

Market Risk & Liquidity Management

Jawwad Farid

alchemy.com

FinanceTrainingCourse.com

jawwad@alchemy.com

Agenda

Introductions

Challenges

Market Risk

Questions

Wrap up

Jawwad Intro



- Fellow Society of Actuaries, Investments
- MBA, Columbia Business School
- 21 years consulting: US, UK, MENA, Africa, Pakistan & Far East.
- Risk Management, Product Development, Regulatory Reporting, Actuarial Practice
- Prefers - Jawwad - (*Pronounced Javaad*)

<http://FinanceTrainingCourse.com>

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jawwad@alchemya.com

palgrave
macmillan

MODELS AT WORK JAWWAD FARID



GLOBAL FINANCIAL MARKETS

MODELS AT WORK

A Practitioner's Guide to Risk Management

JAWWAD FARID

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Market Risk

Why is risk broken?

A survey of opinions

The governance structure is broken.

Market Risk and Middle Office function is dysfunctional.

The separation between Risk and business is not working.

The best risk managers come from business.

More opinions on risk

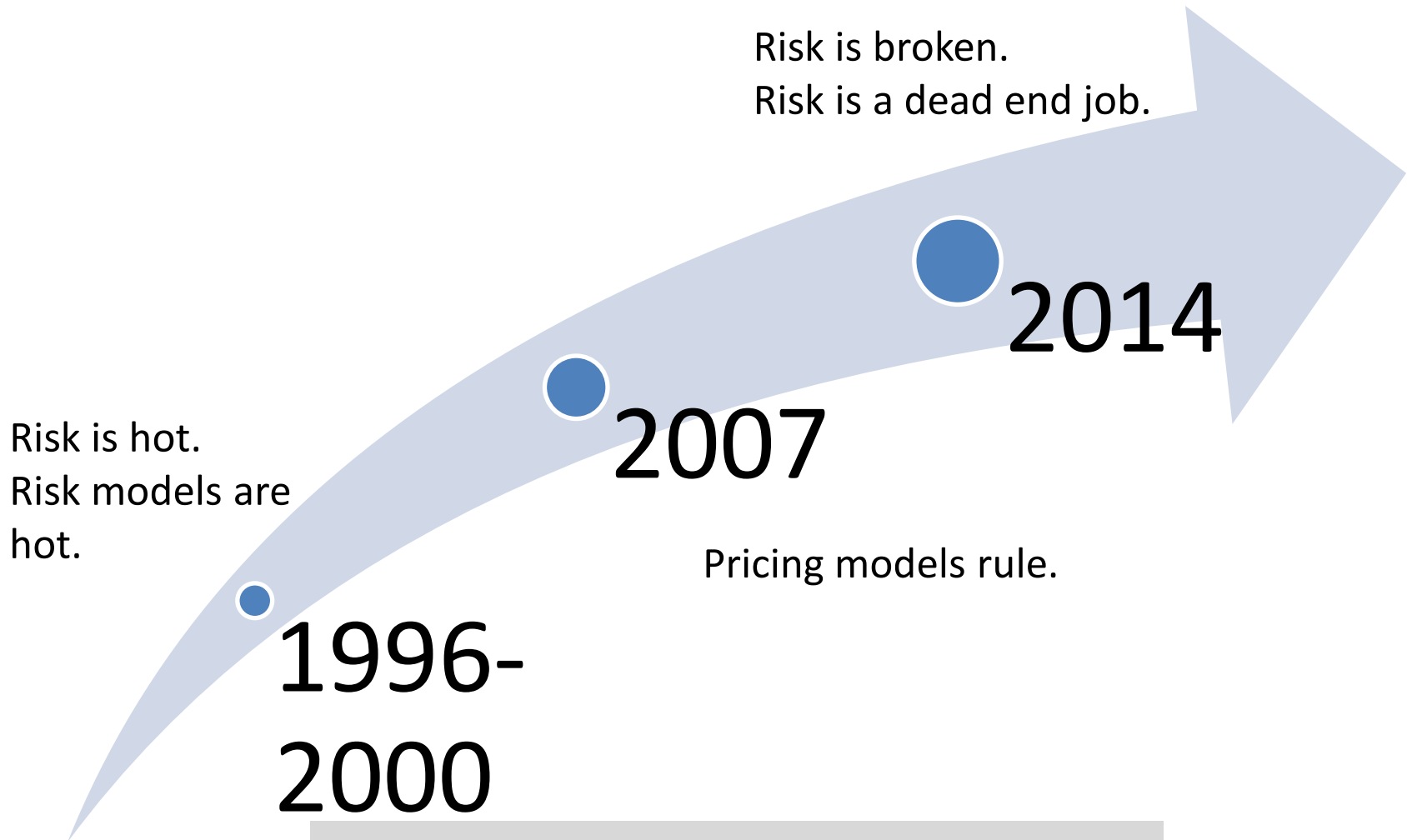
Risk is a dead end job. Can't attract the right talent.

Is volatility the right measure?

Risk is the stupid trade that should have never happened.

Pre-Trade limit enforcement.

From hot to dead end.



Top Questions

Why is risk broken?

What drives the distrust towards risk in board rooms?

What can we do to fix it?

Why is risk broken?

Non
Integrative
Risk
Management

Models vs.
Applications
vs.
Interpretation

Decoding
Volatility

Reconciling
Risk and
Financial
systems.

- Gap between practice and theory
- Validation of models

Real World Models

- Reporting lines
- Backseat driving
- Talent management

Governance

Single Source Data

Tracking Volatility

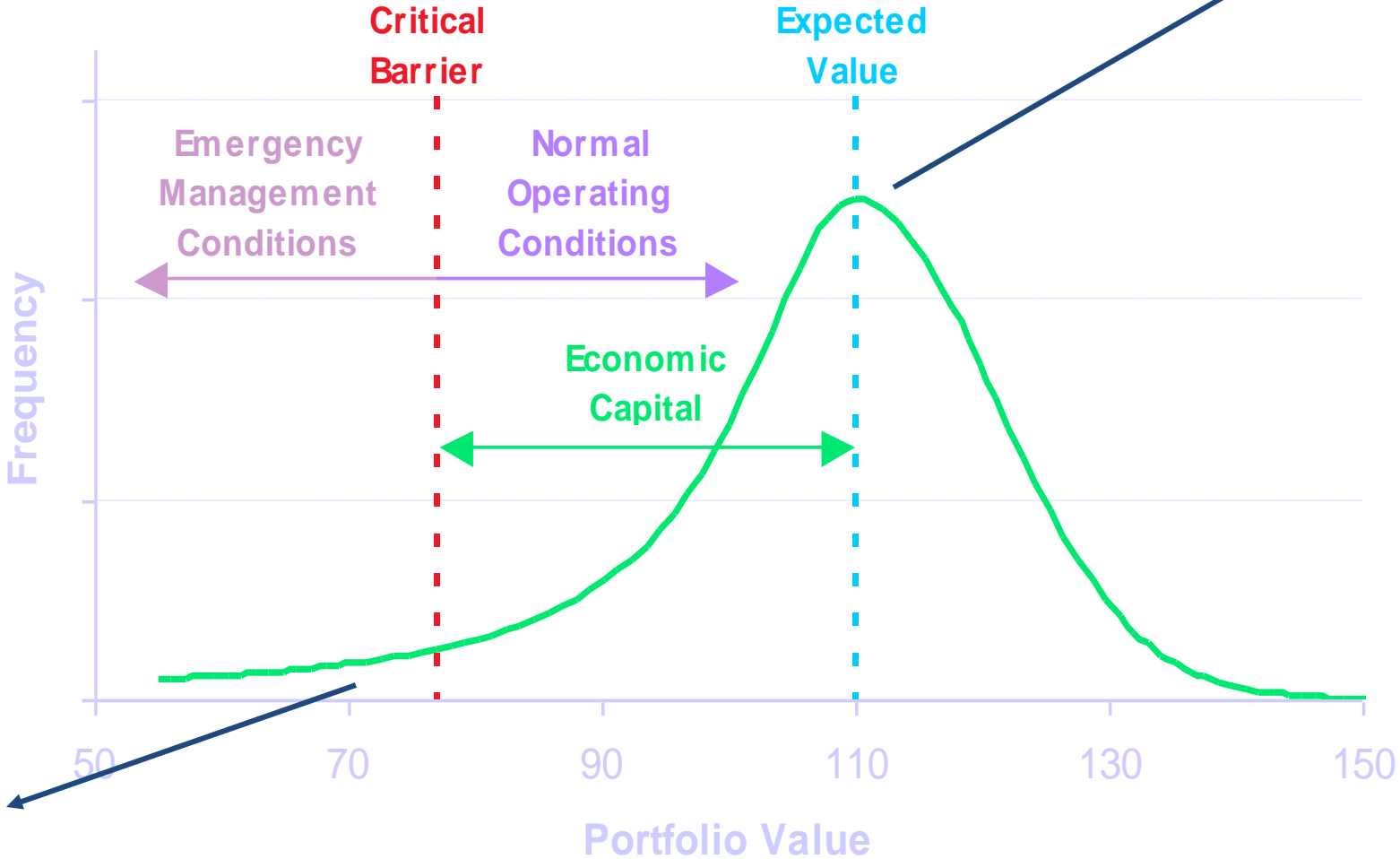
- Reconciling data with financial source systems.
- Credibility issues

- Unstable correlations
- Cyclical volatility

Capital & Distribution

Then

Distribution of Portfolio Value

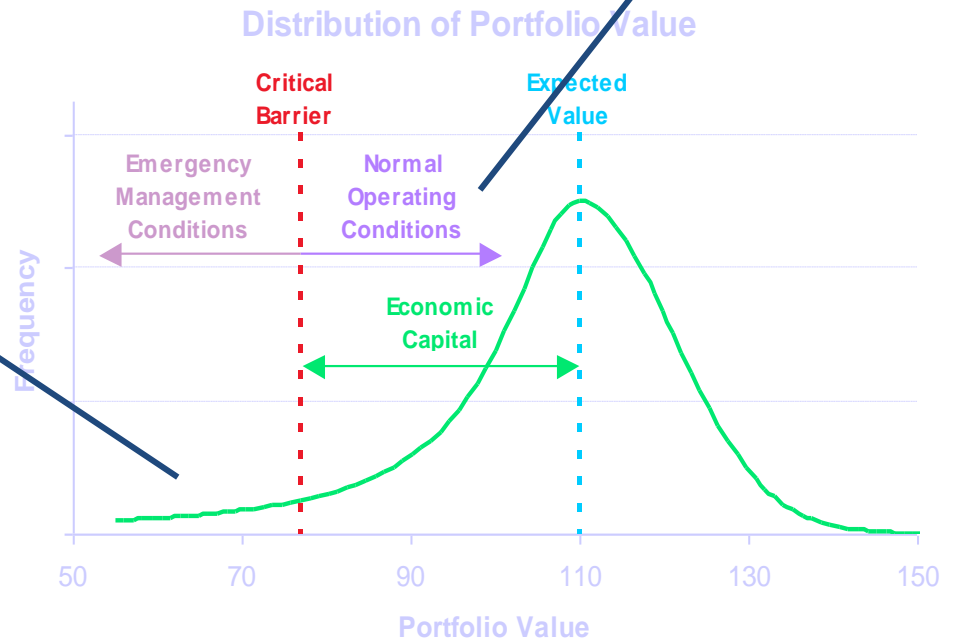


Capital & Distribution

Regulator,
Shareholders

Depositors,
Counterparties,

Rating Agencies



Real world models

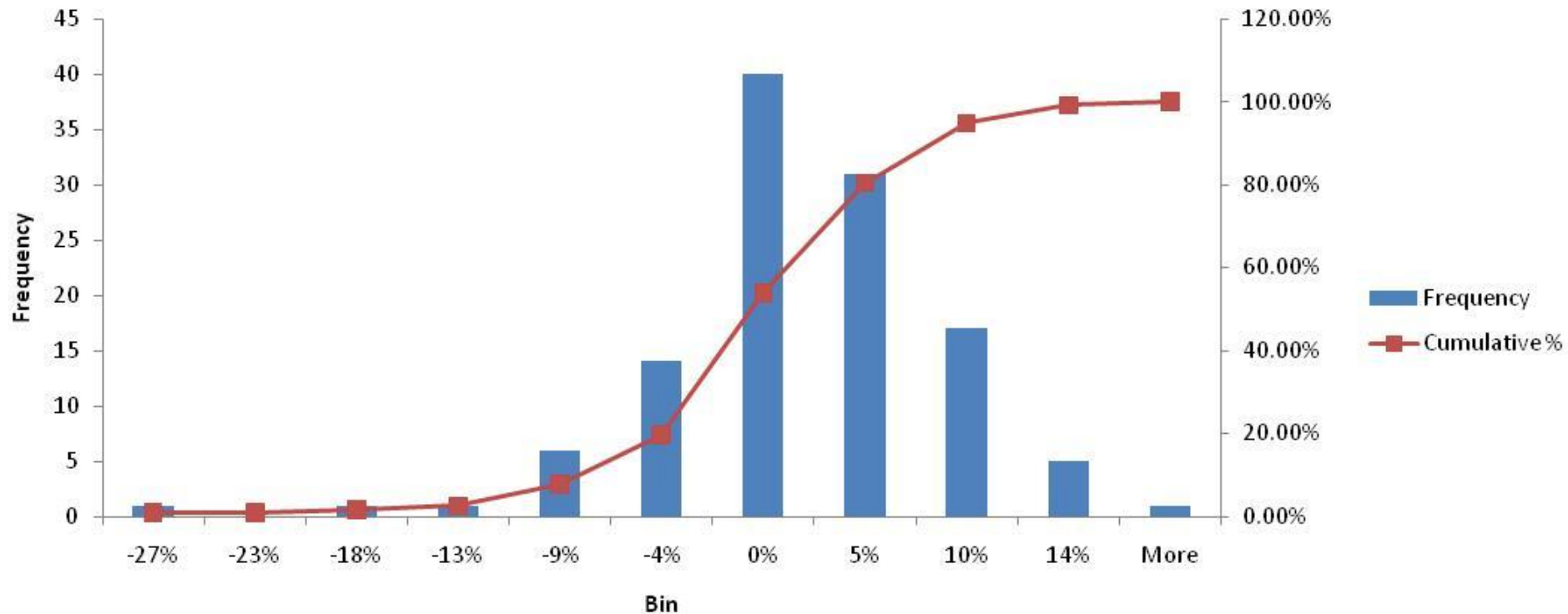
Why is risk broken?

Thought experiment - One

Correlations

Distribution & Correlations

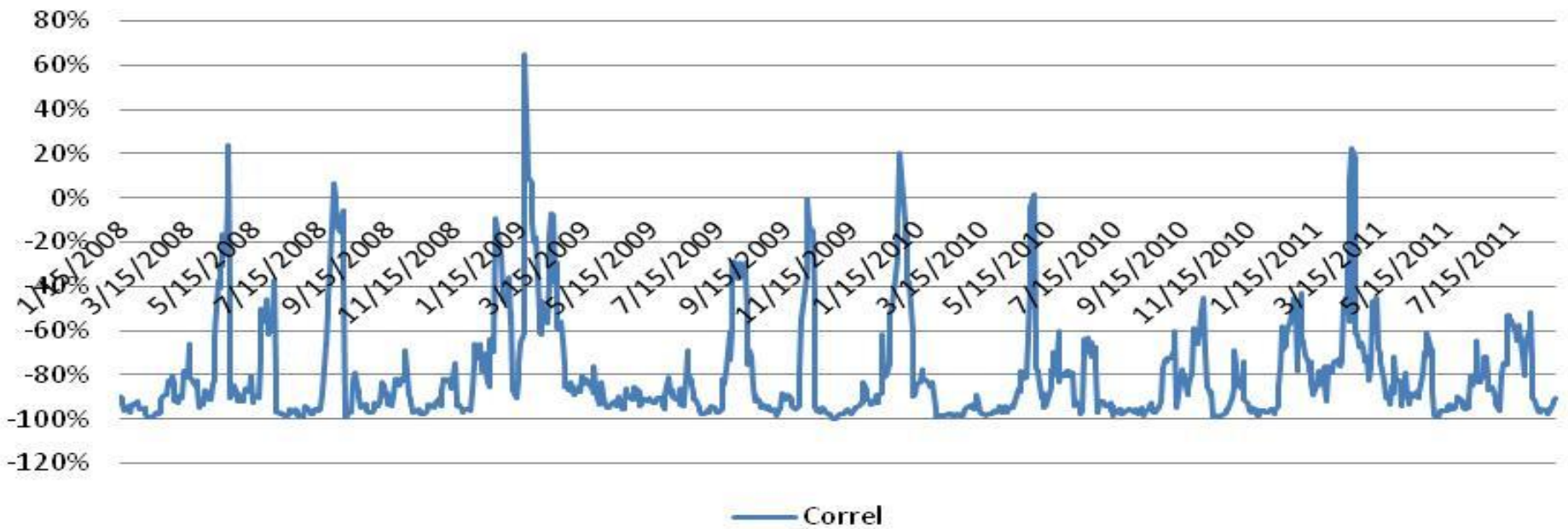
Crude Input Price Change



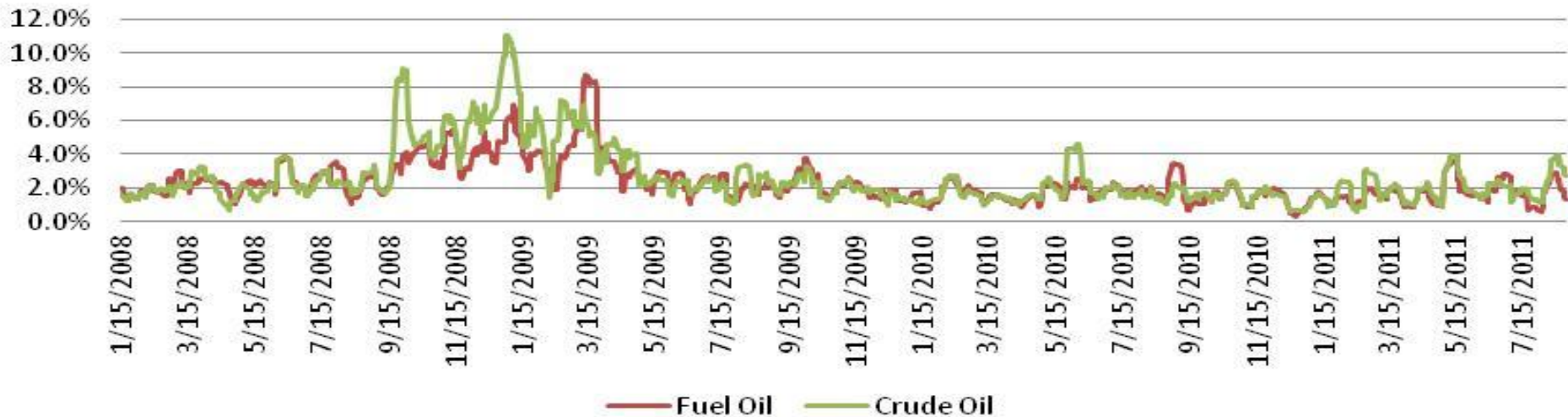
Correlations

| | | Correlation Matrix | | | |
|-----------------|--|---------------------------|------------|-------------|-----------------|
| | | Fuel Oil | WTI | Gold | Jet Fuel |
| Fuel Oil | | 1.0000 | 0.8969 | 0.1690 | 0.9681 |
| WTI | | 0.8969 | 1.0000 | 0.1307 | 0.8816 |
| Gold | | 0.1690 | 0.1307 | 1.0000 | 0.1205 |
| Jet Fuel | | 0.9681 | 0.8816 | 0.1205 | 1.0000 |

