William Blair

Case Study
July 2013

How We Apply Game Theory
The Koreas

WHAT IS GAME THEORY?

- Events, geopolitics, and policy changes affect market prices in ways that can seem uncertain or random.
- William Blair's Dynamic Allocation Strategies team uses game theory in its analysis to provide clarity on investment opportunities.
- Game theory considers the interests and incentives of the "players"—in this case, governmental and economic leaders.
- Today's leaders are engaged in a multilateral bargaining game where players devise a strategy and demonstrate various powers as they interact with other players to achieve a desired outcome.
- In order for us to assess investment opportunities and risks, we examine four strategic powers.

Game Theory Powers and Behaviors

Strategic Powers	Examples	Demonstrated Behaviors
Endowment	Political capital, nuclear warheads	Confidence, aggression
Threat	Lob some bombs, sacrifice collateral	Bluffs, aggression, sacrifice
Risk tolerance	Willing to accept "no agreement"	Bluffs, disinterest, 11th hour
Coalition	"Merkozy" (Merkel & Sarkozy), media	Solidarity, adaptability

Our Investment Process

Step 1:
Identify Value to Price Discrepancies

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Fundamental analysis identifies *where* value/price discrepancies exist

Step 2:
Understand Macro Themes

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Game theory helps explain *why* prices deviate from values

Step 3:
Design Portfolio and
Integrate Risk Exposures

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Dynamic risk capital allocations help determine *how* best to capture investment opportunities

CASE STUDY: MARKET EVENT OVERVIEW

- Korea has been in the media headlines recently, given the threats issued by North Korea's young leader Kim Jong-Un
- From a fundamental valuation perspective, Korea is currently one of the more attractive emerging markets equity markets

GAME THEORY ANALYSIS HIGHLIGHTS

- South Korea's strong coalition power (U.S.) and endowment power (greater nuclear arsenal) provides a decided advantage in the bargaining game
- The wild card remains whether North Korea's young leader Kim Jong-Un will make a mistake that leads to escalation
- At this point in the bargaining process, the strong upper hand of South Korea points to market behavior that is supportive of the attractive valuation

See back page for Strategy Implications

"We strongly believe that broad macro themes increasingly will dominate portfolio performance. Robust investment processes will need to include a greater focus on integrating the disciplines of game theory, macroeconomic theory, and geopolitical science – the tools required to fathom the behaviors of these players and understand the ramifications of their decisions."

-Brian D. Singer, CFA

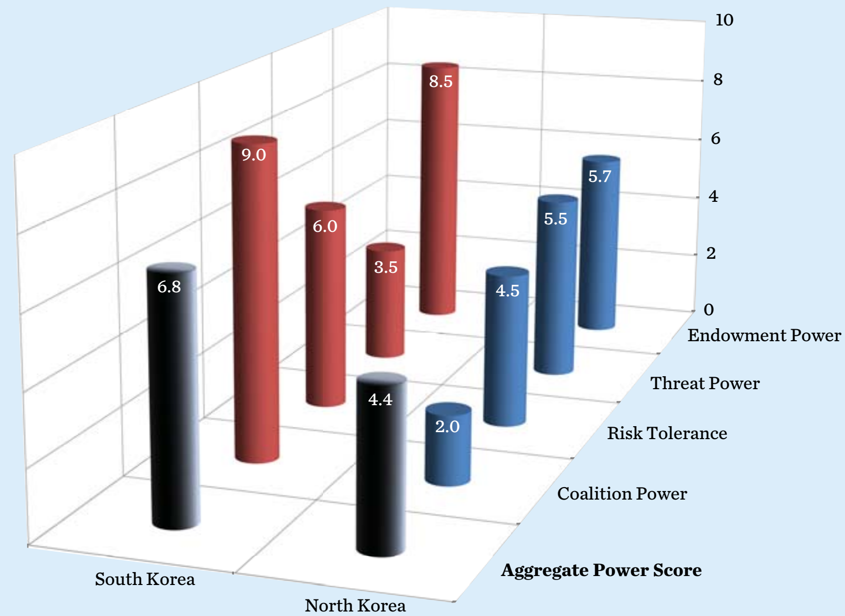
- Started in Industry: 1981
- Head of Dynamic Allocation Strategies Team
- M.B.A., University of Chicago
- B.A., Northwestern University

WHY MACRO MATTERS

- Historically, over 90% of portfolio return variation has been attributable to top-down allocation decisions[1]
- Global interconnectedness has increased the relevance and pace at which macro political and economic factors affect investment results
- Traditional asset allocation/portfolio rebalancing may not be dynamic enough to fully reflect opportunities and risks as they unfold

1 Source: Determinants of Portfolio Performance II: An Update Brinson, Gary P.; Singer, Brian D.; Beebower, Gilbert L. Financial Analyst Journal; May/June 1991; 47, 3; ABI/INFORM Global pg. 40.

Koreas' Bargaining Powers



Power Score Scale
1: Weak 10: Omnipotent

2Q 2013 assessment
Source: William Blair & Company

STRATEGY IMPLICATIONS

- Given both valuation and market behavior considerations, we increased our exposure to Korea equity and reduced exposure to frontier markets equity, leaving total equity exposure unchanged
- Re-affirmed won (Korea's currency) long exposure
- Reduced broader Japanese equity (NIKKEI) long exposure