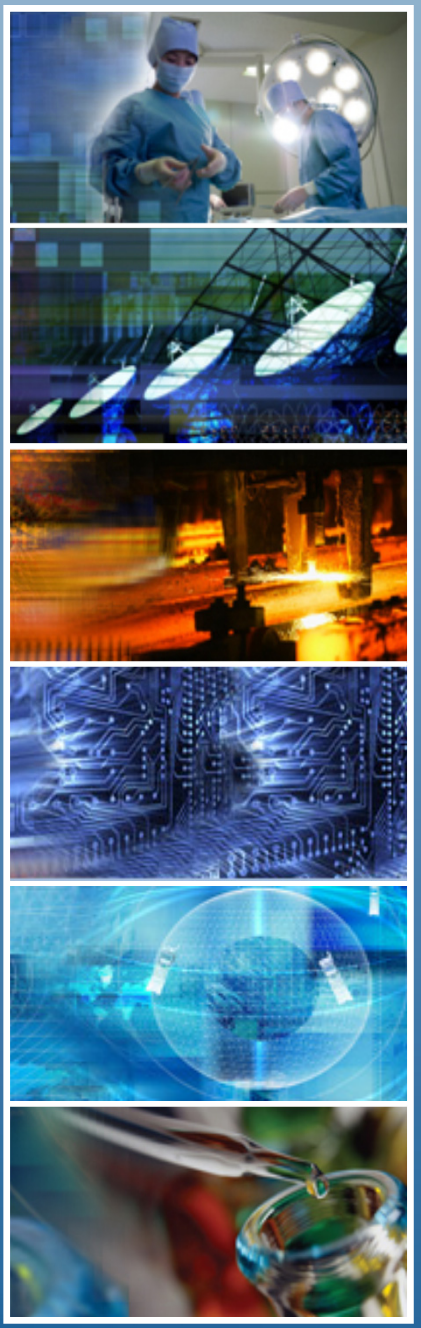

Globalview Advisors

Financial Valuation and Advisory Services

Valuation of Japanese High Speed Rail Technology / System

9th ICVPME Conference, Tokyo, Japan

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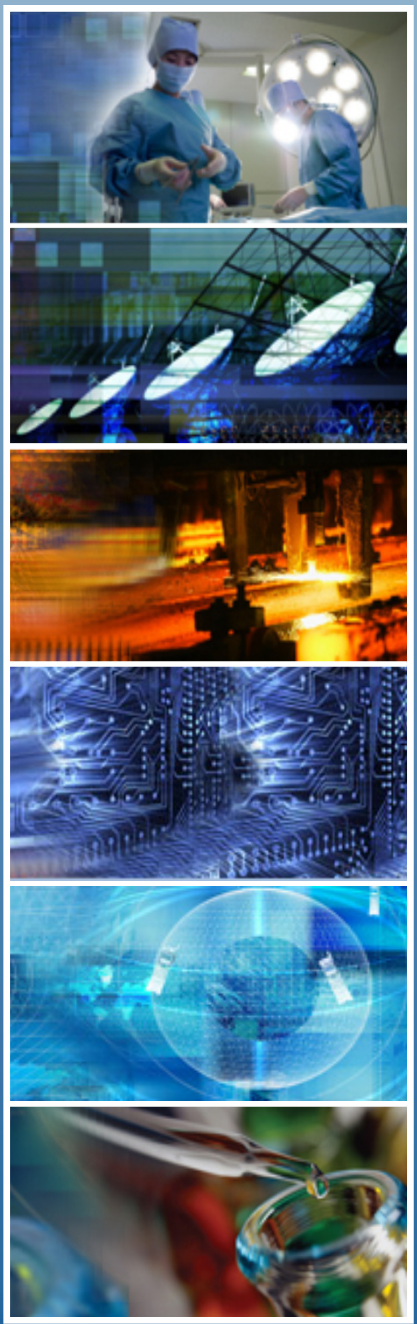
Presenter's Contact Information

Raymond Rath, ASA, CFA
Managing Director
Globalview Advisors LLC
19900 MacArthur Boulevard, Suite 810
Irvine, CA 92612
949-475-2808
rrath@globalviewadvisors.com

Contents

Objectives

1. Provide overview of the complexity of high speed rail (“HSR”) technology and overall HSR system
2. Recognize range of benefits from HSR investment
3. Overview of direct and indirect financial benefits
4. Recognize concept and importance of “value capture”
5. Discussion of indirect financial benefits
6. Overview of types of non-financial benefits of HSR
7. Overview of costs and risks associated with HSR investment
8. Recognize attributes of a factor model for evaluating a potential investment in HSR
9. Understand benefits and risk reduction associated with investment in Japanese HSR



Introduction and Background

Introduction - Valuation of High Speed Rail System

- For any valuation, it is important to fully understand the valuation question at hand.
- For our discussion, we will focus on the assessment of relative value impacts of different HSR technologies/systems to an entity considering the construction of a HSR project.
- We will also provide an overview of factors in evaluating competing HSR systems

- An alternative question would be what is the value of HSR to the various entities that have developed HSR technology. Our discussion will not address this different valuation question.

Introduction – Valuation of High Speed Rail Projects

- High Speed Rail is an Extremely Complex System
- HSR Investment has Significant Uncertainty
- Traditional Valuation Viewpoint - Uncertainty Increases Risk and Greater Risk Reduces Value
- We Will Discuss General Process, We Will Not Attempt to Estimate a Range of Value for HSR Projects
- Economic Benefits of HSR are Both Direct and Indirect
- Indirect Benefits are Significant but Not Readily Captured in a “Traditional” Valuation Model
- Our Focus is the Relative Valuation of Different HSR Systems / Technologies on a HSR Project

Elements of HSR Technology / System

- Train Cars ("Rail Set" or "Rolling Stock")
  - Numerous unique elements
- Separate Dedicated Track
  - Separate from other trains – improves safety
  - Built without road crossings at grade
  - No track access
- Track and Automatic Train Control (No signal system needed)
- Software
- Operating Protocols
  - Inspection / Maintenance / Repair System / Other
- Other

