

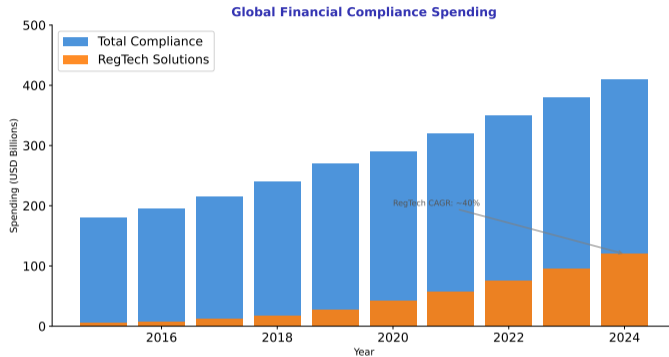
Lesson 43: RegTech Compliance

Mini-Lecture Version (30 min)

Digital Finance

Learning Objectives: Understand RegTech scope and technology applications — Analyze Basel III capital and liquidity requirements — Examine IFRS 9 expected credit loss implementation — Evaluate regulatory reporting automation (EMIR, MiFID II)

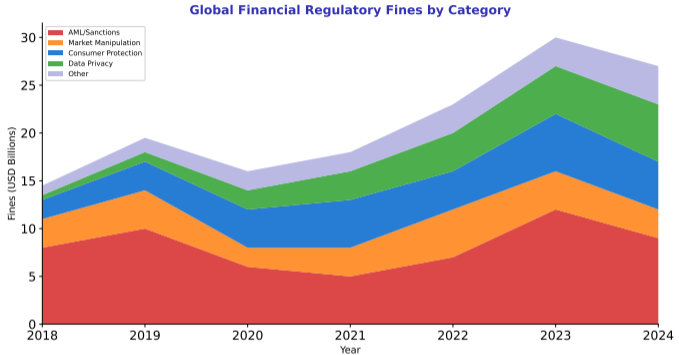
Compliance Cost Trends



Source: Deloitte, KPMG, Thomson Reuters

These trends will shape the future of RegTech Compliance.

Regulatory Fines and Penalties



This concept is fundamental to understanding RegTech Compliance.

RegTech Definition and Scope

RegTech Definition:

Use of technology (especially information technology) to enhance regulatory processes, compliance, and reporting.

Key Drivers:

- Post-2008 regulatory explosion (Dodd-Frank, MiFID II, EMIR)
- Rising compliance costs (10-15% of bank revenues)
- Manual processes prone to errors and delays
- Regulatory demands for real-time reporting
- (See full lecture for details)

RegTech Applications:

- 1 **Regulatory Reporting:** Automated data extraction and submission
- 2 **Risk Management:** Real-time risk analytics and stress testing
- 3 **Compliance:** Policy enforcement and monitoring
- 4 **Identity Management:** KYC/AML automation
- 5 **Transaction Monitoring:** Fraud and market abuse detection
- 6 **Regulatory Intelligence:** Track and interpret rule changes

Market Size:

- Global RegTech market: **\$12B** (2023), projected **\$50B+** by 2030
- 20-30% CAGR driven by regulatory complexity

Understanding this definition is foundational for RegTech Compliance.

Core Technologies:

- **Machine Learning:** AML pattern detection, risk scoring
- **Natural Language Processing:** Regulatory text parsing, contract analysis
- **Robotic Process Automation (RPA):** Data extraction from legacy systems
- **Cloud Computing:** Scalable infrastructure, vendor solutions
- **Blockchain:** Immutable audit trails, shared KYC utilities
- **Big Data:** Transaction monitoring across terabytes

Leading RegTech Vendors:

- **Compliance:** ComplyAdvantage, Chainalysis, Elliptic
- **Regulatory Reporting:** Wolters Kluwer, Moody's Analytics, ABIDE Financial
- **KYC/AML:** Refinitiv World-Check, LexisNexis, Trulioo
- **Transaction Monitoring:** NICE Actimize, SAS, Feedzai
- **Risk Analytics:** Axiom, Quantexa, Ayasdi

Build vs Buy:

- Large banks: Hybrid (build core, buy specialized)
- Regional banks: Primarily vendor solutions
- Fintechs: Cloud-native RegTech-as-a-Service

This concept is fundamental to understanding RegTech Compliance.

Historical Context:

- **Basel I (1988):** Simple risk weights by asset class
- **Basel II (2004):** Internal models, three pillars
- **Basel III (2010):** Post-crisis reforms
- **Basel III Finalization (2017):** Output floor, standardized approach revisions

Three Pillars:

- 1 **Minimum Capital:** CET1, Tier 1, Total Capital ratios
- 2 **Supervisory Review:** Stress testing, Pillar 2 add-ons
- 3 **Market Discipline:** Public disclosure requirements

Capital Adequacy Ratios:

- **CET1 Ratio:** $\geq 4.5\%$ (Core equity / RWA)
- **Tier 1 Ratio:** $\geq 6\%$ (CET1 + AT1 / RWA)
- **Total Capital Ratio:** $\geq 8\%$ (Tier 1 + Tier 2 / RWA)
- **Capital Conservation Buffer:** 2.5% above minimums
- **Countercyclical Buffer:** 0-2.5% (jurisdiction-specific)
- **G-SIB Surcharge:** 1-3.5% for systemically important banks

Effective CET1 Requirement (G-SIB):

$$4.5\% + 2.5\% + 1\% + 2.5\% = 10.5\% \text{ CET1}$$

(Minimum + Conservation + Countercyclical + G-SIB)

