

G2G ADVISORY

TMT Sector Reference

Industry Special — Sector-Specific Reference

Prepared exclusively for G2G Advisory candidates | March 2026

Supplement to the G2G Complete Reference. No duplication — sector-only knowledge.

I. SAAS METRICS & FOUNDATIONS

SaaS businesses derive value from recurring subscription revenue, and elite-performing companies significantly exceed industry averages across all metrics. Annual Recurring Revenue (ARR) normalizes subscription contracts to a 12-month basis. A \$25K/month contract = \$300K ARR; a \$1M contract for 3 years = \$333K ARR. This normalization is critical because payment terms vary dramatically. Multi-year upfront contracts (\$1M for 3 years) generate materially different cash flow than monthly recurring revenue (\$333K/month = \$4M annually), yet both contribute \$333K to ARR. **Net Revenue Retention (NRR)**, measured as (Beginning ARR - Churn ARR + Expansion ARR) / Beginning ARR, is the single most important metric for SaaS quality. Elite companies achieve 120 percent+ NRR. Snowflake historically achieved 158 percent NRR, meaning for every \$100M ARR with 5 percent monthly churn (\$5M lost), expansion revenue added \$10M through upsells, cross-sells, and price increases, netting \$5M growth monthly or 60 percent annualized. Datadog maintains 130 percent+ NRR; Twilio 120 percent+. This expansion-driven growth is powerful because it requires no new customer acquisition (zero CAC marginal cost) and comes from existing satisfied customers (low churn risk). The benchmark: 100-110 percent is strong growth, 100-105 percent is acceptable but concerning, below 100 percent is negative (churn exceeding expansion). **Gross Revenue Retention (GRR)**, excluding expansion, measures pure customer retention: (Beginning ARR - Churn - Contraction) / Beginning ARR. Healthy GRR ranges 85-95 percent; below 85 percent signals serious product or retention issues indicating product-market fit deterioration.

The Rule of 40 balances growth and profitability: Growth Rate (percent) + FCF Margin (percent) \geq 40. A 40 percent growth company with 0 percent FCF margin passes; a 20 percent growth company requires 20 percent+ FCF margin to pass; a 50 percent growth company can afford FCF-negative economics. This heuristic filters hype (high growth, cash burn) from sustainable unit economics. A company claiming 30 percent growth and 15 percent FCF margin passes (45), signaling disciplined growth. One claiming 30 percent growth but 0 percent FCF fails (30), suggesting either mature product or mismanagement. **Magic Number** (Net New ARR / S&M Spend) captures sales efficiency: above 0.75x is excellent (every \$1 of S&M generates \$0.75+ of net new ARR in the same period), 0.5-0.75x is solid, below 0.5x signals either immature sales organization or deteriorating efficiency. **Burn Multiple** (Annual Cash Burn / Net New ARR) indicates cash efficiency: below 1.0x is exceptional (company generates more ARR than it burns in cash), 1.0-1.5x is good (every \$1 of ARR costs \$1-\$1.50 to acquire), above 2.0x is concerning (unsustainable burn relative to revenue generation). A company adding \$10M ARR with \$8M annual burn (0.8x burn multiple) is deploying capital exceptionally; one adding \$10M ARR with \$25M burn (2.5x) is burning cash unsustainably and faces a cliff when funding ends.

SaaS valuation relies heavily on these metrics. **EV/ARR multiples vary dramatically by growth, profitability, and retention**: hyper-growth SaaS (50 percent+ YoY growth, unprofitable) trade 25-40x ARR (Figma \$20B valuation on \$400M ARR = 50x when private, pre-AI profitability questions), fast-growth SaaS (30-50 percent growth, high retention) trade 10-20x ARR (Datadog 18-25x, Cloudflare 20x), moderate-growth profitable SaaS (5-15 percent growth, strong FCF) trade 5-10x ARR (Adobe 8-10x, ServiceNow 12-15x). **Cohort analysis is essential**: segment customers by acquisition cohort (month/quarter acquired). Track revenue/retention per cohort over time. Plot retention curves (percent of original cohort revenue remaining after 12, 24, 36 months). If 2024 cohorts have 90 percent 1-year retention vs 2023 cohorts 85 percent, retention is strengthening (network effects, product improvements). If both are 85 percent, retention is stable but potentially concerning if below 90 percent. If 2024 cohorts are 80 percent, retention is deteriorating (product regression, competitive pressure). Cohort-based DCF (projecting each cohort forward) is more accurate than top-down extrapolation because it captures cohort quality decay and churn acceleration. **Interest rate sensitivity is acute**: a 100bps Fed rate rise can compress SaaS multiples 15-20 percent because SaaS is a high-multiple, long-duration asset (cash flows concentrated in years 3-10 matter greatly; rising discount rates compress present value dramatically).

II. MARKETPLACE & CONSUMER METRICS

Marketplaces monetize fundamentally differently than SaaS. **Gross Merchandise Value (GMV)** (total transaction value flowing through the platform) is NOT revenue and cannot be confused. A \$1B GMV marketplace with 12 percent take rate generates \$120M net revenue before payment processing, fraud, and operational costs. GMV growth alone is misleading without take-rate context. A competitor with \$2B GMV at 10 percent take rate generates \$200M net, more revenue despite lower take rate. Take rates vary dramatically by vertical: product marketplaces (Etsy, eBay, Amazon third-party seller) target 5-15 percent (lower commission for lower-value items, higher for niche categories), service marketplaces (Uber, TaskRabbit, Fiverr, Upwork) command 15-30 percent (higher commission for labor marketplace network effects), fintech platforms (LendingClub, Square, Stripe) manage 1-3 percent (lower commission on capital flow, but volume economics). **GMV-to-revenue translation requires detail**: \$1B GMV, 12 percent take = \$120M gross revenue. Deduct payment processing (1-2 percent of GMV, \$10-20M), fraud/chargebacks (0.5-1 percent of GMV, \$5-10M), guarantees/insurance (0.25-0.5 percent of GMV, \$2.5-5M) - net revenue \$85-105M, representing 8.5-10.5 percent effective take on GMV. Unit economics hinge entirely on take rate, customer acquisition cost (CAC), and retention.