Correl b/w Fuel Oil / Crude Oil



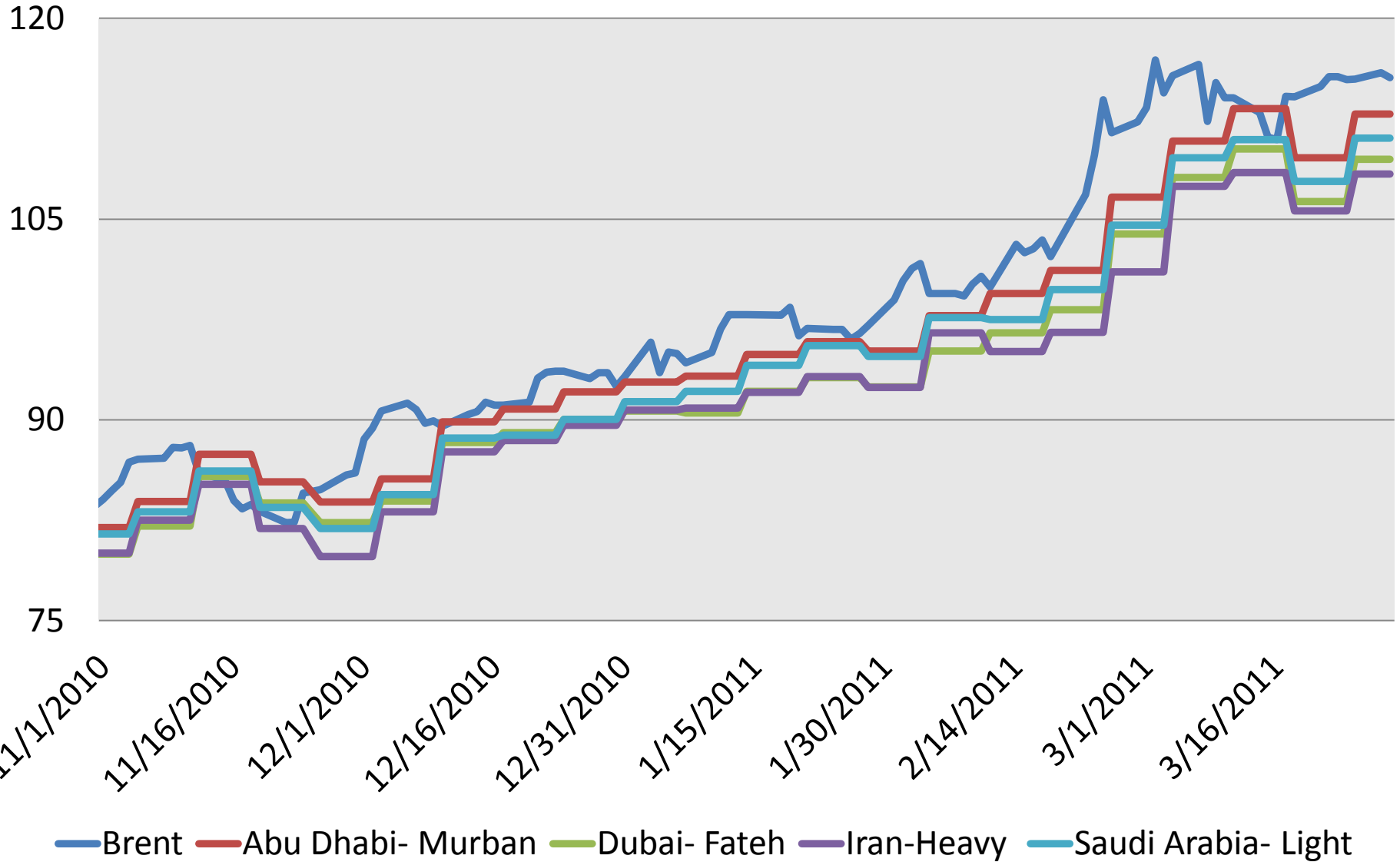
Trailing Vol



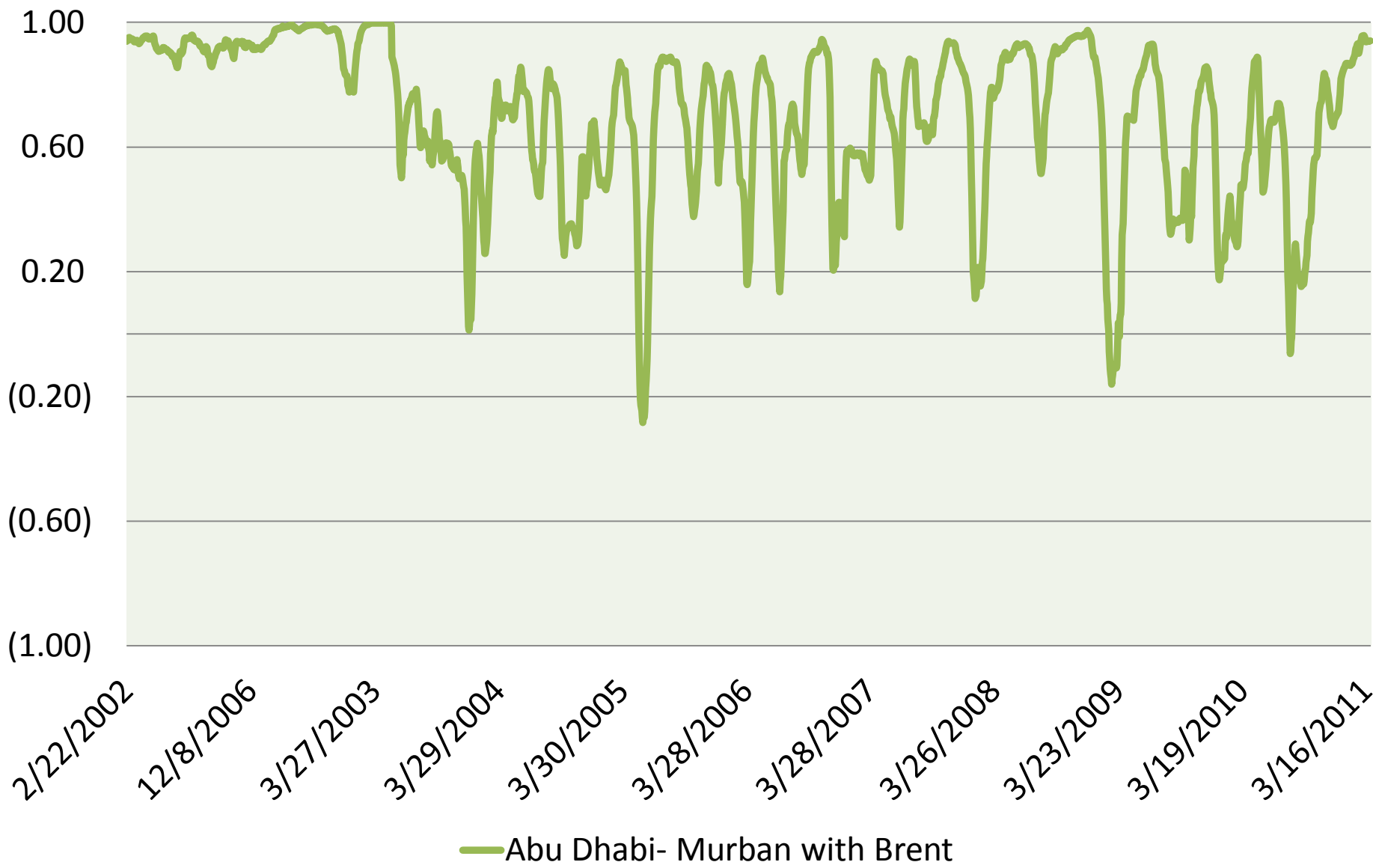
The right blend - correlations

| | Brent | Abu Dhabi-Murban | Dubai-Fateh | Iran-Heavy | Saudi Arabia-Light |
|--------------------|--------------|-------------------------|--------------------|-------------------|---------------------------|
| Brent | 1.000 | 0.995 | 0.993 | 0.994 | 0.995 |
| Murban | 0.995 | 1.000 | 0.999 | 0.997 | 0.997 |
| Fateh | 0.993 | 0.999 | 1.000 | 0.998 | 0.998 |
| Iran Heavy | 0.994 | 0.997 | 0.998 | 1.000 | 0.999 |
| Saudi Light | 0.995 | 0.997 | 0.998 | 0.999 | 1.000 |

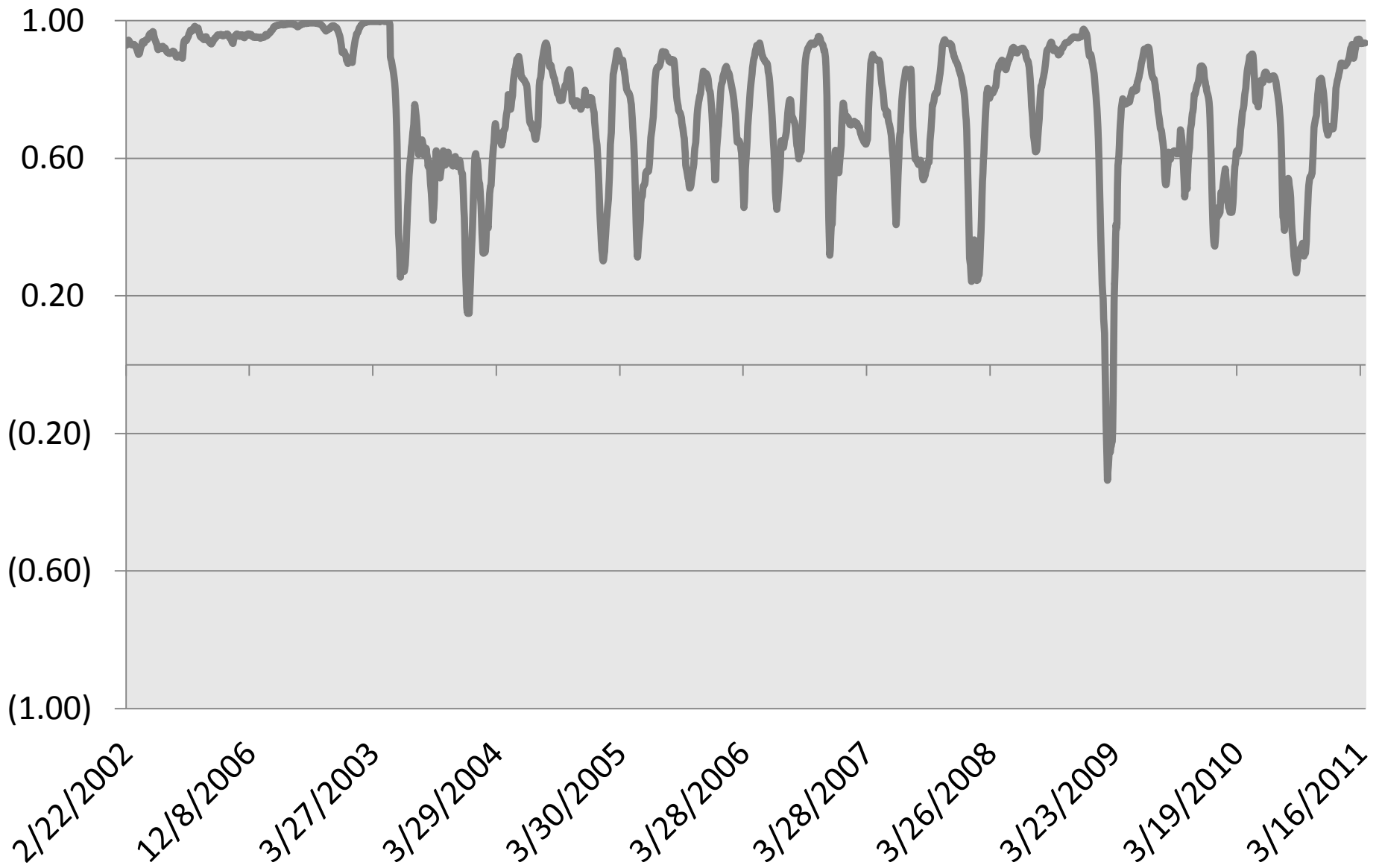
Crude Oil Blends - Prices



Correlation Abu Dhabi- Murban with Brent

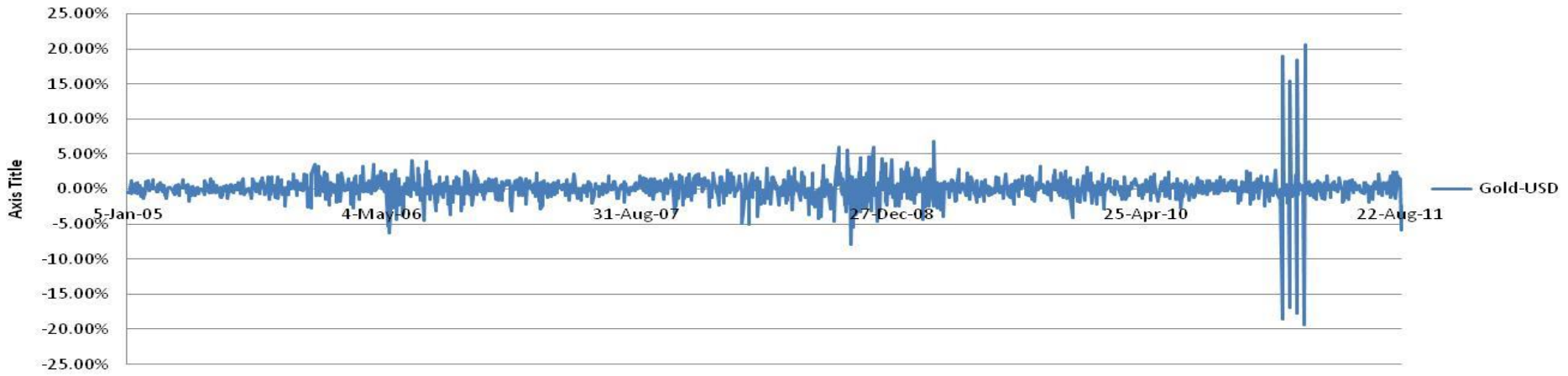


Correlation - Saudi Arabia- Light with Brent

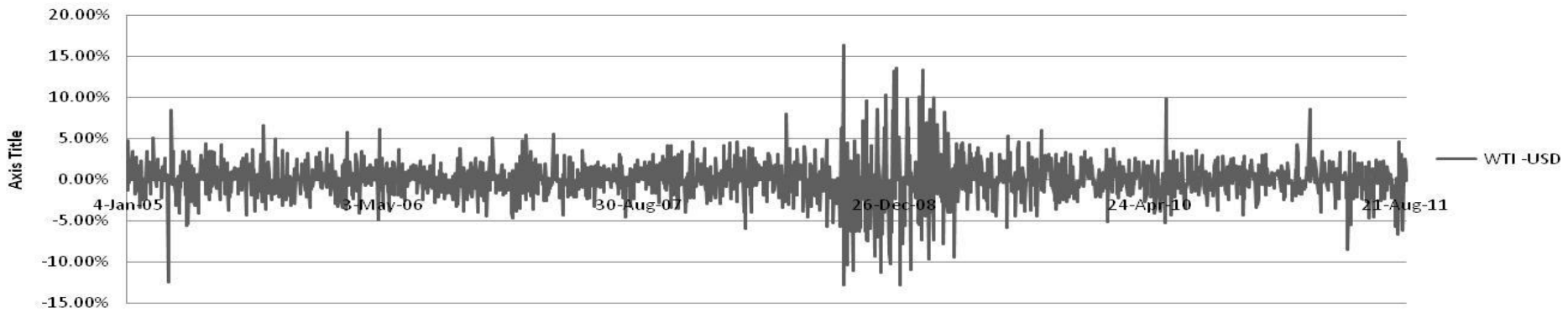


Thought experiments- Two

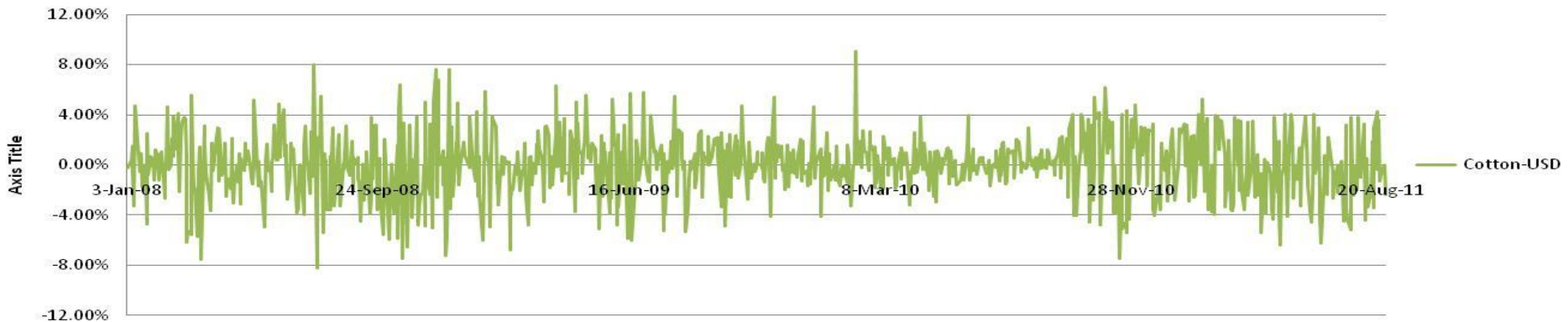
Change in the Value of Gold (US Dollar Amount)- oilinsights.net



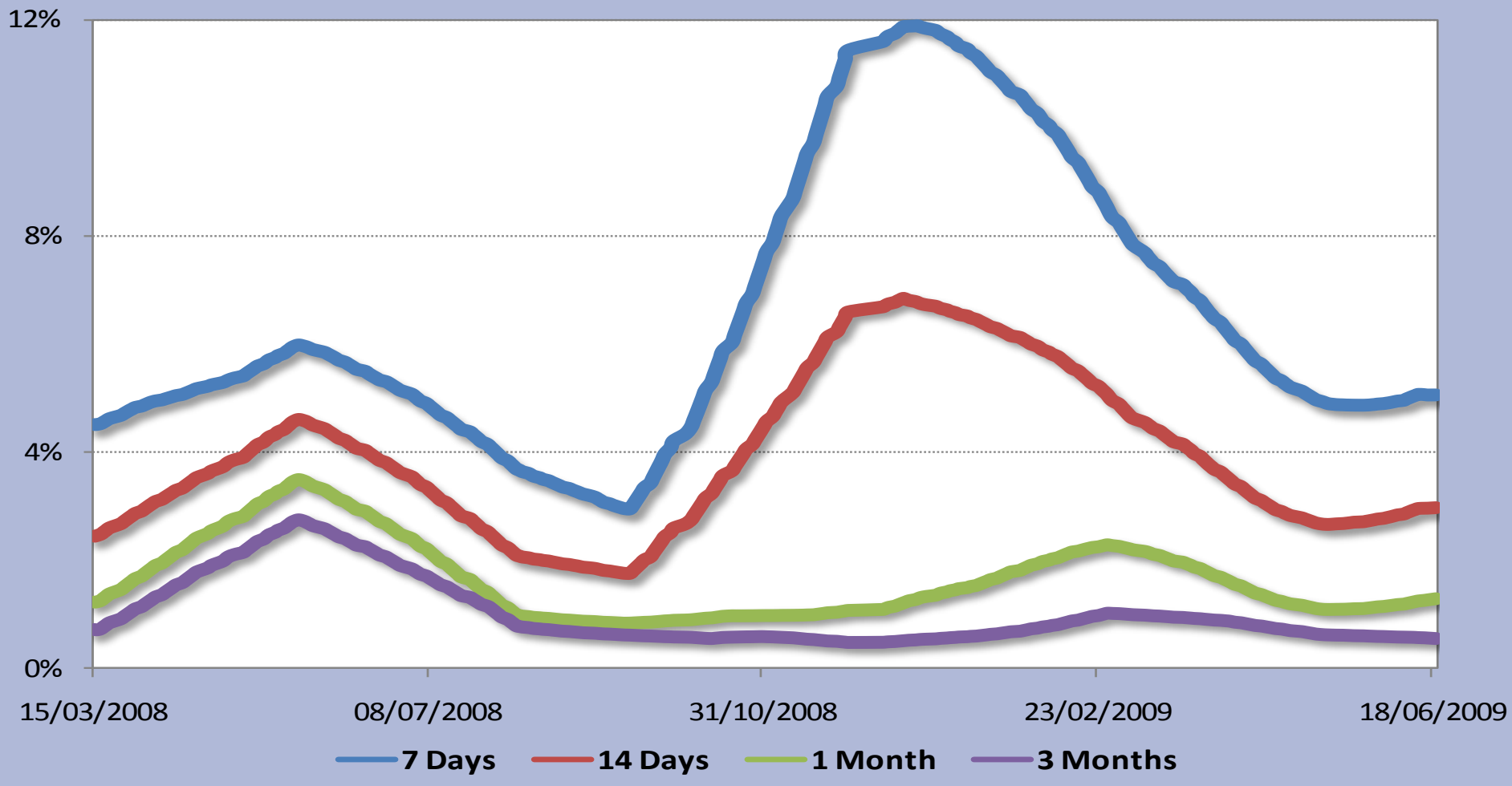
Change in the Value of WTI (US Dollar Amount)- oilinsights.net



