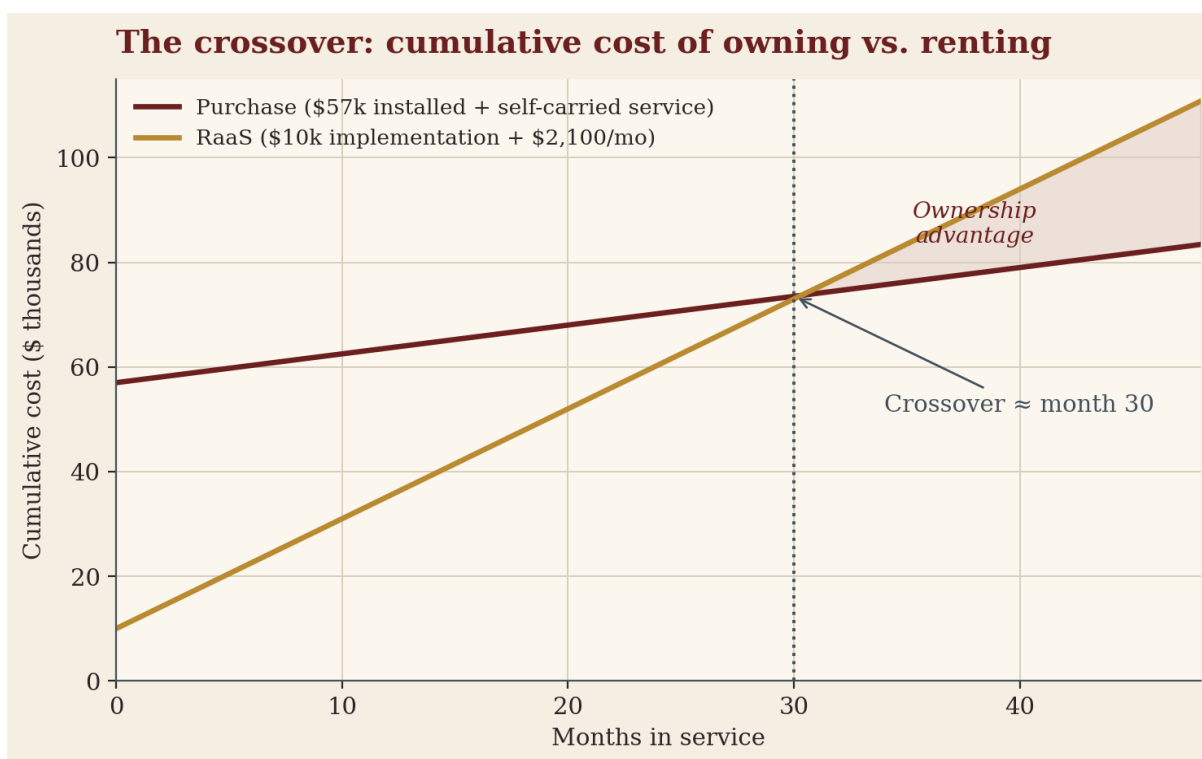


Figure 4 — Cumulative cost of ownership versus subscription for the representative machine-tending deployment. Owner self-carries service and software at the same monthly reserves used in the Figure 3 decomposition. [ANALYTIC]

The tax thumb on the scale

[GROUNDED] United States tax treatment now leans hard toward ownership. Section 179 permits expensing up to \$2,560,000 of qualifying equipment placed in service in 2026, phasing out above \$4,090,000 of total qualifying property — a ceiling that comfortably covers even a large robot fleet for a mid-market manufacturer. Separately, 100% bonus depreciation was made permanent for qualifying property acquired after January 19, 2025. An owner can deduct the full cost of the fleet in year one; a subscriber deducts payments as they go and never builds basis or equity.

