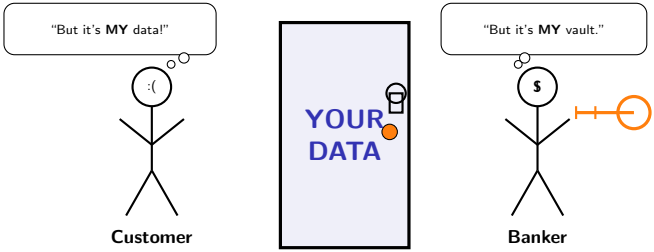
Neobanks & Open Banking

Lesson 02

Digital Finance



Before PSD2, banks owned the keys to your financial life.

Outline

Learning Objectives

By the end of this lesson, you will be able to:

1. Apply contestable markets theory to explain why neobanks can challenge incumbent banks
2. Define neobanks and distinguish them from traditional banks and challenger banks
3. Explain PSD2 regulation and its role in enabling Open Banking in Europe
4. Describe Open Banking architecture including APIs, AIS, and PIS
5. Evaluate how value chain disaggregation reshapes financial services delivery

Why Could Neobanks Challenge Century-Old Banks?

Banking has been dominated by the same institutions for decades. Contestable markets theory says even a monopoly behaves competitively if entry costs are zero — and suddenly, entry costs dropped.

Theory of Contestable Markets

- **Contestable market:** Even monopolies behave competitively if entry is costless and exit is frictionless
- Threat of entry disciplines incumbents (Baumol, 1982)
- Banking traditionally NOT contestable: high barriers (branches, licenses, trust)

What Changed?

- **Regulation:** PSD2 mandates data access, lowering regulatory barriers
- **Technology:** Cloud infrastructure, APIs enable asset-light models
- **Customer expectations:** Digital natives demand mobile-first banking
- Builds on Lesson 01: switching costs previously protected incumbents

---

Contestable markets theory (Baumol, 1982) explains why the THREAT of entry disciplines incumbents.

What Happens When Banking Gets Unbundled?

Traditional Banking: Vertical Integration

- Banks perform all functions: deposits, payments, lending, wealth management
- **Bundling strategy:** Cross-subsidization and customer lock-in
- High fixed costs justify integration

Key Structural Shift

- APIs enable modular assembly of financial services
- Specialists focus on one value chain stage

Unbundled Banking Model

Function	Specialist Provider
Account	Neobank (N26)
Payments	Stripe, Adyen
Lending	Funding Circle
Wealth	Robinhood, Wealthfront
Credit scoring	Credit Kudos
KYC	Onfido, Jumio

Value chain disaggregation is the key structural shift enabling all digital banking innovation.

Why Don't Customers Leave Bad Banks?

Recap from Lesson 01: Switching Costs

- **Switching costs:** Barriers preventing customers from changing providers
- In banking: salary deposit inertia, direct debits, credit history portability
- Protected incumbents despite inferior digital offerings

How Neobanks Reduce Switching Costs

- Easy onboarding: 5-minute account opening via mobile app
- Account aggregation: Multi-bank view reduces need to "fully switch"
- "Try before you switch": Secondary account strategy

PSD2 as Switching Cost Reducer

- Mandates **data portability:** Banks must share transaction history with third parties (AIS)
- Enables automated direct debit transfers
- Lowers information asymmetry: New entrants can assess creditworthiness

Regulatory Tool for Competition

- PSD2 deliberately reduces switching costs
- Contrast with regulatory capture: Regulation to INCREASE competition

PSD2 deliberately reduces switching costs – regulation as a tool for increasing competition.

What Is a Neobank and How Does It Differ from a Challenger Bank?

In 2010, opening a bank account meant visiting a branch with proof of address. By 2024, 400 million people had bank accounts they opened in 5 minutes on their phones.

