



TECHNOLOGY AND FINANCIAL MARKETS

ANTHONY NEOH, QC, SC

20th Central Bank
Conference on
Microstructures of
Financial Markets
12 Sept 2025

AAIL ASIAN
ACADEMY OF
INTERNATIONAL
LAW

Our Journey Today

1. Darwin's Lens on Markets
2. The Evolution of Informational Norms
3. Crises & Regulatory Responses
4. FinTech AI & Global Policies

Darwin's Evolutionary Principles in Markets

"One general law, leading to the advancement of all organic beings, namely, multiply, vary, let the strongest live and the weakest die."

— Charles Darwin, *On the Origin of Species*

"Those communities which included the greatest number of the most sympathetic members would flourish best, and rear the greatest number of offspring."

— Charles Darwin, *The Descent of Man*

Darwin's principles of natural selection provide a powerful framework for understanding financial markets:


The first quote illustrates the competitive nature of markets, where innovation and adaptation determine which financial instruments, institutions, and practices survive.


The second quote highlights the equally important role of cooperation and collaboration in market systems, suggesting that markets function best when participants work together within established norms.


The Core Question


How effectively has human collaboration dealt with the consequences of technological progress in financial markets?

The story of Technology and Financial Markets is a story of how humankind has collaborated and dealt with the consequences of its own progress. This exploration requires us to examine the evolution of informational norms across centuries.

 Innovation drives financial markets forward, creating new opportunities and efficiencies

 Each technological advance introduces new risks and potential for market disruption

 Regulation emerges in response to market failures and information asymmetries

 This cycle of innovation, crisis, and adaptation has repeated throughout financial history

Informational Norms

Informational norms are the foundation for exploring technology and financial markets. They represent the shared expectations about how information should be collected, used, and distributed within market systems.





What Are Informational Norms?

The rules, practices, and expectations governing information exchange between market participants. These norms evolve over time as technology and markets develop.

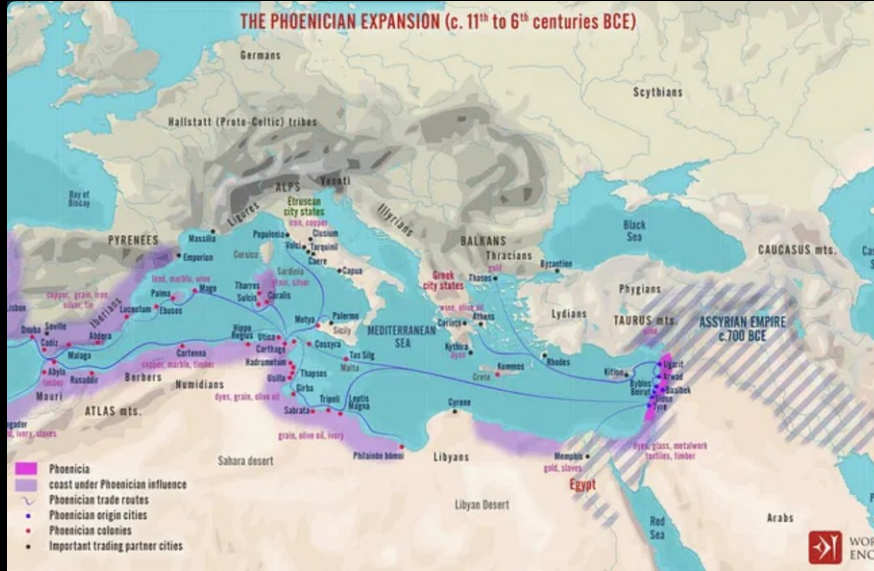
Why They Matter

Effective markets require trust and transparency. Informational norms help reduce uncertainty, facilitate transactions, and promote fair competition by establishing common expectations.

Evolution of Informational Norms

-  Ancient trading customs and early legal codes established basic expectations for honest dealing
-  Medieval and early modern markets developed more sophisticated norms through merchant customs
-  Industrial era brought formalized regulations and standardized accounting practices
-  Digital age introduces new challenges with instant global transactions and complex algorithms

Basic Informational Norms in International Trade



Phoenician trade routes and networks - early examples of international trade systems

International trade requires basic informational norms to operate effectively. Markets are places for the exchange of goods for means of payment, but trading requires a **“meeting of the minds”** between merchants - an informational commonality. This shared understanding forms the foundation of all trade relationships, from ancient times to modern global commerce.

