

金融科技



Tamkang  
University  
淡江大學

FinTech: Financial Technology

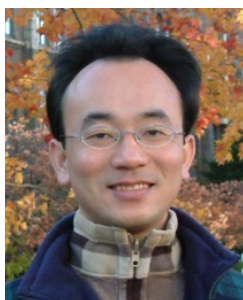
# Fintech 金融科技的演進： 貨幣與金融服務

(Evolution of Fintech: Money and Financial Services)

1052FinTech02

MIS EMBA (M2263) (8595)

Fri, 12,13,14 (19:20-22:10) (D409)



Min-Yuh Day

戴敏育

Assistant Professor

專任助理教授

Dept. of Information Management, Tamkang University

淡江大學 資訊管理學系

<http://mail.tku.edu.tw/myday/>

2017-02-24



# 課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
1	2017/02/17	Fintech 金融科技課程介紹 (Course Orientation for Fintech: Financial Technology)
2	2017/02/24	Fintech 金融科技的演進：貨幣與金融服務 (Evolution of Fintech: Money and Financial Services)
3	2017/03/03	Fintech 金融科技：金融服務科技創新 (Fintech: Technology Innovation in Financial Services)
4	2017/03/10	Fintech 金融科技與金融服務價值鏈 (Fintech and Financial Services Value Chain)
5	2017/03/17	Fintech 金融科技商業模式創新 (Fintech Business Models Innovation)
6	2017/03/24	Fintech 金融科技個案研究 I (Case Study on Fintech I)

# 課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
7	2017/03/31	金融服務消費者心理與行為 (Consumer Psychology and Behavior on Financial Services)
8	2017/04/07	教學行政觀摩日 (Off-campus study)
9	2017/04/14	區塊鏈技術 (Blockchain Technology)
10	2017/04/21	期中報告 (Midterm Project Report)
11	2017/04/28	Python Pandas財務大數據分析 (Finance Big Data Analytics with Pandas in Python)
12	2017/05/05	人工智慧與深度學習金融科技 (Artificial Intelligence and Deep Learning for Fintech)

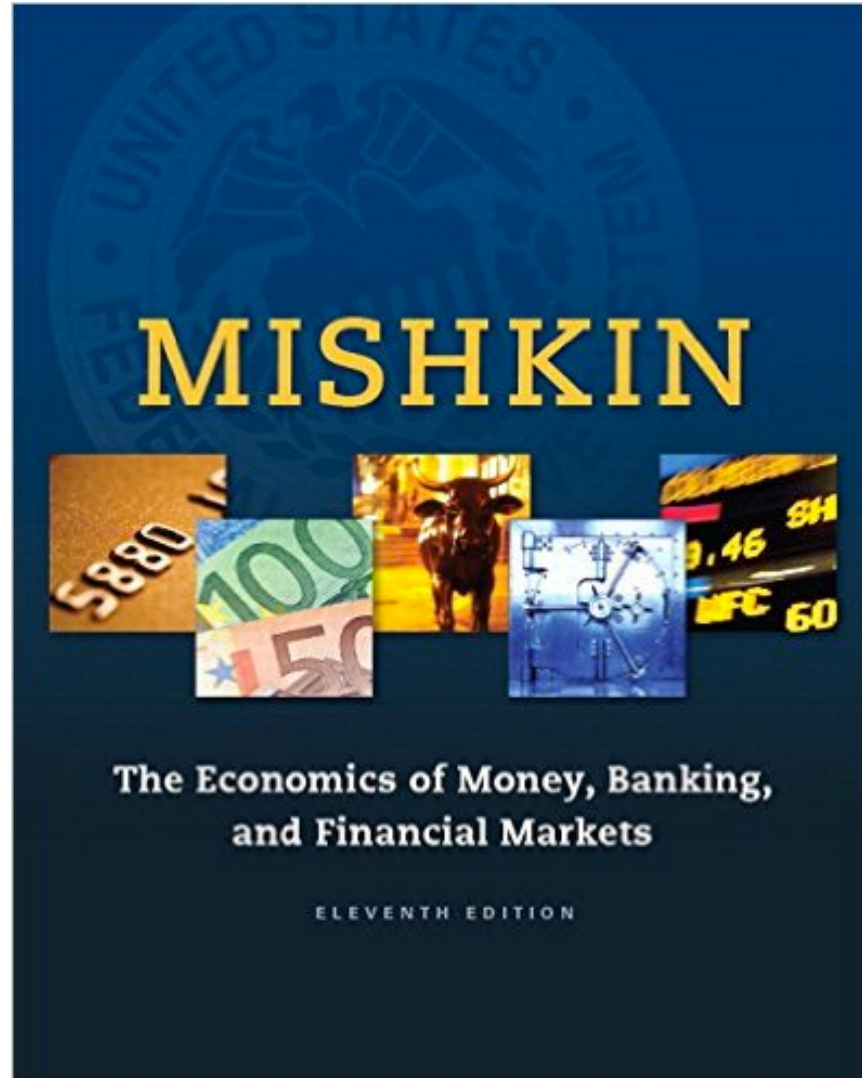
# 課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
13	2017/05/12	Fintech 金融科技個案研究 II (Case Study on Fintech II)
14	2017/05/19	金融科技財富管理：機器人理財顧問 (Robo-Advisors for Wealth Management in Fintech)
15	2017/05/26	投資組合最佳化與程式交易 (Portfolio Optimization and Algorithmic Trading)
16	2017/06/02	金融科技智慧問答系統 (Intelligent Question Answering System for Fintech)
17	2017/06/09	期末報告 I (Final Project Presentation I)
18	2017/06/16	期末報告 II (Final Project Presentation II)



# **Evolution of Fintech: Money and Financial Services**

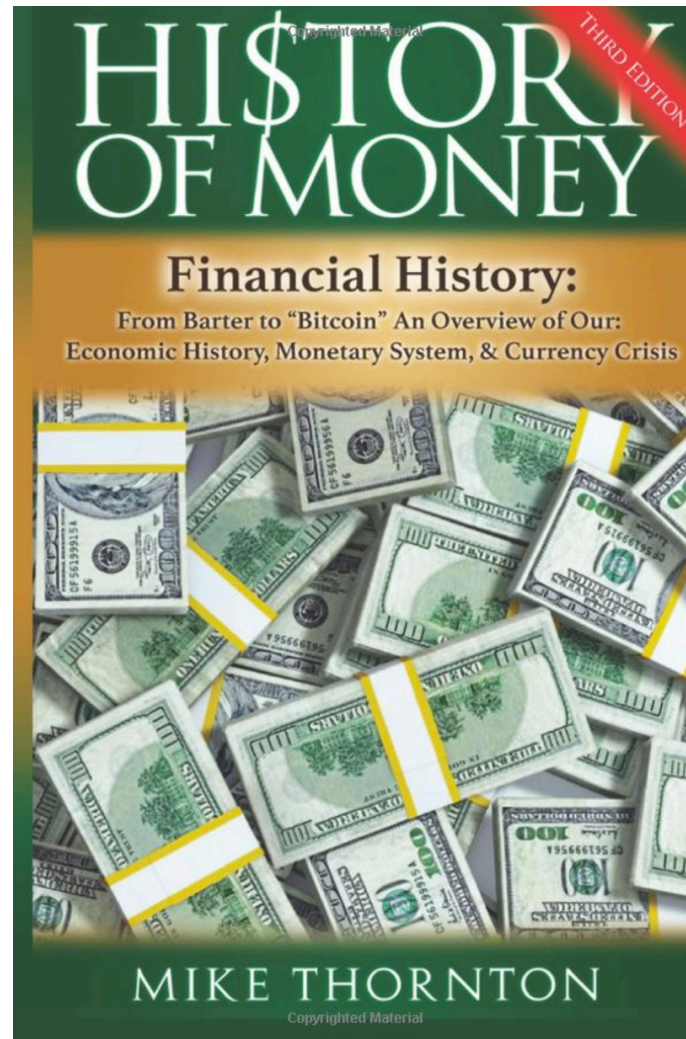
**Frederic S. Mishkin (2015),  
The Economics of Money, Banking and Financial Markets,  
11th Edition, Pearson**



Mike Thornton (2016),

## History of Money: Financial History:

From Barter to Bitcoin - An Overview of Our Economic History, Monetary System & Currency Crisis, CreateSpace Independent Publishing Platform



# Money and Financial History

- Why is a printed piece of paper worth anything?
- How can a coin be worth more or even less than the number stamped on it?
- Why is digital money real money?
- How can money be worth more or less than it was yesterday?