Daily Active Users (DAU) and Monthly Active Users (MAU) measure engagement depth. The DAU/MAU ratio reveals stickiness and user behavior patterns: messaging apps (WhatsApp, iMessage, Telegram) achieve 60 percent+ DAU/MAU (users return multiple times daily, habit-forming), social platforms (Instagram 35-45 percent DAU/MAU, Facebook 50 percent+ DAU/MAU among older demographics, TikTok 40-50 percent DAU/MAU) substantial but not daily, content platforms (YouTube, Twitch, Netflix) 20-30 percent DAU/MAU (consumption-driven), e-commerce (Amazon, Shopify, eBay) under 15 percent DAU/MAU (transactional, not habitual). **Average Revenue Per User (ARPU)** is platform revenue / users. A 100M user base at \$2 ARPU = \$200M revenue. Trends matter critically: flat ARPU despite user growth signals monetization weakness or saturation. **Customer Lifetime Value (LTV)** represents total gross profit a customer generates across their lifetime. Perpetuity formula (assume infinite lifetime): $LTV = ARPU / Monthly\ Churn\ Rate$. If ARPU is \$500/month and monthly churn is 5 percent, $LTV = \$500 / 0.05 = \$10,000$ (customer lasts 20 months on average, generating \$10K gross profit). With discount rate (more realistic): $LTV = (ARPU \times Gross\ Margin\ percent) / (Monthly\ Churn + Monthly\ Discount\ Rate)$. For a \$500 ARPU customer with 80 percent contribution margin, 5 percent churn, 2 percent discount: $LTV = (\$500 \times 0.80) / (0.05 + 0.02) = \$400 / 0.07 = \$5,714$. **Customer Acquisition Cost (CAC)** is fully-loaded S&M spend / new customers acquired. The critical ratio is LTV/CAC: target 3x or higher. 6.7x is elite (payback 1.5 months, high reinvestment capacity), 3x breakeven (payback 4 months, sustainable growth), below 1x is a death spiral (customer lifetime profit less than acquisition cost). Payback period = $CAC / (ARPU \times Gross\ Margin\ percent / 12)$. A \$1,500 CAC, \$500 ARPU, 80 percent margin yields payback = $\$1,500 / (\$500 \times 0.80 / 12) = \$1,500 / \$33.33 = 45$ months (unacceptable, customer only lasts 60 months, barely recovers CAC). Reduce CAC to \$300: payback = 9 months (healthy, customer lasts 30x payback, strong unit economics). **Churn rate** (customers lost per period) dictates business viability. SaaS SMB churn: 5-8 percent monthly (customers last 12-20 months on average). Enterprise SaaS churn: 1-3 percent monthly (customers last 33-100 months, 5-10x longer). Consumer/non-contractual churn: 10-20 percent+ monthly, requiring constant acquisition.

III. B2B SAAS REVENUE MECHANICS & UNIT ECONOMICS

SaaS revenue decomposes into components for cohort analysis. **Net New ARR** = New ARR (from new customers) + Expansion ARR (upsells, cross-sells, price increases on existing customers) - Churned ARR (lost customers) - Contraction ARR (downgrades). A \$100M ARR company with \$25M new, \$15M expansion, \$5M churned, \$2M contraction yields \$33M net new ARR (33 percent growth rate). Expansion ARR is a leading indicator of product-market fit and customer satisfaction; companies with high expansion weather economic downturns better because they grow through installed base without paying new CAC. Slack, HubSpot, and Datadog historically achieved 40-50 percent NRR entirely from expansion. Subscription types vary strategically: monthly contracts are lowest commitment but highest churn (5-8 percent monthly, customers last 12-20 months), annual contracts trade discount for certainty (higher upfront billings, lower churn 2-5 percent monthly), multi-year contracts maximize upfront cash but create ASC 606 revenue recognition complexity. Multi-year billings (\$1M 3-year = \$333K annually recognized) are deferred revenue on the balance sheet and recognized ratably as revenue; billings growth can exceed revenue growth by 2-3x, signaling strong pipeline, but watch for churn acceleration when contracts mature. **Fully-loaded CAC is typically 2-3x stated CAC**. Sales & Marketing costs are obvious, but true CAC includes onboarding support, first-purchase discounts, referral credits, and success engineer time. A company claiming \$1,000 CAC might cost \$2,000-\$3,000 when all-in. True formula: $CAC = (All\ S\&M + Referral\ Credits + First-Purchase\ Discounts + Onboarding + Support) / New\ Customers\ Acquired$. CAC payback benchmarks: Enterprise SaaS 12-18 months (long sales cycle, high contract value justify patient capital), Mid-market 8-12 months, SMB 4-8 months (lower contract values require faster payback). **Gross margin is destiny for SaaS profitability**. Pure SaaS: 70-85 percent (hosting costs 10-15 percent, support 5-10 percent, low COGS). Margins compress via: (a) services-heavy products (requiring professional services, implementation), (b) infrastructure cost inflation (AWS price increases), (c) support scaling faster than revenue (hiring ahead of growth). Public SaaS comps average 75-80 percent gross margin. **Customer concentration risk**: if top 10 customers exceed 20 percent of ARR, single-customer loss threatens business continuity and valuation multiples. Diligence: top 10 customers name/size/tenure, churn history, expansion potential, contract dates (bunching = re-sale risk).

Valuation for B2B SaaS uses three methods: (1) EV/ARR multiples (5x-40x+ depending on growth/profitability - fast-growth unprofitable 25-40x, mature profitable 5-8x), (2) Rule of 40 premium (companies with growth + margin \geq 40 trade 20-30 percent premium over base multiple), (3) DCF using cohort economics (project each annual cohort of customers forward using empirical retention/expansion curves; sum PV of all cohort streams). For DCF, build a model with: (a) acquisition cohort forecast (new customers by period), (b) retention curve (percent of cohort retained after 12, 24, 36 months), (c) expansion curve (average NRR by cohort age), (d) gross margin by cohort age, (e) terminal value assumption (cohorts eventually stabilize or churn). This method captures cohort quality decay and churn acceleration better than top-down extrapolation. **Interest rate sensitivity is acute**: a 100bps Fed rate rise can compress multiples 15-20 percent because SaaS is a high-multiple, long-duration asset (cash flows in years 3-10 matter greatly;

higher discount rates compress present value). Public SaaS comps: Datadog 25x ARR, Cloudflare 20x, HubSpot 15x (all high-growth, profitable or near-profitable). Salesforce 10-12x (large, mature, profitable). Zoom 6-8x (mature, declining growth post-COVID, profitable).

IV. CLOUD INFRASTRUCTURE & VENDOR LOCK-IN

AWS, Azure, and GCP dominate IaaS/PaaS with 70 percent+ market share, competing primarily on price, ecosystem breadth, and vendor lock-in. Revenue model is consumption-based pricing: customers pay per compute hour, GB data stored, API call, data transferred. Elastic demand is double-edged: good during growth (scale without capex), bad during downturns (revenue drops with utilization). Gross margins are 60-65 percent, lower than pure SaaS, because hyperscale requires massive capex (15-25 percent of revenue annually). A \$100B cloud revenue company requires \$15-25B annual capex to maintain and expand data centers. Only incumbents with sustainable profitability (AWS parent Amazon, Azure parent Microsoft) justify this capex treadmill. Margins compress further via: (a) GPU inflation (AI workload capex explosion, GPUs 10-20x more expensive than CPUs), (b) inter-cloud price wars (price wars between AWS/Azure/GCP compress margins 10-20 percent), (c) electricity costs (electricity as a commodity input, rates rising globally). **Vendor lock-in is the moat.** A \$10M-ARR customer using AWS proprietary services (RDS relational databases, DynamoDB NoSQL, Lambda serverless, SageMaker machine learning) faces \$2M+ switching cost (rearchitecture codebase, retest for compatibility, downtime risk, re-training). This creates defensibility and pricing power; AWS can raise prices 5-10 percent annually without losing customers to Azure due to lock-in. **Reserved Purchasing Obligations (RPO)** (multi-year commitments for discounts) are leading indicators of future revenue. AWS customers committing \$50M over 3 years signals \$17M annual revenue locked in; RPO growth exceeding revenue growth signals strong land-and-expand pipeline. **Cloud infrastructure valuation:** multiples of 8-12x revenue (lower than SaaS due to massive capex, lower margins) plus a capex discount. A \$100B cloud revenue business with 65 percent gross margin and 15 percent capex intensity: valuation = \$100B revenue x 10x multiple x capex discount (0.85) = \$850B. AWS private valuation benchmarks higher (approximately 50x revenue equivalent when isolated) due to 70 percent+ gross margins and AWS-specific capex efficiency (proprietary silicon, data center optimization).