[ANALYTIC] First-year expensing does not change *whether* ownership wins — it changes *how fast*. At a 25% blended marginal rate, expensing a \$57,000 purchase returns roughly \$14,000 of year-one cash tax benefit; at the model's \$1,550/month ownership advantage, that pulls the effective crossover in Figure 4 forward by roughly nine months for a taxpaying buyer with income to absorb the deduction. The common objection — 'but RaaS keeps it off the balance sheet' — is mostly obsolete: under ASC 842, operating leases go on the balance sheet as right-of-use assets and lease liabilities anyway. The residual off-balance-sheet game is the pure service contract, and buyers should notice that vendors structure RaaS agreements as services precisely because classification as a lease under ASC 842's tests — term versus economic life, present value versus fair value — would put them on the customer's books.

Dimension	Own (cash or debt)	Finance / operating lease	RaaS service contract
Balance sheet	Asset + any debt	ROU asset + lease liability (ASC 842)	Generally off balance sheet if it fails lease tests
Tax posture	§179 / 100% bonus — full year-one expensing available	Depends on tax ownership; conditional sales expensed by lessee	Payments deducted as incurred; no basis, no equity
Residual risk	All yours	Shared — set by residual position and any guarantees	Vendor's — priced into the rate
Obsolescence risk	All yours	Mostly yours through the term	Vendor's — upgrades often contractual
Counterparty risk	Parts/support only	Lessor + OEM	Total — service, software, and uptime die with the vendor
Exit flexibility	Sell into an unknown market	Term-bound; early-out penalties	Term-bound; often shortest commitments

Table 3 — The three structures, honestly compared. No column dominates; the deployment phase decides. [GROUNDED / ANALYTIC]

6. The Counterparty Problem: When the Insurer Dies First

The RaaS premium buys insurance, and insurance is only as good as the insurer. Here the robotics sector's recent history should be read the way a credit analyst reads it, not the way a technology enthusiast does.

[GROUNDED] Berkshire Grey — a warehouse-automation vendor whose customer list included Walmart, Target, and FedEx, and an early, loud champion of the RaaS model — went public by SPAC in 2021 at

a \$2.7 billion valuation and was taken private by SoftBank in 2023 for approximately \$375 million: roughly 86% of its public value gone in two years. 6 River Systems was acquired by Shopify, sold on to Ocado amid reported layoffs, and stands as the sector's case study in what analysts politely called mobile-robot vendors 'striving to survive.' The AMR consolidation wave documented in REA-005 — Fetch into Zebra, iRobot's collapse, the 2025 vendor distress cohort — is the same phenomenon. These were funded, referenced, marquee-customer vendors.

[ANALYTIC] Now trace what vendor failure does to each capital structure. The *owner* of a dead vendor's robot loses future parts and updates — painful, but the asset keeps running today, and for mechanically dominated assets a third-party service market often forms. The *RaaS subscriber* of a dead vendor loses everything at once: the service team, the software subscription, the cloud autonomy stack, the backup units, and — if the estate's creditors move faster than the customer's lawyers — possibly the robots themselves, which the customer never owned. A RaaS contract in a vendor bankruptcy is an unsecured claim for services no longer being rendered. The subscriber paid a premium every month specifically to *avoid* holding asset risk and ends up holding the concentrated form of it: operational dependence on a counterparty with no successor obligated to perform.

The RaaS premium is an insurance policy written by an underwriter that cannot price the risk — and may not survive the policy term. Underwrite the insurer, not the brochure.

The practical discipline is to underwrite the vendor the way a lender would: balance-sheet runway against burn, revenue concentration, whether the autonomy stack can run on-premises if the cloud goes dark, whether source code and model weights sit in escrow, and whether the contract survives assignment in an acquisition. REA-008 in this series will build that checklist in full; for present purposes the point is narrower — **counterparty durability is a component of the capital structure decision itself**, and it systematically favors either owning hardware from vendors you'd trust dead or renting only from vendors you'd trust alive.