# Money

# Exchange

# Barter

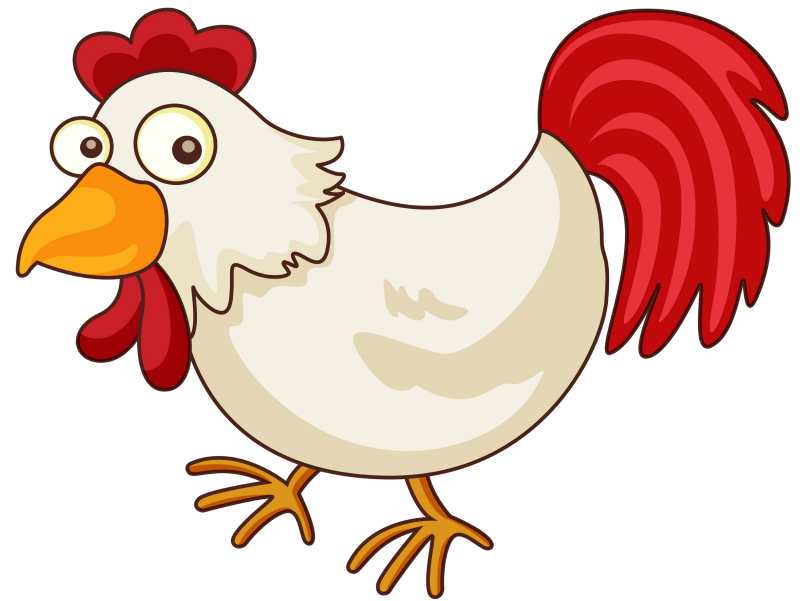


# Barter

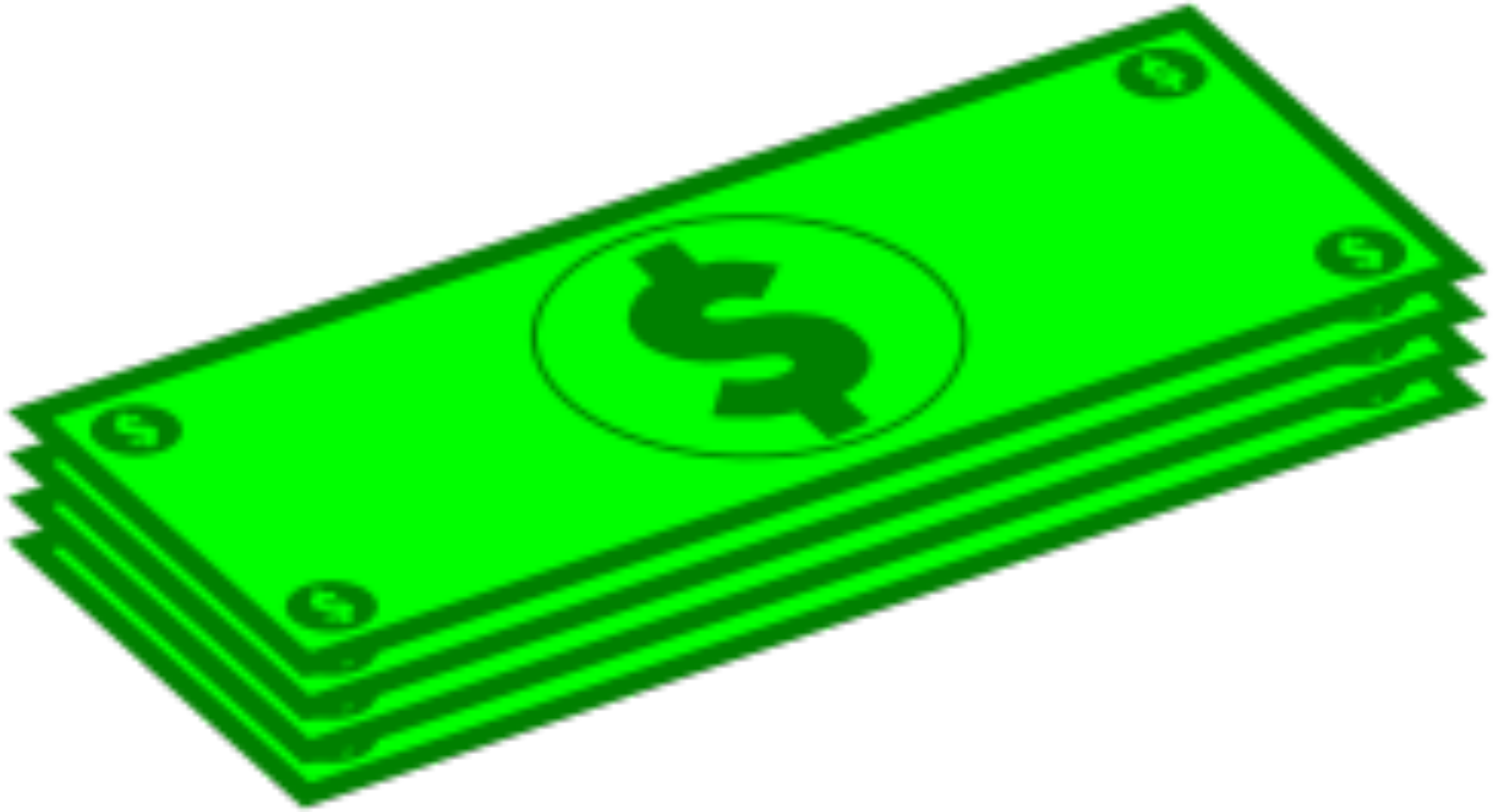




# Barter



# Money



# Bills





# Gold Bullion Coin



# Gold Bullion Coin



# Coin US Penny





# Gold Bricks



# Financial Services



# Financial Services



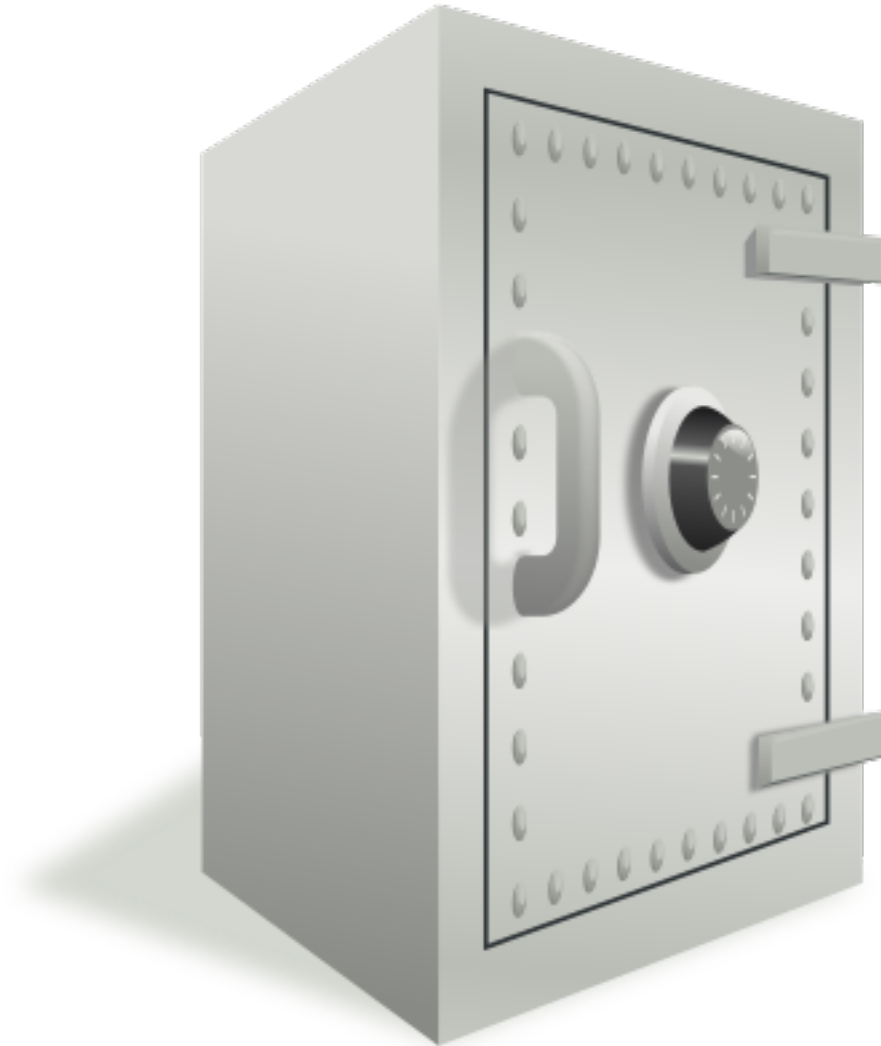
# Financial Services



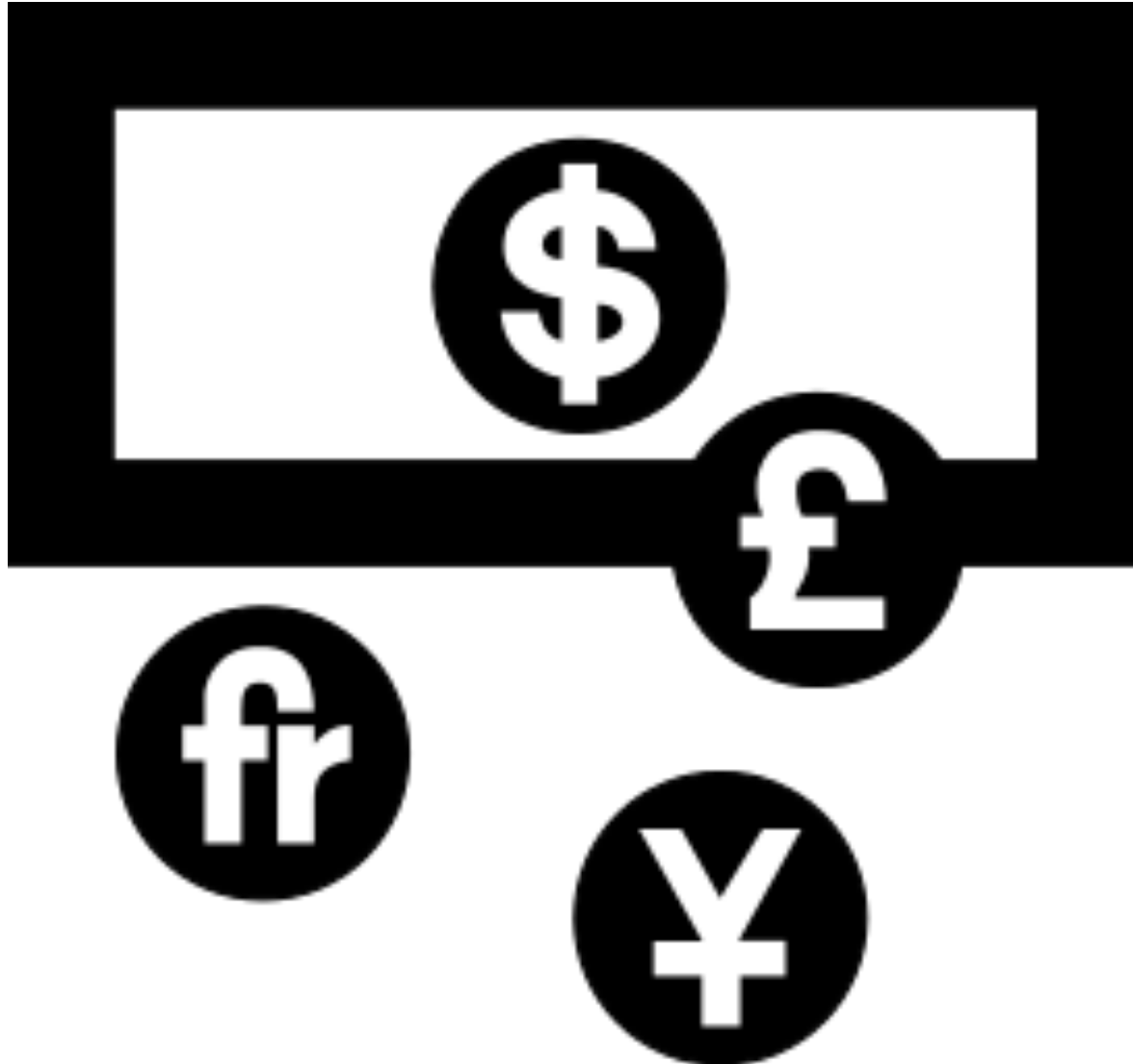
# Treasure



# Safe



# Currency Exchange



# Market

# Financial Services



# Financial Revolution with Fintech

## A financial services revolution

### Consumer Trends



1. Simplification



2. Transparency



3. Analytics



4. Reduced Friction

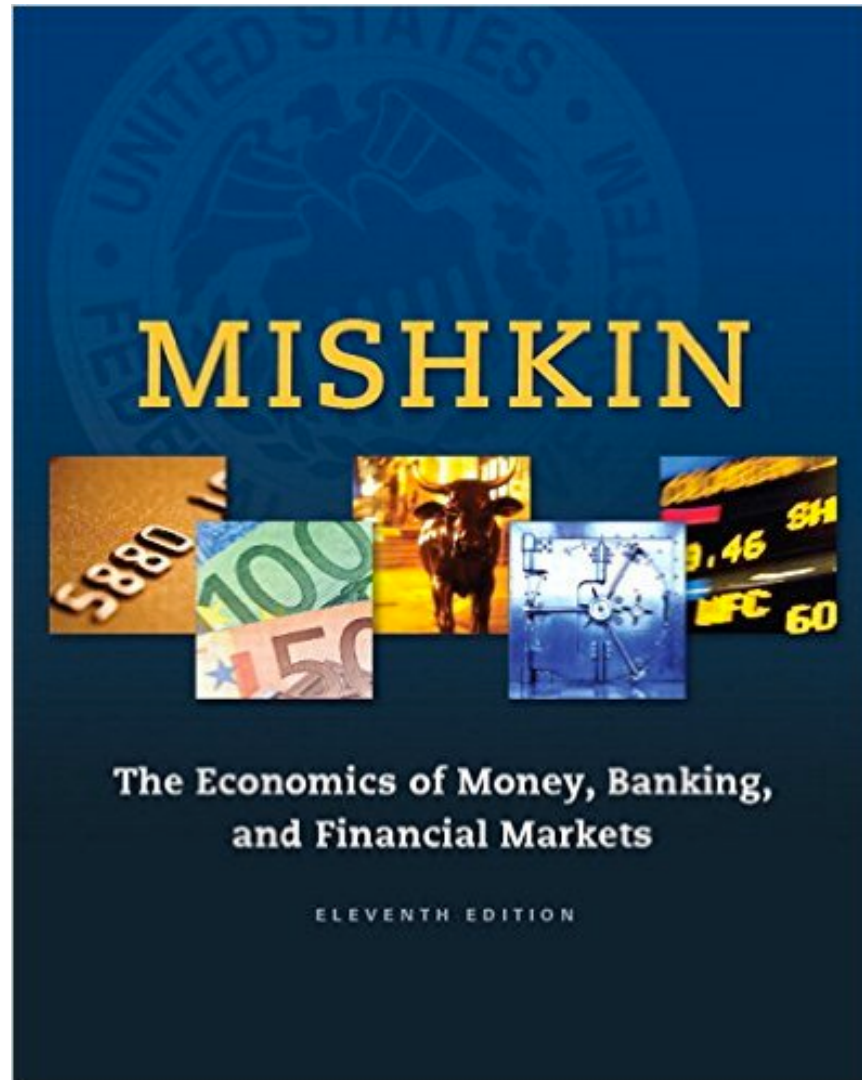


# FinTech: Financial Services Innovation



# **The Economics of Money, Banking and Financial Markets**

**Frederic S. Mishkin (2015),  
The Economics of Money, Banking and Financial Markets,  
11th Edition, Pearson**



# Economics of Money, Banking and Financial Markets

1. **Money**, Banking, and Financial System
2. Financial Markets
3. Financial Institutions
4. Central Banking and the Conduct of Monetary Policy
5. International Finance and Monetary Policy
6. Monetary Theory
7. **Financial Services** Industry

# INTRODUCTION

1. Why Study Money, Banking, and Financial Markets?
2. An Overview of the Financial System
3. What Is Money?

# FINANCIAL MARKETS

- 4. Understanding Interest Rates
- 5. The Behavior of Interest Rates
- 6. The Risk and Term Structure of Interest Rates
- 7. The Stock Market, the Theory of Rational Expectations, and the Efficient Market Hypothesis