Definition and Characteristics

- **Neobank:** Digital-only bank with no physical branches, mobile-first interface
- Built on modern cloud infrastructure (not legacy core banking systems)
- Typically focuses on retail customers and SMEs

What Licensing Determines

- **E-money license:** Can store funds, issue cards, but cannot lend deposited money
- **Full banking license:** Can accept deposits, provide credit, covered by deposit insurance
- Many start as EMI, later upgrade to full license

Key Distinctions

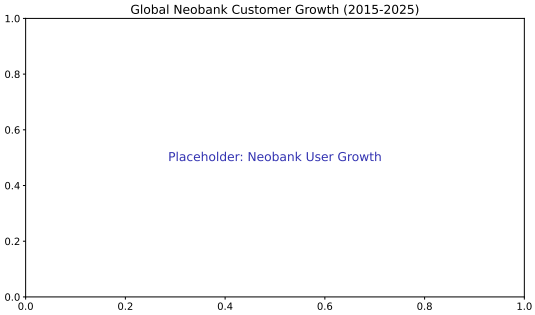
Type	License	Example
Neobank	EMI	Revolut
Challenger	Full License	Starling
Digital	Incumbent	Marcus

Examples

- **Revolut:** Multi-currency, crypto, stocks
- **N26:** German neobank, 8M+ customers

Licensing determines neobank capabilities.

What Does 400M Users Tell Us About Market Contestability?



Interpretation

- **400M+ users globally** by 2024, up from ¡100M in 2019
- Growth as evidence of market contestability: Barriers to entry have genuinely fallen
- Strongest growth in Europe (PSD2), Asia (mobile-first populations), Latin America (underbanked)
- User growth does NOT equal profitability (most neobanks still unprofitable)

Drivers of Adoption

- COVID-19 accelerated digital banking adoption
- Younger demographics (18-35) disproportionately adopt neobanks
- Multi-banking: 60%+ neobank users retain traditional bank accounts

Growth rates this steep are only possible when barriers to entry have genuinely fallen.

Can Neobanks Actually Make Money?

Revenue Streams Mapped to Value Chain

Revenue Source	Value Chain Stage
Interchange fees	Payments
Subscription (premium)	Account management
Lending interest	Credit provision
FX markups	Cross-border payments
Referral fees	Marketplace platform

Profitability Challenge

- Low-cost customer acquisition initially, but customer acquisition cost (CAC) rising
- Interchange fee income declining (EU caps)
- Need to cross-sell higher-margin products (lending, wealth)

Licensing Strategies

- **Full banking license:** Own balance sheet, deposit insurance, can lend (e.g., Starling, Monzo)
- **E-money institution (EMI):** Lighter regulation, faster to launch, but limited product scope (e.g., Revolut pre-2021)
- **Banking-as-a-Service (BaaS) partner:** Partner with licensed bank for regulatory compliance, focus on UX (e.g., Chime uses Bancorp)

Examples

- **Starling Bank:** Full UK license, profitable via lending and BaaS platform
- **Chime (US):** BaaS model, no lending license, earns via interchange

Most neobanks are not yet profitable – the path to profitability depends on licensing strategy.

How Did PSD2 Turn Regulation into a Weapon for Competition?

Regulation usually protects incumbents — economists call it regulatory capture. PSD2 did the opposite: it forced banks to open their vaults to competitors.

Regulatory Capture Theory

- **Regulatory capture:** Incumbents influence regulators to create entry barriers
- Common in finance: Basel III capital requirements favor large banks
- PSD2 is the OPPOSITE: Regulation designed to REDUCE incumbent advantage

PSD2 Overview

- **Payment Services Directive 2 (PSD2):** EU regulation effective 2018
- Goal: Increase competition, innovation, and security in payments

Three Key Provisions

1. **Third-party access:** Banks must provide API access to licensed third-party providers (TPPs) for account data and payment initiation
2. **Strong Customer Authentication (SCA):** Two-factor authentication required for online payments
3. **Ban on surcharging:** Merchants cannot charge extra for card payments (Visa/Mastercard)

Economic Logic

- Provision 1 reduces switching costs and enables unbundling
- Provision 2 addresses information asymmetry in fraud risk
- Provision 3 reduces transaction costs for consumers

PSD2 is a rare example of regulation designed to REDUCE incumbent advantage.

Why Does Your Bank App Demand Your Fingerprint AND a PIN?

