China Eastern Airlines
A Minority Stake?

Emerging Financial Markets
Prof Mei.
April 14th, 2003

QiTing Cen
Kevin Cheng
Patrick Chu
Hyesi Jun
Annibelle Lin
Agenda

• Significance of Case Study

• Case Situation
  – China
  – Shanghai
  – Aviation Market
  – China Eastern Airline (CEA)
Significance of Case

• Forecast and DCF Analysis
  – Effects of Consolidation and Deregulation

• International Cost of Capital
  – EM Z-Score model
  – Goldman Integrated Hybrid model

• Non-quantitative factors
  – Challenges inherent in valuing a Chinese company
Situation Overview

• Continental Airlines
  – Larry Kellner, President
  – 10% Minority Stake in CEA?
Situation Overview

- Continental is in strong position versus other US airlines to invest.
- Attractive Chinese aviation market
  - strategic position in Chinese airline market

To invest or not to invest?
Country Overview: China

• Market Reforms
  – “Crossing the river by feeling for the stones.”
  – Opening up of Industries; Privatization
  – Special Economic Zone (SEZ)
Overview of Country: China

Gross domestic product growth
% change, year on year

Foreign direct investment
US$ bn

Source: Economist Intelligence Unit.
Source: China Statistical Yearbook.
WTO

- China enters the WTO – November 2001
  - China is to reduce trade and capital barriers
  - Increased Trade
  - Increased Foreign Investments
  - Privatization of SOE
Economic Outlook

- Stable GDP Growth
- #1 Inward FDI
- Low Inflation

- Fixed exchange rate will unlikely be abandoned

Forecast of Economic Variables 2003-2007

<table>
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<tr>
<th>Year</th>
<th>GDP (% real change pa)</th>
<th>Inward direct investment</th>
<th>Consumer prices (% change yoy)</th>
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<td>2007*</td>
<td>8</td>
<td>73,000</td>
<td>1.4</td>
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*estimated
Source: EIU Country Data
Special Economic Zone

• To attract foreign capital
• Set up Sino-foreign joint ventures and partnerships
• Export-oriented
• Market driven activities
Shanghai

- Fastest growing part of China
  - 14% GDP Growth
- Financial and Technological Hub of China
Shanghai

- Location of many regional headquarters of foreign companies
- Maximum Tax Rate: 15%
- Location of CEA Headquarters
CAAC History

- Created in 1949
- Only airline operator in China till 1988
- Similar role to the FAA in the US
- Broke up into 9 regional airlines to promote competition
Consolidation

• In 2001, CAAC merged 9 airlines into 3
  – Air China, Beijing
  – China Eastern, Shanghai
  – China Southern, Guangzhou
• Reduce Overcapacity
• End of Illegal Price Wars
Deregulation

• Don’t have to buy jet fuel from CAAC at a premium
  – Use of futures contract to hedge fuel prices
• Free to assemble their own optimal fleet
• Likely to reach efficiency of regional competitors
Market Outlook

High Correlation of GDP & Passenger

Correlation coefficient = 0.98

10yr CAGR traffic growth = 13.2%

Source: China Stat. Yearbook

China Eastern Airlines: A Minority Stake?
Market Outlook

• More efficient operations
  – Reduction of overcapacity
  – Optimizing fleet configuration

• Code sharing
  – Needs to meet international quality standards
Direct Links with Taiwan

- Currently airlines are not allowed direct flights
- Exception: Chinese New Year Holiday 2003
- Government expected to allow direct flights in the future
China Eastern Airlines

• Established in 1987 under CAAC
• Base hub in Shanghai
• Operates over 400+ destinations around the world
• Owns air cargo subsidiary with China’s flagship shipping company, COSCO.
Consolidation

• Acquired Northwest Airlines and Yunnan Airlines
• One of the three largest aviation groups
  – $6 billion in assets
  – 118 aircrafts
  – 400+ air routes
  – 25,000 staff