Integrated Management of HSR System

- **Hardware**
  - Dedicated track
  - Signaling system, automatic train control (“ATC”)
  - Rolling stock
  - Electrical facilities
  - Disaster countermeasure
  - Security
- **Software**
  - Safety promotion structure
  - Employee education/training
  - Employee aptitude
  - Maintenance
  - Operation

Multiple Definitions For High Speed Rail Are In Use Worldwide

- The International Union of Railways (UIC) make use of the European EC Directive 96/48, stating that high speed is a combination of all the elements which constitute the system:
  - infrastructure,
  - rolling stock and
  - operating conditions.
- The International Union of Railways states that high-speed rail is a set of unique features, not merely a train travelling above a particular speed

Markets for High Speed Rail

- Commuter vs. Freight Application
  - Very limited freight – TGV for French postal service
- Characteristics of a Potential HSR Market
  - High passenger volumes (cities / population centers)
  - "Moderate" distances - Best suited for journeys of 1 to 4½ hours (about 150–900 km or 93–559 miles)
    - Shorter distances reduce HSR benefit
    - Longer distances increase competition with air

Many Potential Markets for High Speed Rail

- US / Canada –
  - Dallas to Houston
  - Atlanta to Columbus
  - Los Angeles to San Francisco / San Diego
  - Washington DC to Boston / Philadelphia / New York
  - New York to Montreal
  - Montreal to Toronto
  - Chicago to St. Louis / Detroit
- Africa – Johannesburg to Durban
- Europe - Various
- Russia – Moscow to St. Petersburg
- Asia
  - India - New Delhi to Chennai
  - Malaysia and Singapore
  - Thailand – Bangkok to Chiang Mai
  - Vietnam – Hanoi to Ho Chi Minh City
  - Indonesia
  - Sydney to Melbourne
- South America
  - Brazil – Rio de Janeiro to Sao Paolo
  - Argentina

Competition for High Speed Rail Investment

- Traditional rail systems
  - Upgrade existing
  - Build new traditional rail systems
- Other means of transit
  - Air transportation
  - Automobile / bus
- Other infrastructure investments
  - Tunnels / bridges
    - Repair
    - New construction

Background on Japanese High Speed Rail

- Construction started – April 1959
- World's first HSR passenger service – Tokaido Shinkansen in 1964
- Current HSR in Japan
  - Longest service record
  - Over 2,300 kilometers of track
  - Many cities served
  - More than 10 billion passenger rides
- Very timely service – 30 second average delay
- Very high frequency of service
  - Up to 50 trains operating on a line – 4 minute spacing
- Larger train cars

Background on Japanese High Speed Rail - Safety

- Impeccable safety record – no fatalities despite being the first HSR and large passenger volumes
- Safely shut down in major earthquake – March 11, 2011 earthquake
  - 27 Shinkansen trains running
  - Sensors pick up preliminary seismic waves
    - Apply train brakes before seismic waves hit
    - Turn off electrical supply

Background on Japanese High Speed Rail – Ecological Impacts

- Improved air quality
- Reduced greenhouse gas
- Reduced energy use
  - Much more efficient than air or car / bus

Background on Japanese High Speed Rail – On-Time Record

- Japanese HSR has very strong on-time record. Factors include:
  - Rail-set reliability
  - Near-total separation from slower traffic
  - Other
- On-time performance
  - In 2012, JR Central reported that the Shinkansen's average delay from schedule per train was 36 seconds. This includes delays due to uncontrollable causes, such as natural disasters.
  - In 1997, the average delay was 18 seconds.

Competitors – Other Providers of HSR

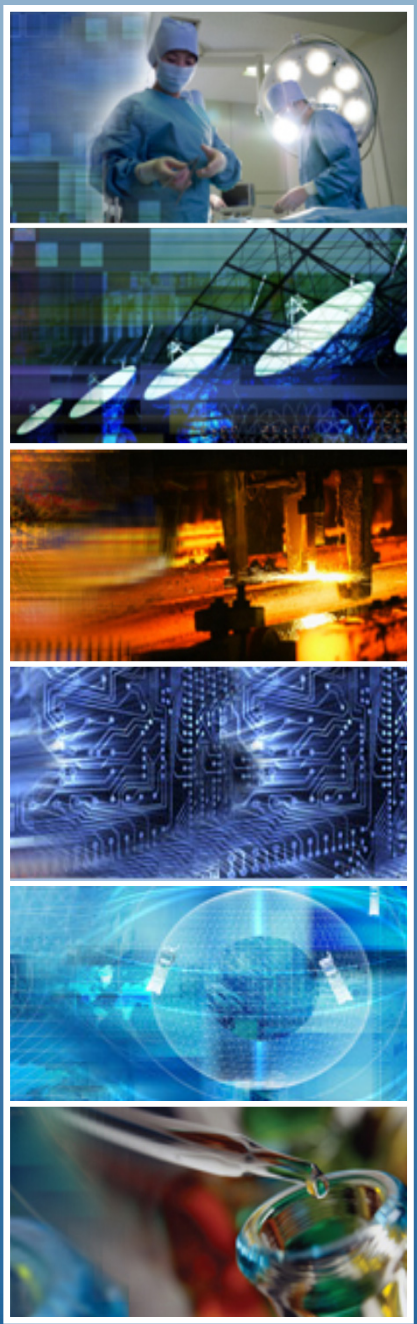
- Components or entire high speed rail systems are offered by a variety of sources. Reported bidders for rail sets for a planned HSR project in California include:
  - AnsaldoBreda (Italy)
  - Alstom (France)
  - Bombardier Transportation (Canada – parent entity)
  - China National Railway
  - Hyundai Rotem (Korea)
  - Kawasaki Heavy Industries Rolling Stock (Japan)
  - Siemens Mobility (Germany)
  - Talgo (Spain)
  - Hitachi

Status of California High Speed Rail Project

- A brief overview of efforts to develop HSR in California highlights complexities for building HSR systems
- California High Speed Rail Commission established in 1993
- Phase 1 – Los Angeles to San Francisco
  - Estimated cost of $68.4 billion
  - Blended system (some shared track) to reduce cost
  - Construction and funding in segments
  - Partially funded
    - Bonds approved by California voters in November 2008
    - Federal grants
  - Targeted completion of LA to SF by 2029

