Overview

Current DOD/Intel uses of Info. Mkts.
Nature and Merit of an IMPA
Non-Commercial Information Markets
Qualities of an IMPA
Net Exchange IMPA Design
Phase I Activities to Date
Phase I Test-of-Concept
Progress towards a Phase II
Futures Markets are Information Markets
- Aggregate Private Information from Disparate Parties
- Coalesce Information into Enhanced Predictions (Prices)
- Maintain Information Security while Improving Predictions

Current & Past Policy Analysis Uses
- Oil Futures (Mid-East concerns, non-OPEC mitigation)
- Precious Metals (late 1980s analysis of USSR condition)

Consider the role played by Options: A payoff based on a contingency provides an incentive for those with information about the contingency to add that information to the market.
Nature and Merit of an IMPA

Interplay of basics, policies, and events
- Basics: Economy, Internal Cohesion, Interstate Rivalries
- Policies: Military Deployments, Trade Relations
- Events: Civil Unrest, State-to-State Conflict, Terrorism

Merit Claim: IMPA can amplify critical insight; improving event predictions.

Interconnected systems of information and policy analysis:
- Specialized Information
- Generally Observed Information
- IMPA
- Aggregate Coalesce Predict
- Policy Analysis (Guidance)
Non-Commercial Info. Markets

**Current Art in Non-Commercial Info. Markets**

- Security sets that *span* an event (Bush, Gore, Nader, Other)
- Assign a value to each set; e.g., 2000 U.S. Pres. Set = $1.00
- Pre-Event, issue sets to a population and facilitate exchange
- Evolution of prices (all ≤ $1.00) track aggregate predictions

**Summary of performance to date**

- Election markets provide superior predictions to opinion polls
- Intra-firm decision support markets show promise
- Limitations: Fixed Horizon, Set Piece (e.g., no endogenous definition), Limited (if any) access to options.
Necessary Qualities in an IMPA

Advancing Horizon of well-defined securities
- Securities that *span* an ongoing policy environment
- Observable & Measurable: GDP, deployments, deaths

Ability to Handle Fundamental Ignorance
- Don’t really know what specific future events to care about
- Interdependencies among Events: how so and which matter?

Broad Aggregation leading to Coalescence
Judge to assay security’s *State* at maturity

Compliance: Legal and Policy
Key to Coalescence -- Amplify Insight

Problem: Which, if any, $A \cap B$ is worthwhile

- Lead/Lag? Prior levels? Context w.r.t. others (e.g., C)?

Solution: Basis Securities + Endogenous Issuance of Intersections

$B = \text{Indian GDP} \uparrow$

Power of Optionality
Basis Securities (Spanning the Event Space)

- What events will matter? Note: Event \( \approx \) \{Fundamentals\}
- Provide Basis Securities spanning U.S. and foreign events
- Likely specific events gleaned from basis interplay revealed through the trading activity among information holders.
- Widely Observed: GDP, Civil Unrest, Deployment, Conflict

Probability of Iraqi-backed terror in U.S. in 2Q03 \( \approx \) \{DOW_{3Q04}, IRQcivil_{1Q04}, US/TR$_{1Q04}\}

A Basis Security is a time series of Triples

\[
\text{Change in the Dollar Value of all flows from U.S. to Turkey} = \frac{\$US}{\text{TR}} = \begin{cases} 
\$US/\text{TR}_t^+ & \text{when increase from } t - 1 \geq 5\% \\
\$US/\text{TR}_t^- & \text{when change from } t - 1 \text{ within } 5\% \\
\$US/\text{TR}_t^- & \text{when decrease from } t - 1 \geq 5\%
\end{cases}
\]
Endogenous Issuance of Intersections

- Quarterly Auction: Traders nominate basis pairs for intersections and bid using scarce, perishable *script*

- If $A_4 \gamma B_3$ is chosen, then all $A_4^-, A_4^=, A_4^+, B_3^-, B_3^=, B_3^+$ and $B_3^+$ are replaced by mixes of the nine intersection pairs.

- Overall, market value remains constant.

Valuable uses of Combinatorial Processes

- The basis securities in an issued intersection can still be traded using a package order.

- Unions can be traded w.r.t. issued intersections.

- Liquidity enhancement; e.g., swaps, XOR
Each Invitee may buy $N worth of new basis securities per quarter at $1.00 per Triple.
Phase I Activities to Date

Investigation into basic questions
- Process Significance under Interdependence
- Relationship between underlying liquidity and mechanism
- Susceptibility to Manipulation
- Being undertaken by GMU & Caltech (Exp. Comp. 5/02)

Test-of-Concept Demonstration System
- Design finalized and under development
- Functional test planned for late May, Demo in June.

Preparations for Phase II (covered on final chart)
Phase I Test-of-Concept

Two-Nation Regional Model
- Sueland and Bobland
- Sues and Bobs have a long inter-history, not all of it good

Securities:
- Sueland: GDP, Civil Deaths, Mil. Deaths w.r.t. Bobland
- Bobland: GDP, Civil Deaths, Mil. Deaths w.r.t. Sueland

Market Functions: Next in Series, Periodic Call, Intersection Issuance
Phase I Test-of-Concept

Status of Development

- Existing combinatorial securities trading product is being modified for periodic call (DB work for intersections)
- New system for intersection issuance: design done, matching engine done, GUI underway, DB under design
- Designing information environment for eight participants

Demonstration Plan

- System components should be ready by 15 May
- Alpha-System should be assembled by 25 May
- First demonstration run completed at GMU by 7 June
Progress towards Phase II

Judge of Events (discussions advanced)
- Economist Intelligence Unit (assist in securities definition)
- Meeting with Managing Editor in London on May 7th

Commercial Partners (disc. just started)
- HP Labs: Info. Market Pioneer, IT System Architect

Participant Populations (identified only)
- Academia: Domestic (and Foreign)
- Press: Domestic (and Foreign)