Change in the Value of Cotton (US Dollar Amount)- oilinsights.net

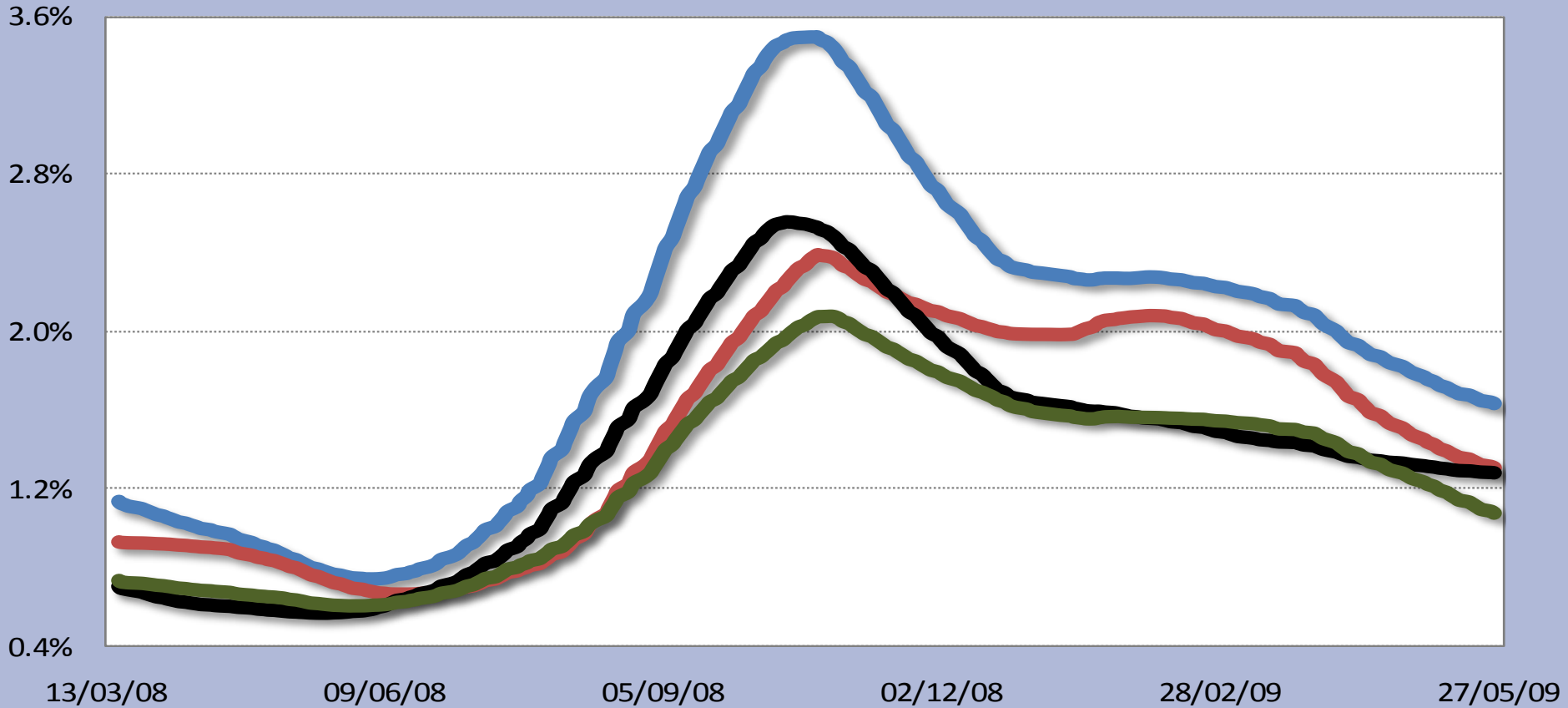


Interest Rates - Volatility

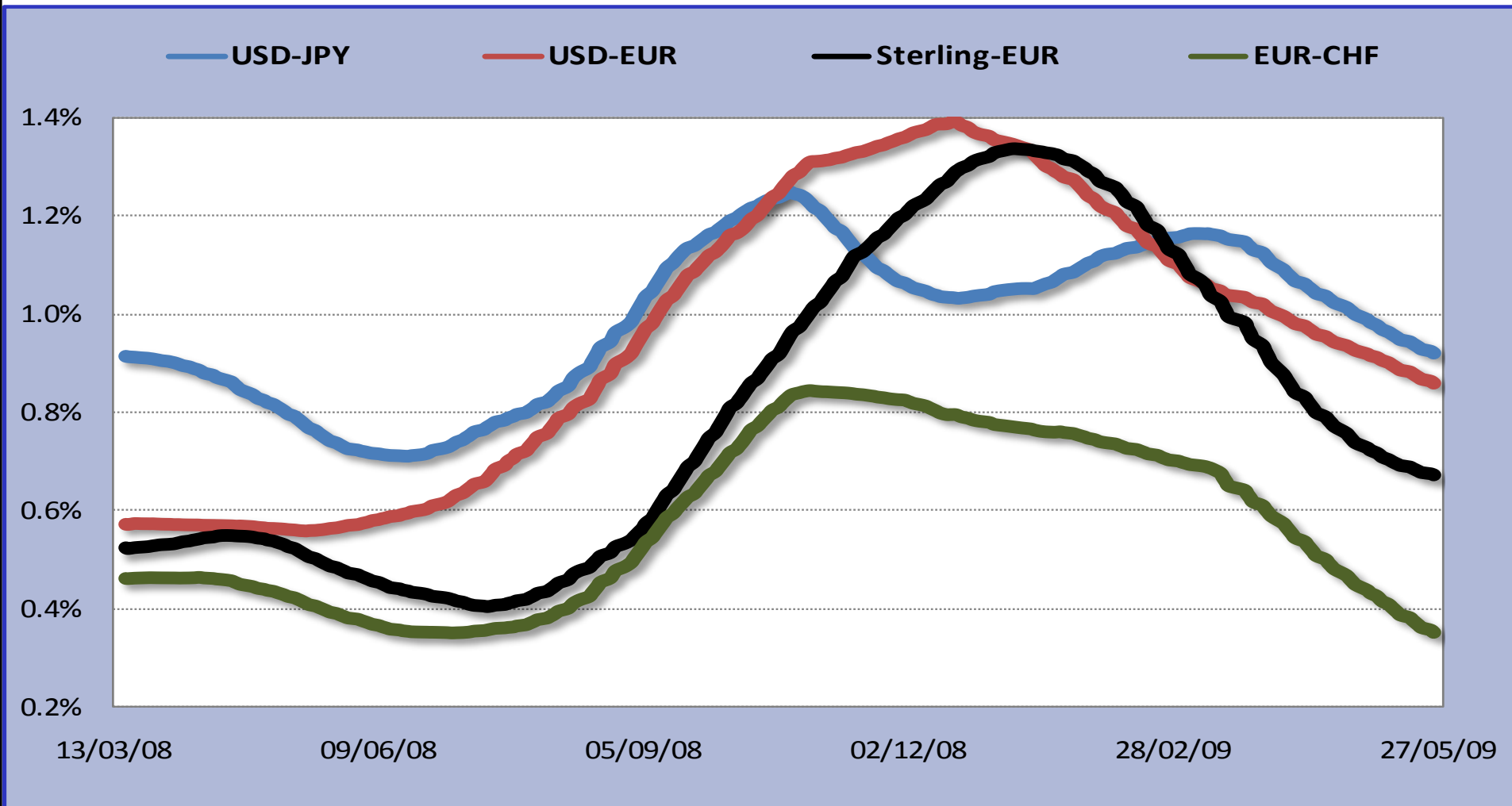


FX Rates - most

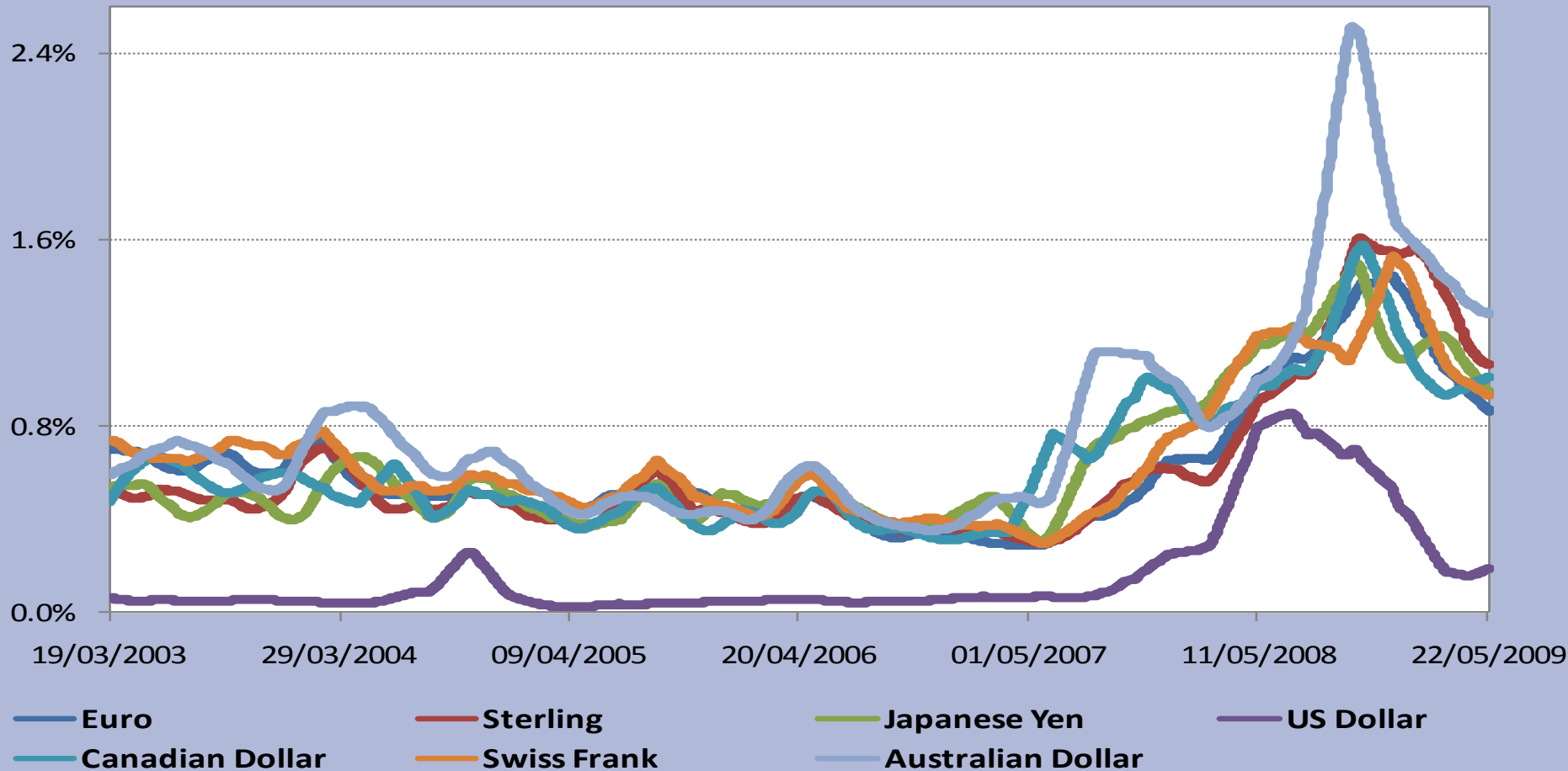
AUD-JPY Sterling-JPY USD-AUD EUR-JPY



FX Rates - least



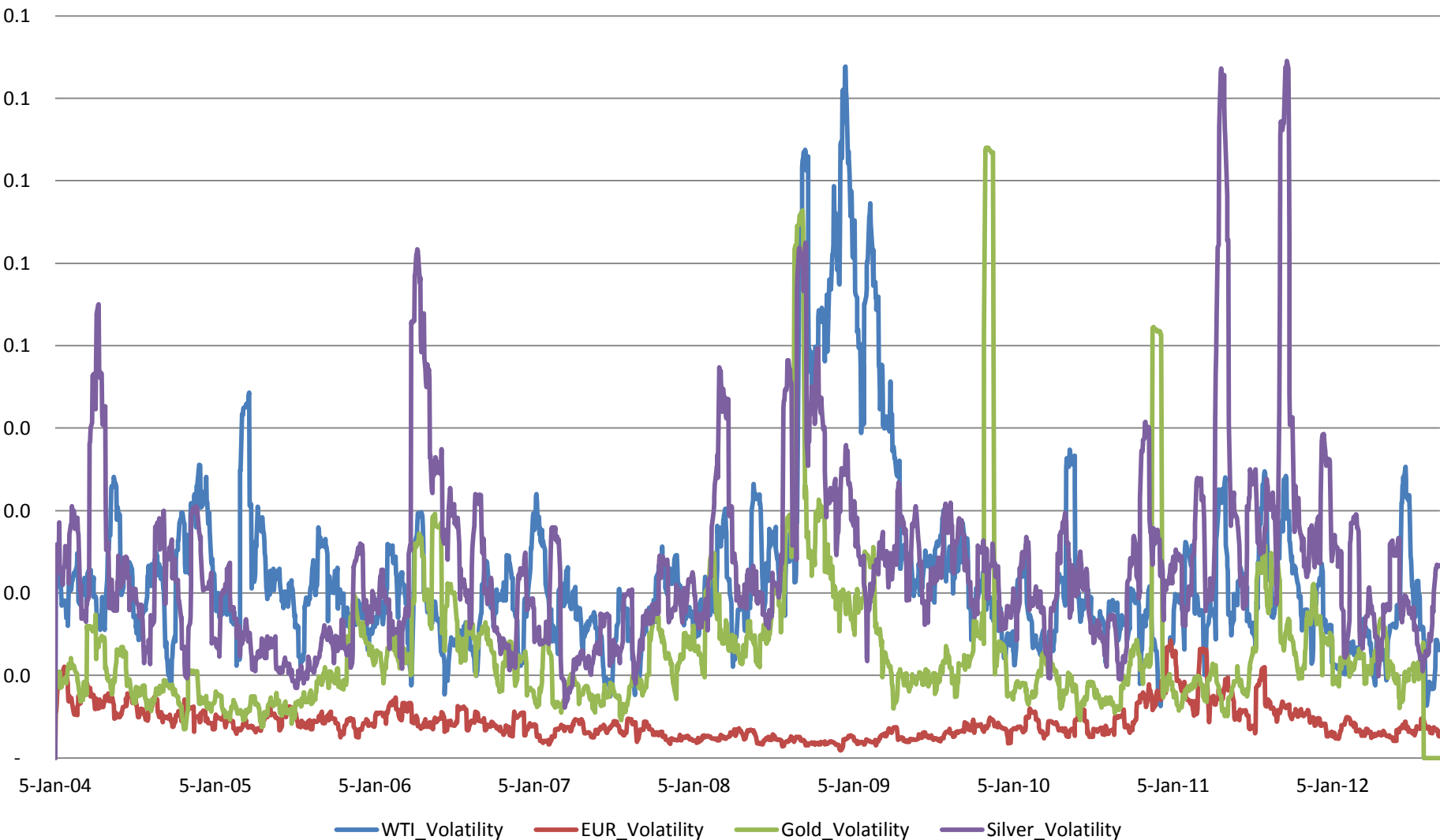
FX Rates Volatility – Emerging Markets



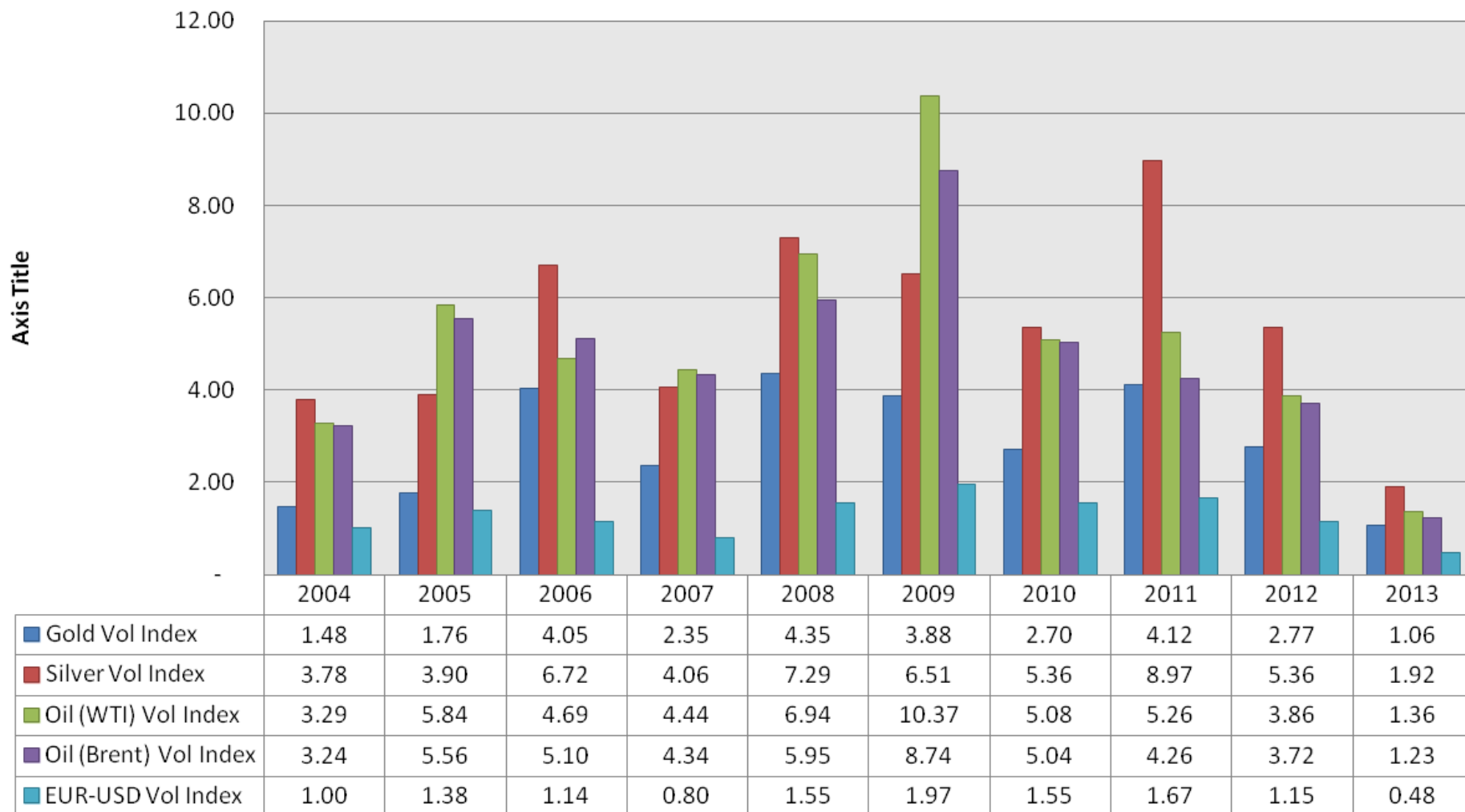
Tracking volatility

Trailing volatility & correlations

Trailing Vol - Trends

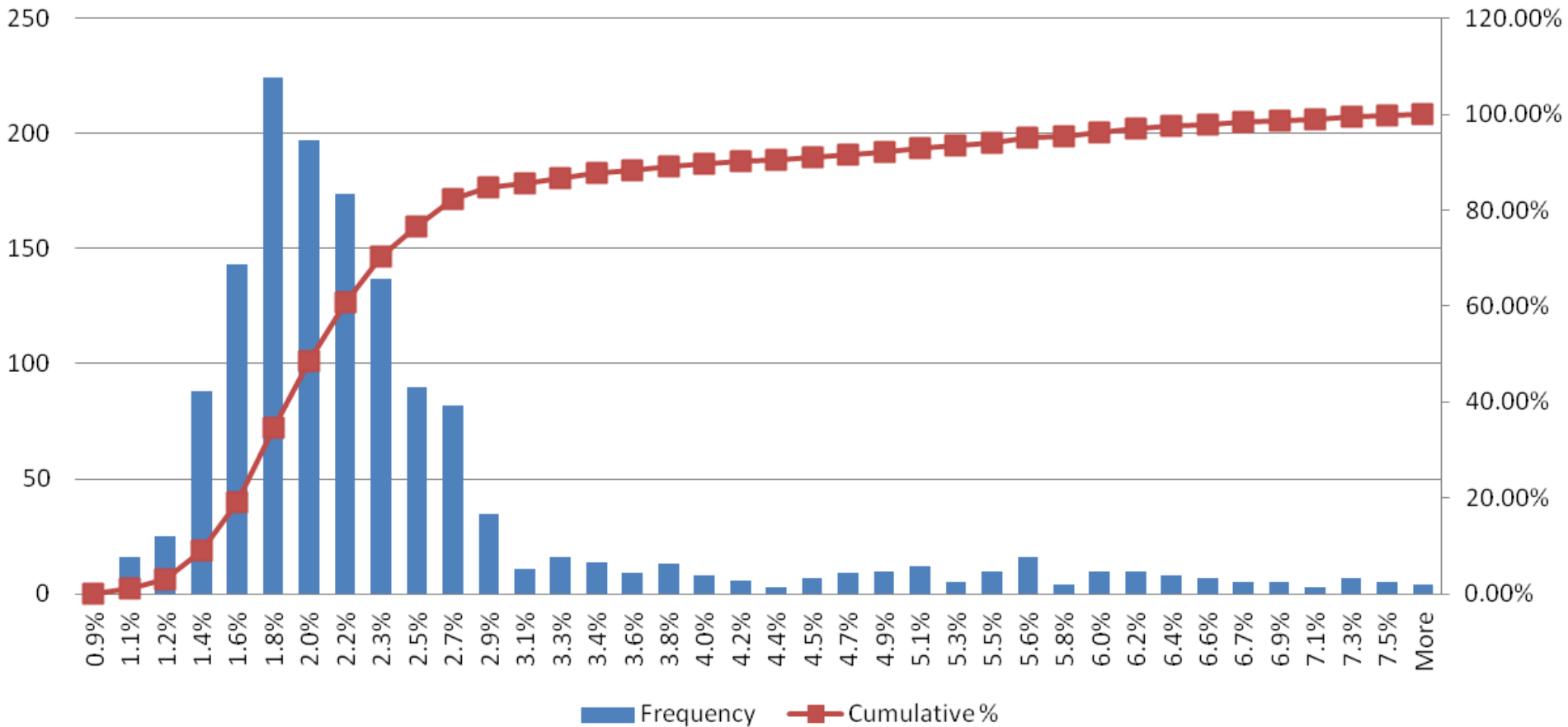


Relative Volatility Index 2004 - 2013 (2013 six months data)