7. Who Should Bear the Risk: A Decision Framework

Pull the threads together. Residual value is unpriced (Section 2), the usual analogies fail (Section 3), new-price deflation pins used values toward the floor (Section 4), the RaaS rate charges roughly a fifth for carrying that risk (Section 5), ownership wins economically past a crossover the tax code pulls earlier (Section 6), and the risk transfer is only as good as the transferee's solvency (Section 7). The framework that falls out is not 'rent versus own' as a philosophy. It is an allocation question: *at each phase of the deployment, who is best positioned to bear residual risk — and what is the fair price for moving it?*

[PROJECTION] Three futures bound the residual outcome for hardware bought today. In an *orderly-market* future, two or three platforms standardize, parts ecosystems form, and year-three residuals for winning platforms settle in the 35–45% range — arm-like behavior. In a *floor* future, deflation and fragmentation hold residuals to parts-and-scrap value, perhaps 10–20%. In a *stranded-asset* future — vendor failure plus cloud-dependent autonomy — residuals round to zero. No responsible analyst can

currently assign confident weights across that spread, which is precisely the point: the spread, not the midpoint, is what a capital structure must survive.

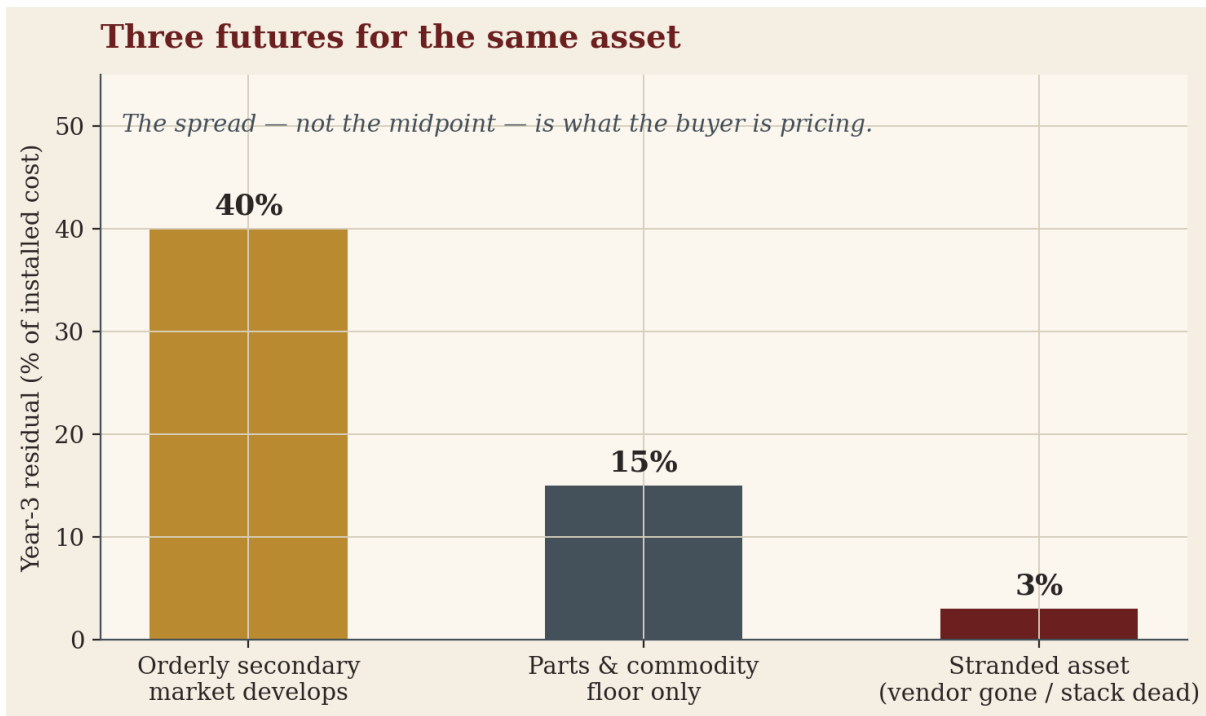


Figure 5 — Year-three residual outcomes under the three futures. [PROJECTION]