- ✓ Assurances of quality of goods and fitness for purpose
- ✓ Agreements on delivery methods and payment terms
- ✓ Risk allocation during transport and examination rights
- ✓ Enforcement mechanisms for contracts and disputes

These elements represent the ongoing tension between innovation and risks, and how they are reconciled as civilization advances.

Ancient Trading Civilizations



The Silk Road: Ancient network of trade routes connecting East and West

Code of Hammurabi (circa 1754 BCE)

Established early contracts for loans, partnerships, and shipping, creating a proto-legal system for trade enforcement. One of the earliest examples of codified commercial norms.

Phoenicians and Carthaginians

Developed sophisticated maritime trading customs across the Mediterranean. Created standardized weights, measures, and trading practices that facilitated commerce between diverse cultures.

Pax Romana (27 BCE to 189 CE)

Roman peace enabled unprecedented trade network expansion. Standardized currency, protected trade routes, and established consistent legal frameworks across the empire.

Silk Road Trade

Developed customary usages of fairness and integrity across vast distances and diverse cultures. Gold, silver, and silk served as trusted means of payment, creating a proto-international monetary system.

Medieval to Modern Trade Law



The evolution of trade law represents one of humanity's longest collaborative efforts to establish common informational norms across diverse cultures and geographies.

Medieval European Markets

Development of the *Lex Mercatoria* (Merchant Law) – a system of customary rules and best practices that governed trade between merchants across different jurisdictions.

16th-19th Centuries

Gradual codification of merchant customs into national laws as nation-states developed more sophisticated legal systems and colonial trade expanded globally.

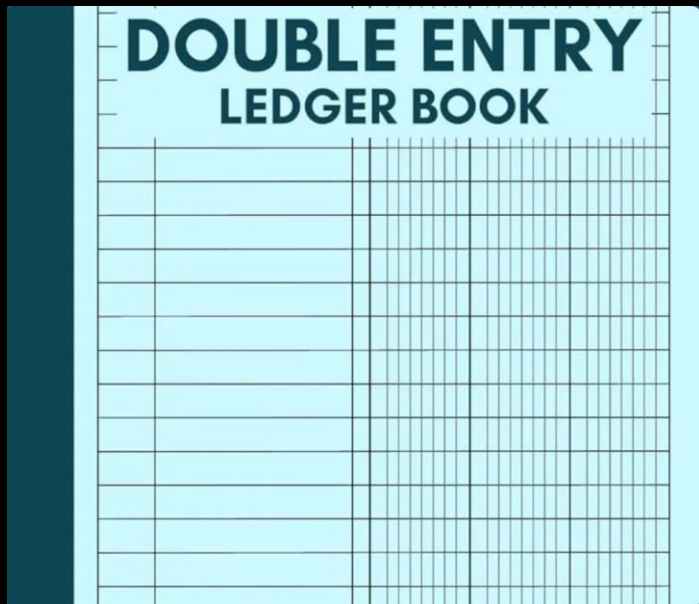
20th Century

International standardization through conventions and organizations: ICC Customs, Antwerp Visby Rules for Shipping, Baltic (BIMCO) Charter forms.

Modern Era

Comprehensive frameworks including the Convention on International Sale of Goods and UNCITRAL Rules for Commercial Dispute Resolution, creating a truly global system of trade norms.

Financial Innovation: Double Entry Accounting



In the late 15th century, Luca Pacioli's "Summa Arithmetica" formalized double entry bookkeeping, revolutionizing how businesses tracked financial information. This innovation created the foundation for modern accounting and financial reporting.

$$\text{Assets} = \text{Capital} + \text{Liabilities}$$

This elegant equation established the fundamental balance that underlies all financial statements and transactions, ensuring that accounts always remain in balance.

- ✓ Enabled merchants to track complex business operations across multiple ventures
- ✓ Created transparency and accountability in financial relationships
- ✓ Formed the basis for financial intermediation and the development of banking

Banking and Financial Intermediation

Financial intermediation is the process by which institutions channel funds between savers and borrowers, transforming short-term deposits into long-term loans, reducing transaction costs, and managing risk. The development of these institutions has been crucial to economic growth throughout history.



Banking

Banks evolved from ancient money changers and deposit takers to become sophisticated financial institutions.