Status of California High Speed Rail Project

- January 2015 California High-Speed Rail Authority issues Request for Proposals (RFP) for rolling stock. Anticipated award of contract in 2016.
- Bidders include:
  - AnsaldoBreda (Italy)
  - Alstom (France)
  - Bombardier Transportation (Canada – parent entity)
  - China South Locomotive & Rolling Stock (China)
  - China North Locomotive and Rolling Stock (China)
  - Hyundai Rotem (Korea)
  - Kawasaki Heavy Industries Rolling Stock (Japan)
  - Siemens Mobility (Germany)
  - Talgo (Spain)



Section 2

Benefits / Costs / Risks of Investments in New HSR Projects

Benefits of Investment in New High Speed Rail Projects

- Benefits from HSR project investments are varied
  - Financial benefits
    - Direct
    - Indirect
  - Other benefits
- Ability to measure the different benefits varies

- Correctly identified HSR projects can be viewed as **Transformational** rather than simply as **Transportation**
  - Create dramatic changes in geographic areas

Benefits of Investment in New High Speed Rail Projects – Direct Financial Benefits

- Operating cash flows upon completion
  - Ticket sales
  - Other revenue streams
- Tax revenue increases
  - Property value increases leading to tax revenue increases
    - Land appreciation
    - Addition of structures
  - Income tax increases
    - New businesses
    - Expansion of existing businesses

Benefits of Investment in New High Speed Rail Projects – Indirect Financial Benefits

- Increased productivity / convenience (Time savings)
  - Scheduling frequency and flexibility
  - Reliable, punctual operation – delays are minuscule
  - Comfort
  - Greater productivity during travel time
- Job creation
  - Construction phase
  - After completion
- Revitalization / reinvestment
- Generated traffic (new travel)
- Expansion of urban areas into “megaregions” (Transformational)
  - Spread population away from dense downtowns
- Alleviate pressure on existing air and auto transport infrastructure

Benefits of Investment in New HSR Projects – Indirect Financial Benefits (continued)

- Expand labor pools – HSR reduction in travel time expands housing range for work force
  - Improve matching of workers to job opportunities
  - Greater specialization of labor supply leads to greater efficiency and increased productivity
  - Knowledge spill-over (greater opportunity for communication due to increased accessability)
  - Greater choice of jobs
  - Increased competition between companies and individuals

Benefits of Investment in New HSR Projects – Other Benefits

- Other benefit
  - Convenience
  - Safety
  - Reduced pollution
  - Energy efficiency
  - Prestige
  - Risk reduction due to transit diversification
  - Transport system capacity expansion
    - HSR can reduce frequency of short hall air flights and free up airport gates for longer distance flights

Costs of New HSR Projects

- Direct
  - Land costs
  - Construction costs
  - Interest on investment
  - Possible relocations
- Noise pollution
  - Tunnel boom significantly reduced due to engineering solutions
  - Maglev actually quieter than traditional
- Opportunity costs
  - Other uses of funds

Risks of New HSR Projects (cont'd)

- Technical
  - Past HSR experience can mitigate
- Cost Overruns
  - Technology development / acquisition
  - Land acquisition
  - Construction
  - Increased interest costs due to possible delays
- Achieve Targeted Ridership, Operating Performance and other Performance Metrics
- Political
  - Administrative / governmental / legal delays

Section 3

Assessing Development or Purchase of HSR System

Market Recognition of Complex Technology / System Value

- Various transactions demonstrate the importance of developed technology / systems
- Large markets with bargaining power may be able to require technology transfer to complete a transaction
  - Airplane, automotive, HSR and other contracts with large markets often include direct or indirect technology transfer
    - Some HSR rolling stock (train set) acquisitions included requirements for local rather than foreign manufacture. Local manufacture increases likelihood of technology / skills transfer
    - Various aircraft and automotive contracts
    - Large market buyers require that benefits cannot only accrue to foreign economies

Buy vs. Build Decision for HSR Technology / System

- A common investment question is often – “Buy” vs. “Build”
- Buy – Essentially a Market Approach
  - Go to market and obtain bids
- Build – Essential a Cost Approach
  - Estimate costs to develop technology and system internally
- Types of “build” costs to consider
  - Direct cost estimates
  - Indirect cost estimates
  - Capital costs associated with delays
  - Societal costs associated with delays

Buy vs. Build – Impact of Complex, Inter-related Intangible Assets on Cost to Create

- The choice between the two options is almost always a function of the specific circumstance
- HSR technology / systems involve numerous complex intangible elements associated with the technology and system
- Complexity of interactions of the intangibles can lead to greater potential for additional costs and unexpected outcomes which can lead delays in completion
- Assets / systems with less complexity would have more limited intangible elements
- Intangibles are generally recognized as higher risk assets
- Complexity increases the potential range of costs to create
- Additional costs / delays can lead to other costs
- Greater cost uncertainty reduces attractiveness of the build scenario and increases attractiveness of the buy scenario

Buy vs. Build – HSR Technology / System

- For HSR, the purchase of existing HSR technology / system is expected to be a better investment decision
- Factors include:
  - Very high degree of complexity of HSR systems
  - Complex, multi-factor learning curve
  - High development cost risk
  - Large capital investment increases risk associated with delays
    - Delays / second chances are costly
  - Multiple parties depend on timely completion given their investment in tertiary developments

Buy vs. Build – Cost Approach and Estimation of Cost to Create

- As complexity increases, estimation of cost to create becomes increasingly more challenging
  - Cost to include
    - Cost of successful efforts
    - Costs of "failed" efforts ("dry holes")
      - Direct costs
      - Numerous other costs associated with delays
    - Overhead allocations
    - Capital costs
- Existing HSR technology / systems benefit from costs incurred from prior development efforts
  - Completed learning curve results in significant risk reduction

HSR System Selection – Cost Considerations

- Costs associated with unexpected delays
  - Capital costs
  - Litigation costs
  - Project reductions
  - Project terminations
  - Societal costs
    - Bankruptcies
    - Transfer payments
- Costs to sponsors associated with unexpected delays