V. CONSUMER SUBSCRIPTIONS & STREAMING DYNAMICS

Freemium consumer products (Spotify, Zoom, Slack) convert 2-5 percent of free users to paid. Spotify historically converts approximately 3-4 percent; early cohorts 1 percent, mature cohorts 4-5 percent. Conversion is non-linear with cohort maturity (users more likely to upgrade after 3-6 months of usage). **Netflix exemplifies streaming:** \$238B market cap, \$33B revenue (2024), 283M subscribers, \$17B annual content spend (7 percent of revenue per thousand subs). Unit economics: Average ARPU \$12 (varies US \$15.49, International \$8.50), churn 2-3 percent monthly (non-contractual, voluntary), lifetime 40-50 months, LTV = $\$12 / 0.025 = \480 gross profit per subscriber lifetime. Content cost \$60/subscriber/year. Payback: $(\$60 / \$12 / 12) = 5$ months (highly efficient). But content amortization is complex: a \$200M film for 50M watchers is \$4/sub in period; if watched by 100M subs over time, it is \$2/sub across cohorts. Netflix uses weighted amortization curves based on viewing data. The business hinges on: (a) subscriber growth (net additions 3-5 percent quarterly in developed markets, higher in emerging), (b) ARPU expansion (price increases in developed markets, monetization in emerging markets through ad tier), (c) content efficiency (higher ROI per dollar spent). Password-sharing crackdown in 2023-2024 shifted to paid-sharing tiers (\$6.99/month for shared account), monetizing the household concept and recovering \$500M+ annually. Netflix+Ad tier (started late 2022) addresses low ARPU markets; advertising revenue targeted to contribute 10-15 percent of revenue by 2025. **Voluntary churn** (subscription fatigue, content exhaustion) is the persistent threat. Netflix content calendar and release velocity are moats; retention requires constant content velocity (new releases weekly). Competitor streaming (Disney+, Amazon Prime, Apple TV+, Max) creates choice fragmentation; Netflix retention inversely correlates with competitor offering variety. A household can sustainably subscribe to 2-3 services; beyond that drives cancellation waves.

VI. ADTECH & MARTECH ECONOMICS

Digital advertising generates \$700B+ globally: Search 40 percent (\$280B), Social 30 percent (\$210B), Display 20 percent (\$140B), Video 10 percent (\$70B). Google and Meta control 60 percent+ of US digital ad spend; this duopoly concentration defines the entire ecosystem. Google Search captures \$150B+ annually (60 percent+ of search ad market), YouTube \$60B+ (dominant in video ads). Meta (Facebook, Instagram, WhatsApp) captures \$120B+ (60 percent+ of social ad market). **AdTech is fragmented:** Demand-side platforms (DSPs, e.g., The Trade Desk) buy on behalf of advertisers, supply-side platforms (SSPs, e.g., PubMatic) sell on behalf of publishers, ad networks aggregate inventory, exchanges enable real-time bidding. **CPM (cost per thousand impressions)** ranges \$2-15 depending on audience quality and context. Premium sports/finance \$15-30 CPM; commoditized display \$2-5 CPM. **Take rates are 10-20 percent per layer** (DSP takes 10-15 percent, exchange 2-5 percent, network 5 percent, ad tech stack can eliminate 30 percent of advertiser spend before reaching publishers). The Trade Desk processes \$200B+ in media spend with 10 percent platform take = \$20B+ GMV on \$2-3B revenue. **MarTech (marketing technology - email, CRM, analytics, attribution)** is distinct: companies like HubSpot, Salesforce Marketing Cloud achieve 70 percent+ gross margins because they stack software rather than trading inventory. MarTech valuations (15-20x revenue) dwarf AdTech valuations (1-3x revenue) because of margin profile. HubSpot trades at 18-22x revenue; PubMatic (pure ad tech) at 1-3x revenue due to margin differential. **Privacy disruption reshapes economics.** Apple iOS 14.5+ ATT (App Tracking Transparency) requires opt-in tracking; opt-in rates less than 25 percent globally (average 15-20 percent). Google Chrome is phasing out third-party cookies (2024-2025 delay from 2023). This kills audience-based targeting and attribution, forcing shift to: (a) first-party data (customer email lists, CRM), (b) contextual targeting (advertise on sports sites to sports fans), (c) upper-funnel branding (unmeasurable ROI). **CPM compression is real:** loss of precision targeting drives CPM down 20-40 percent for many verticals. The Trade Desk and other DSPs are defensible because they aggregate scale (\$200B+ daily impressions) and offer lower-funnel attribution; smaller players face margin compression and consolidation risk.

VII. VERTICAL SAAS & EMBEDDED PAYMENTS

Vertical SaaS targets specific industries (restaurants, construction, life sciences, real estate). Advantage: deep domain expertise commands 10-15x ARR multiple premium vs horizontal SaaS (15-25x vs 8-12x). **Toast (restaurants):** \$1.5B+ valuation, vertical SaaS + embedded payments. Restaurants use Toast POS system for ordering, kitchen display, payments. Embedded payment processing (Stripe, Toast Pay) generates 30 percent+ of revenue at high margins (3-5 percent take rate vs typical less than 1 percent for merchant processors). This is powerful: once Toast is the POS, monetizing payment rails is nearly free revenue with 80 percent+ gross margins. Restaurants have no choice but to use Toast payments (integration exclusive), driving recurring revenue stream. **Procore (construction, \$2B+ valuation)** embeds financial tools, project management, compliance. Ecosystem is sticky: general contractor uses Procore for project tracking, subcontractors use Procore to bid, payments flow through Procore, materials vendors integrate. **Veeva (life sciences, \$30B+ market cap)** dominates clinical trial management (Vault CRM) with 50 percent+ market share among top pharma. Sticky because regulated industries face high switching costs (FDA validation, compliance re-testing, operational disruption). **Vertical SaaS enables bundling and data advantages:** Toast knows every menu item sold, weather patterns, labor costs, allows supply chain optimization, labor forecasting, ingredient cost analysis. Data becomes moat; competitors cannot replicate Toast's predictive capabilities without 5-10 years of aggregated data. Embedded payment take rate: 0.5-2 percent of GMV, lower than marketplace (5-15 percent) because merchants expect embedded payments as a service component, not a profit center. But even 1 percent on \$500M GMV = \$5M revenue at 80 percent margin = \$4M gross profit. Toast payment revenue: \$300M+ GMV, 3 percent take = \$9M revenue at 75 percent margin = \$6.75M GP (strong incremental margin).