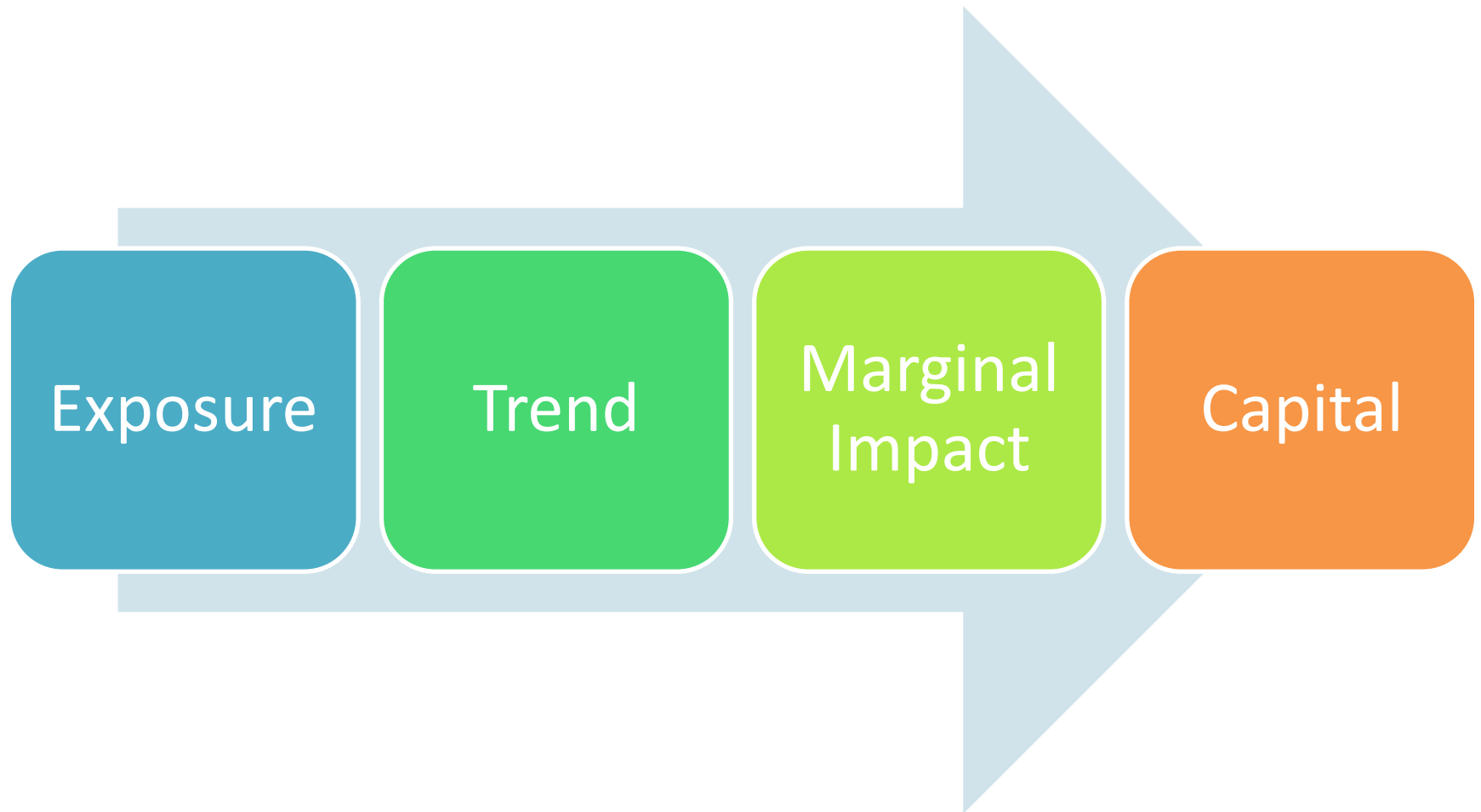
Volatility - Distribution

Crude Oil Price Volatility - 21 days MVA



Governance Structure

The Framework



Connections

Price

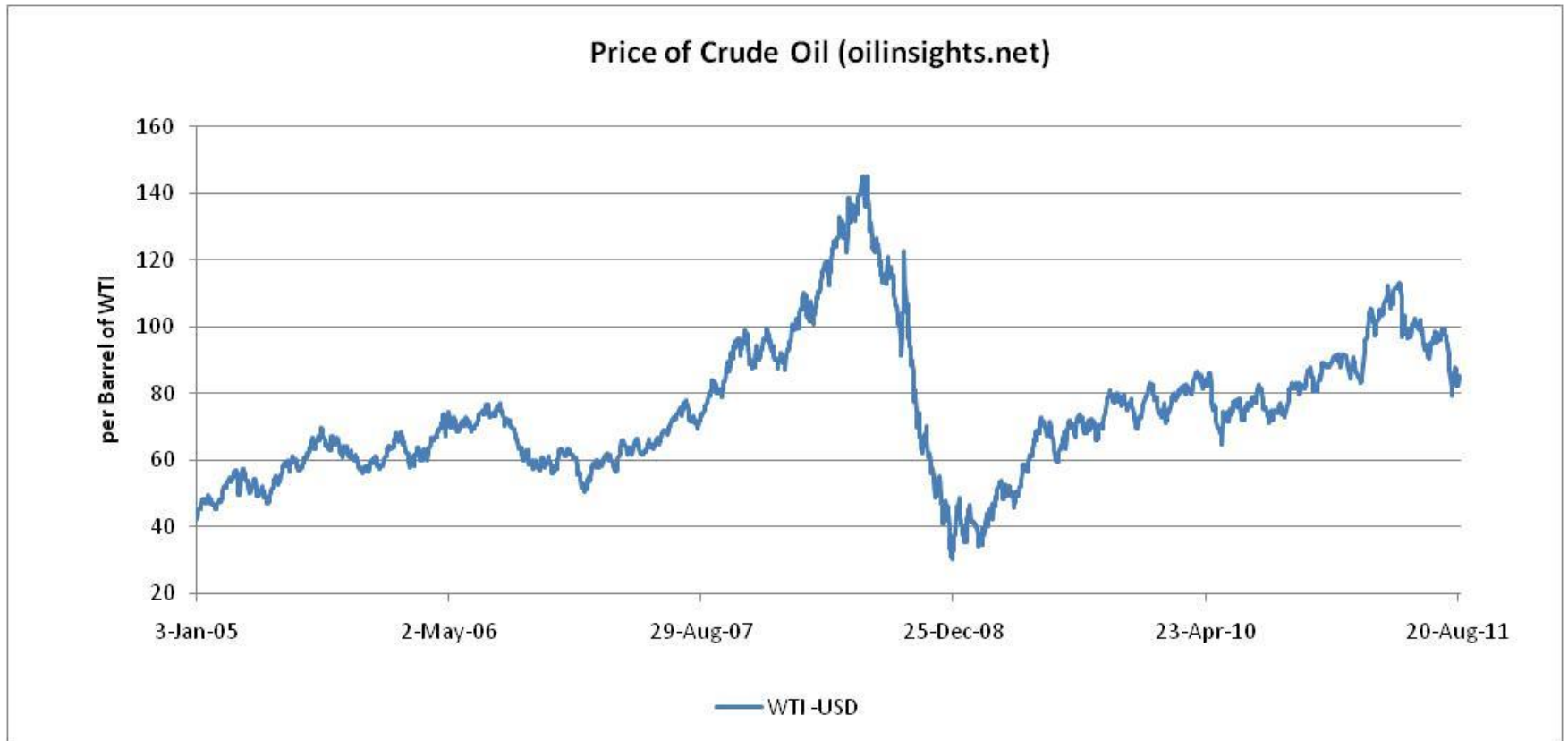
Risk

Value

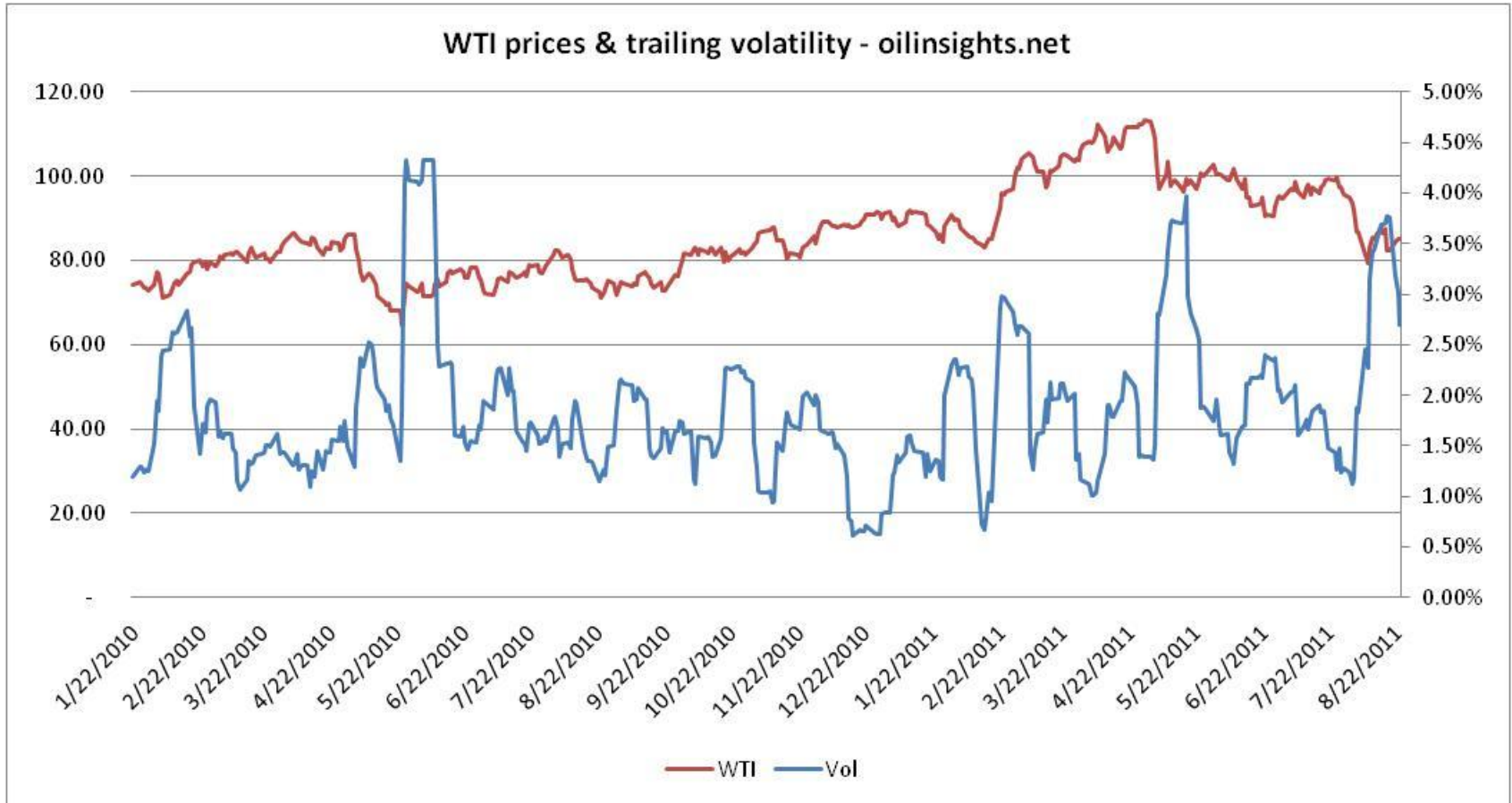
Products

Limits

Price



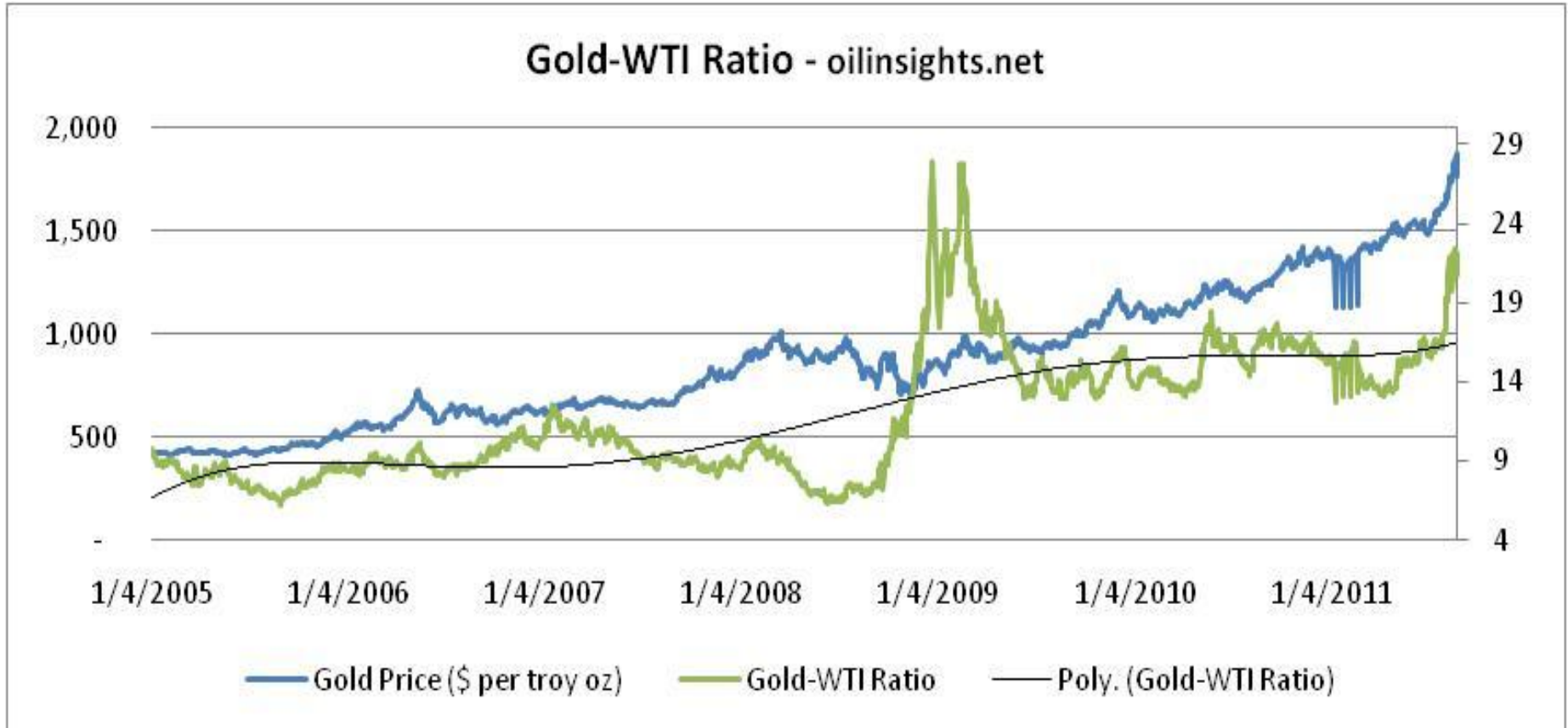
Volatility



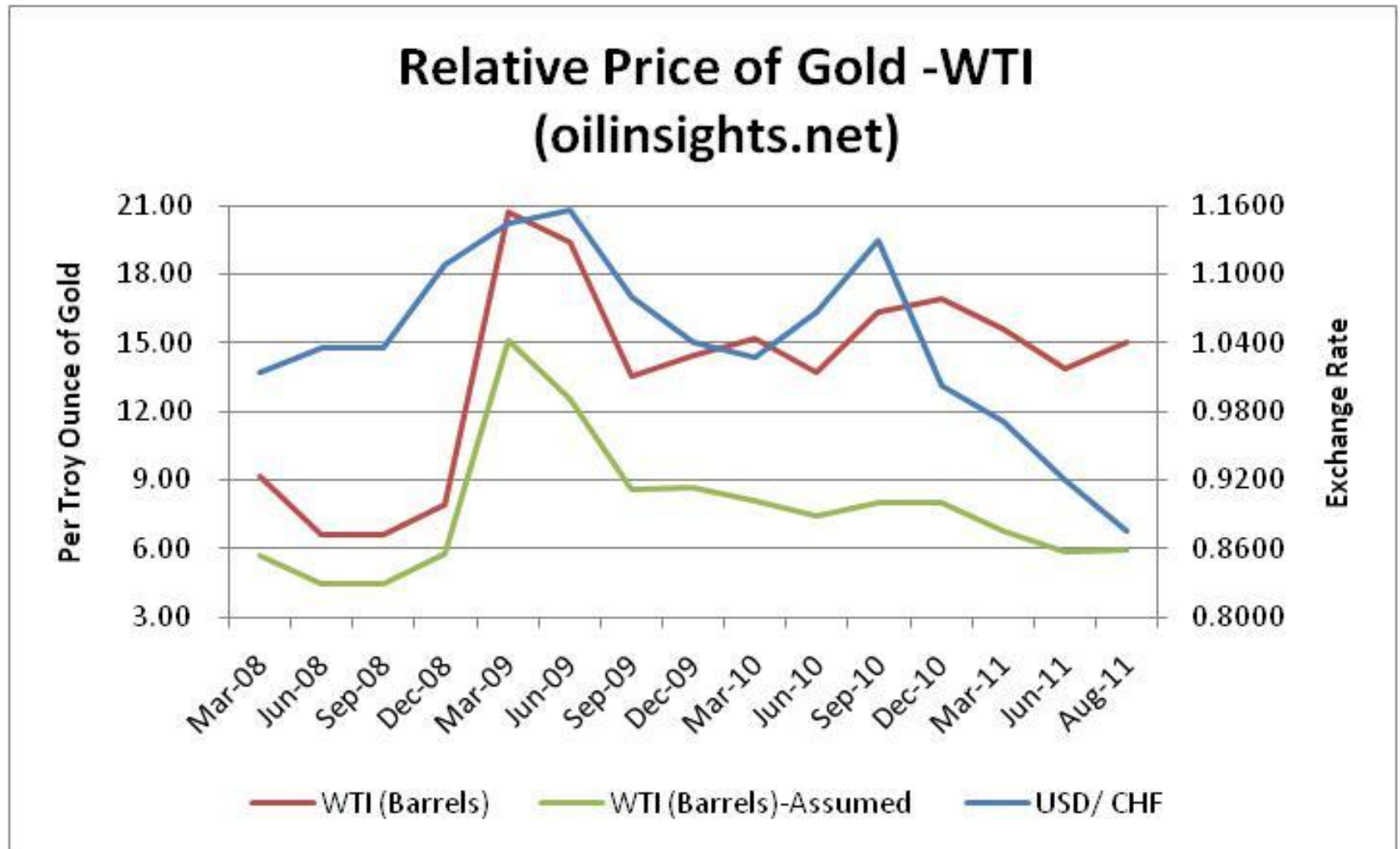
Models



Relative Value



Relative Value - II



Transaction & Exposure Limits

Within a Trade

- Max Ticket size

Within a security

- Max Product limit

Within an operating cycle

- Max Daily limits

Within a tenor or maturity bucket

- Max Tenor Exposure

Within a risk classification or grade

- Max Ticket Size

Sensitivity Limits

To Exchange Rates