Section 4

Valuation of Investment in New HSR Projects

Valuation of Investment in New HSR Projects - Introduction

- Valuation of HSR Technology / Systems from the perspective of the owner / licensor of system is complex
  - Future HSR Infrastructure spending is difficult to forecast
    - Number of projects and size
    - Timing
    - Competition
  - HSR technology / systems includes multiple elements for consideration
  - Separation of technology from other transaction components – technology that is integrated into the rolling stock
  - Limited transactions
  - Available transactions involve multiple elements

Valuation of New HSR Project Investment – Valuation Methodology for Financial Benefits

- Financial benefits from HSR projects can be estimated using traditional financial models
- Other benefits require alternative approaches

- For financial benefits - Income Approach - Discounted Cash Flow Method
- Key Assumptions
  - Cash flow estimates –
    - Initial periods of cash outflows
    - Subsequent periods of cash inflows
  - Discount rate selection – government, private, other

Valuation of New HSR Project Investment – Challenges Measuring Direct Financial Benefits

- Challenges modelling direct benefits
  - Capital costs uncertainty
  - Project completion uncertainty
  - Complexity of system (right-of-way requirements, others)
  - Forecast market demand and pricing
  - Revenue mix
    - Ticket sales
    - Increasing focus on other revenue streams for the HSR operator

Valuation of New HSR Project Investment – Value Capture and Indirect Financial Benefits

- The concept of “value capture” recognizes many indirect financial benefits from infrastructure investment projects
- Property value increases
  - Land value increases
  - Value of new and refurbished structures
- Business value increases
  - Enhance customer traffic

- In many jurisdictions, these benefits are recognized and those that benefit agree to tax and fee structures to help fund infrastructure investment that increases value of their assets
  - Special Assessment and/or Business Improvement Districts
  - Development Impact Fees

Valuation of New HSR Project Investment – Use of Multiple Scenarios

- Cash-Flow Based Valuation Models Include Single or Multiple Scenarios
  - Multiple scenario models recognize the range of potential future outcomes
- Given complexity of HSR investment, any valuation would require complex multi-scenario valuation models
  - Monte Carlo Simulation
  - Key variables
  - Ranges of estimates
- Multiple scenarios models are recognition of HSR risks
- Requirement for multiple scenarios suggests importance of risk mitigation efforts

Valuation of New HSR Project Investment – Discount Rate Estimates

- Developing discount rates for valuing infrastructure investment is challenging.
- Benefits streams include financial and non-financial benefits
- Projection of current and future capital costs, future revenues and operating expenses are difficult
- Infrastructure investment are frequently valued using discount rates at the “low” end of the return spectrum
- Factors consistent with this view include
  - High capital costs create barrier to entry and reduced risk
  - Income streams from property taxes are low risk – below debt and equity costs for real estate
  - Government involvement suggests availability of lower cost funding
- Public benefit projects often have lower discount rates due to numerous non-financial benefits (“Social discount rate”)

Valuation of New HSR Project Investment – Indirect Financial and Non-Financial Benefits

- Measuring multiple indirect financial and non-financial benefits is difficult
  - Employment benefits
  - Environmental benefits
  - Travel flexibility
    - Increase competition
    - Reduce risk of possible travel monopolies
  - Overall property value increase
  - Technology transfer benefits to new markets
  - Numerous other
- Known / proven HSR technology systems reduce uncertainties / risks

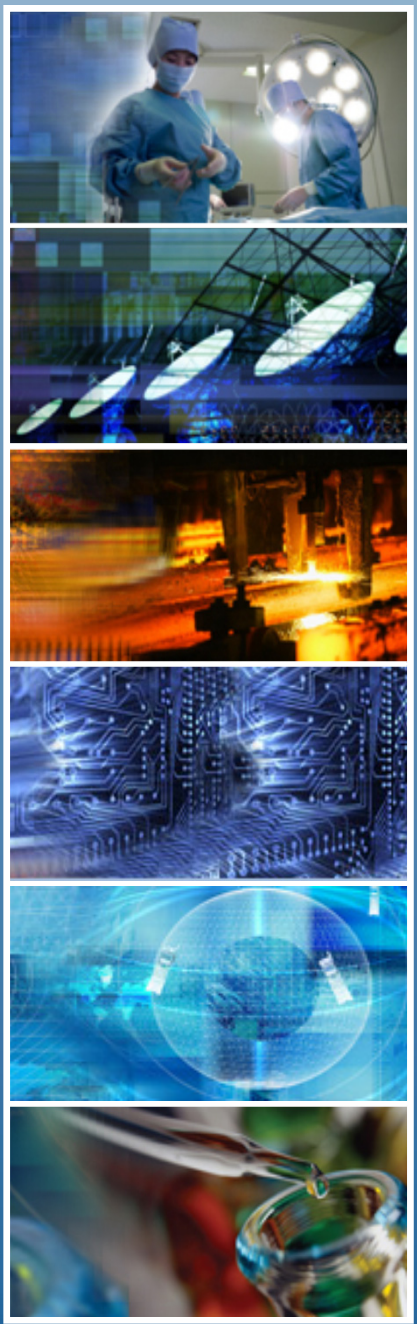
Evaluation of New HSR Project Investment May Use a Factor Model

- Given many complex benefits, costs and competing options, HSR investment opportunities may be evaluated using factor models
  - Desired Economic and Non-Economic Benefits and Costs Identified by Potential Buyer
  - Weights Afforded to Each Benefit (or Cost) (Criteria)
  - Evaluation and Scoring Method for Each Criteria
  - Examples
    - HSR Investment
    - U.S. Military Transport – Boeing vs. Airbus
    - Contract Award (Greek Theatre in Los Angeles)
    - Many, many others

Key Elements of Project Assessment

- Sensitivity Analysis
  - Critical Variables
- Probability Distribution for Each Critical Variable
- Calculation of the Distribution of Performance Indicators
  - Financial Net Present Value
  - Economic Net Present Value
- Discussion of Results and Acceptable Levels of Risk
- Discussion of Ways to Mitigate Risks

Source: *EU Guide to Large Scale Investment Projects*



Section 5

Japan HSR and Impact on Overall System Cost

HSR New Project Investment Summary

- HSR Project investment is very capital intensive
  - Large up-front costs for land acquisition
  - Large up-front costs for system construction
  - Long time periods until completion
  - High capital costs –
    - Interest expense
    - Cost increases if HSR system delayed
- Importance of assessing costs and related benefits
  - Cost increases due to delays and other unexpected factors could far exceed any potential cost savings associated with providers with a lower quoted up-front cost
- Assessing different technology providers would require careful consideration of risk of delays