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Risk-Weighted Assets (RWA) Calculation

Credit Risk RWA:

Standardized Approach:

- Fixed risk weights by exposure class
- AAA-AA: 20
- Residential mortgages: 35
- Corporate: 100
- (See full lecture for details)

IRB Approach (Internal Ratings-Based):

$$RWA = K \times 12.5 \times EAD$$

where K = capital requirement function of PD, LGD, M

$K =$

$$[LGD \times N(\sqrt{\frac{1}{1-R}} N^{-1}(PD) + \sqrt{\frac{R}{1-R}} N^{-1}(0.999)) - PD \times LGD] \times (1 + (M - 2.5)b)$$

where R = correlation, M = maturity

Market Risk RWA:

- Standardized Approach (SA): Sensitivity-based
- Internal Models Approach (IMA): Expected Shortfall
- FRTB (Fundamental Review): $RWA = 12.5 \times \text{Capital}$

Operational Risk RWA (Standardized):

$$\text{OR Capital} = \text{BIC} \times \text{ILM}$$

where BIC = Business Indicator Component, ILM = Internal Loss Multiplier

Output Floor (Basel III Finalization):

$$RWA_{IRB} \geq 72.5\% \times RWA_{Standardized}$$

Limits internal model benefit, effective January 2023 (phased to 2028)

Addressing these challenges is critical for RegTech Compliance success.

Liquidity Requirements: LCR and NSFR

Liquidity Coverage Ratio (LCR):

$$\text{LCR} = \frac{\text{High-Quality Liquid Assets}}{\text{Net Cash Outflows (30-day stress)}} \geq 100\%$$

HQLA Categories:

- **Level 1:** Cash, central bank reserves, sovereign debt (0% haircut)
- **Level 2A:** High-quality corporate/covered bonds (15% haircut)
- **Level 2B:** Lower-rated corporates, equities (50% haircut)
- **Cap:** Level 2 max 40% of HQLA, Level 2B max 15%

Net Cash Outflows:

- Retail deposits: 3-10% runoff (stable to less stable)
- Wholesale deposits: 25-100% runoff
- Committed facilities: 30-100% drawdown
- Derivatives collateral calls

Net Stable Funding Ratio (NSFR):

$$\text{NSFR} = \frac{\text{Available Stable Funding}}{\text{Required Stable Funding}} \geq 100\%$$

ASF Factors (by liability type):

- Equity, long-term debt (≥ 1 year): 100
- Stable retail deposits: 95
- Less stable retail, SME deposits: 90
- Wholesale deposits (≥ 1 year): 50
- (See full lecture for details)

RSF Factors (by asset type):

- Cash, reserves: 0
- Sovereign bonds (≥ 6 m maturity): 5
- High-quality bonds: 10-15
- Residential mortgages: 65
- (See full lecture for details)

This concept is fundamental to understanding RegTech Compliance.

Key Changes from IAS 39:

- **Incurred Loss** → **Expected Loss**: Forward-looking provisioning
- **3-Stage Model**: Based on credit deterioration
- **Lifetime ECL**: For Stage 2 and 3 assets
- **Effective Date**: January 1, 2018 (EU/IFRS jurisdictions)

Three-Stage Classification:

- 1 No significant credit deterioration since origination
- 2 Interest revenue on gross carrying amount
- 3 Significant increase in credit risk (SICR)
- 4 Not yet credit-impaired
- 5 (See full lecture for details)

3. Stage 3 (Non-Performing): Lifetime ECL

- Credit-impaired (objective evidence of default)
- Typically 90+ days past due
- Interest on net carrying amount (after provisions)

ECL Formula:

$$\text{ECL} = \text{PD} \times \text{LGD} \times \text{EAD}$$

Stage 1: 12-month PD

Stage 2/3: Lifetime PD (sum over maturity)

$$\text{Lifetime ECL} = \sum_{t=1}^T \text{PD}_t \times \text{LGD}_t \times \text{EAD}_t \times \text{DF}_t$$

where DF_t = discount factor, T = contractual maturity

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Key Takeaways

- ① Understand RegTech scope and technology applications
- ② Analyze Basel III capital and liquidity requirements
- ③ Examine IFRS 9 expected credit loss implementation
- ④ Evaluate regulatory reporting automation (EMIR, MiFID II)

Bottom Line: RegTech Compliance is transforming how financial services operate and compete.

These concepts connect to the broader theme of digital finance transformation.



Technology view



Application view



Future view

Visual representations help reinforce key concepts of regtech compliance.

Concrete Examples: Making It Real

Technical Examples

- Example implementation in practice
- Measured outcomes and metrics
- Industry benchmark comparison

Case Study

- Real-world deployment scenario
- Quantifiable results achieved

Industry Leaders

- Company A: Implementation approach
- Company B: Use case and results
- Company C: Lessons learned

Market Data

- Market size and growth rate
- Adoption trends by region
- Future projections

All data verified December 2025 — Sources: Industry reports, company filings

Quiz Questions (1–5)

Q1. What is the primary purpose of regtech compliance?

- A) Increase efficiency B) Reduce costs C) Improve access D) All of the above

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Q10. What is a key takeaway about regtech compliance?

- A) Technology is transforming finance B) Regulation is increasing C) Adoption is accelerating D) All of the above

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- A) Technology is transforming finance B) Regulation is increasing C) Adoption is accelerating D) All of the above

Answer: D – All these trends are interconnected.