What is SCA?

- **Strong Customer Authentication:** Requires two of three factors for online payment authorization
- Three factors:
  1. **Knowledge:** Password, PIN (something you know)
  2. **Possession:** Mobile phone, hardware token (something you have)
  3. **Inherence:** Fingerprint, face recognition (something you are)
- Mandatory for electronic payments exceeding €30 or cumulative €100

Exemptions

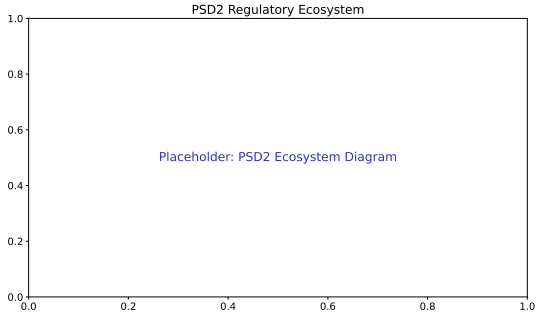
- Low-value transactions (¡€30)
- Trusted beneficiaries (whitelisted merchants)
- Low-risk transactions (fraud rate below threshold)
- Merchant-initiated transactions (subscriptions)

Economic Trade-off

- **Information asymmetry:** Merchant cannot observe customer fraud risk
- SCA shifts authentication burden to banks (who have fraud data)
- **Usability cost:** Too strict SCA reduces checkout conversion (friction), too lenient enables fraud

SCA balances security with usability – too strict reduces conversion, too lenient enables fraud.

Who Are the New Players PSD2 Created?



Key Actors

Actor	Role
ASPSP	Bank (account holder)
AISP	Read account data
PISP	Initiate payments

Data Flows

- Customer grants consent to AISP or PISP
- TPP authenticates via qualified certificate (eIDAS)
- ASPSP exposes APIs (AIS, PIS)
- TPP cannot store bank credentials

PSD2 mandates standardized API access.

Why Was Screen Scraping the Wild West of Data Access?

Theory: Before PSD2, third-party access to bank data relied on *screen scraping*—automated login using customer credentials to extract account data.

Problems with screen scraping:

- **Security risk:** Customer credentials shared with third parties
- **Fragility:** Breaks when bank redesigns its website
- **No consent mechanism:** Banks cannot distinguish customer from third party
- **Legal gray area:** No regulatory framework governing access

PSD2 mandated standardized APIs to replace screen scraping:

- Secure: OAuth 2.0 token-based authentication (no credential sharing)
- Consent-based: Customer explicitly authorizes data access
- Standardized: Common API specifications (Berlin Group, Open Banking UK, STET)
- Regulated: Banks must provide APIs; third parties must be licensed (AISP, PISP)

Current status: APIs mandatory in EU since 2019, but quality varies. Some markets (US, Australia) still permit screen scraping as fallback.

Screen scraping was the Wild West of data access—PSD2 APIs brought law and order.

Who Controls Your Financial Data – You or Your Bank?

Theory: Consent is the legal basis for Open Banking data sharing, at the intersection of PSD2 and GDPR.

Consent lifecycle:

1. **Grant:** Customer explicitly authorizes a third party to access specific data
2. **Use:** Third party accesses data within authorized scope and purpose
3. **Review:** Customer can view which parties have access via consent dashboard
4. **Revoke:** Customer can withdraw consent at any time; access stops immediately

Key regulatory requirements:

- **Explicit opt-in:** Consent must be affirmative (not pre-checked boxes)
- **Purpose limitation:** Data used only for the stated purpose
- **Time limitation:** PSD2 requires re-authentication every 90 days
- **Data minimization:** Only data necessary for the service may be accessed

GDPR alignment: Right to data portability, right to be forgotten, and data minimization principles all apply.
Challenge: Consent fatigue—users approve without reading, undermining the consent model.

Effective consent management is where PSD2's competition goals meet GDPR's privacy protections.

What Is Open Banking and Where Is It Heading?

