Lesson 1.4: Platform Economics and Fintech Business Models
Practice Exercises

Digital Finance Course

Exercise 1: Unit Economics Calculation

Calculate the viability of a neobank's unit economics:

Given data per customer:

- Customer Acquisition Cost (CAC): \$55
- Monthly interchange revenue: \$3.50 (from card spend)
- Premium subscription: \$10/month (12% of users convert)
- Lending interest margin: \$2.00/month (only 8% of users take a loan)
- Monthly variable cost per customer: \$2.80
- Annual churn rate: 20%

Calculate:

1. Blended Average Revenue Per User (ARPU) per month
2. Monthly contribution margin per customer (ARPU $-$ variable cost)
3. Average customer lifetime in months ($= 12 \div$ annual churn rate)
4. Customer Lifetime Value (LTV = contribution margin $\times$ lifetime)
5. LTV/CAC ratio—is this healthy ($> 3.0\times$)?
6. Months to break even on each customer (CAC $\div$ monthly contribution margin)

Exercise 2: Platform vs. Pipeline Analysis

Compare two financial services firms serving the small-business lending market:

Firm A (Pipeline – Traditional Bank):

- Funds loans from its own deposits
- Employs 50 loan officers
- Processes 200 loans/month
- Average loan: \$80,000
- Net Interest Margin (NIM): 4.0%
- Fixed cost: \$600,000/month

Firm B (Platform – Lending Marketplace):

- Matches borrowers with institutional investors
- 5-person engineering team
- Processes 800 loans/month
- Average loan: \$60,000
- Platform fee: 2.5% origination
- Fixed cost: \$250,000/month

Analyze:

1. Calculate monthly revenue for each firm
2. Calculate profit (revenue − fixed cost) for each
3. Which has better unit economics? Which carries more risk?
4. If loan defaults increase to 8%, which firm is more exposed? Why?

Exercise 3: Network Effects Identification

For each scenario, identify the type of network effect (direct, indirect, or cross-side) and explain:

1. A stock exchange where more listed companies attract more investors, and more investors attract more companies seeking to list
2. A mobile banking app where users can instantly split bills with other users of the same app
3. A financial data platform where more data consumers attract more data providers (banks, exchanges) who build integrations
4. An insurance marketplace where more policyholders attract more insurers, and more insurers attract more policyholders with better pricing
5. A cryptocurrency blockchain where more users increase the number of nodes, which increases network security, which attracts more users

Bonus: For each, describe the "chicken-and-egg" challenge and how the platform might solve it.

Exercise 4: Embedded Finance Revenue Model

An e-commerce platform is considering embedding financial services. Model the revenue opportunity:

Platform data:

- 2 million monthly active merchants
- Average merchant monthly Gross Merchandise Volume (GMV): $25,000
- Current payment processing revenue: 2.5% of GMV

Proposed embedded finance products:

- **Working capital loans:** 15% of merchants eligible, avg loan $10,000, 5% origination fee, 2 loans/year
- **Merchant insurance:** 10% adoption, $50/month premium, platform keeps 25% commission
- **Business savings account:** 20% adoption, $0.80/month per account (BaaS revenue share)

Calculate:

1. Current annual payment processing revenue
2. Annual revenue from each embedded product
3. Total embedded finance revenue as a % of current payment revenue
4. Which embedded product has the highest revenue per participating merchant?

Exercise 5: BaaS Build-vs-Buy Decision

A fintech startup wants to offer digital bank accounts. Compare two approaches:

Option A: BaaS Partnership

- Setup cost: $150,000
- Time to launch: 4 months
- Per-account fee: $2.50/month to BaaS provider
- Revenue share: 20% of net revenue to BaaS
- No banking license needed

Option B: Own Banking License

- License application cost: $3,000,000
- Time to launch: 18 months
- Regulatory capital requirement: $10,000,000
- No revenue sharing
- Full compliance team needed: $80,000/month

Shared assumptions: Expect 50,000 accounts in Year 1, growing to 200,000 by Year 3. ARPU = $8/month.

Analyze:

1. Calculate Year 1 and Year 3 net revenue under each option
2. At what scale (number of accounts) does Option B become cheaper annually?
3. What non-financial factors should influence the decision?
4. Which option would you recommend for: (a) a startup with $5M seed funding? (b) a fintech with 1M existing users expanding into banking?