VIII. MARKETPLACE BOOTSTRAPPING & MONETIZATION

Marketplaces face chicken-and-egg: supply (sellers) will not join without buyers, buyers will not join without supply. **Bootstrapping strategies:** (1) seed supply (Airbnb early team rented apartments to populate inventory manually), (2) single-player mode (Uber started with corporate accounts before consumer launch, solved liquidity via concentrated demand), (3) subsidize supply side (Uber driver subsidies \$5 per ride built density), (4) geographic focus (Uber city-by-city to achieve liquidity density in markets). **Monetization channels:** seller commission (15-30 percent for product, services, 1-3 percent for fintech), buyer fees (rare, increases friction), listing fees (Etsy \$0.20 per listing = \$100M+ annual revenue at 500M+ listings), promoted placement (10-30 percent of mature revenue). A \$1B GMV marketplace with 15 percent take rate yields \$150M revenue; if 20 percent is promoted placement at 8 percent higher rate (20 percent vs 15 percent), that is \$16M incremental from promoted placement (11 percent of revenue from 5 percent of GMV). **Worked example: Dual-cohort CAC payback.** Buyer cohort CAC = \$50 (digital marketing). Buyer purchases \$200/month on average. Seller commission take rate 15 percent. Monthly revenue per buyer = $\$200 \times 0.15 = \30 . Payback = $\$50 / \$30 = 1.67$ months (exceptional). Seller CAC = \$200 (sales team). Seller generates \$500/month GMV with 15 percent take = \$75 revenue. Seller payback = $\$200 / \$75 = 2.67$ months. Blended payback: weighted CAC = $(\$50 \text{ buyer} + \$200 \text{ seller}) / 2 = \125 , blended contribution = $(\$30 + \$75) / 2 = \$52.50$, payback = 2.4 months. Healthy 2-sided marketplaces achieve blended payback 2-4 months; above 6 months signals weak unit economics. **Disintermediation** is the persistent risk: once buyers/sellers transact, they bypass the platform and communicate directly. Defenses: (a) escrow (hold payment, release after confirmation), (b) insurance (fraud coverage builds trust), (c) mandatory payment rails (Airbnb holds payment, Uber handles all payment coordination). **Marketplace health signals:** GMV growth slowing (maturation), take rate flat or declining (price competition), unit economics weakening (CAC rising, LTV stagnant). Mature marketplaces like eBay (\$39B GMV, approximately 8 percent take = \$3B revenue) and Amazon Marketplace (\$650B+ GMV, 15-45 percent take depending on category = \$100B+) show stabilization but defensive moats (trust, selection, logistics integration).

IX. EMBEDDED FINANCE & BANKING-AS-A-SERVICE

Banking-as-a-Service (BaaS) model: regulated bank provides licensed deposit infrastructure and compliance framework, fintech platform provides UI, customer experience, and use cases. Revenue splits: regulated bank takes interest margin (borrow at 3 percent, lend at 8 percent = 5 percent spread), platform takes transaction fee (0.5-2 percent per transaction) or subscription fee. **Revenue streams in embedded finance:** interchange fees (1-3 percent on card transactions, Visa/Mastercard revenue model), lending spread (originate loan at 3 percent, lend at 8 percent, net 5 percent spread; mortgages 2-3 percent spread, consumer lending 3-8 percent spread), subscription fees for premium features (advanced analytics, API access for developers), float income on deposits (hold customer deposits, lend at higher rate than paid to depositor, spread is pure profit - Stripe's banking strategy). **Key risks intensifying:** OCC and FDIC regulatory scrutiny on BaaS partnerships increasing (compliance requirements, deposit insurance implications), partner bank concentration (losing regulated partner = losing business overnight - Stripe's Evolve Bank relationship critical), fraud and credit losses (lending embedded in fintech requires credit risk management), compliance costs scaling faster than revenue (hiring compliance officers, implementing fraud detection). A \$500M GMV lending platform with 5 percent spread = \$25M revenue, but 20 percent loss rates (fraud, defaults) = \$5M losses, 30 percent compliance costs = \$7.5M, net margin negative. Only at scale (\$2B+ GMV) do lending platforms break even on credit-adjusted basis. **Valuation for embedded finance:** core SaaS portion valued 15x ARR (subscription revenue), embedded finance portion valued 5x revenue due to different risk profile (credit risk, regulatory risk). A platform with \$50M ARR subscription, \$20M lending revenue: core 15x =

\$750M, lending 5x = \$100M, blended valuation \$850M (not \$1B which would assume uniform multiple). **Strategic examples:** Shopify Payments (merchant acquiring, payment processing, lending to Shopify sellers), Uber driver payouts (embedded wallet, lending to drivers), DoorDash Dasher Card (prepaid card for gig workers, financial inclusion play). These embedded models lock in network and drive engagement; Shopify Payments revenue likely \$3B+ by 2025, pure margin accretion to core SaaS business.

X. CONSUMER PLATFORMS - ENGAGEMENT & MONETIZATION

Onboarding funnel is critical to consumer app success. Typical waterfall: 100 percent signups (install incentive) - 50 percent app install (friction in download) - 30 percent first action (opening app, creating account) - 10 percent repeat within 7 days (habit formation) - 3 percent daily active users (engagement lock-in). Improving onboarding is highest ROI investment; a 10 percent improvement in first-action conversion cascades to 10 percent D1 retention improvement. **Engagement loops drive retention and viral growth.** Social interaction loop (create content - receive feedback - get reward/validation - return): Facebook/Instagram photo posts, Twitter/X comments. Content consumption loop (consume - algorithm learns preferences - recommend better content - consume more): TikTok infinite scroll, YouTube recommendations, Spotify Discover Weekly. Gamification loops (take action - get reward/stream - competition - reinvest): Snapchat streaks (send photo to friend daily or streak breaks), Duolingo daily lessons with fire streak, Fitbit step challenges. Cross-service loops (messaging - payments - mini-apps - e-commerce): WeChat consolidating payment, shopping, ride-hailing, social, driving 4+ hours daily engagement vs single-app 30-60 minutes. **Retention curves reveal product-market fit:** healthy curve: steep drop day 1-7 (50 percent attrition, natural), flattening after day 30 (25-30 percent retained), stabilizing at 5-10 percent year-round (core engaged users). Poor curve: linear decay (no flattening), indicates low product-market fit. Retained core size x ARPU = sustainable revenue base (100M DAU x 20 percent month-on-month retention x \$5 ARPU = \$100M revenue by year 2). **Ad revenue formula: Revenue = Impressions x (CPM / 1000).** A 5B daily impressions platform at \$5 CPM = \$25M daily revenue (annualized \$9B). Key metrics: ad ARPU (revenue per ad-exposed user), fill rate (percent of ad inventory sold), ad load (ads per session; higher = more revenue but worse UX, higher churn). **IAP economics in games:** 2-5 percent conversion rate (players spending). Top 10 percent of payers (whales) generate 50 percent+ revenue. Median payer approximately \$20/year, mean payer approximately \$100/year (whale skew inflates mean). A 100M daily player base, 3 percent paying, top 10 percent whales: 3M payers, 0.3M whales at \$500/year = \$150M, 2.7M regular payers at \$30/year = \$81M, total \$231M annual IAP revenue. **Subscriptions (YouTube Premium, Spotify Premium, Discord Nitro, LinkedIn Premium):** 1-3 percent free-to-paid conversion. ARPU \$60-120/year. Retention 80-90 percent annually. LTV = ARPU / annual churn. More stable revenue than ads (non-incentive-dependent), but lower scale. YouTube Premium estimated \$5B+ revenue, Spotify Premium \$8B+ (blended subscription + ad). **Blended monetization LTV:** single user lifetime value = (ad revenue LTV) + P(subscriber) x subscriber LTV + P(IAP payer) x IAP LTV. A platform with 100M users: ad LTV \$50, subscriber conversion 2 percent at \$100 LTV, IAP conversion 3 percent at \$200 LTV: blended = \$50 + (0.02 x \$100) + (0.03 x \$200) = \$50 + \$2 + \$6 = \$58 per user. 100M x \$58 = \$5.8B lifetime revenue potential (3-5 percent user base monetization translates to \$3-5B annual recurring gross profit).