# FINANCIAL INSTITUTIONS

- 8. An Economic Analysis of Financial Structure
- 9. Banking and the Management of Financial Institutions
- 10. Economic Analysis of Financial Regulation
- 11. Banking Industry: Structure and Competition
- 12. Financial Crises

# CENTRAL BANKING AND THE CONDUCT OF MONETARY POLICY

13. Central Banks and the Federal Reserve System

14. The Money Supply Process

15. The Tools of Monetary Policy

16. The Conduct of Monetary Policy: Strategy and Tactics



# MONETARY THEORY

19. Quantity Theory, Inflation, and the Demand for Money

20. The IS Curve

21. The Monetary Policy and Aggregate Demand Curves

22. Aggregate Demand and Supply Analysis

23. Monetary Policy Theory

24. The Role of Expectations in Monetary Policy

25. Transmission Mechanisms of Monetary Policy

# Financial Services Industry

- 26. Financial Crises in Emerging Market Economies
- 27. The ISLM Model
- 28. Nonbank Finance
- 29. Financial Derivatives
- 30. Conflicts of Interest in the Financial Services Industry

# **Why Study Money, Banking, and Financial Markets?**

# Why Study Money, Banking, and Financial Markets?

- To examine how **financial markets** such as **bond**, **stock** and **foreign exchange** markets work
- To examine how **financial institutions** such as **banks** and **insurance companies** work
- To examine the **role of money** in the **economy**

# Financial Markets

- Markets in which funds are transferred from people who have an excess of available funds to people who have a shortage of funds
  - Bond market
  - Stock market
  - Foreign exchange market