The staged structure

The resolution is the same staged-commitment discipline REA-005 applied to deployment scope, applied here to capital: **let ownership track confidence, not enthusiasm.**

- **Phase 1 — Pilot (months 0–6): rent everything.** The residual-risk premium is cheapest insurance you will ever buy against a use case that may not survive contact with production. Shortest available terms; explicit exit rights; no deposits you cannot lose.
- **Phase 2 — Validation (months 6–18): rent the fleet, buy the exception.** As duty cycles prove out, selectively purchase units for the most stable, mechanically dominated tasks — and use the purchases to force price discovery on the vendor's own view of residual value via end-of-term purchase options.
- **Phase 3 — Scale (months 18–36): flip the ratio.** Past the crossover, subscription premiums on proven duty cycles are pure over-insurance. Buy the production fleet, capture \$179/bonus expensing and hold RaaS only for surge capacity and new use cases.
- **Phase 4 — Steady state (36+ months): own the core, rent the frontier.** A standing 80–90% owned fleet with a rented experimental margin gets the tax treatment of ownership and the optionality of subscription — each where it belongs.

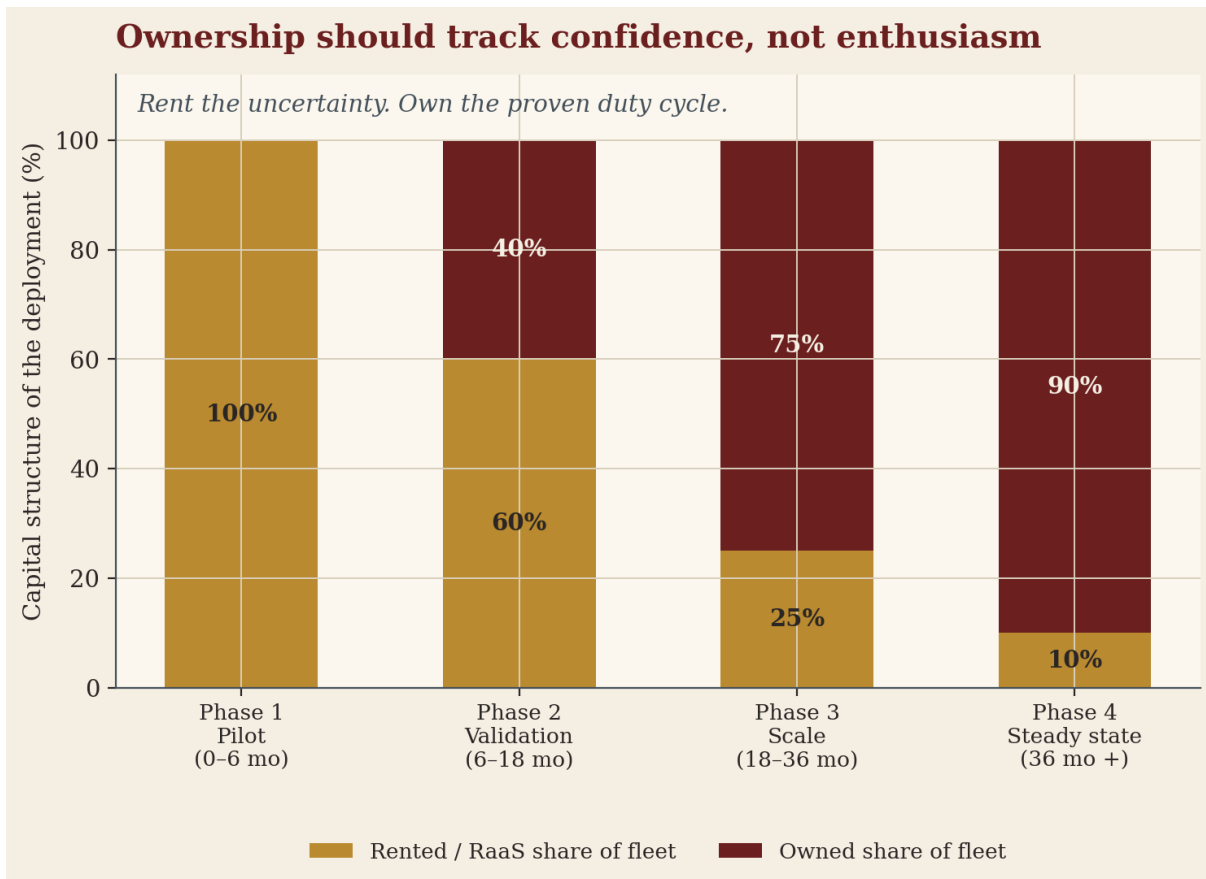


Figure 6 — Capital structure by deployment phase. Rent the uncertainty; own the proven duty cycle. [ANALYTIC]

Contract clauses that reallocate the risk

Whichever structure applies, the residual question should be negotiated explicitly rather than left inside the rate. Five clauses do most of the work:

- **Fixed-price purchase options** at stated points in the term — the vendor's own residual forecast, in writing, that you can hold them to.
- **Source-code and model-weight escrow** with release on insolvency or discontinuation, plus a contractual right to run the autonomy stack on-premises.
- **Parts and service continuity guarantees** — a stated period of spares availability surviving assignment, acquisition, or wind-down.
- **Termination and portability rights** on vendor change-of-control, with data (maps, task models, telemetry) delivered in usable form.
- **Residual-sharing on early exit** — if you return proven, well-maintained units into a rising secondary market, the upside should not be entirely the vendor's.