- Change in USD Equivalent Exposure
- Change in Position value per PiP

To Interest Rates

- Duration, PVBP, Gaps, Interest Rate Mismatch

To Volatility

- Vega, Change in value, Change in projected P&L, Gamma

Earnings

- Change in projected earning, Net Interest Income or Earnings at Risk

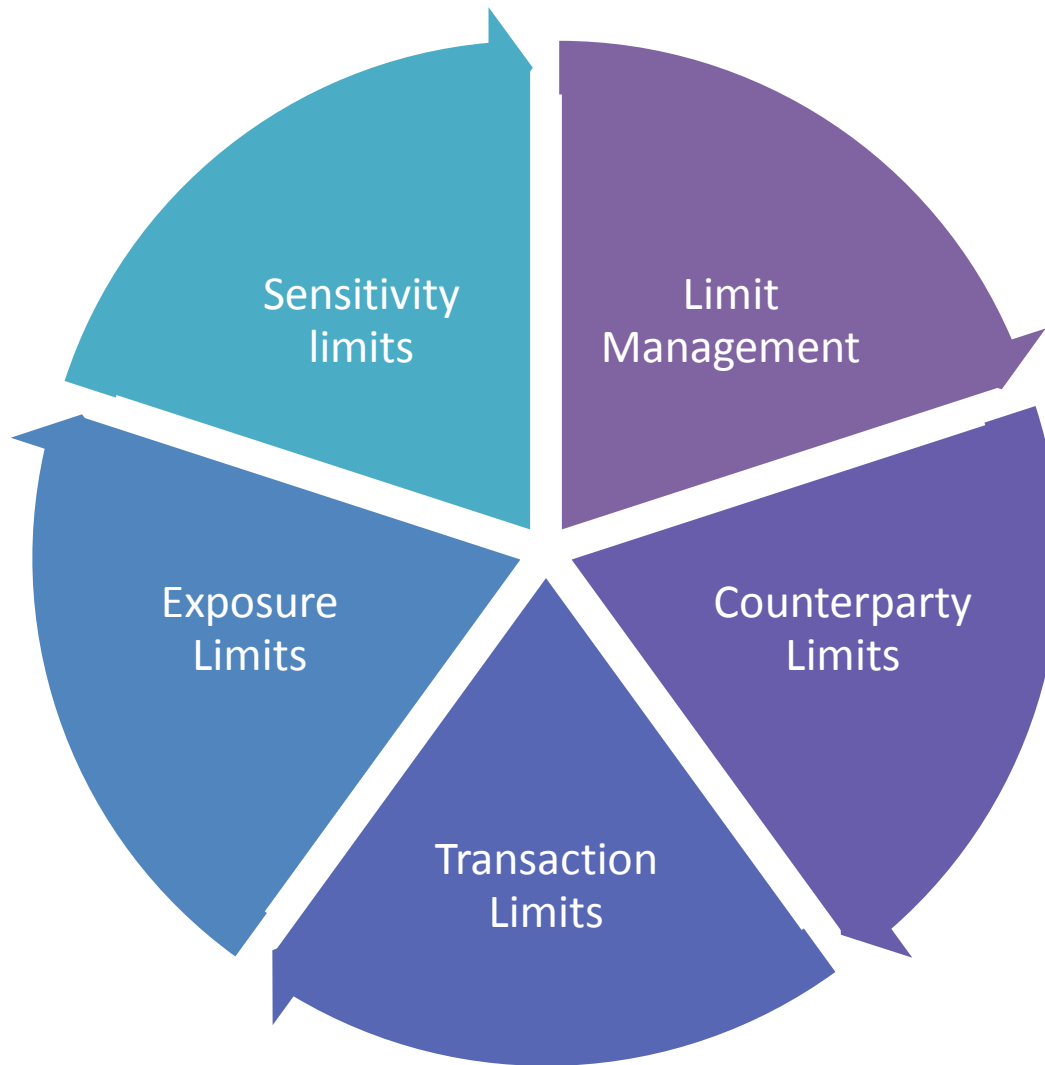
Shareholder Value

- Change in Income, Market Value of Equity or NPV

Equity or Capital

- Maximum Loss, Impact of ALM choices on Capital

Limit Management



Governance

Business

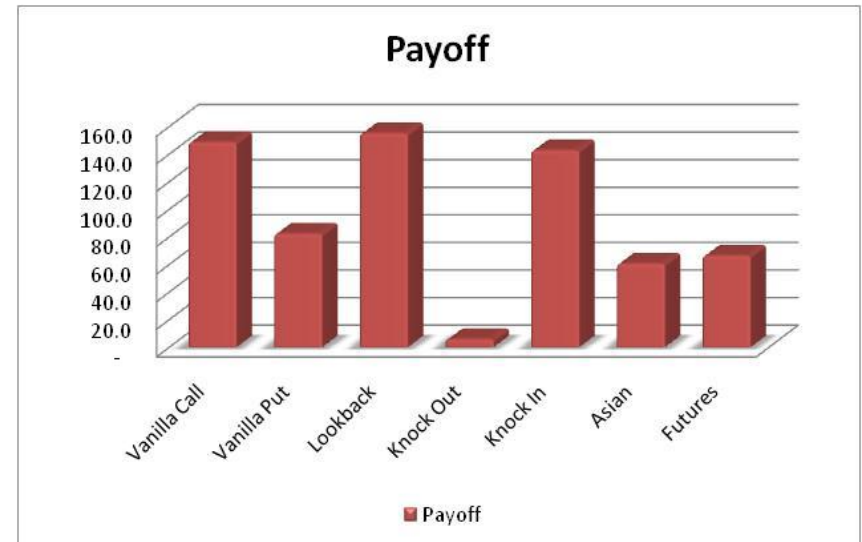
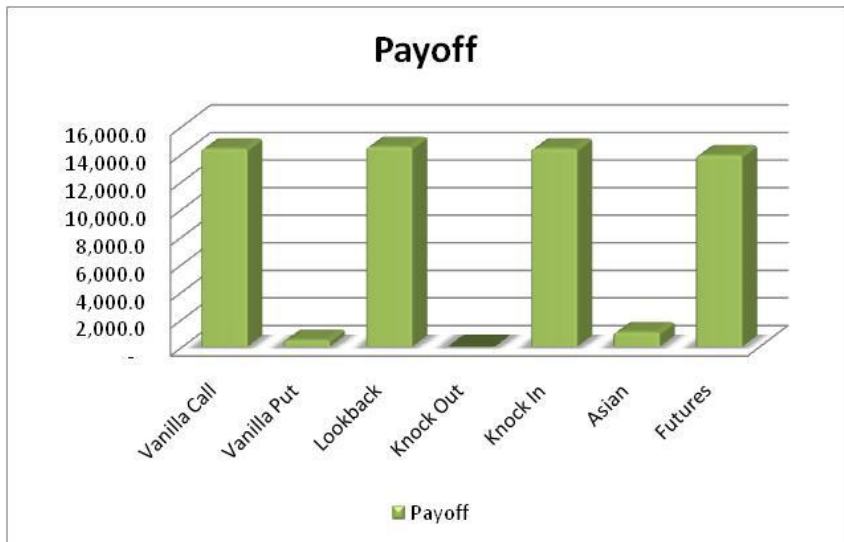
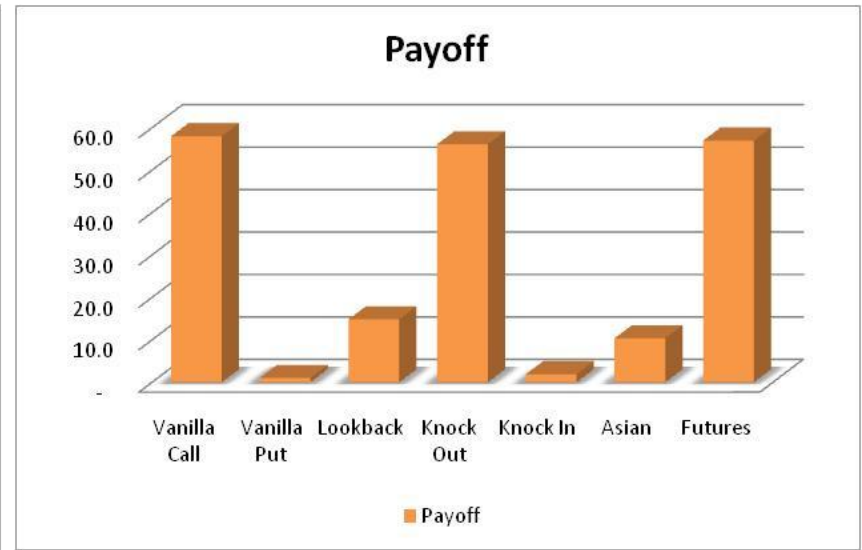
Risk

Reporting
Lines

Conflicts

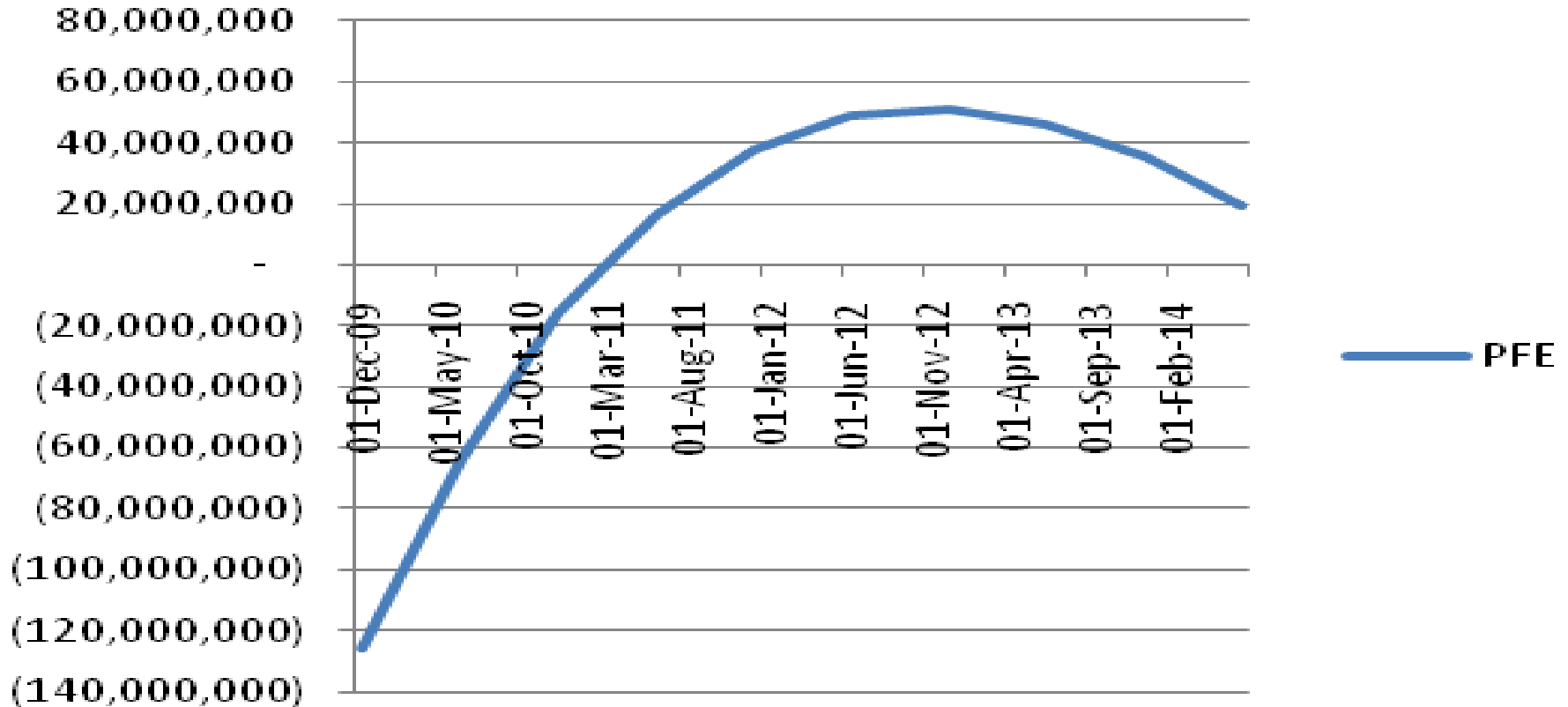
Looking up,
at or down?