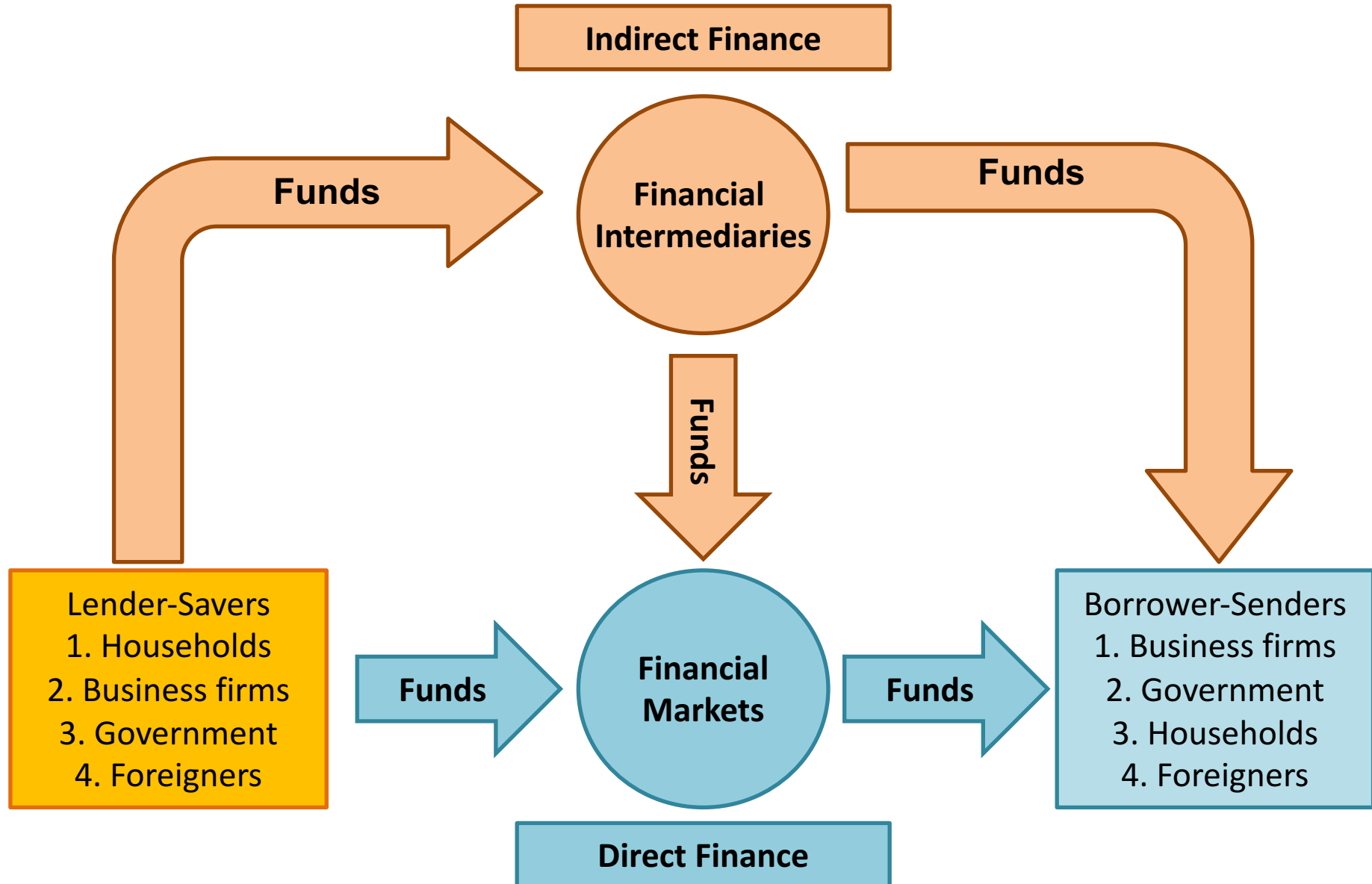
# Financial Institutions

- Financial Intermediaries: institutions that borrow funds from people who have saved and make loans to other people:
  - **Banks**: accept deposits and make loans
  - Other Financial Institutions: **insurance companies, finance companies, pension funds, mutual funds and investment banks**
- **Financial Innovation**: the advent of the information age and e-finance

# Money and Business Cycles

- Money plays an important role in generating business cycles
- Recessions (unemployment) and expansions affect all of us
- Monetary Theory ties changes in the money supply to changes in aggregate economic activity and the price level

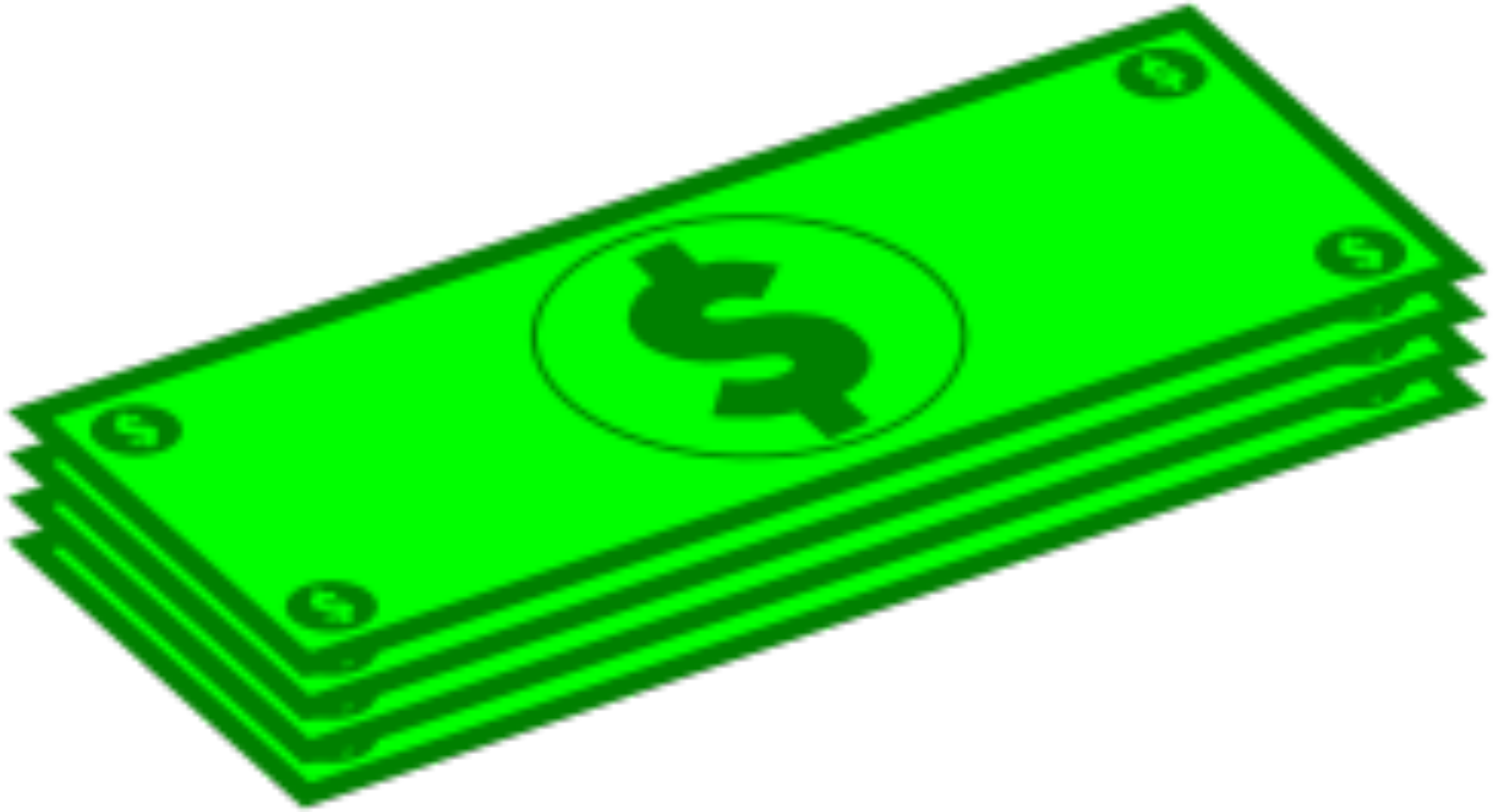
# Overview of the Financial System





# What is Money?

# Money



# Bills



# Meaning of Money

- **Money (=money supply)** any vehicle used as a means of **exchange** to pay for goods, services or debts.
- In today's society, any **asset** that can quickly be transferred into cash is considered money.
- The more **liquid** an asset is, the closer it is to money.
- In economics, **money** does not mean **wealth** nor does it mean **income**.

# Functions of Money

- Medium of Exchange
- Unit of Account
- Store of Value

# Medium of Exchange

- By eliminating barter, this function of money increases efficiency in a society.
- As human societies started to engage in exchange money had to be invented.
- Any technological change that reduces transaction costs increases the wealth of the society.
- Any technological change that allows people to specialize also increases wealth.

# Unit of Account

- We use money to measure the value of goods and services.
- Suppose we had 4 goods and no money. How do we measure the price of each good?
  - A in terms of B
  - B in terms of C
  - C in terms of D
  - A in terms of C
  - A in terms of D
  - B in terms of D
- Money allows to quote prices in terms of currency only.

$$N!/2(N-2)!$$

# Store of Value

- All **assets** are stored value.
- Money, although without any return, is still desirable to hold because it allows purchases immediately.
- Other assets take time (transaction costs) to use as a payment for purchases.
- The more liquid an asset is, the less transaction cost it carries.
- Inflation erodes the value of money.



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# Evolution of the Payments System

- **Commodity Money:**
  - valuable, easily standardized and divisible commodities  
(e.g. precious metals, cigarettes).
- **Fiat Money:**
  - paper money decreed by governments as legal tender.

# Electronic Money

- Debit Cards
  - Instant transfer from your checking account to merchant's checking account.
- Stored Value Card
  - Gift cards.
- Electronic Cash
  - Account set up on a person's PC from her bank whereby she can buy products over the Internet.
- Electronic Checks
  - Checks written on PC and sent through the Internet.

# Benefits of Paper Checks

- Cheaper than telecommunications network.
- Provide receipts.
- Allow float.
- May be more secure; avoid hacker problems.
- Do not leave a wealth of information trail.