8. The Capital Allocator's Verdict

The verdict table follows the house convention: three scenarios, explicit triggers, and the action each implies. The scenarios are about the *asset class*; the actions are about *your capital*.

	Bear case	Base case	Bull case
The world	Deflation continues unabated; vendor shakeout deepens; no secondary market forms; cloud-dependent stacks strand early fleets	Two or three platforms standardize by 2028–29; parts ecosystems and a thin secondary market form around the winners; deflation moderates	Durable, modular platforms emerge; third-party service networks mature; residuals behave like tier-one arms within five years
Year-3 residual	0–10% of installed cost	15–35%, platform-dependent	35–50% for winning platforms
What to do	Rent everything, shortest terms, from the most solvent vendors only; treat every unit as consumable; negotiate exit rights above price	Staged structure of Section 8: rent pilots, buy proven duty cycles past the 20–30-month crossover, demand escrow and purchase options	Buy early and aggressively on the winning platforms; capture \$179/bonus expensing; treat the rented margin as pure experimentation budget
Leading indicators	Continued ASP declines >30%/yr; further take-privates and wind-downs; RaaS rates falling (premium being underpriced to win share)	ASP decline moderating to 10–15%/yr; first credible used-unit listings with real bids; residual-value insurance products appearing	OEMs publishing certified-refurbished programs; lenders quoting advance rates against robot collateral; multi-vendor parts commonality

Verdict table — three scenarios for residual formation and the capital posture each implies. [PROJECTION]

Bottom line: RaaS is honestly priced insurance against a risk nobody can price — buy it for exactly as long as you cannot bear the loss, and not one quarter longer. Past the crossover, on a proven duty cycle, ownership plus first-year expensing beats the subscription in every scenario except the one where you should not have deployed at all.

The next paper in this series, REA-007 — 'The Crew and the Machine' — turns from the capital to the people: workforce response as the hidden variable in automation ROI.

