Pre-Class Discovery Handout: FinTech Fundamentals & Payment Systems

Activity 1: The Invisible Fee

Scenario: You buy a EUR 50 coffee with a debit card. Every card payment involves a hidden chain of fees—the merchant discount rate (typically 2–3%)—split among several parties. Trace where the money goes.

Q1: Where does the 2–3% merchant fee go? Trace the flow from the merchant to each party involved.

Q2: Assume the total merchant discount rate is 2%. Calculate each party's share in EUR if interchange = 0.8%, scheme fee = 0.1%, and acquirer margin = 1.1%.

Q3: Why do small merchants typically pay higher rates than large retailers?

Activity 2: Disruption Detective

Scenario: For each traditional financial service below, identify the FinTech innovation that disrupts it and the specific friction it removes.

Service	FinTech Innovation	Friction Removed
Lending		
Payments		
Insurance		
Wealth Mgmt		
FX / Remittance		

Q1: For each service, name one FinTech company or technology that disrupts it.

Q2: What specific friction (cost, speed, access, transparency) does each innovation remove?

Activity 3: Network Effect Calculator

Scenario: A payment network's value grows with its user base. Metcalfe's Law states that the number of possible connections in a network of n users is:

$$C = \frac{n(n-1)}{2}$$

Q1: Calculate the number of possible connections for a network with $n = 1{,}000$ users.

Q2: Calculate connections for $n = 2{,}000$ users. By what factor did connections increase when the network doubled in size?

Q3: Why does this super-linear growth explain winner-take-most dynamics in payment networks?

Solutions

Activity 1: The Invisible Fee

A1: The merchant pays the full discount rate (2%) to the acquirer. The acquirer retains its margin and forwards the scheme fee to the card network (Visa/Mastercard) and the interchange fee to the cardholder's issuing bank. The flow is: Merchant → Acquirer → Card Scheme → Issuer.

A2: On a EUR 50 transaction at 2% total (EUR 1.00): the issuer receives 0.8% = EUR 0.40, the card scheme receives 0.1% = EUR 0.05, and the acquirer retains 1.1% = EUR 0.55. These sum to EUR 1.00.

A3: Small merchants process fewer transactions and have less bargaining power. Acquirers charge them higher margins to cover fixed per-merchant costs (terminal rental, compliance, fraud monitoring). Large retailers negotiate volume discounts that substantially reduce the acquirer margin component.

Activity 2: Disruption Detective

A1: Lending: P2P platforms (LendingClub, Funding Circle) connect borrowers directly with investors. Payments: Stripe/Square enable instant digital acceptance without legacy POS infrastructure. Insurance: Lemonade uses AI-driven underwriting and instant claims. Wealth Management: Robo-advisors (Betterment, Wealthfront) automate portfolio construction. FX: Wise (TransferWise) offers mid-market rates without hidden markups.

A2: Lending removes access barriers and intermediation cost. Payments remove integration complexity and settlement delay. Insurance removes slow claims processing and opaque pricing. Wealth management removes high minimum balances and advisory fees. FX removes hidden exchange-rate spreads and multi-day transfer times.

Activity 3: Network Effect Calculator

A1: $C = \frac{1{,}000 \times 999}{2} = 499{,}500$ possible connections.

A2: $C = \frac{2{,}000 \times 1{,}999}{2} = 1{,}999{,}000$ connections. The factor of increase is $1{,}999{,}000/499{,}500 \approx 4.0$. Doubling users quadruples the number of connections.

A3: Because value scales as $\sim n^2$ while cost scales roughly linearly, larger networks deliver disproportionately more value per user. This creates a positive feedback loop: more users attract more merchants, which attracts more users. Late entrants face a nearly insurmountable gap in network utility, producing winner-take-most outcomes.