1400s

Medici banking system in Renaissance Italy

1694

Bank of England established

1913

Federal Reserve System created in the US



Stock Broking

Stock exchanges developed to facilitate the trading of company shares and other securities.

1602

Amsterdam Stock Exchange founded

1773

London Stock Exchange established

1792

New York Stock Exchange founded



Insurance

Insurance companies emerged to pool and transfer risk, enabling greater economic activity.

1688

Lloyd's of London coffee house begins marine insurance

1752

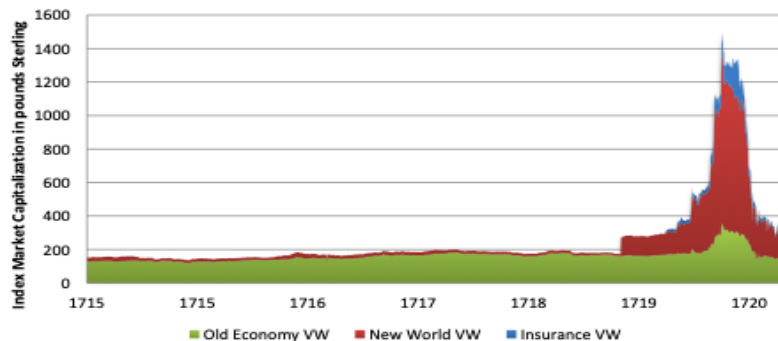
Benjamin Franklin founds first US fire insurance company

1850s

Modern life insurance industry develops

South Sea Bubble (1720)

Value-weighted British Market Capitalizations
Old Economy, New World, and Insurance Indices,
1715-1721



New Evidence on the First Financial Bubble Frehen, Goetzmann, Rouwenhorst.
Yale ICF Working Paper No. 09-04 July 27 212.

The First Major Financial Bubble

The South Sea Bubble laid bare fundamental issues relating to informational asymmetry when financial markets developed beyond the regulatory frameworks of the time.



South Sea Company Act 1720: Authorized the conversion of national debt into company shares, creating an unprecedented financial instrument without proper oversight.



Market Speculation: Share prices rose from £100 to nearly £1,000 in months, driven by misleading information, insider trading, and market manipulation by company directors.



Information Asymmetry: Company insiders possessed crucial information unavailable to ordinary investors, creating a severely unbalanced market environment.



Aftermath: When the bubble burst, thousands of investors were ruined. The crisis led to the Bubble Act, restricting the formation of joint-stock companies for over a century.

This early financial crisis demonstrated how information disparities could undermine market integrity and highlighted the need for transparency in financial markets.

19th Century Company Law Reforms

The 19th century saw fundamental reforms in company law, primarily originating in the UK and later spreading to the US and continental Europe. These reforms established the modern corporate governance framework that continues to influence global business practices today.



Limited liability protection separated company obligations from personal assets of shareholders, encouraging investment and risk-taking



Standardized incorporation processes replaced special charters, democratizing access to corporate structures



Disclosure requirements increased transparency and reduced information asymmetry between management and investors



Separation of ownership and control through boards of directors created new governance structures and accountability mechanisms

Timeline of Key Company Law Reforms

1844



Joint Stock Companies Act (UK)

Required registration and financial disclosure for companies

1855



Limited Liability Act (UK)

Protected shareholders from company debts beyond their investment

1862



Companies Act (UK)

Consolidated previous reforms into comprehensive framework

1875



General Incorporation Laws (US)

Allowed businesses to incorporate without special legislative approval

1884



European Reforms

Similar reforms adopted across continental Europe

Accounting Professionalization

LEDGER BOOK

001





MONTH
YEAR

NO	DATE	DESCRIPTION	DEBIT	CREDIT	BALANCE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

Standardized accounting practices create a common financial language that enables investors, regulators, and the public to make informed decisions based on comparable information.

The professionalization of accounting emerged as a response to growing market complexity and the need for reliable financial information. As businesses expanded globally, standardized accounting practices became essential for maintaining trust in financial markets.

Key Developments in Accounting Standards

-  **1880s-1900s:** Formation of professional accounting bodies in the UK and US, establishing formal qualifications and ethical standards
-  **1930s:** Securities Acts in the US mandated independent audits and financial statement standards following the Great Depression
-  **1973:** International Accounting Standards Committee (IASC) formed to develop global accounting standards
-  **2021:** International Sustainability Standards Board (ISSB) established to develop global sustainability disclosure standards

These developments have progressively reduced information asymmetry in markets by ensuring financial statements are prepared according to consistent, transparent principles that accurately reflect economic reality.