• 24% Passenger Market Share
Market List IPO

• Simultaneous IPO on HKSE and NYSE in 1997

• Trades as ADR on NYSE
  – 1 ADR = 10 underlying shares

• Also listed in Shanghai
  – Part of the Shanghai 30 index
CEA and Shanghai

Capture the Growth of Shanghai’s Economy

Source: China Stat. Yearbook, SHK Research Data
Competition

• CSA – main domestic competitor
  – Higher efficiencies
  – Foreign trained management

• Shanghai Airlines
  – Lack extensive international network

• Regional Competitors
  – Singapore Airlines
  – Thai Airways
  – Malaysian Airlines
CEA Financial Summary

• Rated As BB+ by XinHua Financial
  – High D/E Ratio: 2.15
• ADR Beta to S&P500 = 0.69
• Operating Margins are increasing
  – Benefit from deregulation and consolidation
• Tax Rate
  – Drops to 15% after move of HQ to Shanghai
Questions?
China Eastern Airlines

A Minority Stake?

Solutions

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• Valuation of China Eastern
  – EM Scoring Model
  – DCF Analysis
  – International Cost of Capital
    • Goldman Integrated Hybrid Model
  – Cash Flows

• Risks to Be Considered

• Recommendations and Conclusion
EM Scoring Model Calculations

• EM Score = 3.25 + 6.56(X1) + 3.26(X2) + 6.72(X3) + 1.05(X4)

• EM Score for CEA was 3.15578

• Corresponds to CCC+/B- bond

• Vulnerable to the devaluation of currency and industry affiliation.
WACC: Cost of Debt

- CEA B- rating corresponds to spread of 1350 basis points for 10 year bonds (Bridge Fixed Income Services)
- US 10-year risk-free rate treasury yield on March 3, 2003: 3.68%
- \[ K_d = (\text{risk free rate} + \text{spread}) \times (1 - \text{tax rate}) \]
  \[ K_d = (0.0368 + 0.135) \times (1 - 0.15) \]
  \[ K_d = 14.60\% \]
- CEA after tax cost of debt is 14.60%
WACC: International Cost of Capital

- Goldman Integrated Model: $R = rf + SYS + \beta \sigma_m$
- **Sovereign Yield Spread** (SYS)
  - Chinese Government Dollar bond: 8-year maturity with current yield of 2.81%
  - US 10-year Treasury Bond: 3.68%
  - SYS calculated at -87 basis points
- **Beta** ($\beta$)
  - Calculated historical beta of CEA ADR to S&P 500. Value comes out to 0.69
- **Lambda** ($\lambda$)
  - Kellner assumed US Market premium is representative of market premium of world portfolio. Assumed market premium of 8%
WACC: International Cost of Capital

• Plugging into the Goldman Integrated Model:
  \[ R = 0.0368 + (-0.0087) + 0.69 \times 0.08 \]
  \[ R = 0.0368 - 0.0087 + 0.0552 = 0.0833 \]

• CEA’s international cost of capital = 8.33%
Calculating WACC

- Debt equity ratio is 2.15 ($16,460M/$7639M)
- Plugging into WACC
  - \[ \text{WACC} = K_d \times (1 - T_c) \times (D/V) + K_e \times (E/V) \]
- \[ \text{WACC} = 12.61\% \]
Operating Cash Flow

- CEA Projected Revenue
  - GDP Growth Rate in Shanghai: 14%
  - CEA Correlation with GDP Growth: 0.98

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<th>Base Year 2001</th>
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<td>1907.94</td>
<td>2175.05</td>
<td>2479.56</td>
<td>2826.7</td>
<td>3222.44</td>
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</table>
Operating Cash Flow (cont)

• Profit Before Taxes
  – Used PBT/Rev Ratio
  – Because of deregulation and consolidation, CEA’s PBT/Rev ratio will converge to regional industry average in 5 years time.
  – CEA 2001 PBT/Rev Ratio: 2.58% ($37.9M/$1468.10M)
  – Industry Average: 13.37%
    • Thai Airways, Malaysian Airlines, and Singapore Airlines
Operating Cash Flow (cont)

