

POWER OF SUPPLY CHAINS

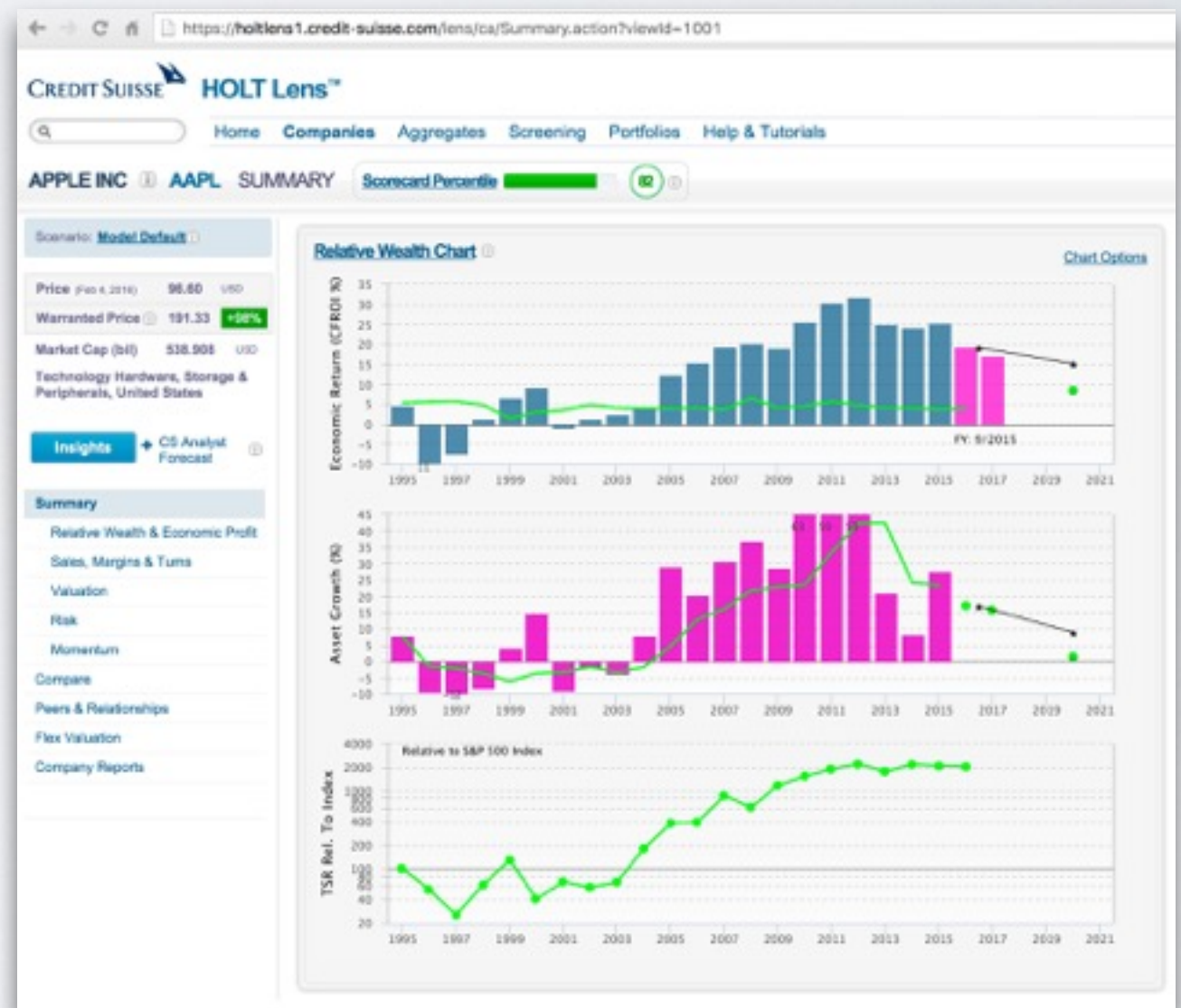
How Credit Suisse HOLT uses Python

David Matsumura

2/11/2016

CREDIT SUISSE - HOLT

- Market Commentary
- Valuation Framework
- Quantitative Data



HOW WE USE PYTHON

- Data Processing - ETL
- Custom Reports
- Research Projects



WHAT MAKES A GOOD COMPANY?

- Good Business Model?
- Inspiring Mission?
- Corporate Governance?
- Talented Employees?

SUPPLY CHAIN?

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October 13, 2014 8:45 am

Bankruptcy turns spotlight on Apple's deals with suppliers

By Tim Bradshaw in San Francisco

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1/24/2002
04:57 PM



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Now In Bankruptcy, Kmart Struggled With Supply Chain

Some software projects, intended to help, got scrubbed, sources say

At a time when discount stores such as Kohl's, Target, and Wal-Mart are recording strong sales, Kmart Corp.--the granddaddy of them all--last week declared bankruptcy. Several factors contributed to the downfall, but one of the biggest is that Kmart didn't compete on price, a failure some attribute to its inability to master supply-chain technology and, consequently, benefit from supply-chain efficiencies.

