ACTUS:
The Data Standard
That Enables Financial Analysis

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Financial Data Summit 2016
Washington, DC
March 29, 2016
OUTLINE

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Computers and Finance

“You can see the computer age everywhere but in the productivity statistics.”

Nobel laureate Robert Solow, July 12, 1987

Professor Solow’s observation was correct in 1987. IT at that point in time had not enabled the transformation of business processes. However, this is no longer the case. Over the past three decades Information Technology has developed:

• High-performance computing
• Digital networks with virtually unlimited bandwidth, and
• High-capacity low-cost data storage
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Information technology advances have enabled the collection and analysis of vast amounts of granular data in a large number of industries with major beneficial impact.

Manufacturing, distribution, retailing, e-commerce, healthcare, air travel, logistics and weather forecasting – have been transformed by these capabilities.

However, finance’s utilization of such capabilities has been uneven, and particularly lagging with respect to analysis for both risk management and regulatory oversight. A few glaring examples:

_Fannie Mae and Freddie Mac (the Enterprises)_

- In mid-July 2008 OFHEO issued a report informing the Congress that the Enterprises were “well capitalized.” Six weeks later the government determined that the enterprises were insolvent and put them into conservatorship.
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**The Collapse of Lehman Bros.**

- “The problems at Lehman Bros. have been known for many months. The counterparties have had ample opportunity to adjust their exposure. Therefore, we can safely let Lehman Bros. go down.”

  Treasury Secretary Henry Paulson, Sept. 16, 2008

**The London Whale**

- Jamie Dimon (CEO of JPMorgan Chase) on April 13, 2012 dismissed press accounts of possible losses on the “London Whale’s trading book as a “tempest in a teapot.” Two months later the bank booked a loss of $6.2 billion on those trades.
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• The Dodd-Frank Act pushed the clearing and settlement of swaps onto clearing houses and required the reporting of swaps data to Swaps Data Repositories (SDRs)
  
  - Vast amounts of data have been reported to the SDRs
  
  - Feb. 10, 2014 the CFTC’s TAC held a public hearing in which CFTC executives reported that the data could not be analyzed

• The reporting requirement was created without sufficient attention to the necessary data standard to make the data usable by the agency.
Why is Finance Lagging in the Application of IT for Analysis

Paradigm Shifts are Hard \(\text{------}\) Just Ask Galileo and Copernicus

The Role of the Accounting Paradigm:

• It is hard to image the success of modern economies without the development of double entry bookkeeping.

• However, accounting measures that track and roll up line-item balances of financial assets and liabilities do not support effective risk management.

• Supplementing static accounting measures with summary statistics on risk may only provide limited additional insight into the level of risk.
Why is Finance Lagging in the Application of IT for Analysis

Sticking with the old paradigm also means that there is no way to gain direct insight into

- The interconnectedness of firms in the financial markets and
- The vulnerability of the financial system to cascading failures,

(Secretary Paulson learned this when he had to rely on assumptions about the exposure of counterparties to a Lehman bankruptcy rather than having access to the actual data.)
Data standards are important because of what they enable:

• The LEI makes possible the assigning of globally unique identifiers for financial market participants, a key requirement for aggregating counterparty risks and exposures.

• Legal standards for contract terminology makes it possible to enter into legally binding agreements with a common understanding of obligations.

• Messaging standards like FpML, FIX, and ISO 20022 provide machine-readable protocols for communicating contractual parameters and terms that make possible automated clearing and settlement of large volumes of financial transactions and payments.
The Importance of Data Standards

• Regulators collect a lot of data, but most is accounting-based, and accounting is not a risk metric.
  o Accounting reports are backward-looking, not timely, and accounting standards are not applied consistently to financial data (i.e. FAS133 and fair-value accounting).
  o Inconsistent firm-level application of accounting standards makes meaningful inter-bank comparisons not possible.
  o Accounting data do not support liquidity analysis, or dynamic analysis.
  o Summary statistics hide important details needed for financial analysis.

• Both risk managers and regulators need a data standard that supports the full range of financial analysis that is critical to understanding the risks to financial institutions and markets.
The ACTUS Solution

- Collecting data alone is not sufficient for effective risk management and regulatory oversight.
- In order to independently assess the risk of financial institutions and markets, regulators must be able to analyze the collected data.
- Such an independent capability requires a data standard that supports consistent, forward-looking financial analysis.
- Such a data standard for financial instruments must be able to generate the key component for effective financial analysis: **Expected State-Contingent Cash Flows.**
Bank shall pay the sum of **$1,000** (Principal) on Jan. 1, 2013 (date) to Mr. Smith (obligor). Obligor will pay an interest of **10%** on a semi-annual basis and repay the full amount in **3 years**.