US New Deal Securities Legislation



Securities and Exchange Commission (SEC)

[si-'kyūr-ə-tēs ən(d) iks-'chānj kə-'mi-shən]

An independent federal government regulatory agency responsible for protecting investors, maintaining fair and orderly functioning of the securities markets, and facilitating capital formation.

Following the 1929 stock market crash and the Great Depression, the US government implemented sweeping reforms to restore public confidence in financial markets and prevent future crises through increased transparency and oversight.



Securities Act of 1933

Often called the "Truth in Securities" law, this act had two primary objectives:

- ✓ Require that investors receive significant financial information concerning securities being offered for public sale
- ✓ Prohibit deceit, misrepresentations, and other fraud in the sale of securities



Securities Exchange Act of 1934

Created the Securities and Exchange Commission (SEC) and empowered it to:

- ✓ Register, regulate, and oversee brokerage firms, transfer agents, and clearing agencies
- ✓ Require periodic reporting by companies with publicly traded securities
- ✓ Regulate proxy solicitations and tender offers

International Standards Bodies



Global financial markets require consistent standards to function effectively across borders, ensuring transparency and reliability of financial information.

US Accounting Standards Board (FASB)

Established in 1973, sets Generally Accepted Accounting Principles (GAAP) for US companies, focusing on investor protection.

International Accounting Standards Board (IASB)

Founded in 2001, develops International Financial Reporting Standards (IFRS) adopted by over 140 countries worldwide.

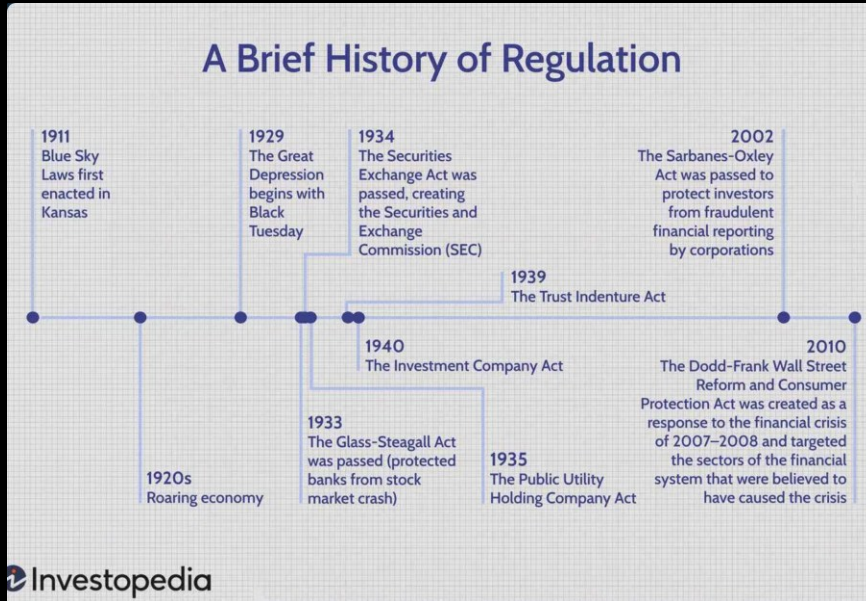
International Sustainability Standards Board

Launched in 2021, develops global sustainability disclosure standards to meet investor demand for consistent ESG reporting.

Convergence Efforts

Ongoing collaboration between standards bodies aims to reduce differences between frameworks, improving global comparability.

Financial Supervision Framework



Historical development of financial regulation and supervision

The global financial supervision architecture has evolved in response to successive crises, with each new framework addressing gaps revealed by market failures.



Basel Committee on Banking Supervision

Established in 1974, develops international standards for bank regulation. The Basel Accords (I, II, and III) progressively strengthened capital requirements, risk management, and liquidity standards for global banks.



IOSCO

International Organization of Securities Commissions, founded in 1983, brings together securities regulators from over 100 jurisdictions. Develops standards for securities regulation and facilitates cross-border cooperation.



International Accounting Standards

IAS provides the common financial language that enables consistent reporting and transparency across global markets, supporting effective supervision and investor protection.