Products & Payoffs



Limits

PFE



Reconciliation

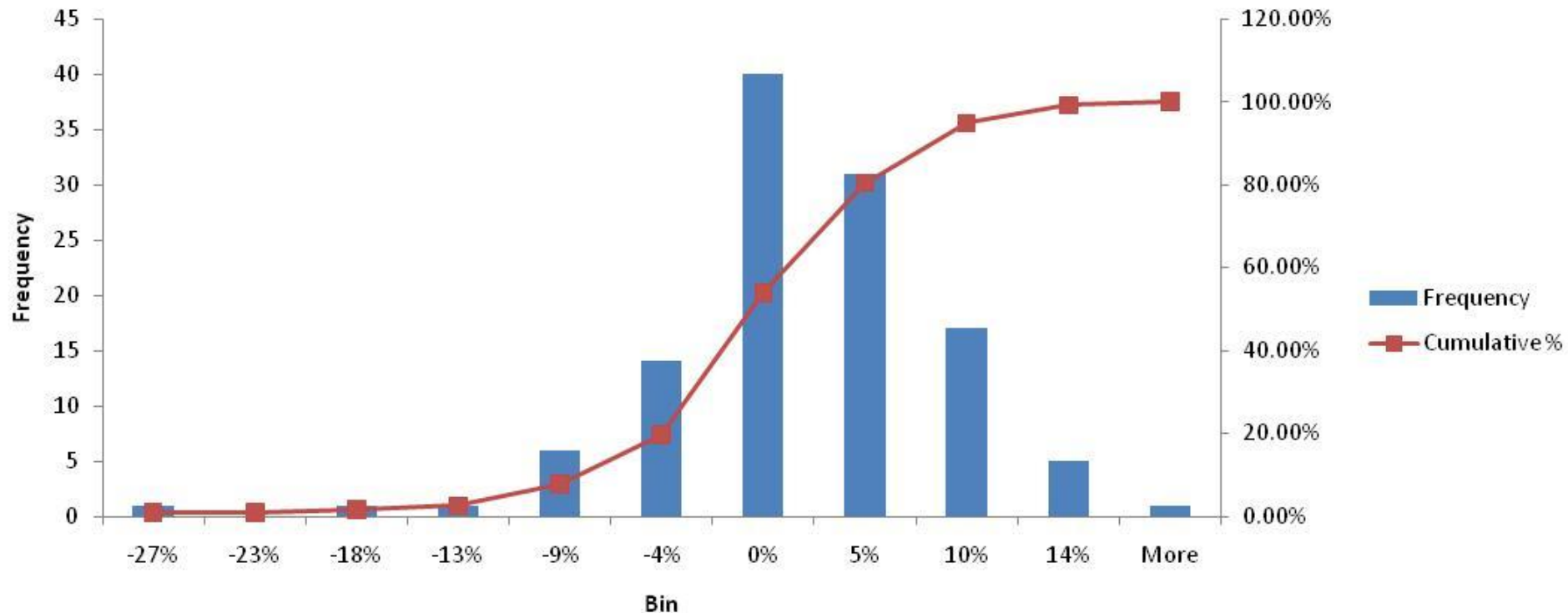
Single Source of data

Volatility

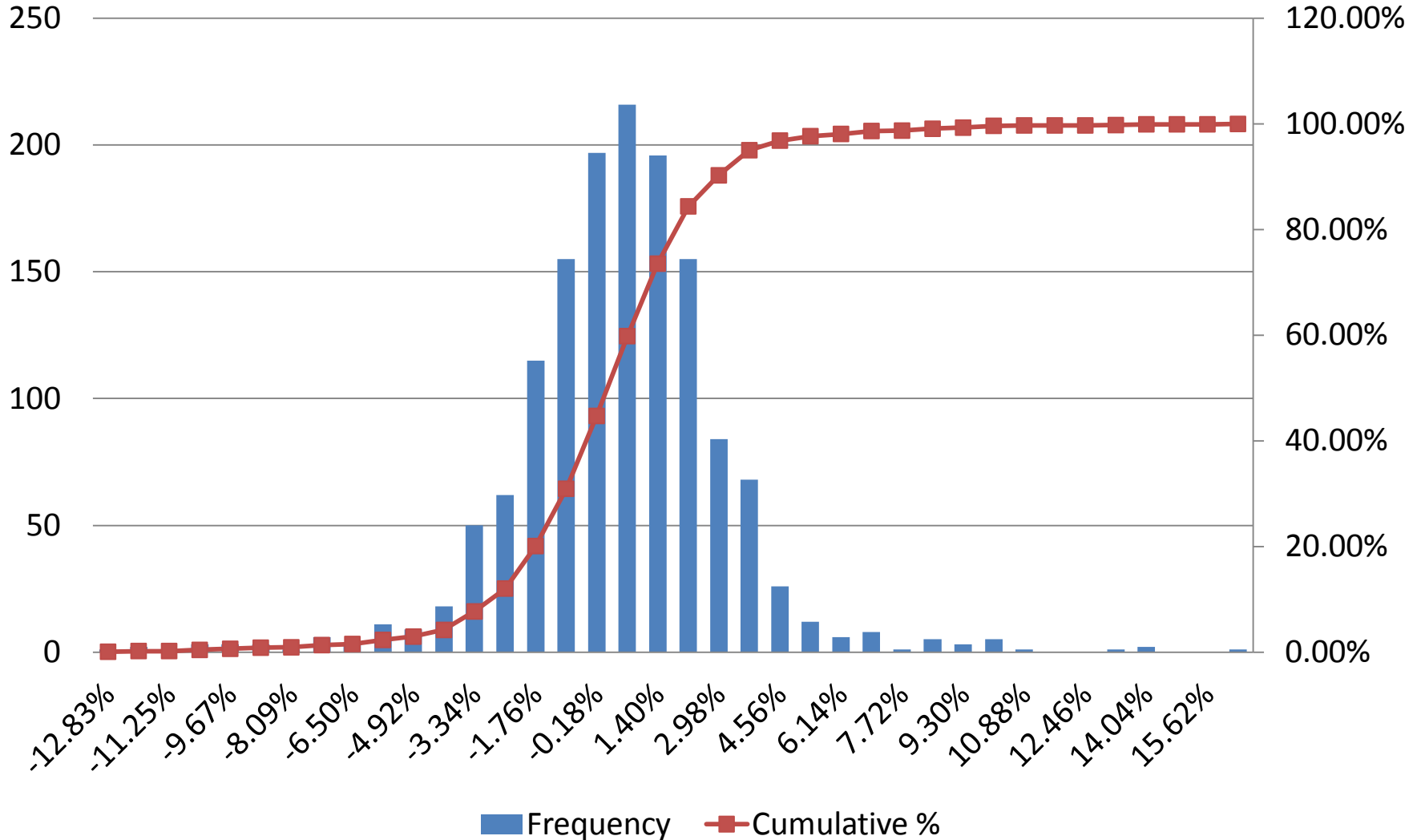
Approaching volatility

Monthly Crude Oil Change

Crude Input Price Change

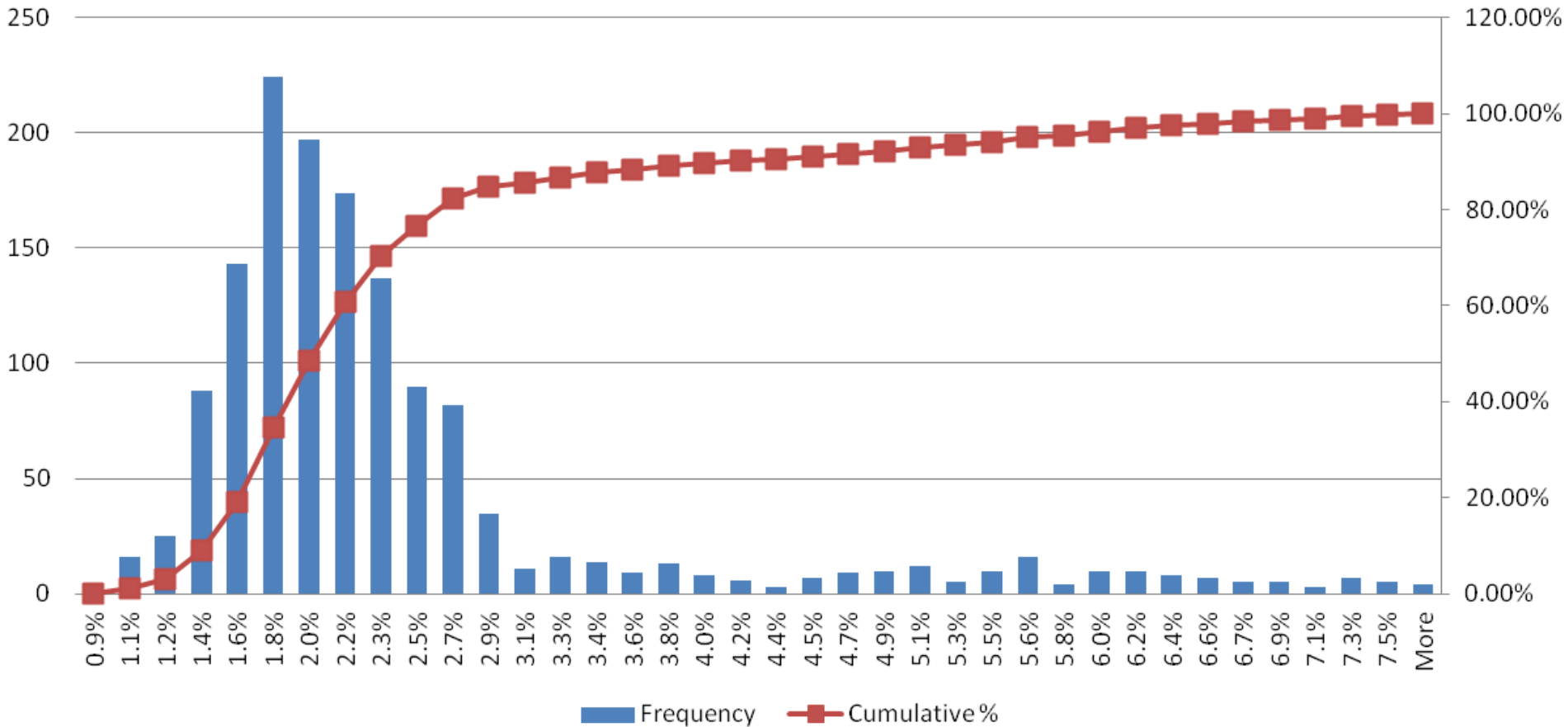


Crude oil price changes - daily



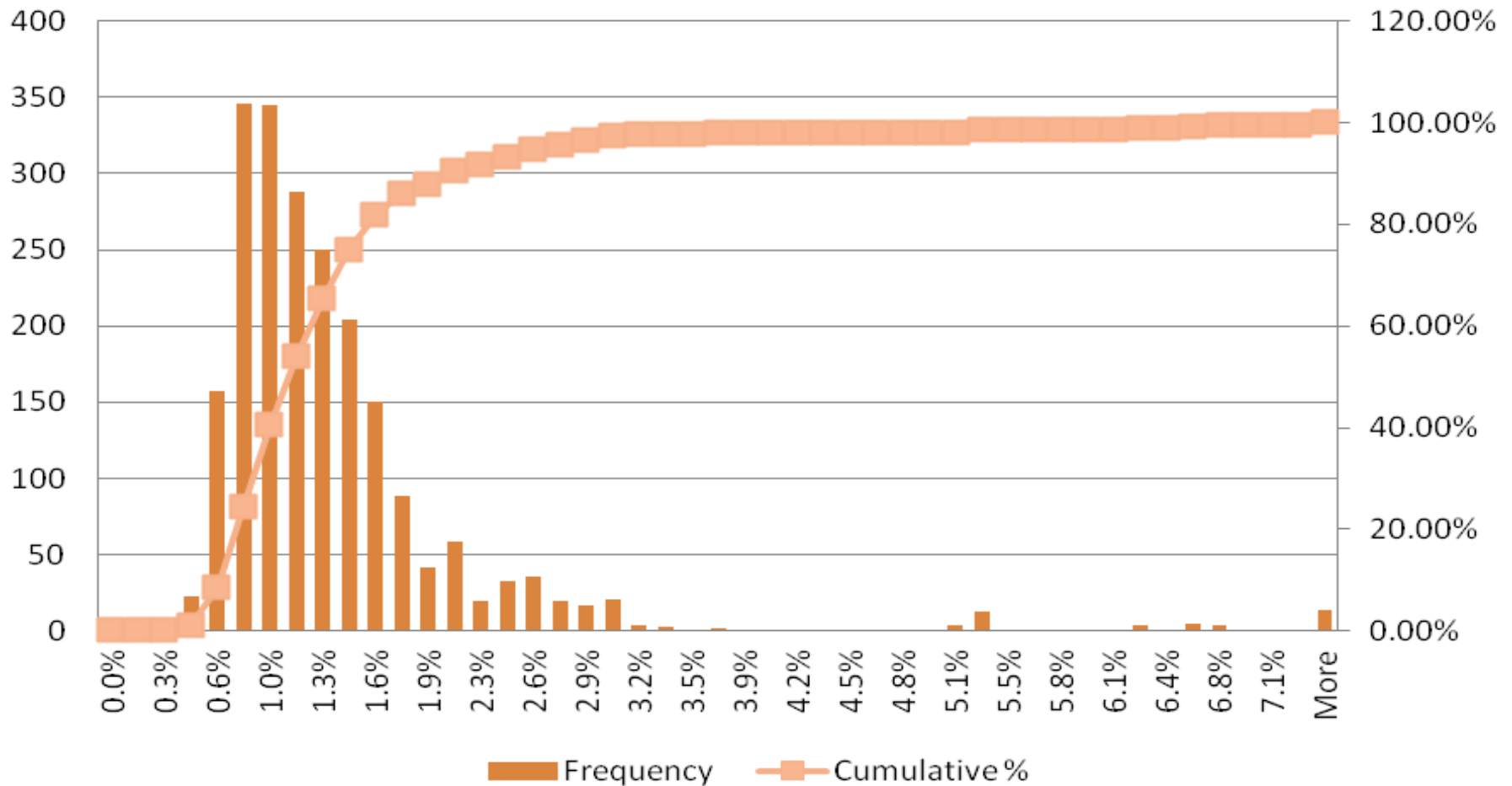
Volatility - Distribution

Crude Oil Price Volatility - 21 days MVA



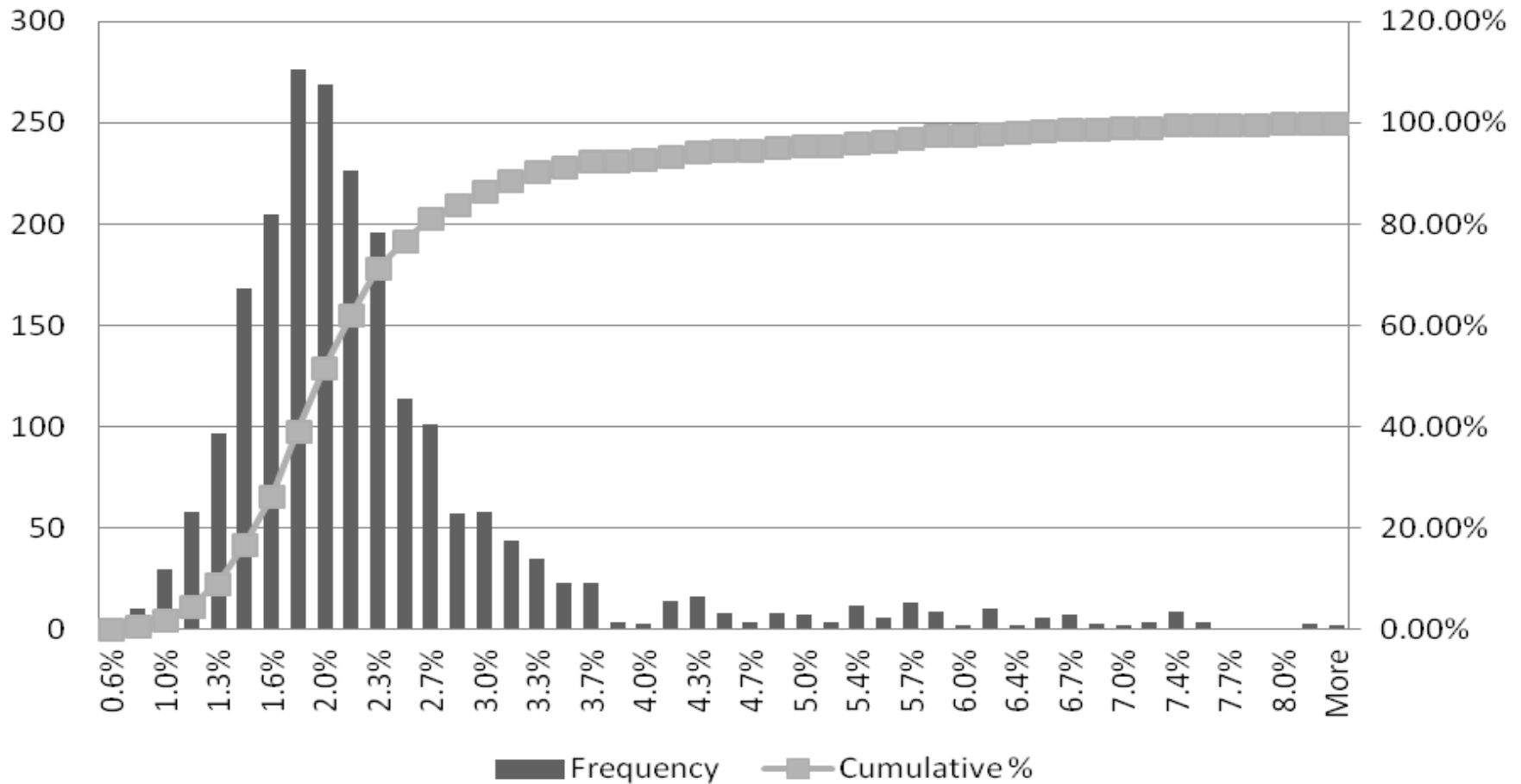
Gold

Gold Volatility Jan '04 - Aug - '12



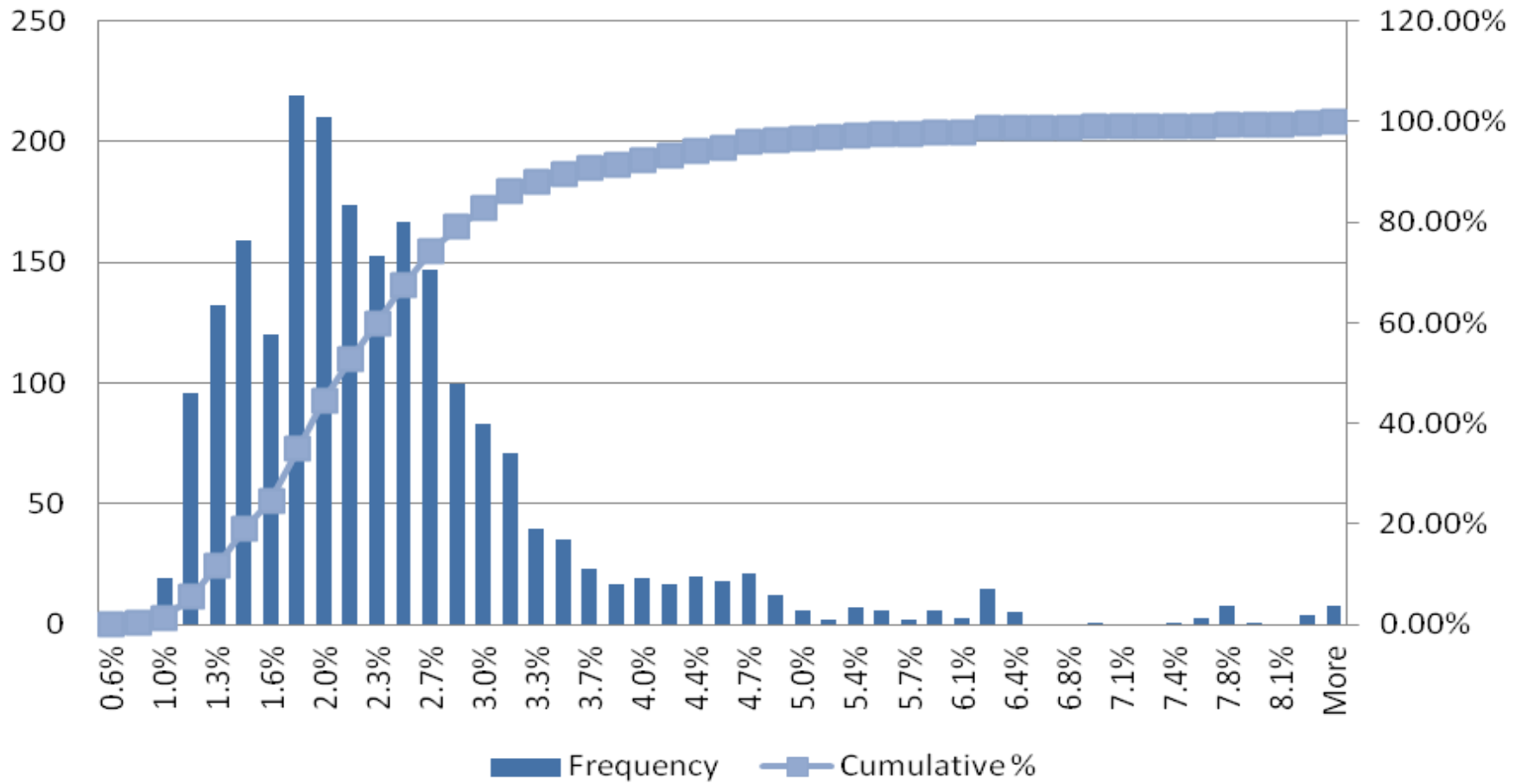
Oil

Oil Volatility - Jan '04 - Aug '12



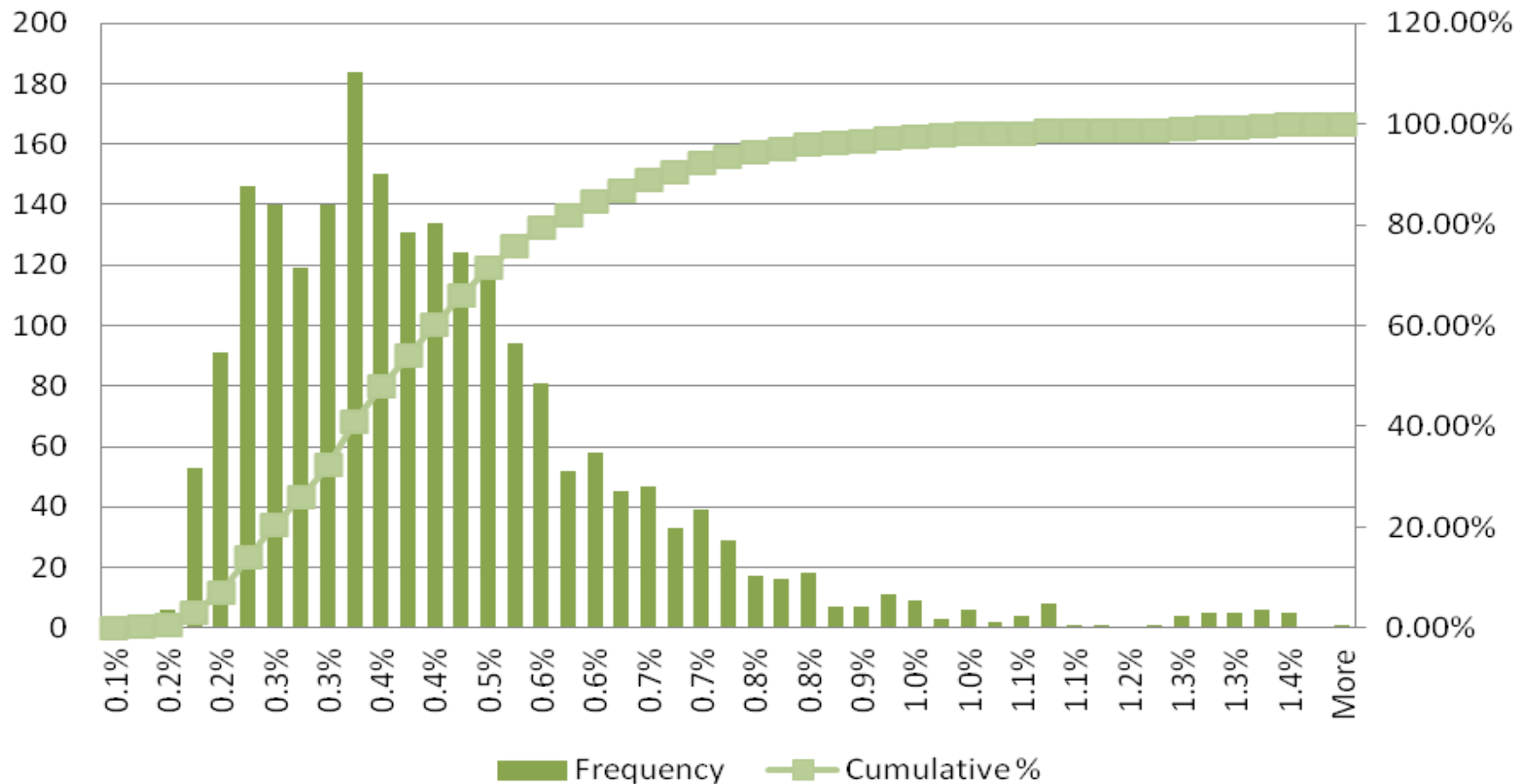
Silver

Silver Vol - '04 - '12 Histogram



EUR-USD

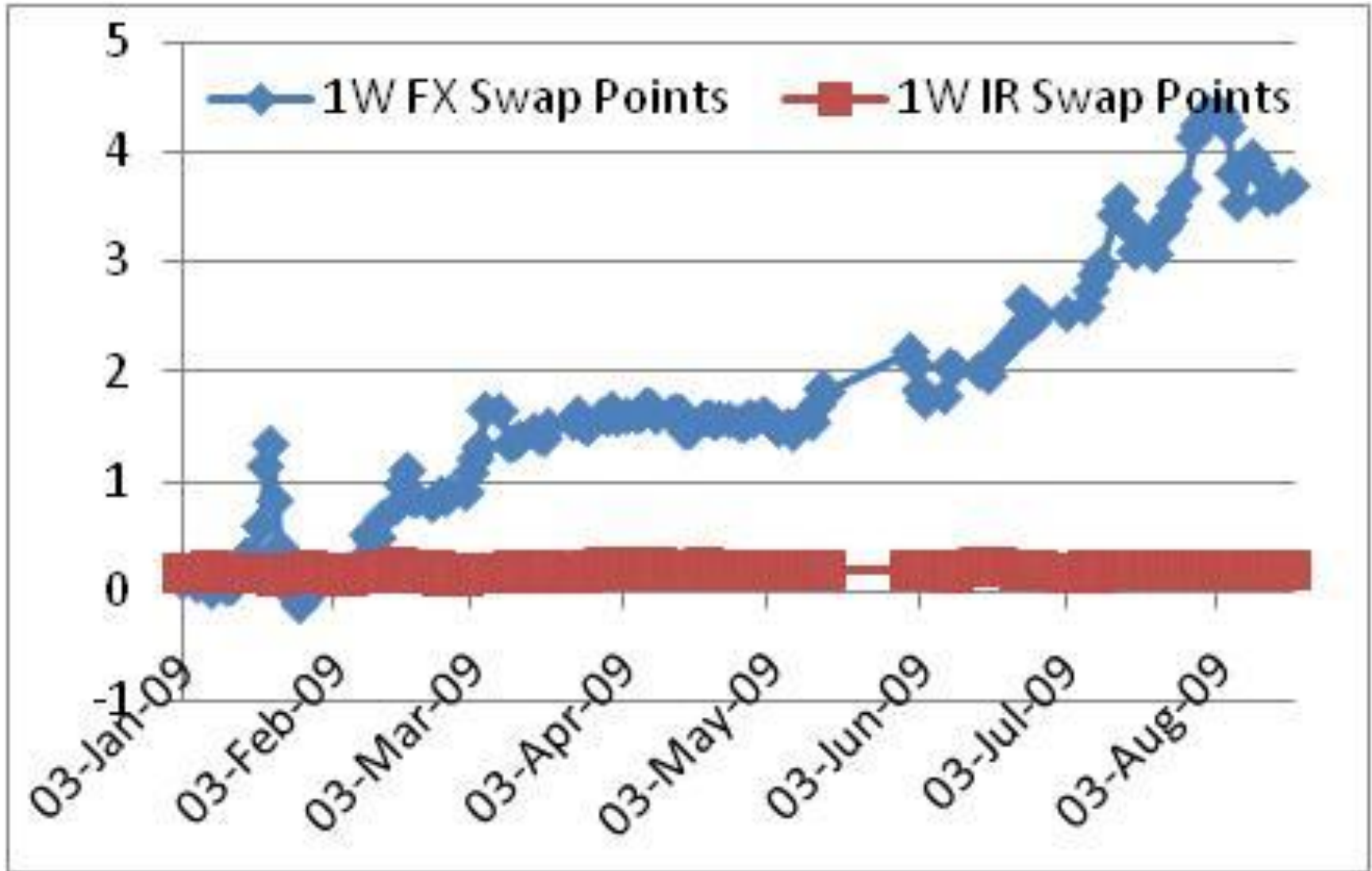
EUR-USD Volatility - '04 - '12 Histogram