Date, Signature
The Real Agreement:
Contracts as Algorithms
The ACTUS Solution

• **Project ACTUS was initiated because there was no standard that supported financial analysis.**

• **ACTUS will realize the following objectives:**
  - Operate at the level of the individual financial contract because that is the level of granularity needed for the best and the most flexible financial analysis.
  - Represent virtually all financial obligations.
  - Clearly and precisely represent legally binding contractual obligations in mathematical/algorithmic form.
  - Include the ability to flexibly model the (stochastic) risk factors according to the need and/or judgment of the analyst.
  - Generate in a consistent way the key inputs for financial analysis – expected state-contingent cash flow of individual contracts.
The ACTUS Model

Risk factors

Markets

Counter-parties

Financial Contracts

Behavior

Input Elements

Contract Events

Analysis Elements

Liquidity

Value

LaR

Income

Sensitivity

EaR

VaR

e_1, e_2, e_3, \ldots, e_n, t
Financial contracts are the deterministic component of financial markets defining the legal obligations of the parties.

The algorithms are the logical, rule-based representation of the obligations embodied in the legal agreements.

The number of fundamental algorithm types needed to represent all financial instruments is limited.

Analysis:
With a consistent, tested and validated algorithmic representation of financial contracts, analysts can apply specific analytical assumptions and behavioral models to bear on stress scenario or stochastic analyses.
The primary components of ACTUS include:

- A Data Dictionary with more than a hundred contract terms and data elements that are necessary and sufficient to produce detailed cash flows and events for existing financial contract

- A set of 30 algorithms, called **Contract Types** (CTs), that will
  - Represent at least 97% of the financial market
  - Generate state-contingent cash flow with great precision

- “Connectors” to link CTs to the Risk Factors (Market Risk, Counterparty Risk, and Behavior Risk.)
The ACTUS Solution: Building The Future of Financial Data

www.projectactus.org

ACTUS is *open source* and *freely* available to all from the not-for-profit ACTUS Financial Research Foundation and ACTUS Users Association

Visit the website for:

- An introduction to the ACTUS Standard
- Descriptions of each Contract Type
- The ACTUS Data Dictionary
- The ACTUS Academy with online educational lectures on how to use ACTUS
- Access to the first sets of programmed algorithms, so that anyone can take ACTUS for a test drive.
Project ACTUS has benefited from the financial support of:

- The Alfred P. Sloan foundation
- Deloitte Consulting
- Stevens Institute of Technology
- Zurich University of Applied Sciences
- Brammertz Consulting GmbH
Dr. Mendelowitz, who was born and raised in Middletown, Connecticut, previously was the Co-founder and Co-leader of the Committee to Establish the National Institute of Finance (CE-NIF). He formulated and executed the legislative and communications strategies of the CE-NIF that led to the creation of the Office of Financial Research by the Dodd-Frank Act. Previously he was the Chairman and a Member of the Board of Directors of the Federal Housing Finance Board, the regulator of the Federal Home Loan Bank System. Previous assignments included serving as the Executive Director of the U.S. Congressional Trade Deficit Review Commission, a congressionally appointed, bi-partisan panel; Executive Vice President of the Export-Import Bank of the United States where he was responsible for overseeing all Export-Import Bank programs and operations; Managing Director for International Trade, Finance and Economic Competitiveness at the U.S. GAO, during which time he directed a large number of studies of the nation’s international trade and finance programs and policies, and testified before the Congress of the United States more than 140 times. Dr. Mendelowitz spent 1980 as the senior economist and representative of the Comptroller General with the Chrysler Corporation Loan Guarantee Board negotiating the terms of that Federal loan guarantee. Prior to joining the GAO he was an Economic Policy Fellow at the Brookings Institution and on the faculty of the Department of Economics of Rutgers University where he taught courses in urban and regional economics and international trade and finance. Articles by Dr. Mendelowitz have appeared in the Journal of Business, the National Tax Journal, the Journal of Policy Analysis and Management, the Financial Times, the American Banker, and other publications. Dr. Mendelowitz received an A.B. degree from Columbia University, and M.A. and Ph.D. degrees in economics from Northwestern University.

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