XI. SUPERAPPS & CREATOR ECONOMIES

Superapps consolidate messaging, payments, commerce, fintech. WeChat (China): 1+ trillion messages/day, 1.3B users, 4+ hours daily engagement (vs single-service app 30-60 minutes). Grab (SE Asia): ride-hailing - food delivery - payments - insurance. Gojek (Indonesia): ride-hailing - food - logistics - payments. **Cross-sell economics are powerful:** User CAC amortized across messaging (free), ride-hailing (15-25 percent take), food delivery (25-35 percent take), fintech (1-3 percent take). Each service increases switching cost exponentially. A user with Grab ride history + food orders + payment history has \$500+ switching cost (porting data, re-establishing reputation, rebuilding habits). Each new service captures 20-30 percent of existing users (existing trust). User ARPU compounds: ride \$2, food \$1, payments \$0.50, fintech \$0.20 = \$3.70 blended. **Regional failure reveals constraints:** Western superapps (Uber rides+delivery+freight, Stripe payments+banking) struggled due to: iOS/Android 30 percent purchase tax restrictions (fintech/payments capped at lower margin), consumer preference for specialized apps (DoorDash stronger than Uber Eats in US due to consumer preference for vertical focus), regulatory fragmentation (fintech regulation differs US/EU, slows expansion). WeChat succeeds in China due to: closed ecosystem (no iOS/Android friction, government alignment), messaging dominance (low CAC to add payments), payment adoption (QR code ubiquity). **Valuation: sum-of-parts applies.** WeChat valued \$600B+ (parent Tencent): messaging/social 40 percent, payments 40 percent, commerce 15 percent, other 5 percent. Profitable payments command 15-20x revenue multiple (SaaS-like stickiness), growth ride-hailing 8-12x, emerging fintech 3-5x speculative. Blended 10-12x revenue multiple (lower than pure SaaS, higher than pure payments due to mix). **Creator revenue splits vary dramatically:** YouTube 55/45 (creator/platform), Apple App Store 70/30 (up to 85/15 for subscriptions after year 1, incentive misalignment), Twitch 50/50 (top streamers negotiate 70/30), Patreon 5-12 percent (creator-favorable), OnlyFans 80/20 (creator keeps 80 percent), Substack 10 percent (creator keeps 90 percent). **Creator concentration is extreme:** top 1 percent earn 30-50 percent of platform revenue. Top 10 percent earn 80 percent+. Losing top creator = catastrophic (MrBeast on YouTube generates \$50M+ annually, leaving would devastate platform). Platform leverage is limited by creator mobility. **Rake compression pressure is real.** Apple's 30 percent fee faces Epic Games lawsuit and developer backlash. Competitive pressure (Patreon 5-12 percent, OnlyFans 20 percent, Substack 10 percent) forces platforms to improve terms. YouTube's 55/45 is now competitive baseline; higher takes face churn. **Multi-platform diversification limits single platform pricing power.** Creators spread across YouTube (primary), TikTok (secondary), Twitch (streaming), Instagram Reels, Patreon (subs), newsletter (Substack), merchandise (Shopify). Platform loses leverage; creator can always pivot. MrBeast starting YouTube, now on Netflix (exclusive show) - platform switching cost less than 10 percent. This structural shift reduces platform rake from 30-40 percent historical to 15-20 percent going forward.

XII. STRUCTURAL WEAKNESSES - SOCIAL GRAPH PLATFORMS

Facebook exemplifies social-graph platform maturity and decline. 3B users, 90 percent+ penetration in developed world (US, EU), growth zero. Younger demographics actively avoid (TikTok adoption 13-25 age cohort 70 percent+ vs Facebook 30 percent). **Content fatigue is structural.** Social-graph content (friend posts) depends on friends posting consistently. Over time, posting declines (privacy concerns, performance burden, algorithm suppression). Feed becomes stale; engagement drops. User spends less time, revenue per user declines. Network effects reverse: fewer friends posting - less value - fewer users - even fewer posts. **Monetization ceiling is real.** Ads in personal feed feel intrusive; consumer tolerance is 2-4 ads per 20 post-feed (20 percent ad load). Can't increase beyond 25 percent without UX degradation and churn. A 3B user base at \$20 ARPU = \$60B revenue ceiling (current Meta revenue \$134B, but includes Instagram, WhatsApp monetization - Facebook core stagnating). **Privacy/regulation structural headwinds:** GDPR restricts data, Cambridge Analytica destroyed trust in data practices, iOS ATT kills third-party identifiers. Targeted ads rely on precise audience data; removing identifiers drops CPM 30-50 percent. Facebook solved via first-party data (pixel tracking on websites, CRM import), but scale diminishing (conversion APIs less precise than cookies). **Interest-graph competition proves algorithmic beats social.** TikTok's algorithmic content discovery (machine learning optimizing for watch time) beats social-graph lock-in ('friends' posts). Algorithm-selected videos are 5-10x more engaging than friends' updates for discovery. Legacy platforms cannibalize own inventory with Reels (Instagram, Facebook competing with TikTok) and Shorts (YouTube), fragmenting watch time and revenue. Meta's 2024 pivot to Reels cost revenue short-term (Reels lower CPM than Feed ads, 5-8x lower inventory value); long-term survival but transitional margin compression.

XIII. STRUCTURAL WEAKNESSES - HYPERLOCAL & HARDWARE HYBRIDS

Hyperlocal marketplaces face zero-to-one per city. Uber/Airbnb/DoorDash network effects are city-by-city (London dominance doesn't help Paris). Each city requires critical mass for liquidity; critical mass requires subsidy. Scaling requires \$500M-\$2B capex (city-by-city subsidies, ops teams). **Multi-homing destroys pricing power.** Drivers work simultaneously for Uber, Lyft, or DoorDash/Uber Eats. Riders/customers switch on price, ETA, or driver quality. No stickiness. Lyft existence caps Uber pricing (riders always have alternative). Uber raised prices 15 percent in 2023, Lyft gained share. **Thin margins are structural.** \$15 ride: driver pay 75-80 percent (\$11-12), platform take 20-25 percent (\$3-4). Minus incentives (new driver bonuses, surge subsidies), CAC (\$2-5 per new customer), processing (\$0.30), support (\$0.05) = -\$0.85 per ride unit negative contribution initially. Profitability only at massive scale (brand maturity, organic CAC, leverage opex). **Regulatory risk is existential.** Gig worker classification as employees (California Prop 22 fight, UK Supreme Court ruling) adds 20-30 percent to driver costs (benefits, payroll taxes, workers comp). Unit economics fundamentally break. Uber driver cost 80 percent - 100-105 percent = negative. Only at category scale (Uber with \$30B revenue) can margins absorb. **Worked unit economics: \$15 ride detail.** Driver pay 80 percent = \$12.00. Platform gross revenue \$3.00. Payment processing 1 percent = \$0.15. Support cost \$0.10. Marketing/incentive \$0.50. Platform opex allocation (corporate, R&D) \$0.80. Operating loss \$0.55 per ride. 100M rides/year = \$55M loss. Break-even requires either: (a) \$25 rides (Uber Black, but limited addressable market), (b) 1B rides (scale), (c) reduce driver pay (market constraint). **Hardware+software hybrids face unique challenges.** Apple: iPhone 40 percent margin (supply chain, manufacturing), Services 70 percent margin (software, digital goods). Blended 50 percent margin, elite level. But ecosystem lock-in essential (AirPods - Watch - MacBook - iCloud - Apple TV). Each product increases switching cost incrementally. Without ecosystem, hardware = 2-5x revenue multiple (Dell, HP), not software (10-20x). Peloton failure (\$2B IPO 2020, less than \$1B valuation 2024) exemplifies: hardware \$2K/bike at 40 percent, services required 60 percent of bike owners active (churn less than 3 percent annually) for profitability. Achieved only 20 percent active installed base. Services losses (\$500+ per bike annually) overwhelmed hardware margins. **Ecosystem valuation discipline:** Hardware valued 1-3x revenue, plus services layer 5-10x marginal revenue. Track mix shift (revenue from hardware vs services). Peloton 70 percent hardware/30 percent services (hardware margin cannot subsidize services collapse). Apple 50 percent hardware/50 percent services (services growth offsets hardware maturity). Tesla similar (cars 20 percent margin, energy/software emerging 40 percent+ margin). Failure mode: hardware margin compression + services adoption below breakeven threshold = value destruction.