Yang, Birge, Parker: *The Supply Chain Effects of Bankruptcy*
Management Science 00(0), pp. 000-000, © 0000 INFORMS

Online Supplements to The Supply Chain Effects of Bankruptcy Management Science

S. Alex Yang

London Business School, sayang@london.edu

John R. Birge, Rodney P. Parker

University of Chicago Booth School of Business

john.birge@chicagobooth.edu, rodney.parker@chicagobooth.edu

Building a Global Supply Chain Network

- Database: Neo4j
- Data: Credit Suisse Peers
- HOLT
- Python 3.x
- Py2Neo
- Gremlin/Cypher
- Pandas, NumPy
- statsmodels

15K Nodes
120K Edges

```
clear_db = "MATCH (n) DETACH DELETE n"
merge_co = "MERGE (n:Company {name:{N}, id:{ID}, score:{S}, cfroi:{R}}) RETURN n"
merge_rel_supplier = "MATCH (n:Company {id:{N}}),(m:Company {id:{M}}) MERGE (n)-[:Supplier]->(m) RETURN n"
merge_rel_customer = "MATCH (n:Company {id:{N}}),(m:Company {id:{M}}) MERGE (n)-[:Customer]->(m) RETURN n"

def create_company(companies):
    for value in companies:
        tx.append(merge_co, {"ID": value[0], "N": value[1], "S": value[2], "R": value[3]})
    tx.process()

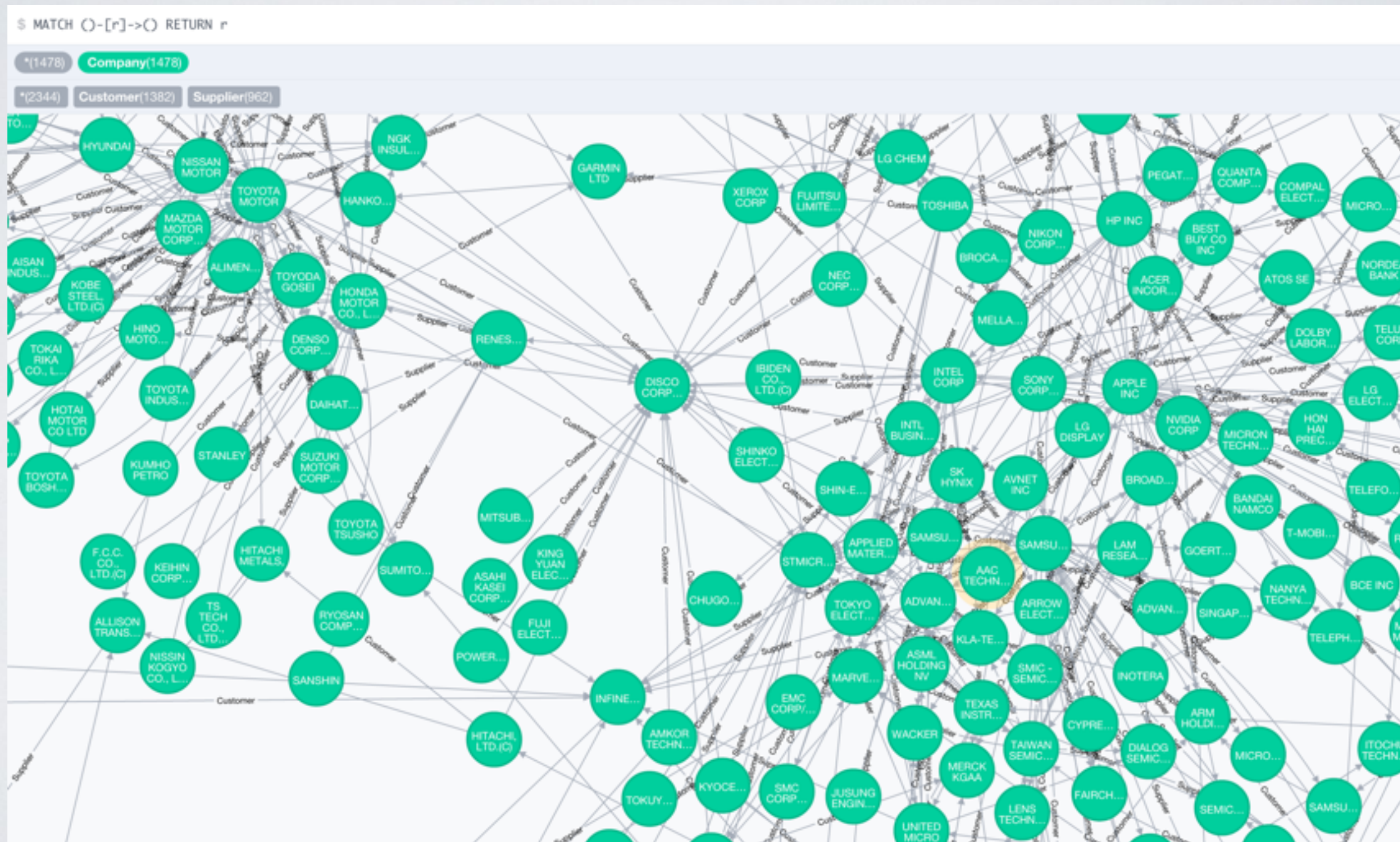
def create_supplier(suppliers):
    for value in suppliers:
        tx.append(merge_rel_supplier, {"N": value[0], "M": value[1]})
    tx.process()

def create_customer(customer):
    for value in customer:
        tx.append(merge_rel_customer, {"N": value[0], "M": value[1]})
    tx.process()

clear = graph.cypher.begin()
clear.append(clear_db)
clear.commit()
```