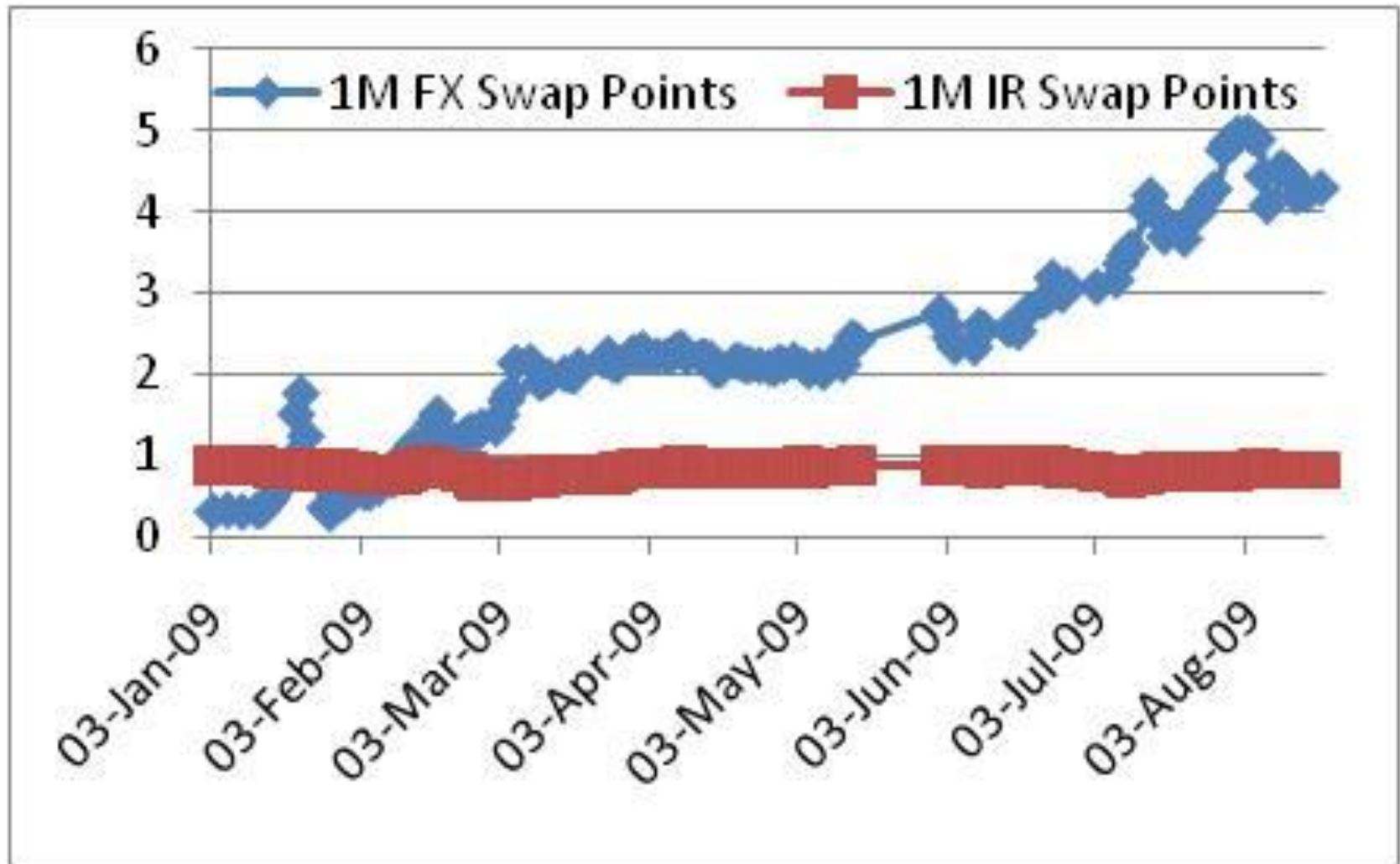
More Thought experiments

Model price vs. Market price vs. liquidity

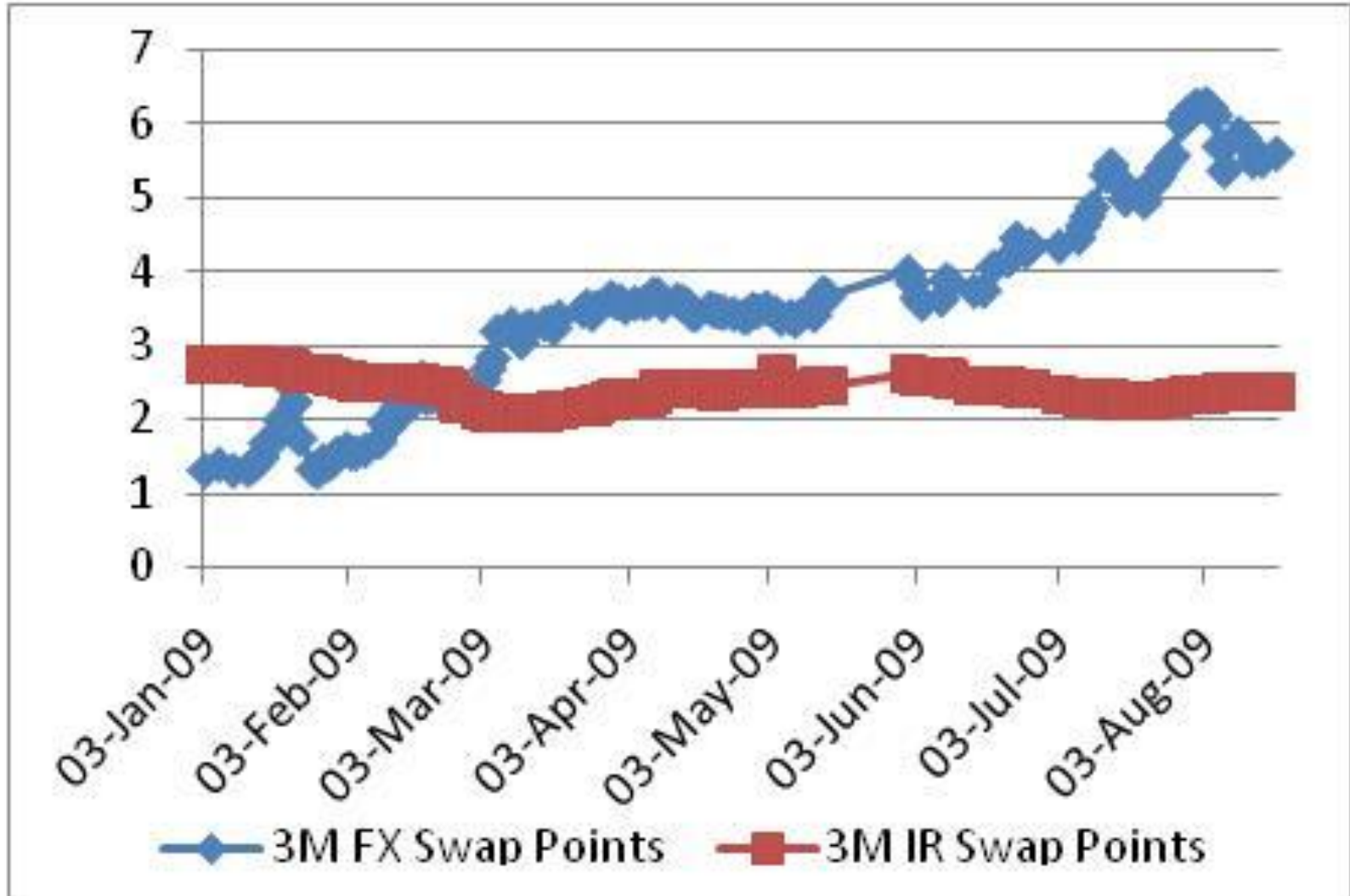
Swap Points - A



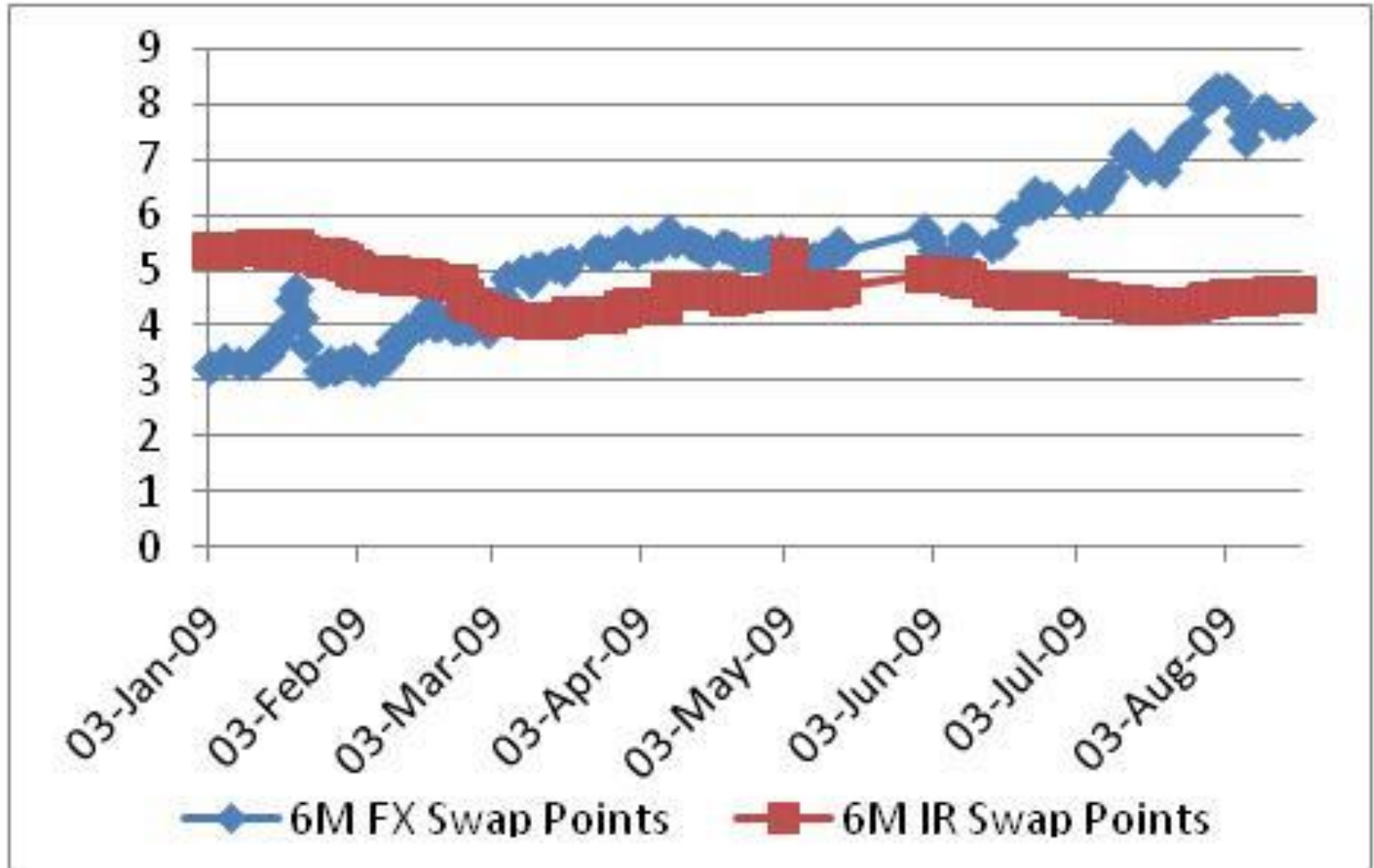
Swap Points - B



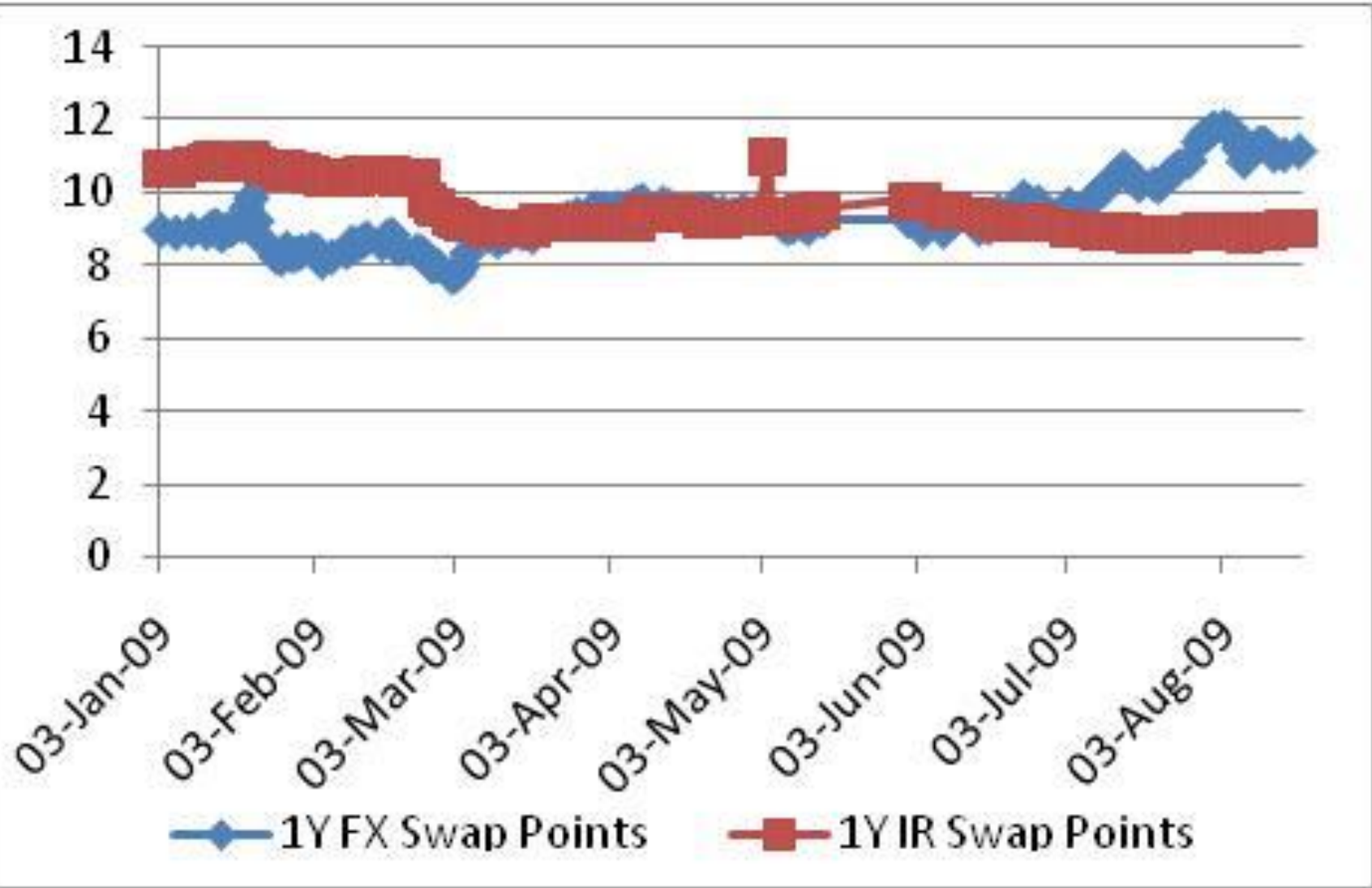
Swap Points - C



Swap Points - D



Swap Points - E



Four relationships

$$(1 + r_{local}) / (1 + r_{\$})$$

Interest Rate
Differential

$$E(1 + i_{local}) / E(1 + i_{\$})$$

Expected Inflation
Rate Differential

=

$$(forward_{local / \$}) / (Spot_{local / \$})$$

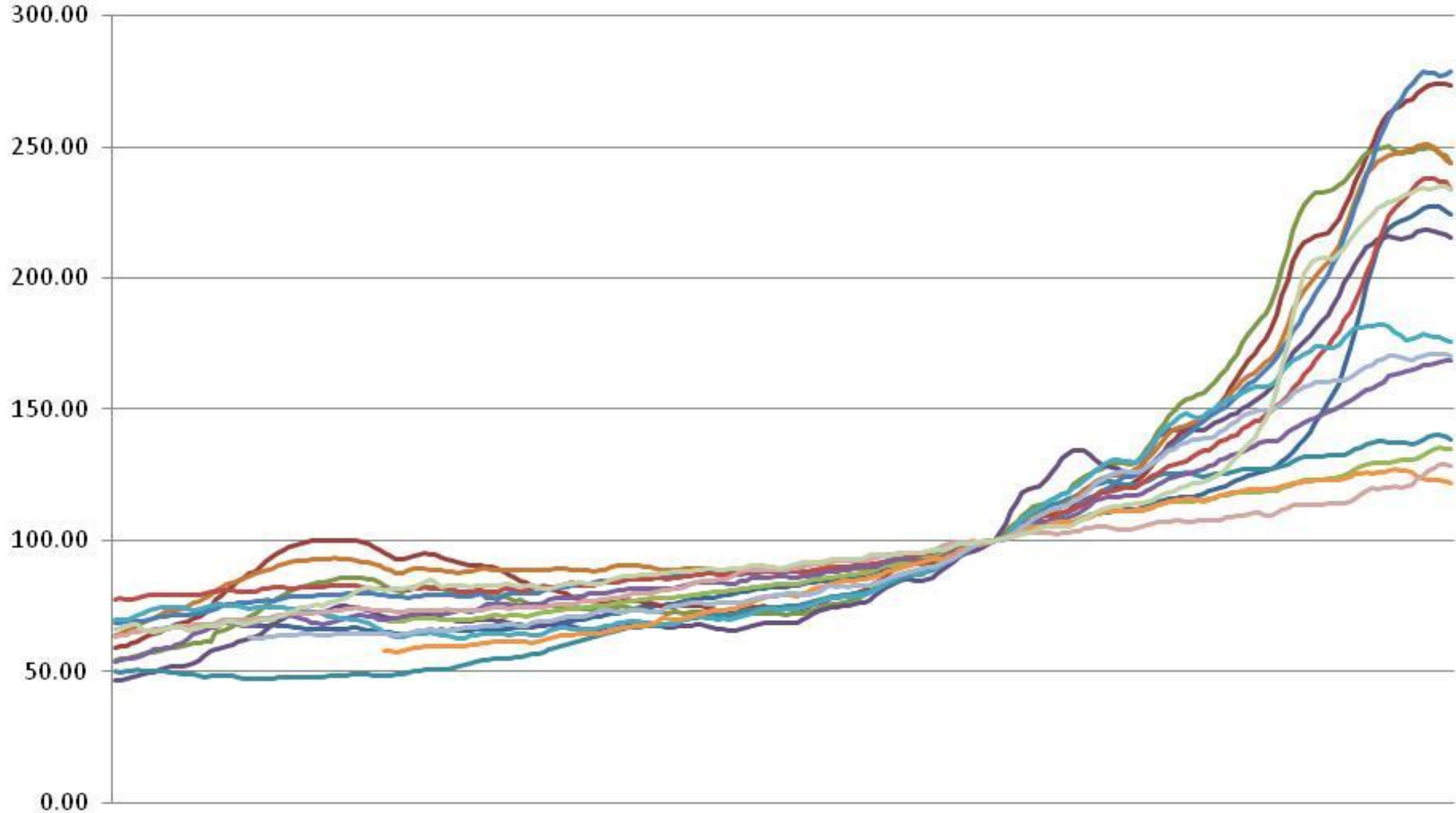
Forward &
Spot
Differential

$$E(Spot_{local / \$}) / (Spot_{local / \$})$$

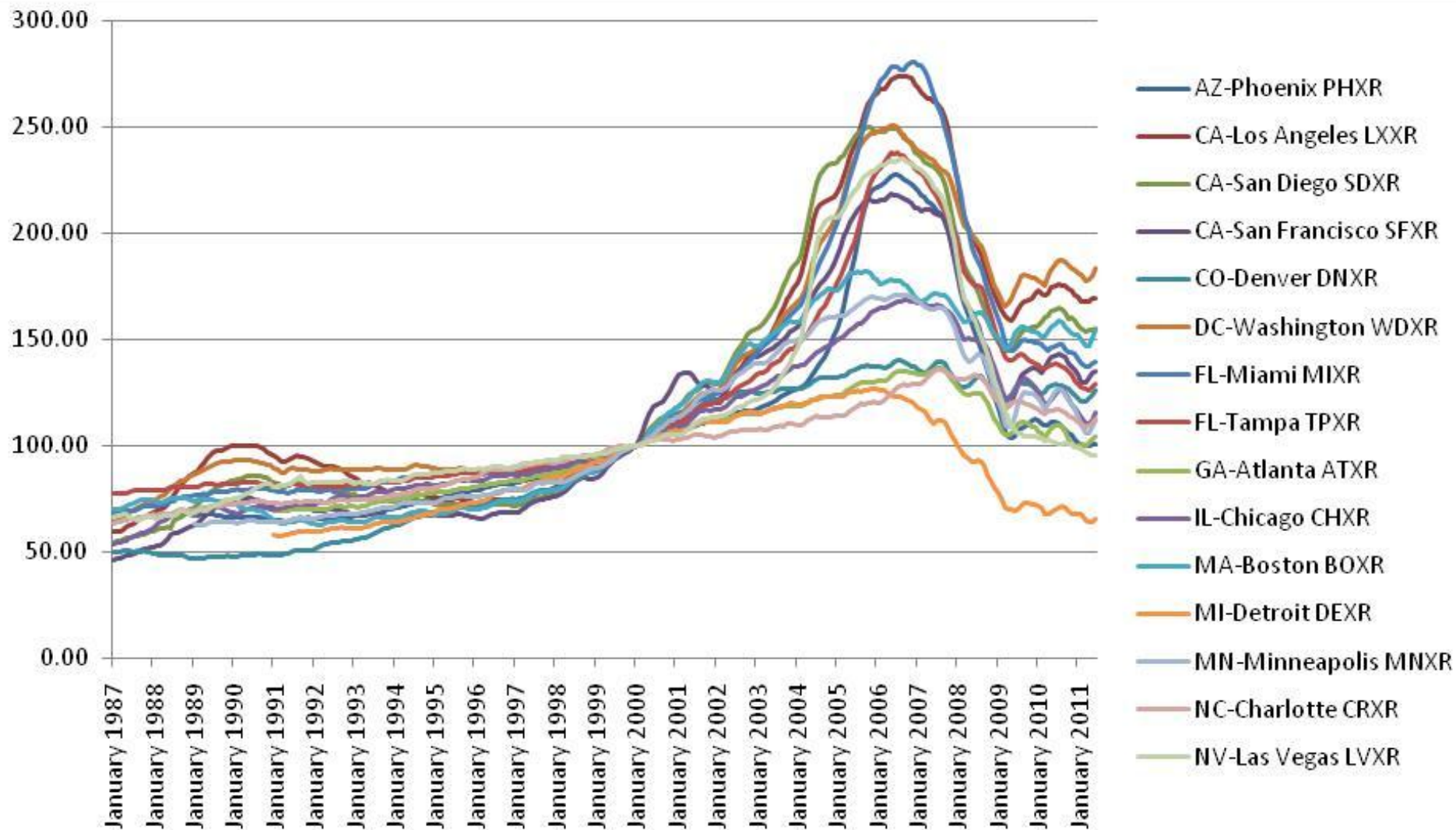
Expected change in
spot rates

Thought Experiment

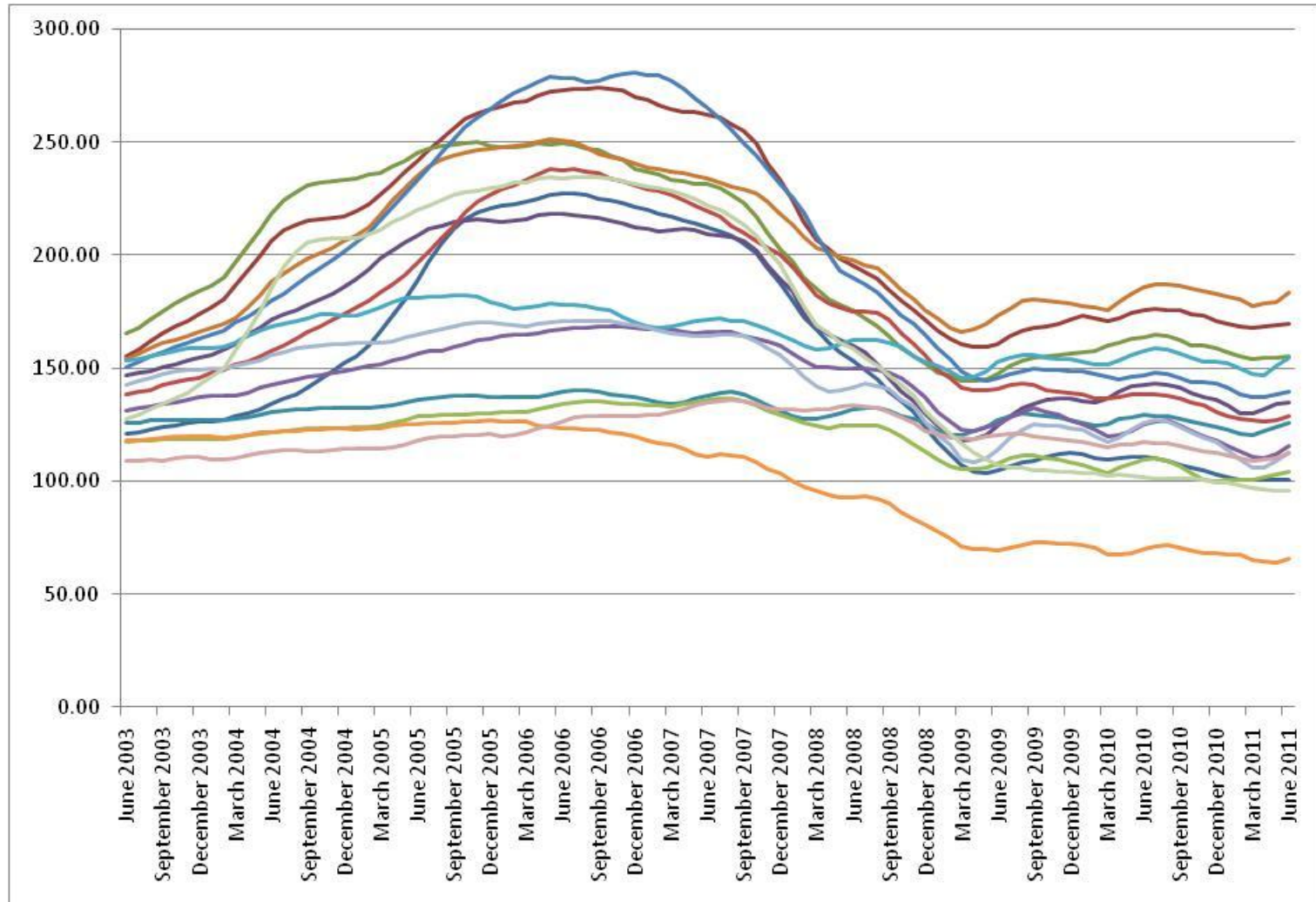
Is Gold safe now?