Definition

- **Open Banking:** System where banks expose customer account data and payment functions via standardized APIs to third-party providers
- Requires customer consent (GDPR compliance)
- PSD2 mandates Open Banking in EU; UK has separate Open Banking Standard

Progression of Openness

1. **Open Banking:** Payment accounts and transactions
2. **Open Finance:** Expanded to pensions, insurance, investments
3. **Open Data:** Beyond finance (utilities, telecom, health)

Foundational Principle: Customer Data Ownership

- Banks are data **custodians**, not owners
- Customer has right to share data with third parties
- Contrast with traditional model: Bank owns customer relationship and data

Key Principles

- **Consent-based:** Customer must explicitly authorize data sharing
- **Secure:** OAuth 2.0, TLS encryption, qualified certificates
- **Standardized:** Common API specifications (e.g., UK Open Banking, Berlin Group)
- **Non-discriminatory:** Banks cannot favor own TPP subsidiaries

Customer ownership of data is the foundational principle – banks are custodians, not owners.

What Can Third Parties Actually Do with Bank APIs?

Account Information Services (AIS)

- **Function:** Read-only access to account balances, transaction history
- **Use cases:** Account aggregation apps (Yolt, Emma), personal finance management (PFM)
- Maps to unbundled value chain: Account data layer
- Consent validity: 90 days (PSD2), requires re-authentication

Payment Initiation Services (PIS)

- **Function:** Trigger payments directly from customer bank account to merchant
- **Use cases:** Pay-by-bank checkout (Trustly, GoCardless), bill payments
- Maps to unbundled value chain: Payment execution layer
- Bypasses card networks (lower fees for merchants)

Card-Based Payment Instrument Issuer (CBPII)

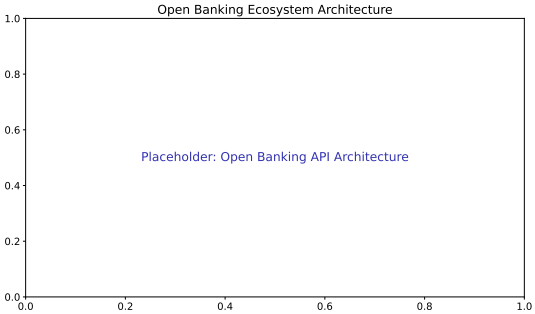
- **Function:** Check account balance before authorizing card payment (reduces overdraft risk)
- Less commonly used than AIS/PIS

Value Chain Mapping

API Type	Bank Function Exposed
AIS	Account data custody
PIS	Payment execution
CBPII	Credit risk assessment

Each API type represents a specific bank function that third parties can now access.

How Does the Technical Architecture Keep Data Sharing Secure?



Architecture Layers

1. **TPP Application Layer:** Third-party app (e.g., budgeting app, payment provider)
2. **API Gateway:** Bank's public-facing API endpoint with rate limiting, security checks
3. **Core Banking System:** Legacy system holding account balances, transaction ledger

Security Mechanisms

- **OAuth 2.0:** Industry-standard authorization framework, token-based access
- **Qualified certificates:** TPPs must be licensed and use eIDAS-compliant certificates
- **TLS encryption:** All data in transit encrypted
- Customer authenticates with bank (not TPP) via redirect flow

OAuth 2.0 and qualified certificates ensure that data sharing is secure and consent-based.

Which Real-World Problems Does Open Banking Solve?

1. Account Aggregation

- **Problem solved:** Information asymmetry (customer cannot see full financial picture across banks)
- Apps consolidate accounts from multiple banks into single view
- Examples: Yolt, Emma (UK), Plaid (US – though not PSD2)
- Enables better budgeting, financial advice

2. Pay-by-Bank (Account-to-Account Payments)

- **Problem solved:** High transaction costs of card payments (interchange fees)
- Customer authorizes direct bank transfer at checkout
- Examples: Trustly (EU), GoCardless (direct debit)
- Merchant saves 1-3% card interchange fees

3. Alternative Credit Scoring

- **Problem solved:** Adverse selection (lenders cannot assess thin-file borrowers)
- AIS data enables income verification, cash flow analysis
- Examples: Credit Kudos (UK, acquired by Apple), Nova Credit (cross-border credit)
- Expands credit access to underbanked segments

Link to Lesson 01 Concepts

- Account aggregation reduces search costs
- Pay-by-bank reduces transaction costs
- Alternative credit scoring reduces information asymmetry

Each use case solves a specific information asymmetry or transaction cost problem.