XIV. COMPLETE DUE DILIGENCE RED FLAGS

Take rate and GMV manipulation is rampant in marketplace diligence. Stated take rate inflated by bundling one-time fees, pass-through revenues. Calculate: effective take rate = actual platform revenue / completed GMV (excluding canceled, refunded transactions). Red flag: stated 15 percent take rate, actual 10 percent after adjustments. **Artificial GMV boosting hides weakness.** Includes canceled orders, intercompany transactions (platform entities transacting), double-counting (same transaction in multiple metrics). Red flag: GMV up 50 percent but revenue up 10 percent (take rate compressed from 15 percent to 10 percent, or half of GMV is fake). Request GMV detail: gross transaction volume, less refunds/cancellations, breakdown by category (real segments, not lumped). **CAC delusions require forensic analysis.** Stated CAC \$100 (paid acquisition ad spend only); real CAC \$300 (includes \$80 signup bonus, \$60 discount, \$40 support onboarding, \$20 payment processing). Demand: fully-loaded CAC = (All S&M + Referral Credits + First-Purchase Discounts + Onboarding + Support) / New Customers. Trend CAC over quarters. Rising CAC signals weakening demand. **Unrealistic LTV projections.** Projecting 5+ year zero churn (laughable, consumer churn 10-20 percent+, SMB 5-8 percent, enterprise 1-3 percent). If payback requires zero future churn, that's speculation. Demand: cohort retention curves (actual data), not perpetuity assumptions. **Cohort blending conceals deterioration.** Averaging early cohorts (30 percent month-1 retention) with newer (5 percent) to show blended 20 percent. Always demand cohort-level data. Plot retention curves: if newer cohorts deteriorate vs older (2024 cohorts 20 percent vs

2023 cohorts 25 percent), product/market fit declining. **Viral bump misattribution.** Low CAC from viral moment extrapolated as permanent. CAC normalizes upward post-viral (viral is one-time). Demand: CAC trend post-viral, organic/paid split. If organic CAC high, paid acquisition not viable. **Channel-blind reporting masks weakness.** Blending organic (near-zero CAC) with paid (\$200 CAC). Blended \$80 looks good but hides paid channel losses. Demand: CAC by channel separately. If paid unprofitable, organic doesn't scale (limited viral coefficient). **Over-adjusted EBITDA is pervasive.** -\$50M GAAP operating loss becomes +\$20M "adjusted EBITDA" by adding back \$70M (stock, depreciation, one-time items). Red flag: recurring "one-off" add-backs for 3+ years = deterioration. Demand: 3-year trend, what's recurring vs one-time. **Gross margin gimmicks hide poor unit economics.** Support costs hidden in R&D/S&M instead of COGS to inflate gross margin (67 percent stated vs 60 percent true). Payment processing treated as opex not COGS. Demand: detailed COGS breakdown by product, time allocation. **Revenue recognition tricks push boundaries.** ASC 606 requires conservative recognition, but companies push (recognizing multi-year upfront vs ratably, including non-recurring as recurring). Demand: revenue by type (recurring, non-recurring, one-time), deferred revenue trend. **Principle: sound business shouldn't obscure core metrics.** Transparent take rates, genuine transaction volume, realistic CAC payback = credible story. Heavy adjustments = red flag.

XV. REFERENCE - TAXONOMY & EXIT PATTERNS

Marketplace types by sides and goods: P2P (eBay, Airbnb, TaskRabbit, Craigslist) individuals supply and demand. B2C (Amazon Marketplace, Farfetch, Shopify) merchants supply, consumers demand. B2B (Alibaba, Faire, Global Sources) businesses both supply and demand. **Services vs Goods:** services harder (trust, reputation, quality variable), goods easier (photographable, returns simpler). Horizontal vs Vertical: horizontal (eBay anything) faces lower switching cost, vertical (specialty B2B) higher switching cost (domain expertise). **LTV derivations with precision:** simple perpetuity LTV = Contribution Margin per Period / Monthly Churn Rate (unrealistic, assumes infinite life). LTV with discount rate = Contribution Margin / (Monthly Churn + Monthly Discount Rate), more realistic (e.g., 5 percent churn, 2 percent discount rate = 7 percent denominator). Cohort-based empirical LTV = sum of (observed gross margin per month x observed retention rate) over customer lifetime. Example: month 1 \$100 margin, 100 percent retention; month 2 \$100 margin, 80 percent retention; month 3 \$100 margin, 60 percent retention; etc. LTV = \$100 + (\$100 x 0.80) + (\$100 x 0.60) + ... = \$1,000+ (actual empirical). **Payback period inversion:** LTV \$5,000, CAC \$1,000, LTV/CAC 5.0x ratio. Payback period = CAC / Monthly Contribution Margin. If monthly contribution \$200, payback = \$1,000 / \$200 = 5 months (healthy). If monthly contribution \$50, payback = \$1,000 / \$50 = 20 months (concerning, long capital recovery). **Strategic exit patterns:** IPO (Uber, Airbnb, DoorDash, Etsy, category leaders with clear moats, \$5B+ market cap), consolidation by incumbents (Walmart acquired Jet.com \$3.3B, Facebook acquired Instagram \$1B, Salesforce acquired Slack \$28B), strategic mergers (Uber+Lyft merger explored, US FTC blocked on competition grounds), PE buyouts (Thoma Bravo acquiring software SaaS, Silver Lake investing in AI platforms), acqui-hires (acquiring for talent/tech, company shut down, team absorbed, common in AI, big tech). Marketplace IPO success rare: only 20-30 IPOs past decade, most consolidations. Median IPO exit multiple: 8-15x revenue for growth platforms, 3-5x revenue mature. Airbnb IPO 2020: \$100B on \$4.7B revenue = 21x (305 percent YoY growth). DoorDash IPO 2020: \$32B on \$900M = 36x (339 percent growth, profitable). Uber IPO 2019: \$76B on \$11.3B = 6.7x (thin margins, mature but non-profitable). Valuation spread due to growth, profitability, and exit cycle.