# Measuring Money

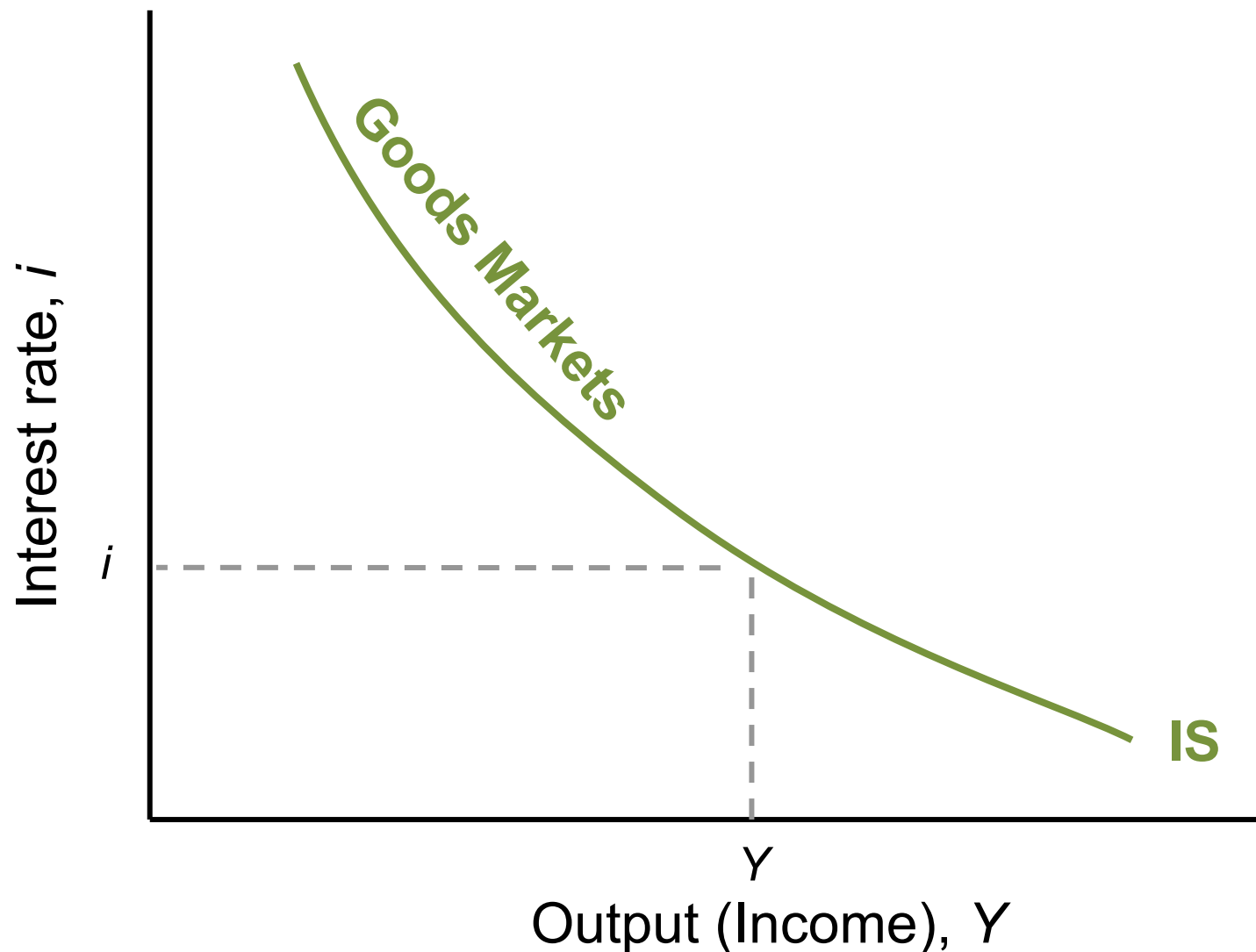
- M1:
  - Currency, demand deposits, travelers checks.
- M2:
  - M1, saving deposits, small time deposits, retail MMMF.
- M3:
  - M2, large time deposits, repos, Eurodollar deposits, institutional MMMF.
- MZM:
  - M2, institutional MMMF minus small time deposits.
- Growth rates of these aggregates do not always go hand in hand, making monetary policy difficult since signals are conflicting.

# The IS Curve

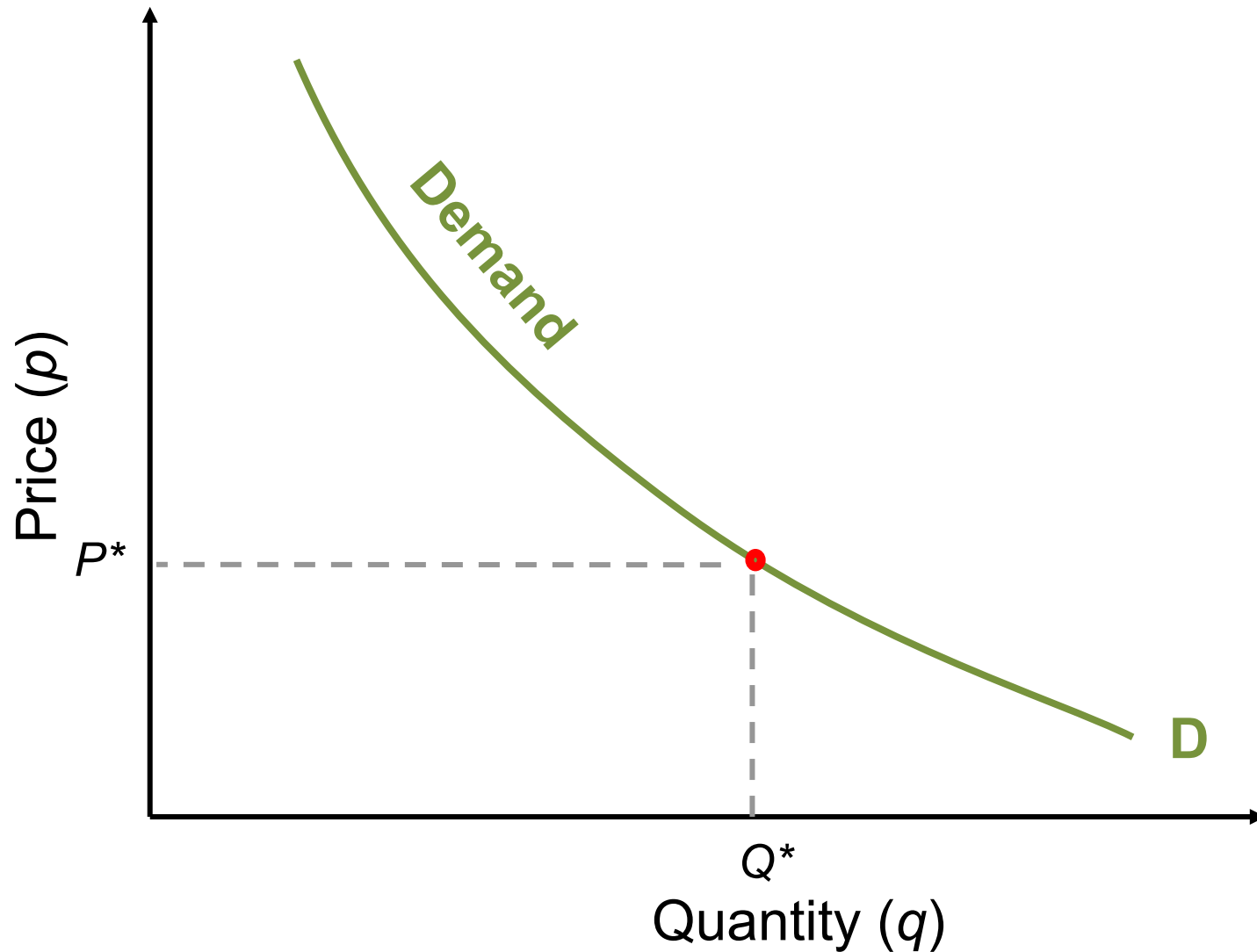
# The IS (Investment/Saving) Curve



# The IS (Investment/Saving) Curve



# Demand



# The ISLM Model

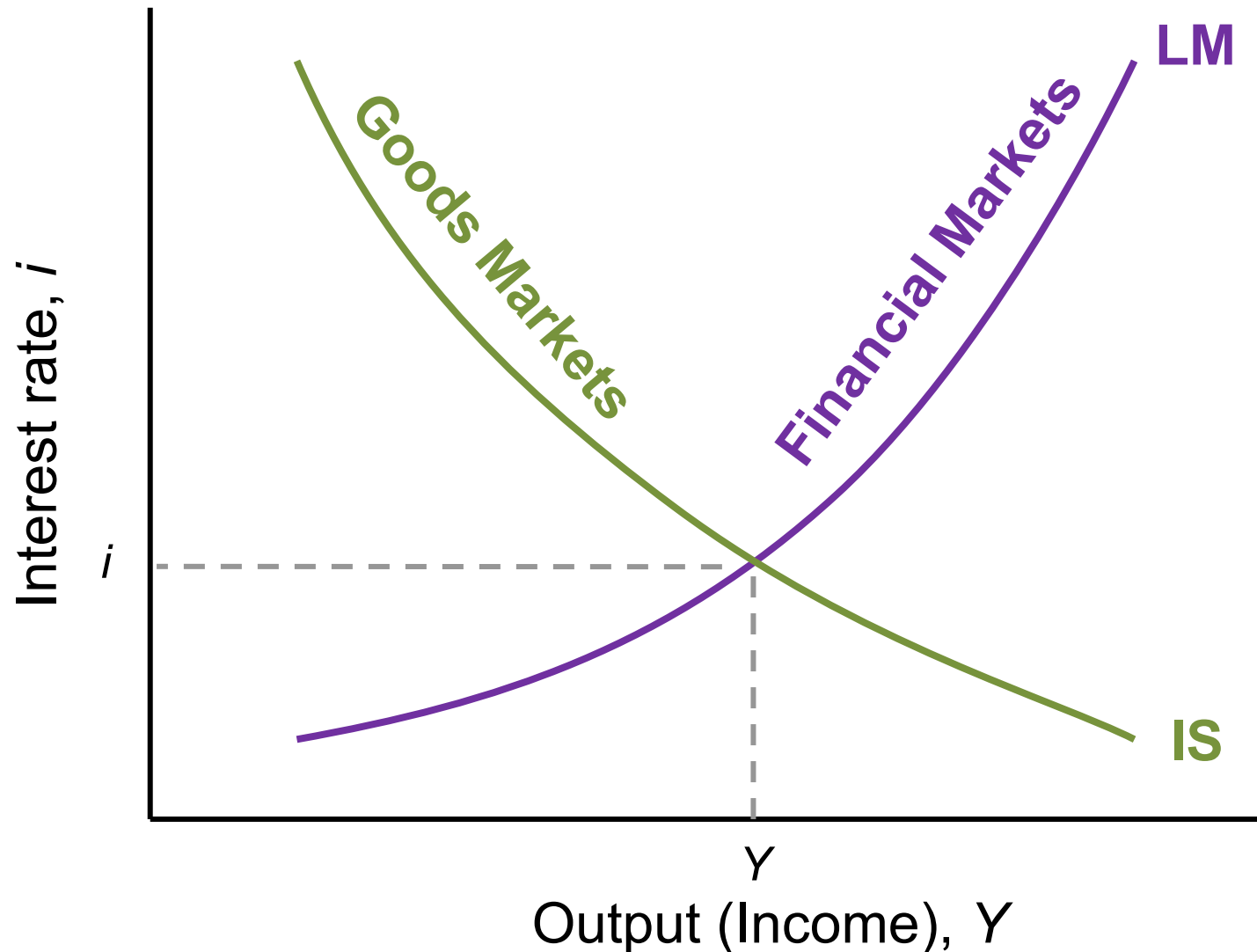
Goods and Financial Markets:

# The ISLM Model

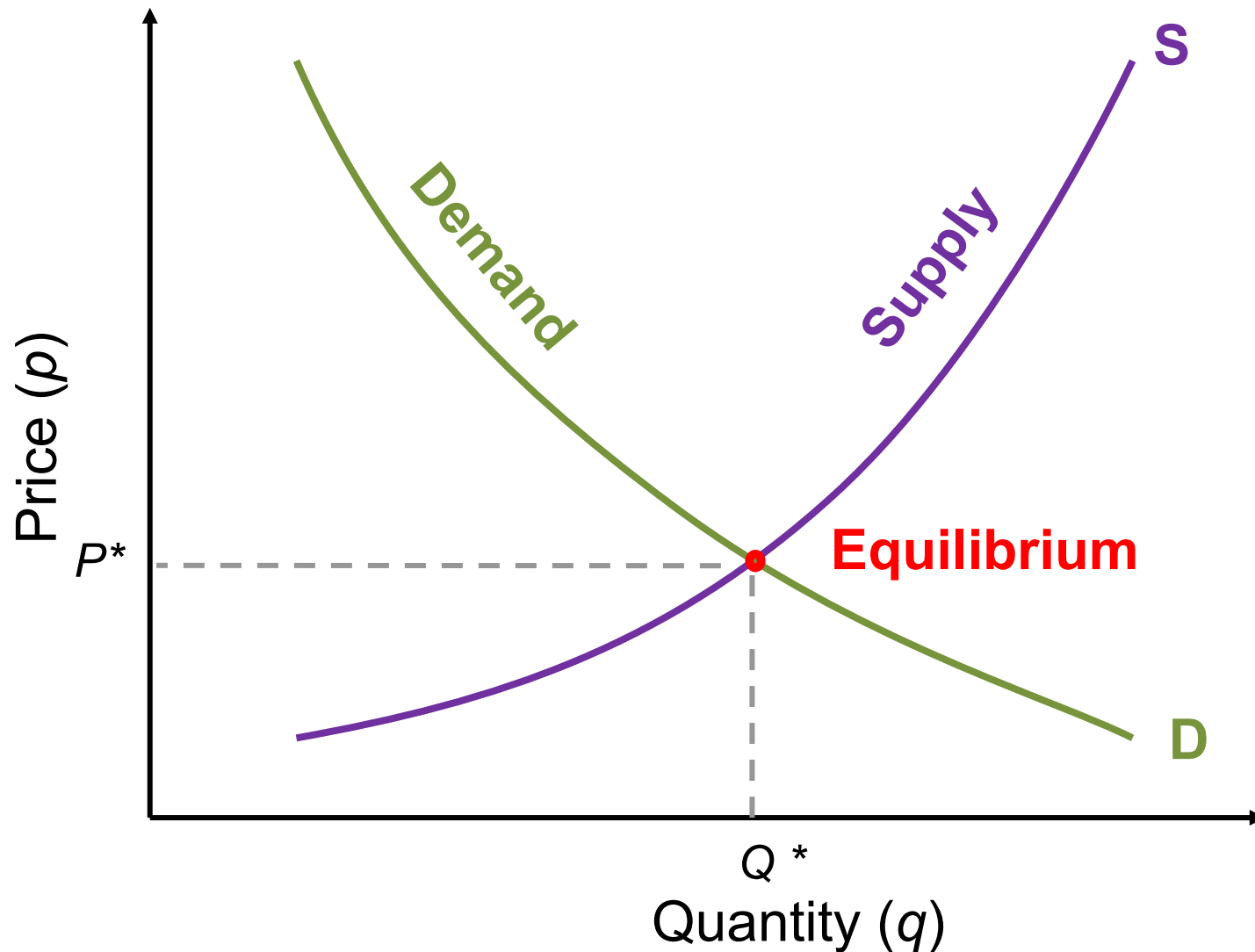
(Investment Saving –  
Liquidity Preference Money  
Supply)  
model