Exercise 6: Super-App Strategy Design

You are designing a super-app strategy for a European neobank with 500,000 users and €3M monthly revenue from payments.

Feature expansion options (estimated investment and projected uplift):

- **Crypto trading:** €400k dev + €100k/yr compliance; +€1.2M/yr revenue; regulatory risk: HIGH
- **Travel insurance:** €150k dev; +€600k/yr revenue (commission); regulatory risk: LOW
- **Stock brokerage:** €500k dev + €200k/yr license; +€2.0M/yr revenue; regulatory risk: MEDIUM
- **Bill splitting/social:** €80k dev; +€0/yr direct revenue but +15% engagement/retention
- **Business accounts:** €300k dev; +€1.5M/yr revenue; regulatory risk: LOW
- **Buy Now Pay Later:** €350k dev + credit risk capital; +€1.8M/yr revenue; regulatory risk: MEDIUM

Budget constraint: €1,000,000 for development

Tasks:

1. Choose the optimal feature combination within budget. Justify your choices.
2. Calculate the projected annual revenue increase from your chosen features
3. What is the revenue ROI (additional revenue ÷ development cost)?
4. Which feature has the best risk-adjusted return?

Exercise 7: Marketplace Lending Economics

Model the economics of a peer-to-peer lending platform over one year:

Platform parameters:

- Loan volume: \$50 million originated in Year 1
- Average loan size: \$8,000, average term: 24 months
- Origination fee: 3.5% (charged to borrower at disbursement)
- Servicing fee: 0.8% p.a. of outstanding principal (charged monthly to investors)
- Default rate: 5% of principal (platform bears no credit loss—investors do)
- Operating costs: \$1.2M/year (team, tech, marketing, compliance)

Calculate:

1. Number of loans originated in Year 1
2. Total origination fee revenue
3. Servicing fee revenue in Year 1 (assume all loans outstanding for full year for simplicity)
4. Total platform revenue vs. operating costs—is the platform profitable?
5. If the default rate rises to 12%, the platform loses no money directly—but what happens to investor returns and platform viability long-term?

Exercise 8: Path to Profitability Analysis

A fintech has been operating for 3 years. Diagnose its unit economics and recommend a path to profitability:

Current metrics:

- Total users: 800,000 (growing 8% quarterly)
- CAC: $35
- Revenue mix: Interchange $1.80/user/mo; Subscriptions $0.30/user/mo (3% premium at $10/mo); FX $0.20/user/mo
- Variable cost: $1.90/user/month
- Fixed costs: $1.5M/month (engineering, compliance, office)
- Monthly churn: 2.5%
- Annual net loss: $12M

Analyze:

1. Calculate current blended ARPU, contribution margin, and LTV
2. Is the LTV/CAC ratio healthy? What does it tell you?
3. Identify the two most impactful levers to improve profitability
4. Model the effect of: (a) increasing premium conversion to 10%, and (b) adding lending at $0.50/user/month—recalculate LTV/CAC for each
5. At what user count does the fintech break even monthly (assuming current per-user economics)?

Answer Key (1/2)

1. **Exercise 1:** 1) ARPU = \$3.50 + (0.12 × \$10) + (0.08 × \$2.00) = \$3.50 + \$1.20 + \$0.16 = \$4.86/mo; 2) Contribution margin = \$4.86 − \$2.80 = \$2.06/mo; 3) Lifetime = 12/0.20 = 60 months; 4) LTV = \$2.06 × 60 = \$123.60; 5) LTV/CAC = \$123.60/\$55 = 2.25× (below healthy 3.0× threshold—needs improvement); 6) Breakeven = \$55/\$2.06 = 26.7 months