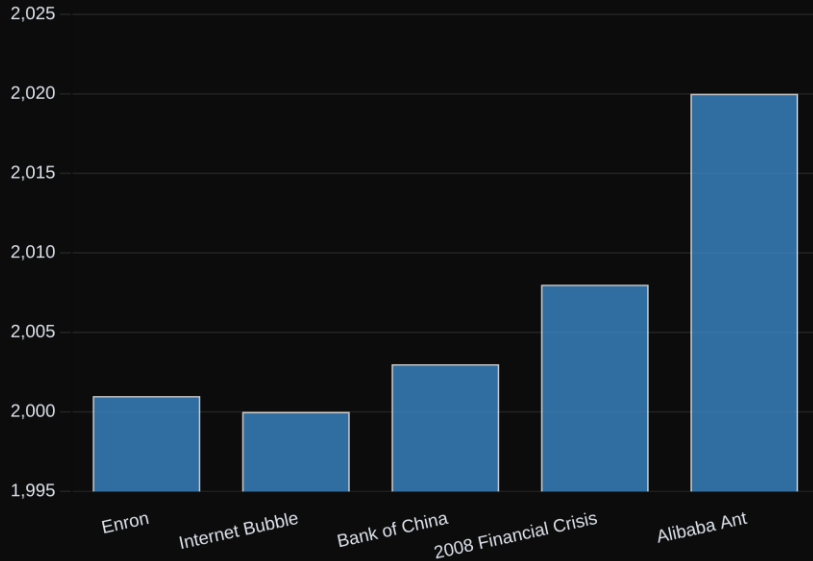


Financial Stability Board

Created in 2009 after the global financial crisis, the FSB coordinates the work of national financial authorities and international standard-setting bodies to develop and promote effective regulatory policies.

Recent Financial Debacles

Major Financial Crises Timeline



Despite advances in technology and regulatory frameworks, financial markets continue to experience significant crises. These events highlight persistent challenges in managing information asymmetry and systemic risk.

Enron Debacle (Late 1990s)

Accounting fraud and corporate governance failures led to the collapse of energy giant Enron, resulting in the Sarbanes-Oxley Act and creation of the Public Company Accounting Oversight Board (PCAOB).

Internet Bubble (1999-2001)

Excessive speculation in internet-based companies with limited revenue models led to market valuations disconnected from economic fundamentals.

2008 Financial Tsunami (2007-2009)

Complex financial instruments, inadequate risk management, and regulatory gaps triggered a global financial crisis, leading to the Dodd-Frank Act reforms.

Alibaba Ant Financial Debacle (2020)

Regulatory intervention halted what would have been the world's largest IPO, highlighting tensions between financial innovation and regulatory oversight in the fintech sector.

Fintech and AI Revolution



"A Peer-to-Peer Electronic Cash system" — Satoshi Nakamoto White Paper, 2008

The convergence of financial technology and artificial intelligence is transforming markets at an unprecedented pace, creating both new opportunities and regulatory challenges.

Blockchain & Distributed Ledger Technology

Bitcoin introduced a revolutionary "triple entry accounting system" that has evolved into diverse applications for Real World Assets (RWA) in DLT infrastructure.

AI in Financial Markets

Machine learning, large language models, and AI analytics are transforming trading, risk management, and customer service across the financial sector.

Advanced Financial Analytics

Specialized AI systems like Alpha Go, Alpha Fold, and Chaudhury Financial Analytics are creating new capabilities for market prediction and analysis.

AI Agents & Automation



Autonomous financial agents and automated systems are increasingly handling complex financial operations, raising new questions about oversight and accountability.

Global Policy Responses






Hong Kong's Balanced Approach

Hong Kong's financial system has always been based on the twin pillars of **innovation with resilience** :

-  AI policies align with UN High Level Body on AI Report (2025) and EU AI Act (2004)
-  Digital asset legislation under LEAP and ASPIRe frameworks




United States Approach

The US is at the forefront of promoting digital assets:

-  Genius Act establishing regulatory clarity for cryptocurrency
-  Executive Order 14178 - "Strengthening American Leadership in Digital Financial Technology"
-  Focus on maintaining innovation while protecting consumers

China's Focus

China's 15th Economic Plan takes a different approach:

-  Strong promotion of AI development and applications
-  Restrictive stance on private digital assets
-  Development of central bank digital currency (e-CNY)

These divergent approaches highlight how different jurisdictions are balancing innovation, stability, and control in the digital financial era.