XVI. CHURN MECHANICS & RETENTION MODELING

Churn is the silent killer of unit economics. Monthly churn measures percent of customers lost per month; cumulative effect is dramatic. 5 percent monthly churn means 39 percent customer loss annually (1 - 0.95¹² = 0.39). A company with \$100M ARR, \$300M CAC spent (3x ratio), 5 percent monthly churn must acquire new customers constantly just to maintain revenue. Retention math: retain 61 percent of cohort annually (39 percent churn). To grow 20 percent, must acquire 20 percent new customers annually plus replace 39 percent lost = 59 percent total acquisition pressure. LTV/CAC payback assumes retention; if actual retention deteriorates, payback extends dramatically. **Cohort curve shapes reveal product-market fit.** D1 retention: percent of day-1 users active on day 2. Typical: 25-40 percent (25 percent = good, 40 percent = exceptional). D7 retention: 10-25 percent. D30 retention: 2-10 percent. Day 90 and beyond stabilizes (core engaged users don't churn further, organic+ network effects lock in). Plot multiple cohorts to identify trends. If D30 retention declining (2024 cohorts 3 percent vs 2023 cohorts 6 percent), product/feature degradation or competitive loss. **Healthy retention curve benchmark:** D1 30 percent, D7 15 percent, D30 5 percent, D90 3 percent, stable thereafter. Each cohort should show similar curve shape if product/market fit stable. **Churn inflection points signal problems.** Sudden spike in month 3 suggests onboarding experience falls apart (customer realizes product doesn't deliver). Gradual acceleration suggests competitive loss or feature parity. Flat (no churn) is red flag (either fake data or extremely niche product with 100 customers). **CAC payback with realistic churn:** LTV = ARPU / Monthly Churn. Monthly churn of 10 percent: LTV = \$500 / 0.10 = \$5,000. CAC \$1,500: ratio 3.3x, payback = \$1,500 / (\$500 x 0.90 / 12) = \$1,500 / \$37.50 = 40 months (stretching profitability). Reduce churn to 5 percent: LTV = \$10,000, ratio 6.7x, payback = 20 months (healthy). Churn improvements are highest leverage. **Retention benchmarks by segment:** Enterprise SaaS (long-term commitments, multi-user): 1-3 percent annual churn (customers last 30-100 months). Mid-market: 5-8 percent annual churn (customers last 12-20 months). SMB (low switching costs, high price sensitivity): 10-15 percent annual churn (customers last 7-10 months). Consumer (non-contractual, high optionality): 20-50 percent monthly churn (customers last 2-6 months on average). Understanding target customer segment's churn profile is essential for realistic LTV modeling.

XVII. VALUATION MULTIPLES BY SEGMENT & STAGE

EV/Revenue multiples vary by business model, growth rate, and profitability. Pure-play SaaS (subscription recurring): 5-40x revenue depending on growth/retention. B2B SaaS 50 percent+ growth, NRR 120 percent+: 25-40x (Figma, Notion). B2B SaaS 30-50 percent growth, NRR 110 percent+: 15-25x (Datadog, Cloudflare). B2B SaaS 15-30 percent growth, NRR 105 percent+, profitable: 8-15x (HubSpot, Okta). Mature SaaS under 15 percent growth, profitable: 5-10x (Salesforce, ServiceNow). **Marketplaces (GMV-based) trade 1-3x revenue** (vs 5-15x SaaS) due to lower margins (40-50 percent vs 70-80 percent), regulatory risk, and multi-homing. Mature marketplaces (eBay, Etsy): 1-2x. Growth marketplaces (DoorDash, Airbnb pre-IPO): 3-5x. **Cloud infrastructure (consumption-based):** 8-12x revenue. AWS, Azure, GCP lower multiples than SaaS due to 60-65 percent gross margins (vs SaaS 75-80 percent) and massive capex requirements (15-25 percent of revenue). **Consumer platforms (ad/IAP/subscription blended):** 5-15x revenue. TikTok (private valuation): estimated 3-4x (lower than SaaS due to regulatory risk, China exposure). Netflix (mature, profitable): 4-6x. Spotify (growth modest, regulatory risk): 2-3x. **Hardware + software hybrids:** 1-3x hardware (Apple 2x), plus 5-10x software/services attached. Apple overall 25-30x revenue (reflects 50 percent services mix), Tesla 4-8x (reflects emerging software/energy mix). **Valuation inflection points:** Rule of 40 achievement (growth + margin >= 40) commands 20-30 percent multiple expansion. Profitability achievement compresses multiple slightly initially (15-20 percent compression as growth may slow), but extends multiples long-term (investor certainty, lower risk). Path to GAAP profitability while maintaining growth above 20 percent = premium valuation. **Multiple compression from interest rates:** 100bps Fed rate rise: SaaS multiples compress 15-20 percent (duration effect, cash flows years 3-10 matter most). Cloud multiples compress 10-15 percent (slightly defensive). Marketplaces compress 5-10 percent (cash flows more near-term, lower duration). **Strategic buyer premiums:** Acquirer willing to pay 1.5-2.5x public market multiple if synergies identified (integration revenue, cost savings, market expansion). Salesforce paid \$28B for Slack (\$21B revenue, 1.3x multiple) for CRM integration upside. Cisco historically paid 6-8x revenue for networking software (vs market 4-5x) for technology/customer overlap. Expect 30-50 percent premium for strategic acquisitions vs pure financial buyers.

XVIII. WORKED EXAMPLES - DETAILED UNIT ECONOMICS

Example 1: Uber ride-hailing economics, detailed. Gross ride value \$20. Driver pay 75 percent = \$15. Platform gross revenue \$5. Payment processing 2 percent = \$0.40. Fraud/chargebacks 1 percent = \$0.20. Support costs allocated \$0.30. Marketing cost (blended new/existing) \$0.60. Ride-hailing opex allocation (ops, compliance, R&D) \$1.20. Remaining \$1.30. Rider incentive (discount, surge mitigation) \$1.00. Net contribution margin \$0.30 per ride. At 100M rides per year = \$30M net. Breakeven at \$0.30 per ride. But fixed opex (corporate, headquarters, legal, insurance) \$500M+ annually. Requires 1.7B rides annually to breakeven on all-in basis. Uber global 6B+ rides annually (rough estimate 2023), suggesting \$1.8B+ net contribution pre-fixed opex. Net income after \$2.5B fixed opex = negative \$700M. Only Uber's scale (global brand, network effects, density) and pricing power (5-15 percent premium to Lyft due to better supply) achieve profitability. **Example 2: Airbnb bookings, detailed.** \$200 booking. Airbnb service fee 16 percent host + 3 percent guest = 19 percent = \$38 gross revenue (simplified). Payment processing 2 percent = \$4. Host payout guarantee/insurance 0.5 percent = \$1. Support costs (messages, disputes, refunds) \$2. Trust/safety opex \$1. Marketing (not needed, supply abundance reduces CAC to near-zero) \$0. Remaining \$30. All-in margin on booking: 30 / 200 = 15 percent. 5M annual bookings (rough estimate Airbnb scale in developed markets) = \$30B bookings, \$4.5B revenue (simplistic, real is \$8B+ due to higher pricing). Difference due to: (a) premium markets higher pricing, (b) long-term stays higher margins, (c) experiences/adventures higher take rate 20 percent+. **Example 3: SaaS customer cohort LTV detail.** Cohort acquired Q1 2024, 100 customers at \$500/month ARPU. Month 1: 100 customers x \$500 = \$50K revenue. Month 2: 95 customers (5 percent churn) x \$500 = \$47.5K. Month 6: 74 customers (26 percent cumulative) x \$500 = \$37K. Month 12: 54 customers (46 percent cumulative churn) x \$500 = \$27K. Month 24: 29 customers (71 percent cumulative) x \$500 = \$14.5K. Month 36: 16 customers (84 percent cumulative) x \$500 = \$8K. Gross margin 75 percent. Lifetime gross profit: (\$50 + \$47.5 + ... + \$8) x 0.75 = \$15K per customer. CAC \$4,000: LTV/CAC = 3.75x, payback = 8 months. Expected margin of safety (customer lasts 36 months, payback 8 months = 4.5x buffer).