Is Gold safe now?



Bubble and after



What is Risk?

A framework for risk management

Four Questions

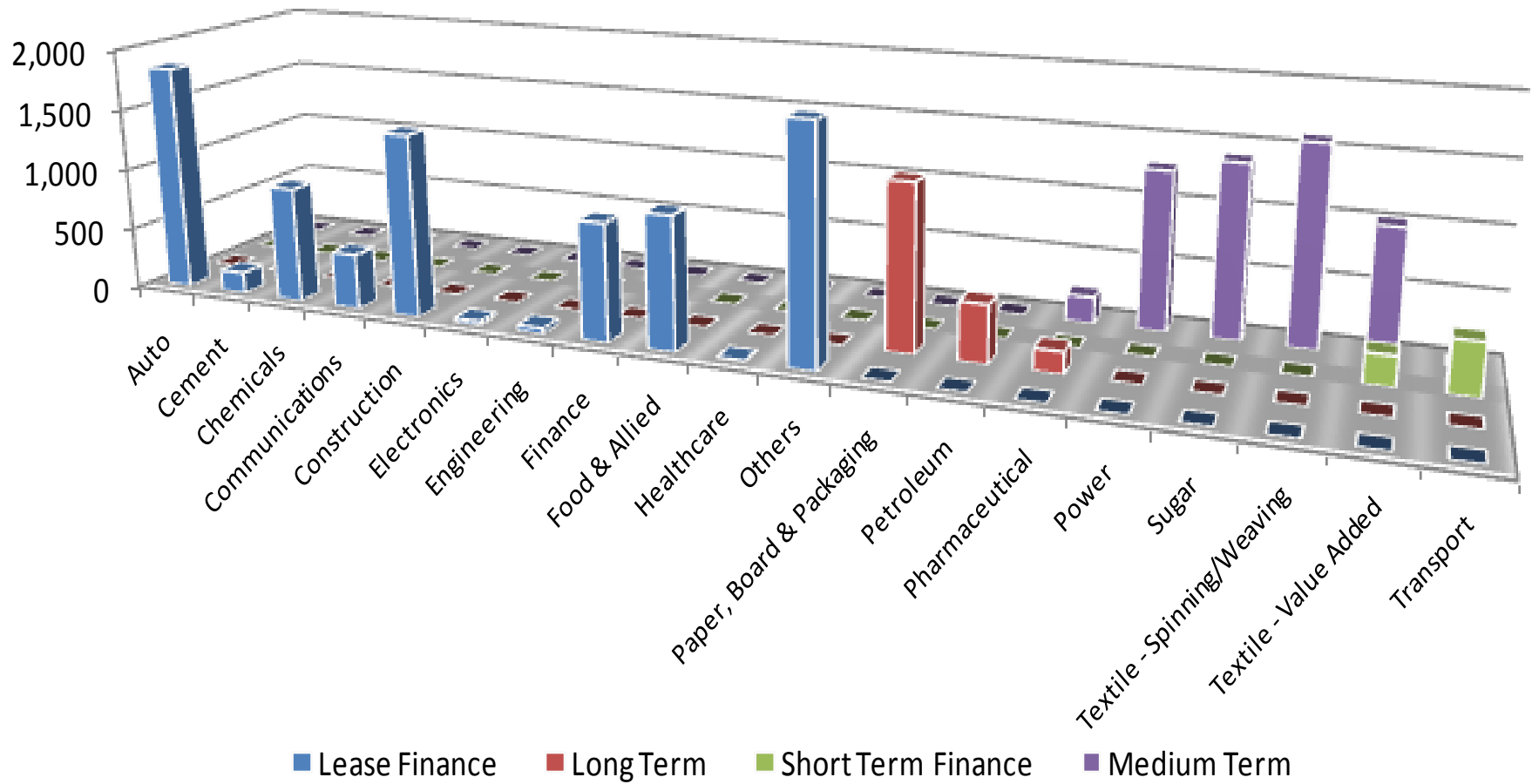
Exposure

Trend

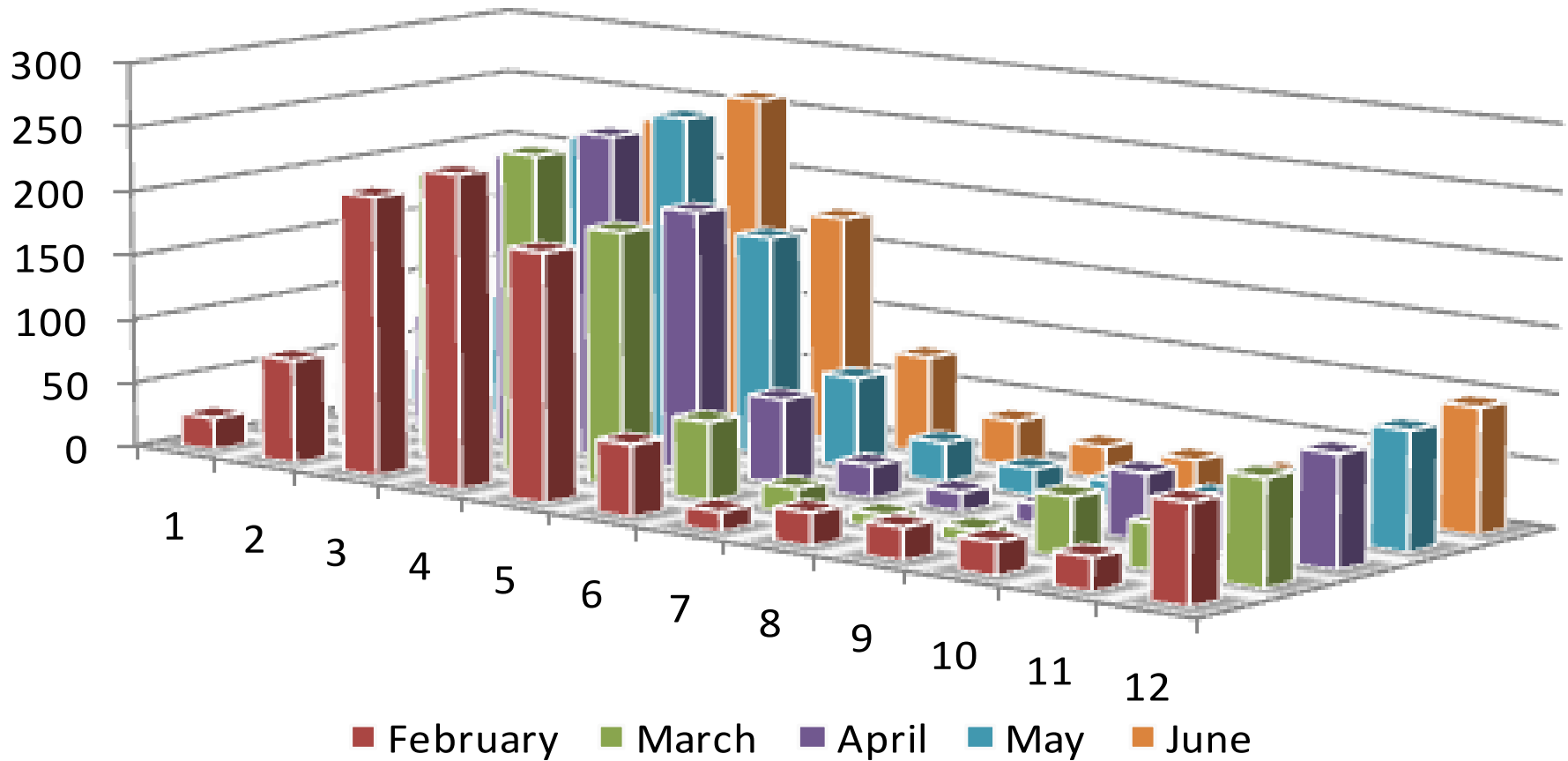
Marginal
Impact

Capital /
Appetite

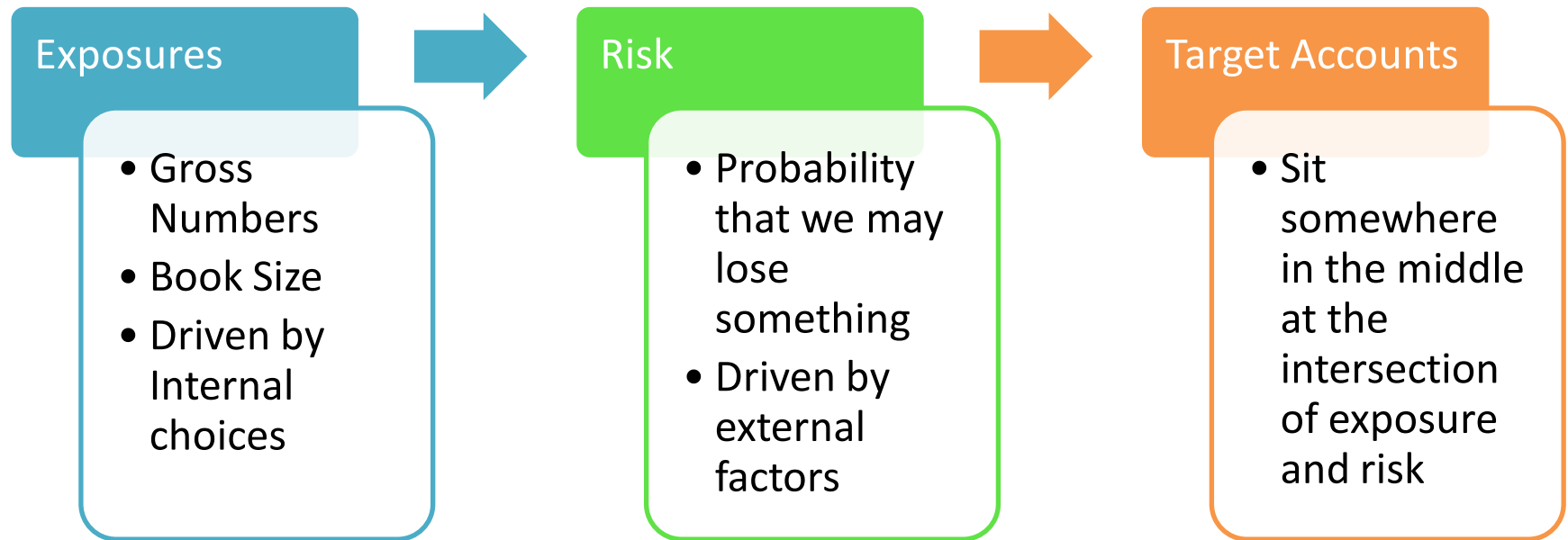
Exposure



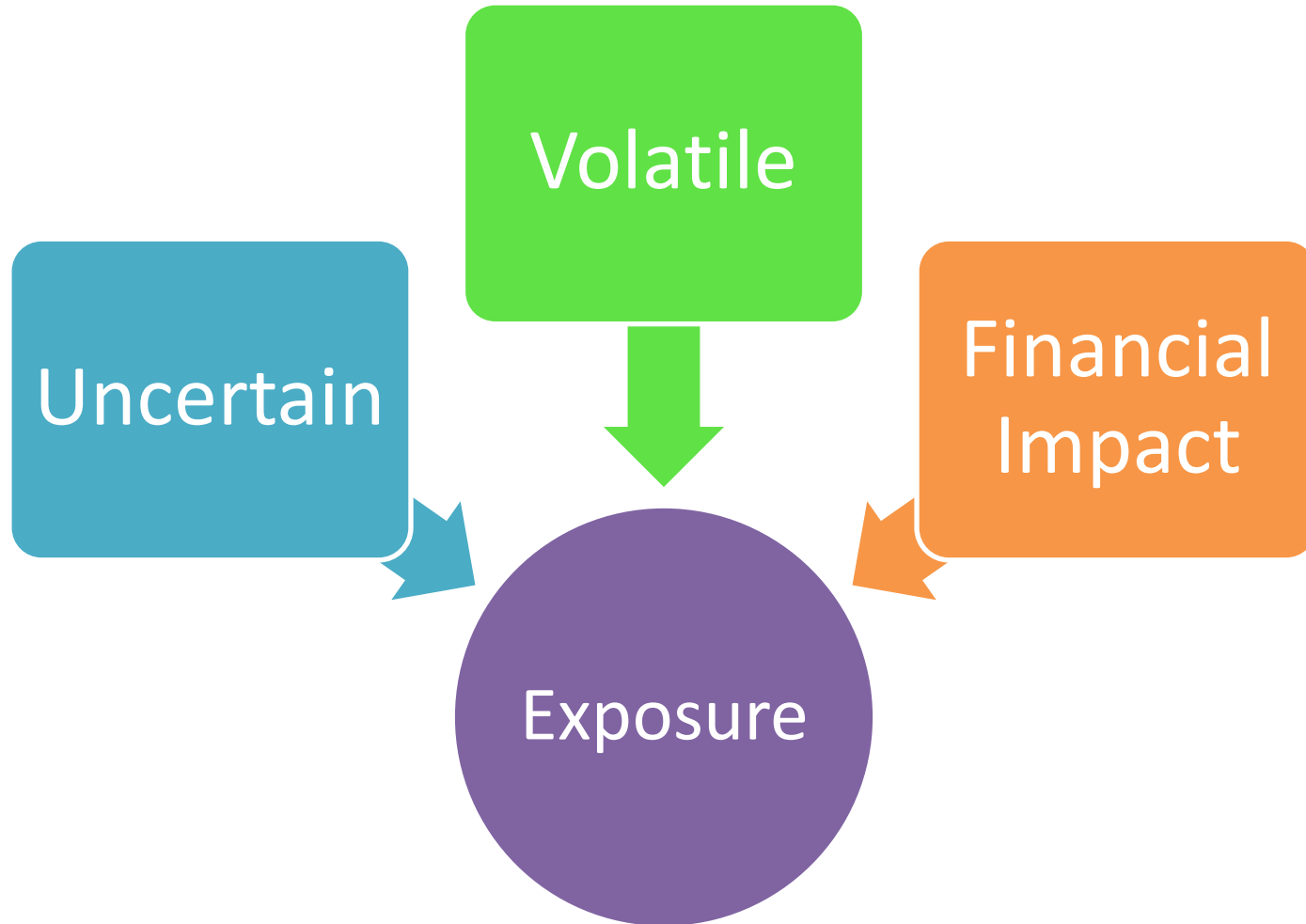
Trend



Exposure, Risk, Target Accounts



What is exposure?



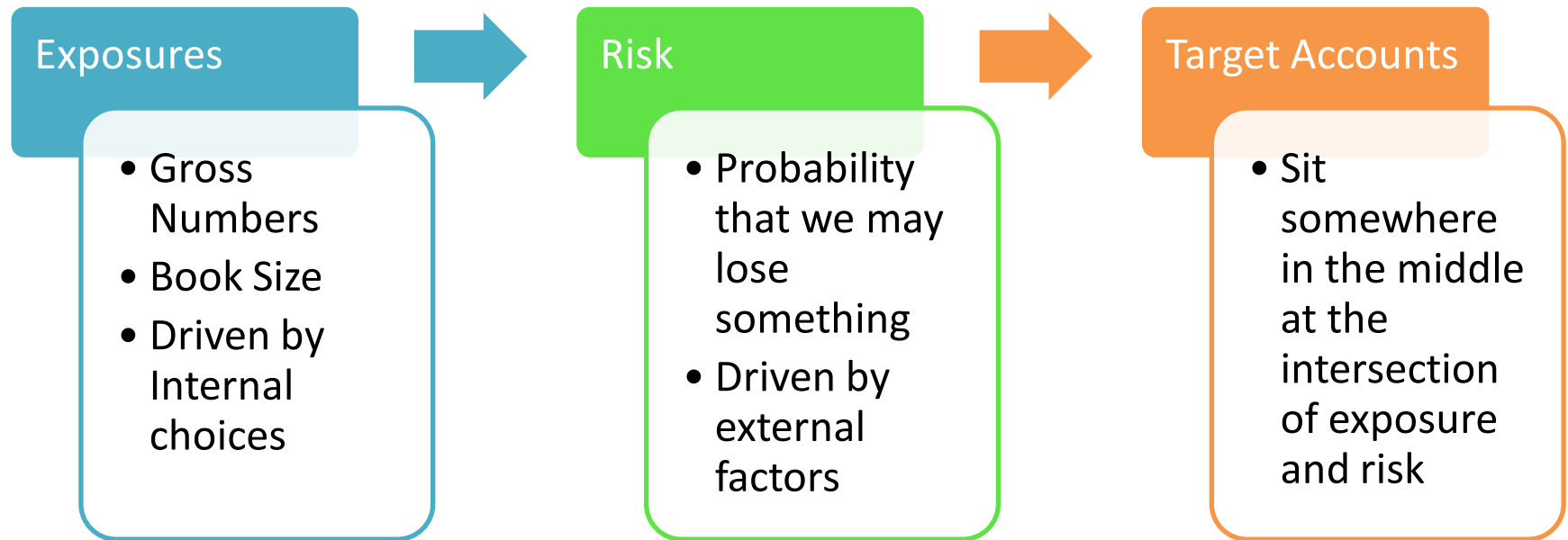
What is a Target Account?

Measurable/
Reportable

Sensitive/
Relevant

Explainable/
Understandable

Exposure, Risk, Target Accounts



Target Accounts & Impact

P&L

Risk &
Capital

Benchmark

Governance revisited

Governance challenges

Who is the regulator?

Local

- Central Bank, Securities regulator
- FMA & ACI Code of conduct

International

- OCC, Federal Reserve, FSA
- North American and EU regulations

Morality

- Broadest definition.
- How do you teach morality to smart people?

The Gambit – Rational thinking

Expected Payoff $>$ Penalty

Expected Payoff $<$ Penalty

In an imperfect world?

Social Costs

- Impact
- Group behavior

Personal Costs

- Recognition
- The desire to get caught

The cost of being caught

- Direct
- In Direct

Regulatory compensation

- Paradigm shift
- Make an example – The bite & teeth

Cases & Messages

Misrepresentation

- The slide in security prices

Collusion

- FSA Libor Crisis, FX Exchange rate crisis

Client Confidentiality

- Front Running, Insider Trading, Gouging

Consequence

Bank wide impact

- Fines, penalties
- Loss of license
- Civil Suit, Class Action Suit

Management

- Suspension & Termination
- Negative lists
- Future prospects

Dealers

- Suspension & Termination
- Negative lists

Q&A

Alchemy Intro

- Actuarial & Risk Advisory firm
- 11 years, 4 Markets
- Banking and Insurance Risk, Capital Adequacy Focus
- Derivative & Risk Management models, Treasury Management
- ALM, ICAAP, Stress Testing, Financial Product Development
- More than 3,000 trained participants across 150 workshops





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