References

Sources are grouped by epistemic weight. Primary documents and prospectus data anchor the deflation and counterparty sections; trade and market sources anchor pricing; modeled figures are the author's and are tagged [ANALYTIC] or [PROJECTION] in the text.

1. Unitree Robotics, A-share IPO prospectus filings (2026): average humanoid selling price ¥593,400 (2023) to ¥166,400 (2025); gross margin 44% to 60%; 2025 shipments of 5,500+ units. As reported in China Biz Insider, "Unitree Breaks the Humanoid Robot Cost Barrier," June 2026.
2. SemiAnalysis teardown estimate of Unitree G1 bill of materials (~US\$8,976) and vertical-integration analysis, cited *ibid*.
3. Gasgoo Auto News, "Humanoid Robots: Have Prices Really Crashed?" (2026): Unitree H1/G1/R1 pricing ladder; Leju Kuafu ASP decline of 25.6% (2024–25); tier structure of the Chinese humanoid market.
4. There's A Robot For That, "Humanoid Robot Price 2026: Cost & ROI Breakdown" (2026): platform price ranges \$13,500–\$320,000; RaaS at \$499–\$5,000/month; 19–20 month buy-versus-subscribe crossover; ~35% ownership savings at 36 months; implementation fees and deposits.
5. There's A Robot For That, "Humanoid Robot Companies 2026": 140+ manufacturers; TrendForce 2026 shipment forecast >50,000 units; China >80% of 2025 installations (Counterpoint Research / Rest of World data).
6. CobotFinder, "Top Robotics as a Service Companies 2026": machine-tending subscriptions ~\$2,100/month all-inclusive; cobot welding at \$8–24/hour; enterprise orchestration at \$5,000–15,000/month; Grand View Research RaaS market projection (\$4.2B 2025 → \$23.3B 2030, ~41% CAGR).
7. Layer3 Labs, "Robotics as a Service: 2026 Pricing Guide": RaaS pricing structures (time-, usage-, outcome-based); market estimate ~\$32B in 2026; contract lock-in and SLA cautions.
8. Service Robot Co. and Commercial Robot Vacuums 2026 pricing guides: service-robot RaaS ranges \$335–\$2,000/month; purchase ranges \$16k–\$96k; service contracts at 10–15% of purchase price annually.
9. Robotics Research, "Refurbished vs. New Industrial Robots: 2026 ROI Comparison" and used-robot valuation guides: 20–30% first-year depreciation; ~10–15%/year thereafter; tier-one brand value retention (FANUC, KUKA, ABB, Yaskawa); parts and scrap floors; industrial robots as globally liquid assets.
10. Peter C. Evans, "Industrial Robots Go Circular" (2024): emergence of secondary marketplaces; smartphone secondary-market analogy (195M used units shipped 2023, ~\$72.9B).
11. Berkshire Grey: SPAC merger at \$2.7B valuation (2021); SoftBank take-private at ~\$375M (2023). Wikipedia corporate history and contemporaneous WSJ/Reuters reporting; company RaaS program announcements.
12. Robotics 24/7, "6 River Systems Handoff a Sign for Mobile Robot Vendors to Demonstrate Value" (2023): Shopify-to-Ocado transfer and layoffs; analyst framing of vendor survival pressure.
13. LegalClarity, "Equipment Rental Accounting Treatment Under ASC 842" (2026): Section 179 limit \$2,560,000 with \$4,090,000 phase-out threshold for 2026; permanent 100% bonus depreciation for property acquired after January 19, 2025 (One Big Beautiful Bill Act); lessor classification mechanics.
14. Rubli / FinQuery ASC 842 classification guides: five finance-lease tests; 75% economic-life and 90% present-value benchmarks; right-of-use asset and lease liability recognition for operating leases.
15. Applied Futures Research: REA-004, "The Humanoid as Capital Asset" (June 2026) and REA-005, "The Pilot Trap" (July 2026) — companion papers establishing the asset thesis and the pilot-to-production failure analysis this paper builds on.

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