Why Hasn't Open Banking Lived Up to the Hype Yet?

Open Banking was supposed to unleash a wave of innovation. Five years later, consumer awareness is below 30%, neobanks are still unprofitable, and there's no global API standard.

Neobank Profitability Challenge

- Low revenue per customer: Free accounts, declining interchange fees
- High customer acquisition costs (CAC): Rising digital ad costs
- Path to profitability requires cross-selling higher-margin products (lending, wealth)
- Many neobanks still loss-making 5+ years post-launch

Trust and Privacy Concerns

- Consumer awareness of Open Banking remains low (¡30% in most EU countries)
- Data breach risk: More parties accessing account data
- Consent fatigue: Customers approve data sharing without understanding scope

Regulatory Fragmentation

- **No global API standard:** EU (PSD2/Berlin Group), UK (Open Banking Standard), US (no mandate), each different
- Limits scale benefits for TPPs operating cross-border
- API quality varies: Some banks provide minimal-compliance APIs

Incumbent Bank Resistance

- Slow API rollout, poor documentation
- Functional but not developer-friendly APIs
- Preference for own digital channels over Open Banking ecosystem

No global API standard exists – this fragmentation limits the scale benefits of Open Banking.

What Comes After Open Banking?

From Open Banking to Open Finance

- **Open Finance:** Extends API access to insurance, pensions, investments, mortgages
- EU FIDA proposal (Financial Data Access): Harmonized framework for data sharing beyond payments
- Enables holistic financial advice, automated switching across all products

Embedded Finance

- **Embedded finance:** Non-financial companies offering financial services within their platforms
- Banking-as-a-Service (BaaS) enables this: API-driven banking infrastructure
- Examples: Shopify Capital (lending), Uber Money (accounts), Tesla Insurance

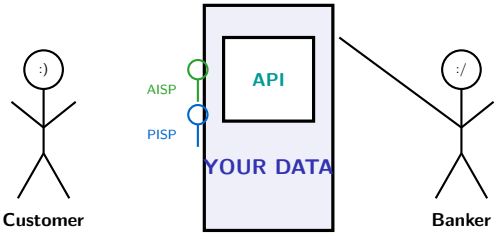
BaaS and Super-Apps

- **BaaS providers:** Solarisbank, Railsbank, Marqeta (provide licensed banking rails via API)
- **Super-app model:** Single app for payments, lending, insurance, investments (e.g., Revolut, Grab in SE Asia)
- Ultimate expression of value chain disaggregation: Financial services as modular components

Open Finance Potential

- Automated tax filing using transaction data
- Dynamic pricing for insurance based on real-time spending
- Cross-product bundling by third parties (not banks)

Embedded finance may be the ultimate expression of value chain disaggregation.



Open Banking didn't remove the vault — it added a window.

Summary

Key Takeaways

1. **Contestable markets theory explains disruption:** PSD2 regulation, cloud technology, and changing customer expectations reduced barriers to entry, making banking contestable. Neobanks are the entrants exploiting this contestability.
2. **Value chain disaggregation is the structural shift:** APIs enable unbundling of banking functions. Specialists focus on narrow value chain stages. Traditional banks lose vertical integration advantage.
3. **PSD2 as competition-enhancing regulation:** Mandates third-party API access (AIS, PIS), reducing switching costs and enabling new business models. Rare example of regulation designed to reduce incumbent advantage.
4. **Open Banking architecture relies on secure, consent-based data sharing:** OAuth 2.0, qualified certificates, and customer ownership of data are foundational principles. Each API type (AIS, PIS) represents an unbundled bank function.

Next Lesson: P2P Lending and Robo-Advisors – How disintermediation transforms lending and advisory services.

Next lesson: P2P Lending and Robo-Advisors – how disintermediation transforms lending and advisory.