# The ISLM Model

(Investment Saving –  
Liquidity Preference Money Supply) model



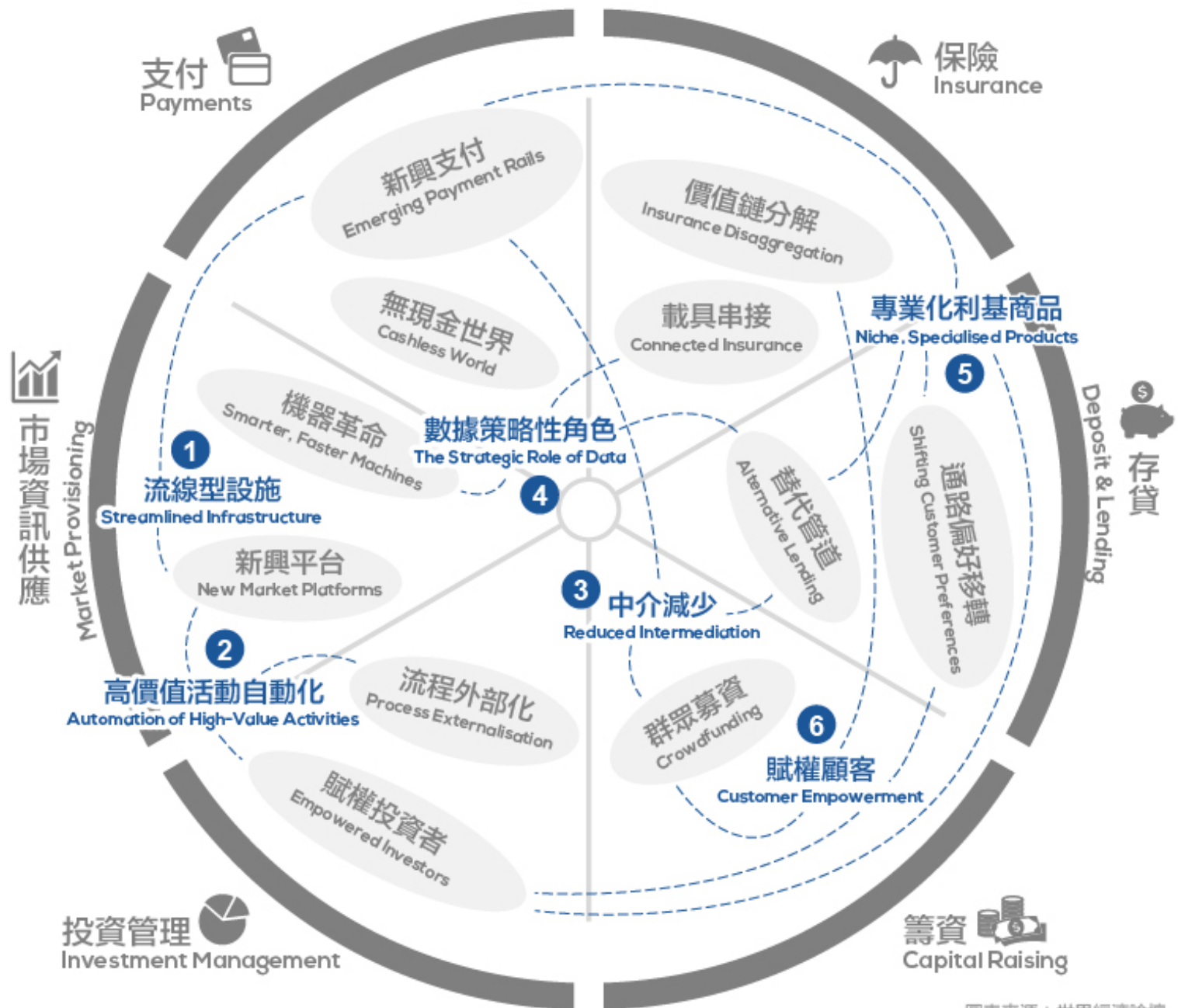
# Supply and Demand



# FinTech: Financial Services Innovation









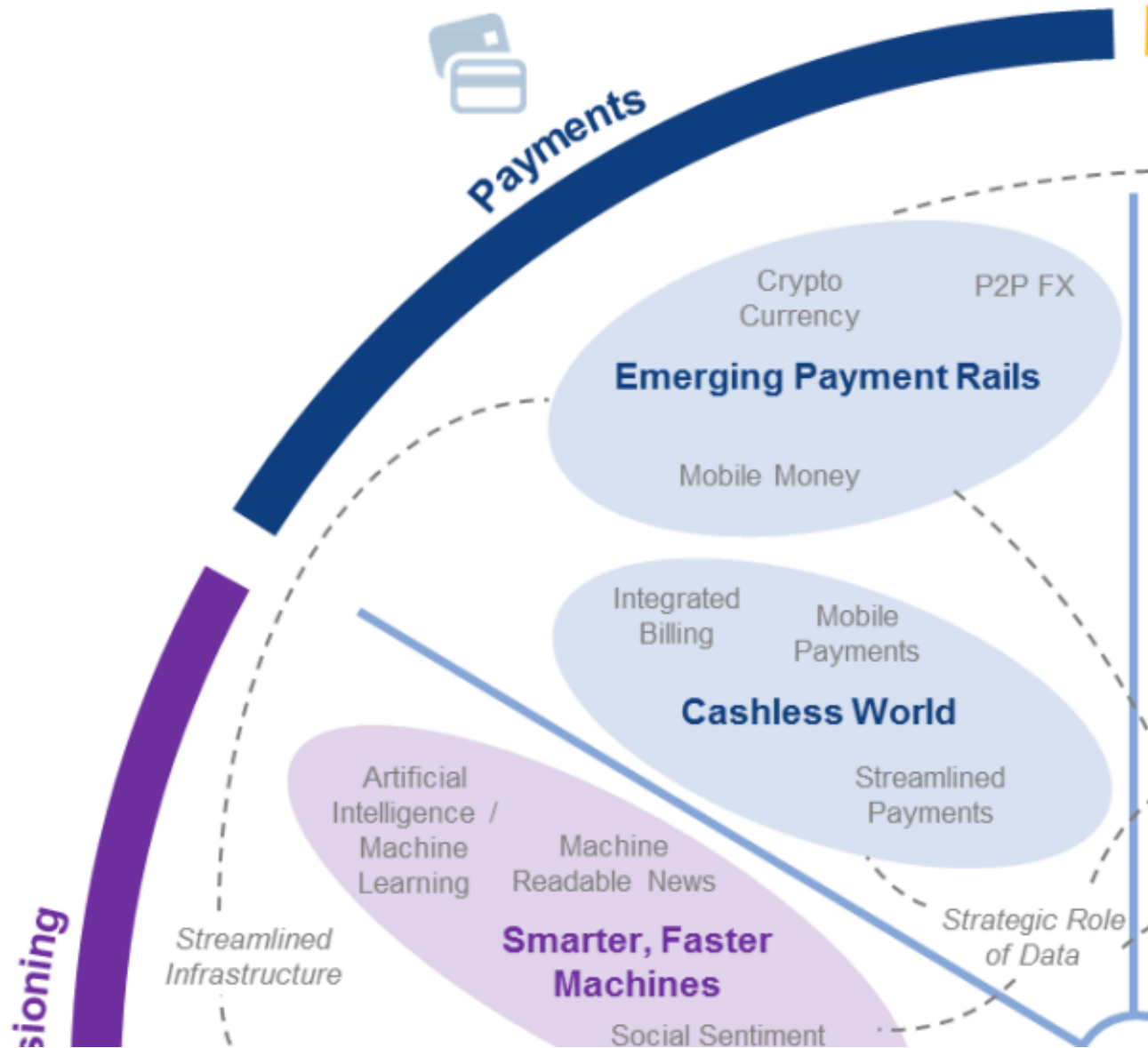
圖表來源：世界經濟論壇

# FinTech

功能	創新項目
 支付 Payments	無現金世界 (Cashless World) 新興支付 (Emerging Payment Rails)
 保險 Insurance	價值鏈裂解 (Insurance Disaggregation) 保險串接裝置 (Connected Insurance)
 存貸 Deposit & Lending	替代管道 (Alternative Lending) 通路偏好移轉 (Shifting Customer Preferences)
 籌資 Capital Raising	群眾募資 (Crowdfunding)
 投資管理 Investment Management	賦權投資者 (Empowered Investors) 流程外部化 (Process Externalisation)
 市場資訊供應 Market Provisioning	機器革命 (Smarter, Faster Machines) 新興平台 (New Market Platforms)