- Straight line forecast of convergence for growth rate of PBT:

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<th>2005</th>
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<td>2479.56</td>
<td>2826.7</td>
<td>3222.44</td>
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<td>PBT/Rev Ratio Growth</td>
<td>4.70%</td>
<td>6.90%</td>
<td>9.10%</td>
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<td>Profit Before Taxes</td>
<td>90.43</td>
<td>150.03</td>
<td>224.54</td>
<td>316.97</td>
<td>430.89</td>
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</table>
Operating Cash Flow (cont)

• Depreciation and Amortization
  – Calculated average D&A/Rev ratio for CEA from past 4 years (1998 to 2001)
  – D&A/Rev ratio is 15.64%; relatively constant

• Operating Cash Flow:

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<td>150.03</td>
<td>224.54</td>
<td>316.97</td>
<td>430.89</td>
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<td>Tax Expenses</td>
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<td>376.15</td>
<td>468.71</td>
<td>579.81</td>
<td>712.84</td>
<td>871.74</td>
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</table>
Networking Capital and CapEx

• Networking Capital
  – Used CEA financial statements to calculate historical change in NWC/Rev over 4 years. Value is 7.04%

• Capital Expenditures
  – Calculated average historical CapEx/Rev ratio from past 4 years (1998-2001) as 12.42%
Terminal Value and Cash Flows

- Constant growth rate model (\( \frac{CF}{(WACC - LTg)} \))
- Terminal value of $3937.43M
- DCF Cash Flows:

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<tr>
<td>Cap Ex</td>
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<td>307.9</td>
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<td>45.47</td>
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<td>162.79</td>
<td>244.69</td>
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<td></td>
<td>4.89</td>
<td>45.47</td>
<td>97.32</td>
<td>162.79</td>
<td>4182.12</td>
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DCF/NPV Analysis

• WACC = 12.61%
• NPV = $2,518.55M
• Value of Equity = NPV - CEA total debt
• Value of Equity = $622.81M ($2,518.55M - $1855.74)
Risks to Be Considered

• Political Risk
• Macroeconomic Risk
• Transaction Exposure
• Translation Exposure
• Operating Exposure
• Interest Rate Exposure
Political Risk

- Leadership turnover will impact the direction and pace of economic expansion.
- Government support for consolidation and deregulation of Chinese aviation industry will affect CEA’s profitability and success in future years.
Macroeconomic Risk

- High positive correlation between China’s macroeconomic performance and the expansion of the Chinese airline industry
- Tensions between China and foreign countries may dampen foreign investment and support
Transaction Exposure

- Fluctuations in exchange rates will make CEA vulnerable to transaction exposure
- Backlog exposure
- Revenue reported in 8 currencies generated from 47 international destinations
- Fulfill 24-hour capital flow to minimize transactional losses
Translation Exposure

- CEA’s financial statements have been translated into USD at the rate of RMB 8.2771/1 USD
- Fluctuations in exchange rates will result in a change in CEA’s net worth and reported net income
Operation Exposure

• Unpredicted fluctuations in exchange rates can result in a change in future operation cash flows

• CEA is exposed to international competitors throughout the global airline industry
Interest Rate Exposure

• Debt structure is subject to interest rate risk
  – Ability to repay debt obligations is reflected in credit risk rating

• Holding of interest-sensitive securities can change the potential earnings to CEA
Recommendation

• Reasons for investing in CEA
  – Positive NPV
  – Value of equity is positive
  – Option value to have code shares in CEA
  – Synergies
Conclusions and Insights

• Effects of SARS Epidemic
  – Short-term: Detrimental to Shanghai-HK route
  – Long-term: Little or no effect; operates out of Shanghai

• No Effect from Direct Linkage to Taiwan

• Informational integrity and asymmetry when dealing with emerging markets
Questions?
### Net Working Capital (cont)

#### Sensitivity Analysis – LT Growth vs. NWC/Rev

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<th>7%</th>
<th>8%</th>
<th>9%</th>
<th>10%</th>
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