Japanese HSR Characteristics

- Several key benefits/features of Japanese HSR systems include:
  - **Safety**
    - No passenger fatalities or injuries due to train accidents for 49 years
  - **Large Capacity**
    - Large capacity: 1,323 passengers per sixteen-car trainset
    - Ridership: 409,000 passengers per day, 149 million passengers per year
  - **Environmental Adaptability**
    - Low energy consumption, low CO2 emissions
    - Low wayside noise, small ground vibrations along high-speed lines

Japanese HSR Characteristics

- **High Speed**
  - System construction with separate tracks allows for high speed operation
- **High Frequency**
  - 323 trips per day (Max. 410 trips per day)
- **Stability**
  - Annual average delay: 0.5 minutes per train

Japanese High Speed Rail Benefits

- Risk reduction due to deep expertise – given substantial investment and history of operation, reduction of adverse project events increases expected return on investment
- Long record of safe operation suggests reduced risk of possible project delays. Reduced risks for:
  - Time for approval
  - Potential re-engineering and related costs
    - Lost investment
    - Adverse impact of capital tie-up
- Favorable reputation can improve community acceptance
  - Increase ridership
  - Increase investment in businesses supporting completed rail system

Japan High Speed Rail Benefits

- Greater perception / acceptance can lead to further expansion of HSR investment
- Greater diversification of transport options
  - Reduce reliance on air and automotive transport
  - Frees up air and auto transport capacity
- Regional transformation
  - Potential to spread development amount wider geographic area covered by HSR

Japan HSR Benefits – Reduced Risk and Discount Rate

- Selection of a HSR vendor with a strong record
  - Increases potential cash flows by reducing potential for adverse outcomes
  - Reduces the risk of these outcomes occurring
- HSR project investment with a strong system provider has less risk and a lower return requirement (lower discount rate is appropriate)
- HSR project investment involves significant cash outflows over an extended investment period followed by cash inflows from numerous sources (and other indirect benefits) beginning after the extended construction period
- A lower discount rate will significantly increase the value of an HSR project due to the extended period over which cash flows are forecast.
- Discount rate estimates also consider “social opportunity cost” which generally results in a lower discount rate

Section 6

Conclusion

Conclusions

- HSR investment provides numerous benefits
- Japanese HSR technology reflects
  - Longest history of use,
  - High ridership volumes,
  - Most frequent scheduling of departures,
  - Construction in geographically challenging settings
  - Safest operating history of any HSR
- Development cost expended and knowledge gained from almost 50 years or HSR operation are immense
- High cost to develop new HSR technology, significant possible costs from delays and uncertainty associated with number of future HSR projects suggest purchase of existing HSR rather than creation of new technology is an optimal course

Conclusions

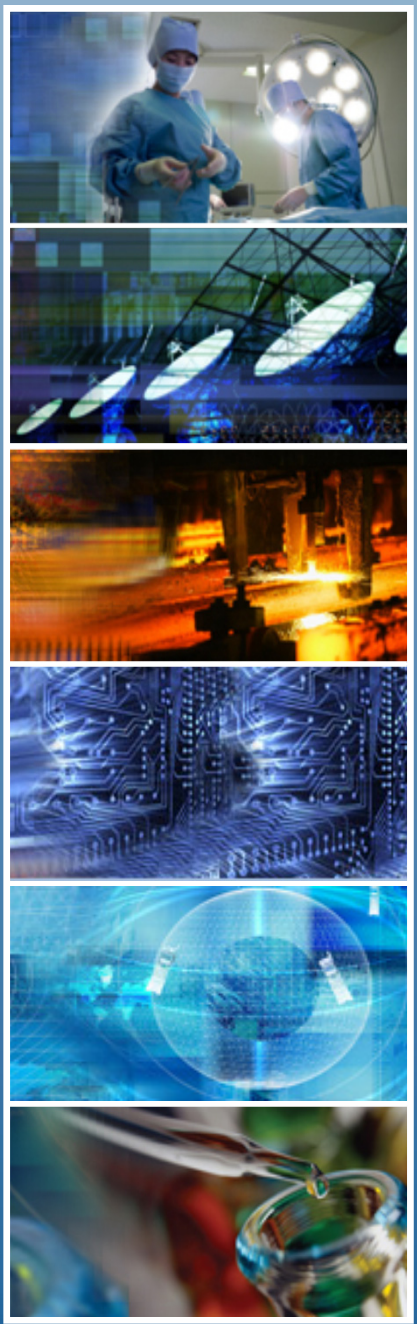
- In assessing existing HSR system / technology options, unanticipated delays can lead to adverse economic impacts
  - Potential reduced public support
    - Reduced ridership
    - Delays in completion
  - Interest costs associated with sunk capital
  - Potential changes in cost of capital
  - Potential loss of funding
  - Delays in generating operating cash flows

Presentation – Key Takeaways

1. Valuation requirements and what is being appraised need to be clarified at onset.
2. Public infrastructure investment often reflects limited funds available and a choice between different infrastructure opportunities.
3. Public infrastructure investments are evaluated with models that extend beyond just a direct cash flow model.
4. Indirect economic benefits are an important consideration in public infrastructure investment.
5. Other indirect benefits (reduced pollution, reduced risk from limited transportation options) are important considerations
6. Quantitative measurement of indirect benefits can be extremely difficult.
7. Factor models where variables and weights are determined by a group with decision making responsibility are often used.
8. The variables and weights in factor models may vary.

Presentation – Key Takeaways *(continued)*

8. Evaluation of different vendors can be based on relative scores from factor models.



Questions

Presenter's Bio—Raymond Rath

Area of Focus

Managing Director at Globalview Advisors LLC. Independent valuation firm with offices in Irvine, Boston and London.

Recognized leader in the valuation of businesses, securities interests and intangible assets. Performs valuation projects for financial and tax reporting, transactions and litigation projects.