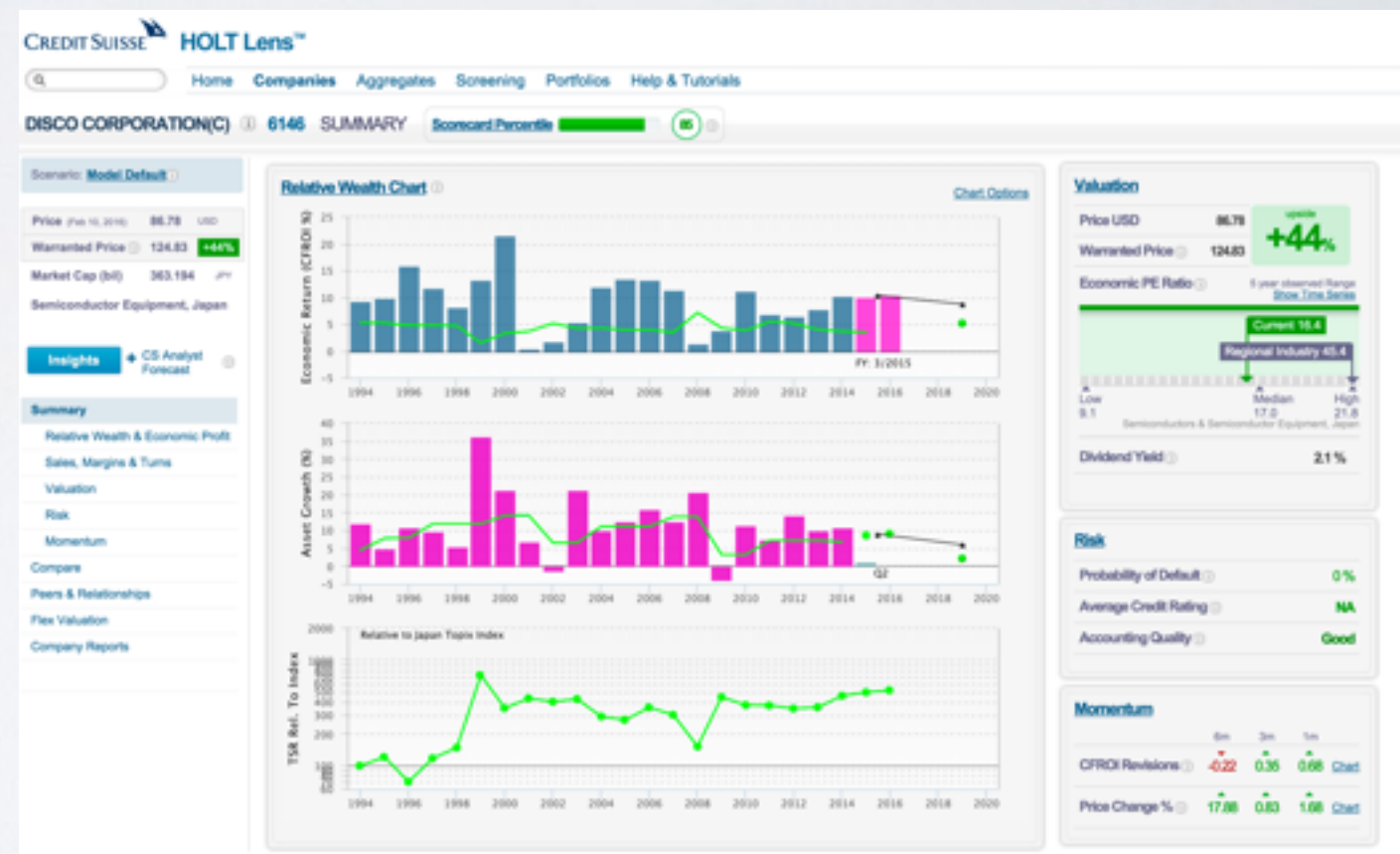


HOW TO USE IT?



COMBINE GRAPH THEORY WITH FUNDAMENTAL ANALYSIS

- Graph Theory finds companies in highly connected positions
- Fundamental Analysis finds good investment opportunities



RESEARCH

- Explore other types of connections (For Example Executive Networks)
- How does a bankruptcy spread through a supply chain
- Do closely related companies correlate on corporate performance?
Price return? Sales growth?
- Does the level of connection matter more for some industries? For larger or smaller companies?
- Do connected executives receive similar pay?
- Does the network predict anything?