2. **Exercise 2:** 1) Firm A: 200 × \$80k × 4%/12 = \$53,333/mo (NIM is annual, monthly portion); actually annual NIM applied to outstanding balance—simplified: 200 × \$80k × 4% ÷ 12 months = \$53,333/mo. Firm B: 800 × \$60k × 2.5% = \$1,200,000/mo; 2) Firm A profit: \$53,333 − \$600,000 = −\$546,667 (loss!—NIM is earned over loan lifetime). Better: annual book of \$192M earning 4% = \$7.68M/yr vs \$7.2M costs = \$480k profit. Firm B: \$1.2M − \$250k = \$950k profit/mo; 3) Firm B has superior unit economics and asset-light model; Firm A carries credit risk on its balance sheet; 4) Firm A is far more exposed—defaults reduce its NIM and erode capital; Firm B only loses reputation (investors bear losses)

3. **Exercise 3:** 1) Cross-side (companies ↔ investors); 2) Direct (same-side, user ↔ user); 3) Indirect (consumers attract providers who build integrations); 4) Cross-side (policyholders ↔ insurers); 5) Direct (users → nodes → security → users)

4. **Exercise 4:** 1) 2M × \$25k × 12 × 2.5% = \$15B × 2.5% = \$375M/yr; 2) Loans: 300k merchants × \$10k × 5% × 2 = \$300M; Insurance: 200k × \$50 × 12 × 25% = \$30M; Savings: 400k × \$0.80 × 12 = \$3.84M; 3) Total embedded: \$333.84M = 89% of payment revenue; 4) Loans: \$1,000/merchant/yr; Insurance: \$150/yr; Savings: \$9.60/yr—lending highest per merchant

Answer Key (2/2)

5. **Exercise 5:** 1) Option A Year 1: 50k × $8 × 12 = $4.8M gross; BaaS fees: 50k × $2.50 × 12 = $1.5M; revenue share: 20% of ($4.8M − $1.5M) = $0.66M; net = $4.8M − $1.5M − $0.66M − $0.15M = $2.49M. Option B Year 1: $4.8M − $3M license − $0.96M compliance = $0.84M (before capital cost). Year 3: Option A: 200k accounts, net ˜$9.96M. Option B: $19.2M − $0.96M = $18.24M; 2) Crossover at approximately 85,000–100,000 accounts (when BaaS fees + revenue share exceed compliance team cost); 3) Speed to market, regulatory control, strategic flexibility, investor preference; 4a) BaaS (insufficient capital for license); 4b) Own license (scale justifies investment, existing user base de-risks)

6. **Exercise 6:** Best combo within €1M: Travel insurance (€150k) + Bill splitting (€80k) + Business accounts (€300k) + BNPL (€350k) = €880k, leaving €120k buffer. Revenue: €600k + €0 + €1.5M + €1.8M = €3.9M/yr. ROI: €3.9M/€0.88M = 4.4×. Best risk-adjusted: Business accounts (€1.5M/€300k = 5.0× ROI, LOW risk). Exclude crypto (HIGH risk) and stocks (exceeds remaining budget).

7. **Exercise 7:** 1) $50M ÷ $8k = 6,250 loans; 2) $50M × 3.5% = $1.75M; 3) $50M × 0.8% = $400k (simplified, assuming flat outstanding); 4) Revenue: $2.15M vs costs: $1.2M ⇒ profit of $950k; 5) At 12% default, investor returns collapse (may go negative after losses), investors withdraw, platform cannot originate new loans—reputation death spiral despite no direct balance-sheet loss

8. **Exercise 8:** 1) ARPU = $1.80 + $0.30 + $0.20 = $2.30/mo; CM = $2.30 − $1.90 = $0.40/mo; lifetime = 1/0.025 = 40 months; LTV = $0.40 × 40 = $16; 2) LTV/CAC = $16/$35 = 0.46×—extremely unhealthy, losing money on every customer; 3) Two levers: (a) increase premium conversion (massive ARPU uplift), (b) add lending revenue; 4a) 10% premium: ARPU = $1.80 + $1.00 + $0.20 = $3.00; CM = $1.10; LTV = $44; LTV/CAC = 1.26×; 4b) Add lending: ARPU = $2.80; CM = $0.90; LTV = $36; LTV/CAC = 1.03×; Both combined: ARPU = $3.50; CM = $1.60; LTV = $64; LTV/CAC = 1.83×—still below 3.0× but viable with CAC reduction; 5) Breakeven: $1.5M ÷ $0.40 = 3.75M users at current economics (unrealistic—must fix unit economics first)