Extremely active in enhancing the quality of valuation practice both domestically and internationally. Organize and moderate eight annual one-day conferences for the American Society of Appraisers on fair value issues including presentations by staff of the SEC, PCAOB, FASB and IASB. Led the development of two three-day valuation courses for the American Society of Appraisers (ASA) - *Valuation of Intangible Assets* and *Special Topics in the Valuation of Intangible Assets*. Led efforts resulting in an education and certification program for an Intangible Assets valuation specialty designation.

Presenter's Bio—Raymond Rath

Professional Experience

- Managing Director, Globalview Advisors, LLC, November 2012 to present.
- Director, Transaction Services, Valuation Services Practice, PricewaterhouseCoopers LLP, April 2002 to October 2012.
- Senior Manager, Valuation Services Practice, KPMG LLP and KPMG Consulting, Inc. 1994 to April 2002.
- Experienced Manager, Arthur Andersen & Co., 1987 to 1994, Senior Consultant, 1984 to 1987.

Presenter's Bio—Raymond Rath

Professional Affiliations

- Member, AICPA Investment Companies Task Force for AICPA Accounting and Valuation Guide, *Determining Fair Value of Portfolio Company Investments of Venture Capital and Private Equity Firms and other Investment Companies*. Guide is presently in development.
- Past Treasurer, Secretary and Member, Business Valuation Committee of the ASA. Elected by ASA international business valuation membership twice (maximum allowed).
- Past President, Los Angeles Chapter of ASA (2004-2005).
- Accredited Senior Appraiser ("ASA"), American Society of Appraisers. Accredited in Business, Intangible Asset valuation & Appraisal Review & Management.
- Chartered Financial Analyst ("CFA"), CFA Institute.
- Member, Appraisal Issues Task Force.

Presenter's Bio—Raymond Rath

Course Development and Instruction

- Lead Developer and Instructor, ASA courses *Valuation of Intangible Assets* (BV 301) and *Special Topics in the Valuation of Intangible Assets* (BV 302).
- Organize and moderate ten one day annual fair value conferences (May 2006 - 2015) for the ASA BVC. Presenters include SEC, PCAOB, FASB and IFRS.
- Instructor, ASC courses BV 201, 202, 203 and 204.
- Course Developer and Instructor, IIBV 301, Valuation of Intangible Assets, in Sao Paolo, Brazil. June 2012.
- Instructor, Current Developments in Valuation, Beijing, China, December 2010.

Presenter's Bio—Raymond Rath

Presentations

- Co-Presenter, *Valuation of Deferred Revenue*, ASA / CICBV International Business Valuation Conference, Toronto, Canada, October 2014.
- ASA Webinar, *Business Valuation Concepts for Fixed Asset Appraisers*, February 11, 2014
- Presenter, *Business Valuation Concepts for Fixed Asset Appraisers and Economic Obsolescence for Fixed Assets*, International Conference on the Valuation of Plant, Machinery and Equipment, St. Petersburg, Russia, September 2013
- Presenter, *Valuation Developments in the United States*, 2nd International Forum on New Developments in Valuation, WuHan, China, November 2012.
- Lecturer, *Valuation of Intangible Assets*, Zhongnan University of Economics and Law, WuHan, China, November 2012.
- Moderator, Fair Value Auditor Panel, ASA Conference, Chicago, IL 2011.

Presenter's Bio—Raymond Rath

Presentations (continued)

- Panelist, *IPR&D Toolkit Update Panel*, ASA Conference, Chicago, IL 2011.
- Presenter, *Valuation of Debt*, ASA, Miami, FL 2010.
- Presenter, *Valuation of Intangible Assets*, 25th Pan Pacific Conference, Bali, Indonesia, September 2010.
- Presenter, *Attrition Measurement and Estimation*, ASA Conference, Boston, MA, Oct 2009.

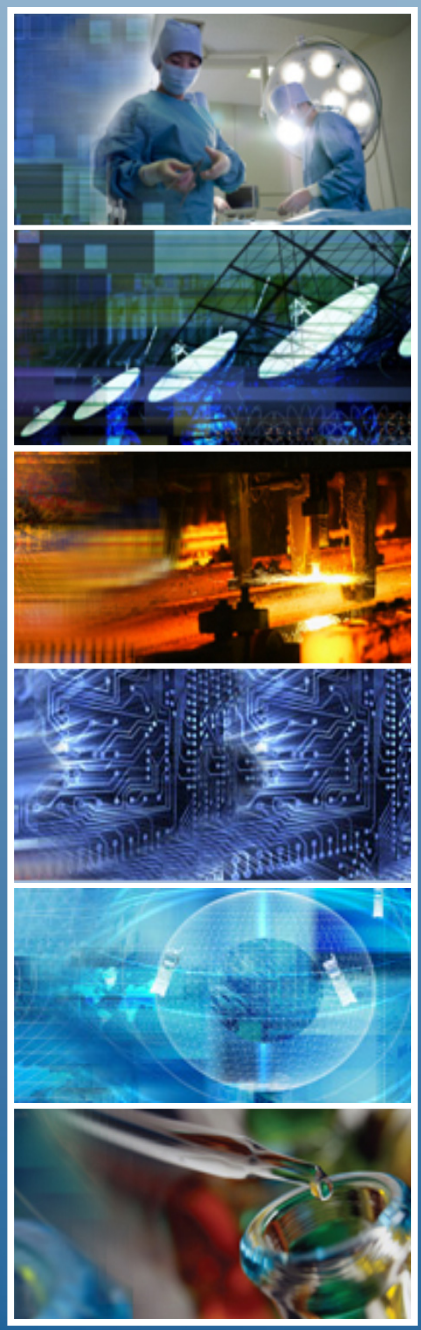
Presenter's Bio—Raymond Rath

Publications

- Author, Private Company Valuation chapter in the CFA Institute text *Equity Asset Valuation*. Chapter is a required reading for CFA level 2 candidates globally.
- Author, *Thoughts on the Excess Earnings Method for Business Valuation*, Financial Valuation and Litigation Expert, FVLE Issue 54, April/May 2015.
- Author, *Advancing the Quality of Valuations for Financial Reporting*, Financial Valuation and Litigation Expert, FVLE Issue 50, August/ September 2014.
- Author, *Intangible Asset Valuation: The Distributor Method,* Financial Valuation and Litigation Expert, FVLE Issue 41, February/March 2013.