Example 4: Marketplace Etsy seller economics, detailed. Seller lists vintage furniture, average sale \$150. Etsy listing fee \$0.20. Etsy transaction fee 6.5 percent = \$9.75. Etsy advertising (seller-optional) 2 percent = \$3 (seller chooses). Stripe payment processing 2.2 percent = \$3.30. Shipping cost (hidden in price, seller absorbs) = \$20. Seller profit: \$150 - \$0.20 - \$9.75 - \$3 - \$3.30 - \$20 = \$113.75 (76 percent margin). Etsy net revenue per sale: \$0.20 + \$9.75 + \$3 = \$12.95 (8.6 percent take rate). 1M annual sellers with 500 sales each = 500M sales, \$6.5B revenue. Cost structure: payment processing 2 percent (\$100M), server/hosting 5 percent (\$325M), trust/safety/support 8 percent (\$520M), marketing 10 percent (\$650M), opex/G&A 15 percent (\$975M). EBITDA: \$6.5B - \$2.57B = \$3.93B (60 percent margin, elite SaaS-like). Etsy market cap \$30B: 4.6x revenue multiple (growth modest, profitable, stable). **Example 5: Netflix subscriber cohort LTV, detailed.** Cohort acquired Q1 2024 in US, 100K new subscribers at \$15.49 ARPU monthly. Year 1: average retention 85 percent (15 percent annual churn), average ARPU \$15.49 (no price increase), 85K retained subs. Year 2: average retention 75 percent cumulatively (25 percent annual churn acceleration), average ARPU \$16.49 (price increase), 63.75K retained subs. Year 3: average retention 60 percent, ARPU \$17.49, 51K retained subs. Gross margin 45 percent (content cost 55 percent). Year 1 gross profit: 85K x \$15.49 x 12 x 0.45 = \$90M. Year 2: 63.75K x \$16.49 x 12 x 0.45 = \$60M. Year 3: 51K x \$17.49 x 12 x 0.45 = \$51M. 3-year lifetime: \$201M gross profit from 100K customers = \$2,010 per customer. CAC (marketing, signup incentives) \$50 per customer: LTV/CAC = 40x (exceptional, subscription stickiness = moat).

XIX. COMPETITIVE DYNAMICS & MOAT ANALYSIS

Durable competitive moats are rare and must be assessed quantitatively. Network effects: value scales with user count. Direct (WhatsApp, Telegram messaging), cross-side (Uber riders benefit from driver supply), data-driven (Waze traffic data improves routing for all users). Measure via retention curves: do newer cohorts retain better (network growing, effects strengthening) or worse (saturation, competitor gain)? Airbnb hosts increasingly multi-home (Vrbo, Booking.com), suggesting weak network effects. Uber drivers multi-home (Lyft, Instacart), weak network effects. WeChat single-platform dominance, strong effects. **Switching costs:** economic pain to leave. Toast embedded in restaurant operations (integration with POS, payroll, inventory, supplier systems), \$2M+ switching cost. Salesforce CRM integrated with hundreds of customer processes, \$500K-\$2M switching cost (enterprise). Stripe integration minimal (payment processor) = low switching cost, differentiation required. Quantify: measure voluntary churn (customers who could leave but don't). Industry baseline 5-8 percent; high-moat companies 1-3 percent. **Brand value:** subjective, hard to quantify. Nike, Apple, Tesla command premiums (20-30 percent price uplift vs generic). Measure: repeat purchase rate, NPS, premium pricing vs competitors. Nike brand enables 40 percent gross margin vs generic athletic 25 percent. Tesla brand enables \$5B+ annual revenue at lower scale (200K units vs Toyota 10M units) due to brand halo. **Scale economics:** fixed cost amortization. AWS scales across millions of customers, achieving unit cost efficiencies no competitor can match. Amazon Marketplace logistics network (fulfillment centers, logistics tech) creates 3-5 year moat (competitor capex requirement \$50B+ to match). Measure: compare unit economics (cost per ride, per delivery, per transaction) across competitors. **Data advantage:** machine learning improves with data scale. YouTube recommendations, Spotify algorithm, Waze traffic all improve with user scale. But data moat degrades if competitor collects identical data (all ride-hailing platforms collect driver/rider data identically). Sustainability: proprietary data types (health data Peloton, transaction data Amazon) more defensible. **Competitive advantage sustainability:** ask: can competitor outspend to overcome moat? Amazon outspent Zappos (\$1.2B acquisition vs \$100M valuation, justified Zappos' switching cost destruction). Microsoft outspent Linux via cloud integration, not raw technology. Conversely, can competitor out-innovate? TikTok out-innovated Instagram/Facebook via algorithm (year 2 advantage, but Instagram Reels catching up). Defensible moats are those where competitor cannot overcome via spending or innovation alone. Few technology companies truly have this (Apple ecosystem, AWS scale, Google search quality). Most are vulnerable to disruption.

XX. MARKET SIZING & TAM/SAM DYNAMICS

Total Addressable Market (TAM), Serviceable Addressable Market (SAM), Serviceable Obtainable Market (SOM) framework. TAM: global revenue potential if product captured 100 percent of theoretical market. SaaS HR software: all HR spending globally, \$500B+ (includes recruiting, payroll, benefits, compliance). SAM: realistic addressable market given competition, geography, product fit. HR software SaaS: enterprises willing to use cloud HR (most developed nations + emerging growth), \$100B. SOM: realistic 5-10 year capture given execution, competition. Year-5 SOM: 5-10 percent of SAM = \$5-10B. **TAM expansion is a growth lever** (land in one segment, expand to others). Stripe started payments (\$100B TAM), expanded to payouts, lending, treasury, climate tech (total TAM \$1T+). Shopify started ecommerce platform (\$50B TAM), expanded to point-of-sale, fulfillment, financing, apps (total TAM \$200B+). **Market penetration rates vary by segment:** North America SaaS SMB: 30-50 percent penetration (highly competitive, commoditized). North America SaaS Enterprise: 60-80 percent (mature, installed base). Europe SaaS: 20-30 percent (smaller companies, less SaaS adoption). India SaaS: 5-10 percent (emerging, cost-driven adoption). Penetration rates drive growth forecasting: mature (70 percent+) = 10-15 percent TAM growth annually, growth (30-70 percent) = 20-30 percent TAM growth, emerging (below 30 percent) = 50-100 percent TAM growth. **Market cycle dynamics:** emerging products (AI/ML 2023-2025) show TAM expansion annually 30-50 percent (category growth). Mature products (email, CRM) show TAM stable or declining (consolidation, commoditization). Declining products (legacy database, mainframe) show TAM contracting 5-15 percent annually. Investable opportunities exist at 20-50 percent TAM growth annually. Below that, growth comes from market share gains (competition). **Market share concentration:** "winner-take-most" markets (Twitter, TikTok, Uber) concentrate 40-60 percent market share to leader, secondary player 20-30 percent, rest fragmented. "Multi-player" markets (CRM - Salesforce 20 percent, Microsoft 15 percent, Oracle 10 percent, rest fragmented) support 3-5 durable players. Design product for winner-take-most (focus on network effects, lock-in) vs multi-player (focus on verticalization, unique UVP) differently. Multi-player markets reward specialization and depth, winner-take-most rewards breadth and speed.

This reference distills core TMT sector metrics, unit economics, valuation frameworks, and red flags for IB due diligence and interviews. Supplement to the G2G Complete Reference. No duplication.