圖表來源：Fugle團隊整理

# FinTech: Financial Services Innovation

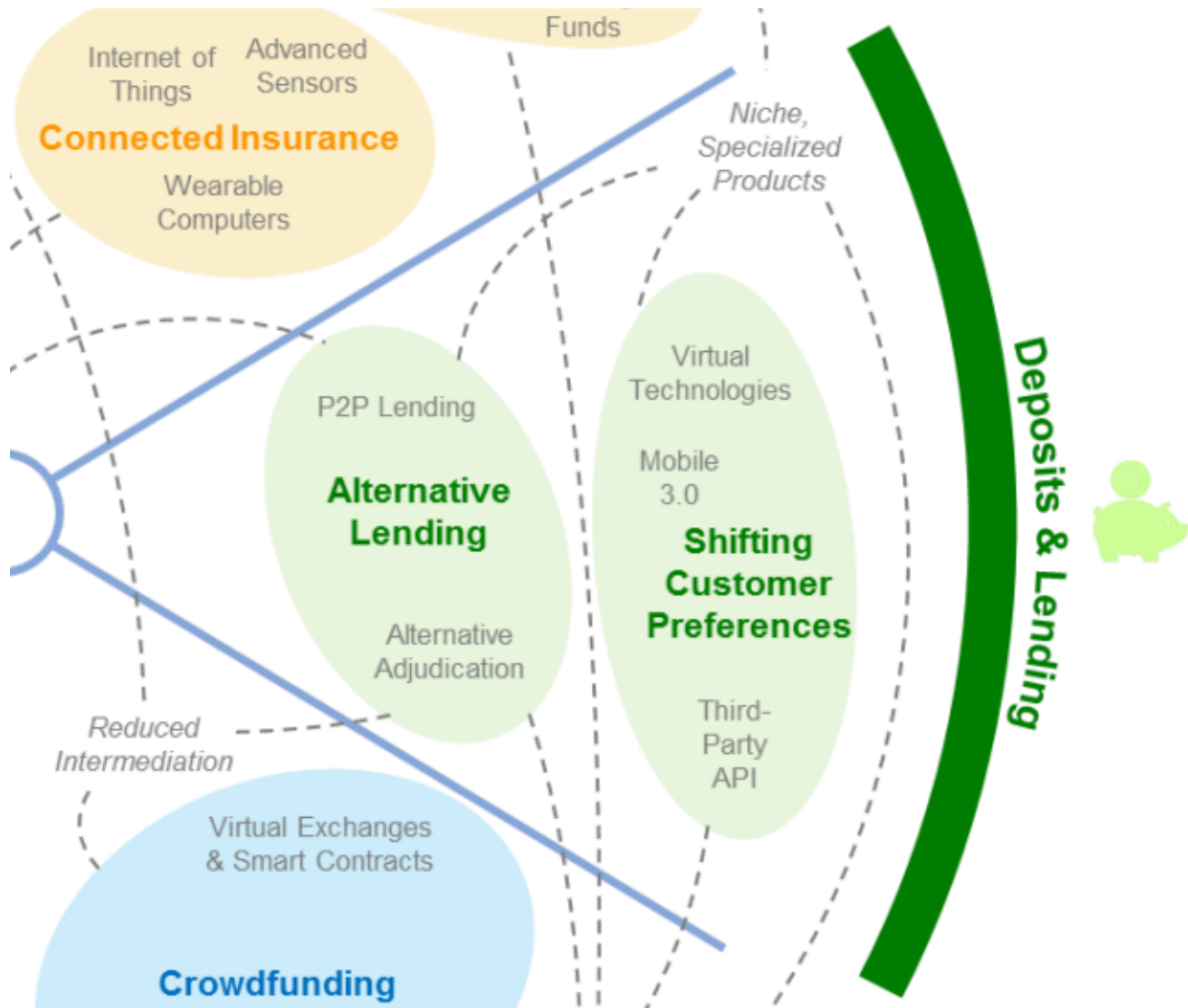


# FinTech: Cashless World Emerging Payment Rails



圖表來源：Fugle團隊整理

# FinTech: Financial Services Innovation



# FinTech: Alternative Lending

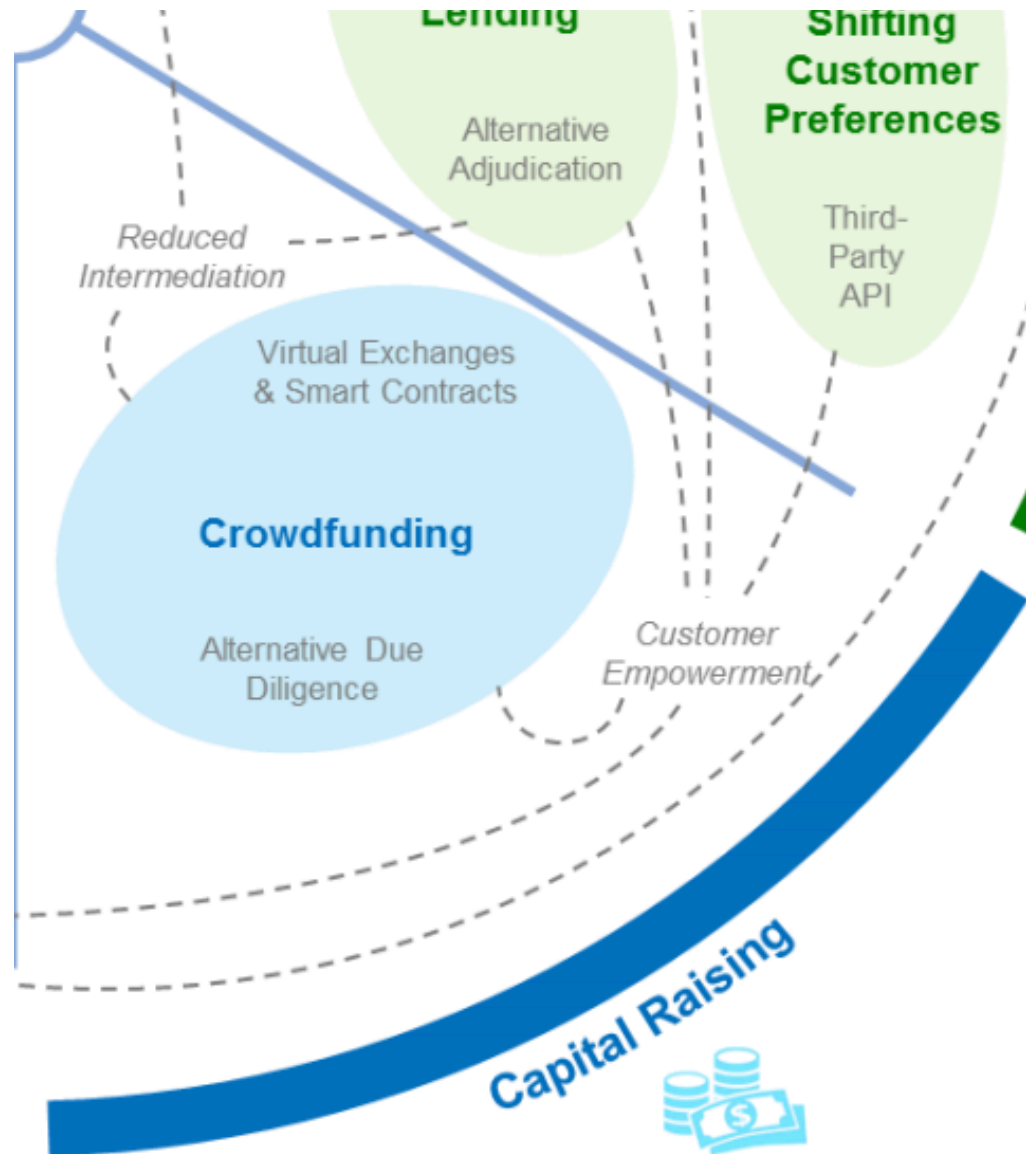
## Shifting Customer Preferences



圖表來源：Fugle團隊整理



# FinTech: Financial Services Innovation



# FinTech: Crowdfunding



圖表來源：Fugle團隊整理



# Fintech: Financial Technology

## Disrupting Banking: The Fintech Startups That Are Unbundling Wells Fargo, Citi and Bank of America

# Fintech: Unbundling the Bank

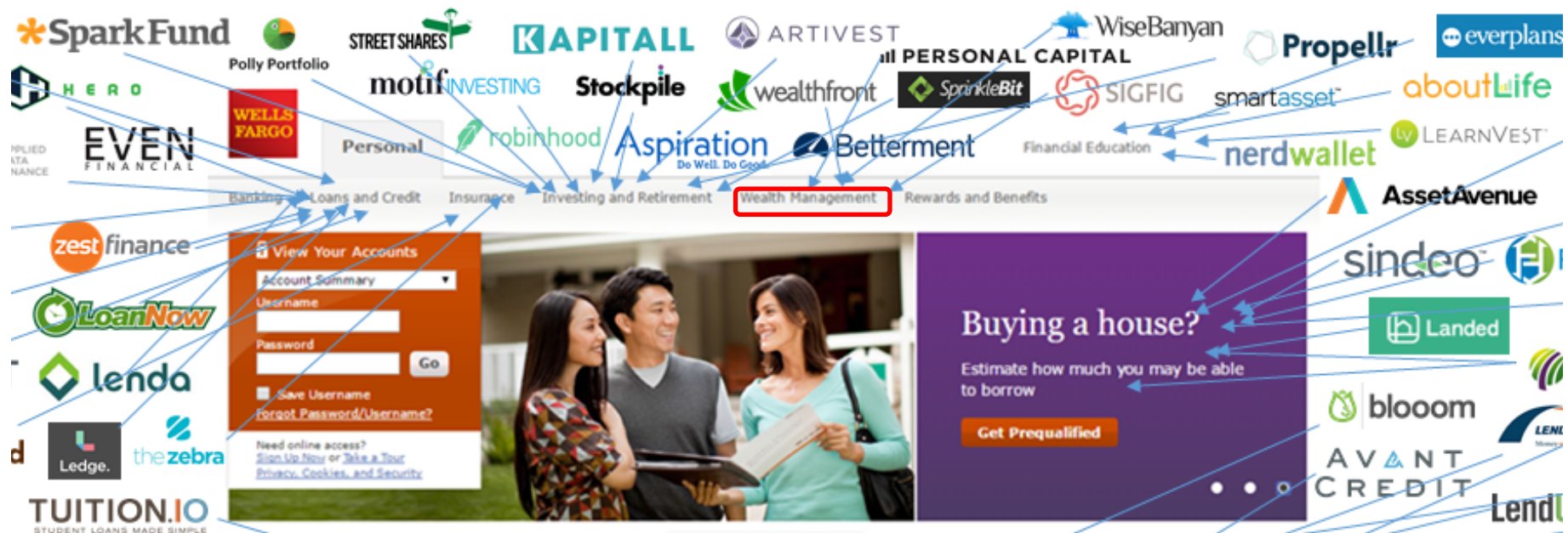
## Unbundling of a Bank



# Fintech: Unbundling the Bank

## Wealth Management: Wealthfront

### Unbundling of a Bank



**Fintech: Financial Technology**

**Disrupting**

**European Banking:**

**The FinTech Startups**

**That Are Unbundling**

**HSBC, Santander, and**

**BNP**

# Unbundling of a European Bank

The image illustrates the unbundling of a European bank, specifically HSBC, into various fintech services. The central focus is the HSBC website, which is surrounded by numerous other financial services. Arrows point from various logos to specific sections of the HSBC website, showing how different services are being unbundled.

**Logos and Services:**

- Top Row:** SavingGlobal, borro, Bondora, Zopa, Lending Works, prêt d'union, Lendico, fruitful, LANDBAY, Property Partner, wonga, Spotcap, Funding Circle, FINEXKAP, fleximize, iwoca, capiota, HOLVI, Trade River, Ebury, Lydia, jusp, ensygnio, payleven.
- Second Row:** ffrees, osper, CENTRALWAY, SQUIRREL, nutmeg, wikifolio, eToro, tink, CAPITAL, Money Dashboard, moni, transferGo, worldremit, azimo, CurrencyFair, Klarna, adyen, sum up, iZettle, BILLPAY, GOCARDLESS, PAYMILL.
- Central Focus:** HSBC website with sections for:
  - Personal, Business, Search, Internet Banking, Log on, Register
  - Everyday banking, Borrowing, Investing, Insurance, Planning
  - Send money overseas in a few clicks
  - Find a mortgage, Our lowest ever loan rate, Save Together offer, International money transfer
  - Business Banking, Commercial Banking, Corporate Banking, International Business, Online Services
  - Discover products and services for your banking needs
  - Get in touch, Call us on 0800 731 8904, Find a branch, Retrieve application



# Unbundling of a European Bank

The image illustrates the concept of 'unbundling' a traditional European bank into specialized fintech services. It features a central screenshot of the HSBC website, with various fintech logos arranged around it, connected by yellow arrows indicating their specific service areas.

**Logos and Services:**

- Top Row:** SavingGlobal, ffrees, osper, CENTRALWAY, SQUIRREL, nutmeg, wikifolio, eToro.
- Second Row:** borro, Bondora, HSBC (Personal/Business tabs), Everyday banking (Accounts & services), Borrowing (Loans & mortgages), Investing (Products & analysis), Insurance (Property & family), Planning (for now & the future), tink, CAPITAL.
- Third Row:** zopa, LENDING WORKS, prêt d'union, Lendico, fruitful, Find a mortgage, Our lowest ever loan rate, Save Together offer, International money transfer, Money Dashboard, mōni.
- Fourth Row:** LANDBAY, LendInvest, auxmoney, lendstar, TransferWise, worldremit, azimo, CurrencyFair.
- Fifth Row:** Property Partner, wonga.com, the currency cloud, HSBC (Business Banking/Commercial Banking/Corporate Banking/International Business/Online Services), CB INSIGHTS, Klarna, adyen.

**Central Website Content:**

**Send money overseas in a few clicks**  
It's secure, quick and easy. See just how much we could save you.  
Fees may apply. Payments may also incur agency and/or beneficiary bank fees. [Find out more](#)

**Find a mortgage** | **Our lowest ever loan rate** | **Save Together offer** | **International money transfer**

**Business Banking** (Turnover up to £2m) | **Commercial Banking** (Turnover £2m to £30m) | **Corporate Banking** (Turnover in excess of £30m) | **International Business** | **Online Services**

**Every business has its own story**

# References

- Frederic S. Mishkin (2015), “The Economics of Money, Banking and Financial Markets”, 11th Edition, Pearson
- Susanne Chishti and Janos Barberis (2016), “The FINTECH Book: The Financial Technology Handbook for Investors, Entrepreneurs and Visionaries”, Wiley.
- Paolo Sironi (2016), “FinTech Innovation: From Robo-Advisors to Goal Based Investing and Gamification”, Wiley.