Education

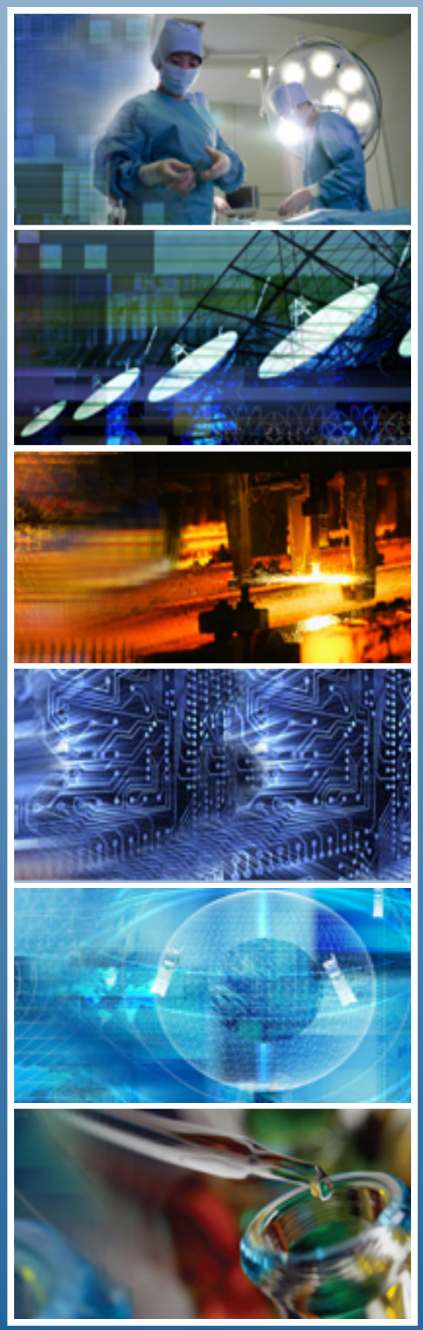
- M.B.A., University of Southern California.
- B.S., Business Administration, University of Kansas, Cum Laude.



Appendices

Appendices

- I – Resources
- II - ???



Appendix I: Resources

Resources – Project Feasibility

- *Guide to Cost Benefit Analysis of Investment Projects*, European Union, Directorate General Regional Policy, July 2008.
- *Benefit/Cost Analysis for Transportation Infrastructure: A Practitioner's Workshop*, Transportation Economics Center, Texas Transportation Institute, May 17, 2010, Washington, D.C.

Resources

- *Risk Management In A Large-scale New Railway Transport System Project* ─ Evaluation of Korean High Speed Railway Experience ─ Sunduck D. SUH, Ph.D., P.E. Associate Professor, Division of Construction and Transportation Engineering Hanyang University Ansan, Korea (Received June 7, 2000)
- *Evaluation of EIB Financing on Rail Projects in the European Union*, European Investment Bank, June 2005.
- *Comparing Approaches For Valuing Economic Development Benefits Of Transportation Projects,* Glen Wesbrod, Michael Grovak.

END

OUT

Valuation of Japanese HSR Technology - With-and-Without Method ("WWM")

- Use of WWM is one means for a potential buyer of a HSR project to estimate the value of Japanese HSR to themselves
- Impact on **revenues** as a result of not having the subject intangible asset
  - Magnitude of impact
  - Duration of impact
  - Probability of impact (for some assets)
- Impact on **expenses** as a result of not having the subject intangible asset
  - Magnitude of impact
  - Duration of impact
  - Probability of impact (for some assets)
- Impact on **working capital needs and capital expenditures** as a result of not having the subject intangible asset

WWM Example – Background

- A very simple example can illustrate the general premise of the With-and-Without Method. Additional complexity can be added to reflect a more real world situation.
- Scenario 1 is the optimal scenario. Construction of the asset takes three years.
- Scenario 2 is the next best alternative scenario – construction requires an additional year to complete (4 years total).
- As a result of construction delay, revenues are delayed by one year.
- All other assumptions are either held constant or are applied in a consistent means to reflect the one year delay.
- Focusing on a single variable simplifies the presentation and highlight the concepts of the WWM.

WWM Example – Scenario 1 – Three Years to Completion

With-and Without Method
Income Statement Forecast
Scenario 1 - No Delay in Completion

Projected Income Statements

		1	2	3	4	5	6	7	8	9	10	Residual
Revenue					25,000	37,500	46,875	51,563	54,141	55,765	57,438	59,161
Growth Rate		*N/A*				*50.0%*	*25.0%*	*10.0%*	*5.0%*	*3.0%*	*3.0%*	*3.0%*
Operating Expenses	97.5%	-	-	-	24,375	36,563	45,703	50,273	52,787	54,371	56,002	57,682
EBITDA		-	-	-	625	938	1,172	1,289	1,354	1,394	1,436	1,479
Depreciation		-	-	-	850	953	1,059	1,168	1,245	1,283	1,321	1,361
Operating Income		0	0	0	(225)	(16)	113	121	108	112	115	118
Interest Expense (Income)		250	500	750	850	953	1,059	1,168	1,281	1,397	1,516	1,639
Pretax Income		(250)	(500)	(750)	(1,075)	(969)	(946)	(1,048)	(1,173)	(1,285)	(1,401)	(1,521)
Income Taxes	40.0%	(100)	(200)	(300)	(430)	(387)	(379)	(419)	(469)	(514)	(561)	(608)
After-Tax Earnings		(150)	(300)	(450)	(645)	(581)	(568)	(629)	(704)	(771)	(841)	(913)

Projected Cash Flows and Present Value

After-Tax Earnings		(150)	(300)	(450)	(645)	(581)	(568)	(629)	(704)	(771)	(841)	(913)
Capital Expenditures		(5,000)	(5,000)	(5,000)	(2,000)	(2,060)	(2,122)	(2,185)	(2,251)	(2,319)	(2,388)	(2,460)
Depreciation		-	-	-	850	953	1,059	1,168	1,281	1,397	1,516	1,639
Projected Cash Flow		(5,150)	(5,300)	(5,450)	(1,795)	(1,688)	(1,630)	(1,646)	(1,674)	(1,693)	(1,713)	(1,733)
Present Value Factor	5.0%	0.976	0.929	0.885	0.843	0.803	0.765	0.728	0.694	0.661	0.629	0.599
Present Value		(5,026)	(4,926)	(4,824)	(1,513)	(1,355)	(1,247)	(1,198)	(1,161)	(1,118)	(1,077)	(1,038)
Sum of Present Values		**(23,446)**										

Notes:
Simplified model to illustrate concepts only

WWM Example – Scenario 2 – Four Years to Completion

With-and Without Method												
Income Statement Forecast												
Scenario 1 - One Year Delay in Completion												
Projected Income Statements												
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Residual**
Revenue						25,000	37,500	46,875	51,563	54,141	55,765	57,438
Growth Rate		*N/A*				*50.0%*	*50.0%*	*25.0%*	*10.0%*	*5.0%*	*3.0%*	*3.0%*
Operating Expenses	97.5%	-	-	-	-	24,375	36,563	45,703	50,273	52,787	54,371	56,002
EBITDA		-	-	-	-	625	938	1,172	1,289	1,354	1,394	1,436
Depreciation		-	-	-		953	1,059	1,168	1,186	1,245	1,283	1,321
Operating Income		0	0	0	0	(328)	(122)	4	103	108	112	115
Interest Expense (Income)		250	500	750	850	953	1,059	1,168	1,281	1,397	1,516	1,639
Pretax Income		(250)	(500)	(750)	(850)	(1,281)	(1,181)	(1,165)	(1,178)	(1,289)	(1,405)	(1,524)
Income Taxes	40.0%	(100)	(200)	(300)	(340)	(512)	(472)	(466)	(471)	(515)	(562)	(610)
After-Tax Earnings		(150)	(300)	(450)	(510)	(769)	(708)	(699)	(707)	(773)	(843)	(915)
Projected Cash Flows and Present Value												
After-Tax Earnings		(150)	(300)	(450)	(510)	(769)	(708)	(699)	(707)	(773)	(843)	(915)
Capital Expenditures		(5,000)	(5,000)	(5,000)	(2,000)	(2,060)	(2,122)	(2,185)	(2,251)	(2,319)	(2,388)	(2,460)
Depreciation		-	-	-	-	953	1,059	1,168	1,281	1,397	1,516	1,639
Projected Cash Flow		(5,150)	(5,300)	(5,450)	(2,510)	(1,876)	(1,771)	(1,716)	(1,677)	(1,695)	(1,715)	(1,735)
Present Value Factor	5.0%	0.976	0.929	0.885	0.843	0.803	0.765	0.728	0.694	0.661	0.629	0.599
Present Value		(5,026)	(4,926)	(4,824)	(2,116)	(1,506)	(1,354)	(1,250)	(1,163)	(1,119)	(1,079)	(1,040)
Sum of Present Values		**(24,363)**										
Notes:												
Simplified model to illustrate concepts only												

WWM Example – Comparison of 1 and 2

With-and Without Method Comparison of Scenario 1 and 2	1	2	3	4	5	6	7	8	9	10	Residual	Total
Projected Revenues												
Scenario 1	-	-	-	25,000	37,500	46,875	51,563	54,141	55,765	57,438	59,161	
Scenario 2	-	-	-	-	25,000	37,500	46,875	51,563	54,141	55,765	57,438	
Difference	-	-	-	25,000	12,500	9,375	4,688	2,578	1,624	1,673	1,723	
Projected EBITDA												
Scenario 1	-	-	-	625	938	1,172	1,289	1,354	1,394	1,436	1,479	
Scenario 2	-	-	-	-	625	938	1,172	1,289	1,354	1,394	1,436	
Difference	-	-	-	625	313	234	117	64	41	42	43	
Projected Operating Income (EBIT)												
Scenario 1	-	-	-	(225)	(16)	113	121	108	112	115	118	
Scenario 2	-	-	-	-	(328)	(122)	4	103	108	112	115	
Difference	-	-	-	(225)	313	234	117	5	3	3	3	
Projected After Tax Earnings												
Scenario 1	(150)	(300)	(450)	(645)	(581)	(568)	(629)	(704)	(771)	(841)	(913)	
Scenario 2	(150)	(300)	(450)	(510)	(769)	(708)	(699)	(707)	(773)	(843)	(915)	
Difference	-	-	-	(135)	188	141	70	3	2	2	2	
Projected Capital Expenditures												
Scenario 1	5,000	5,000	5,000	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	32,785
Scenario 2	5,000	5,000	5,000	2,000	2,060	2,122	2,185	2,251	2,319	2,388	2,460	32,785
Difference	-	-	-	-	-	-	-	-	-	-	-	-
Projected Cash Flows												
Scenario 1	(5,150)	(5,300)	(5,450)	(1,795)	(1,688)	(1,630)	(1,646)	(1,674)	(1,693)	(1,713)	(1,733)	
Scenario 2	(5,150)	(5,300)	(5,450)	(2,510)	(1,876)	(1,771)	(1,716)	(1,677)	(1,695)	(1,715)	(1,735)	
Difference	-	-	-	715	188	141	70	3	2	2	2	
Projected Present Value of Cash Flows												
Scenario 1	(5,026)	(4,926)	(4,824)	(1,513)	(1,355)	(1,247)	(1,198)	(1,161)	(1,118)	(1,077)	(1,038)	(24,484)
Scenario 2	(5,026)	(4,926)	(4,824)	(2,116)	(1,506)	(1,354)	(1,250)	(1,163)	(1,119)	(1,079)	(1,040)	(25,402)
Difference	-	-	-	603	151	108	51	2	1	1	1	918

WWM Example - Observations

- The simplified example highlights the premise of the WWM. Different assets or, in this case, investment decisions may generate different cash flow benefit streams.
- Scenario one provides a significant advantage as a result of the avoidance of the assumed delay associated with scenario two.
- Key notes on the general assumptions include:
  - As HSR is an investment with significant public benefits, pricing is assumed to lead to approximate breakeven operations
  - Model assumes 100 percent debt financing.
  - Indirect economic benefits and other external benefits previously discussed are not captured in the model

Valuation of HSR Technology – Summary

- Use of With-and-Without Method may be a viable means of estimating the relative benefits of Japanese HSR technology compared to other HSR technology
  - Forward looking approach
  - Captures economic impact