



# China Eastern Airlines

## A Minority Stake?

Emerging Financial Markets

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April 14<sup>th</sup>, 2003

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# Agenda

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- 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?**



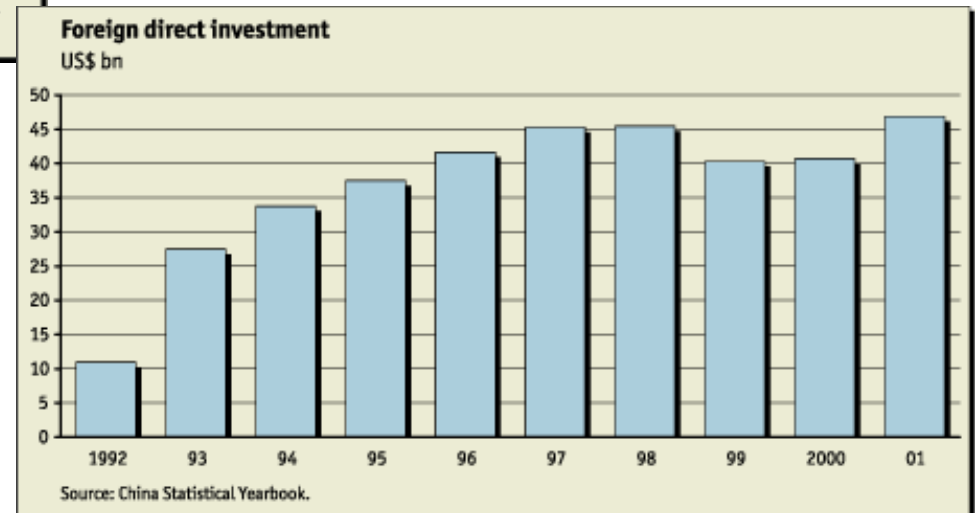
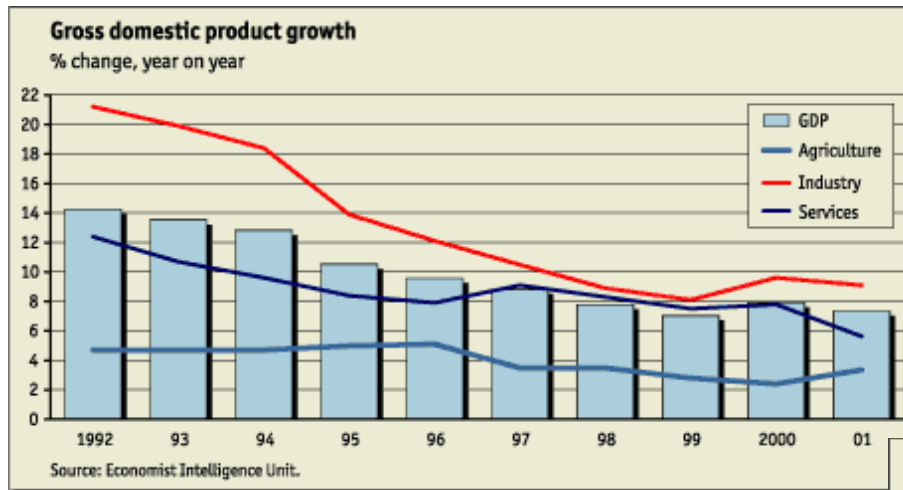
# Country Overview: China

- Market Reforms
  - “Crossing the river by feeling for the stones.”
  - Opening up of Industries; Privatization
  - Special Economic Zone (SEZ)





# Overview of Country: China



# 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

	GDP (% real change pa)	Inward direct investment	Consumer prices (% change yoy)
1993	13.5	27,515	14.6
1994	12.8	33,787	24.2
1995	10.5	35,849	17.1
1996	9.6	40,180	8.3
1997	8.8	44,237	2.8
1998	7.8	43,751	-0.8
1999	7.1	38,753	-1.5
2000	7.9	38,399	0.4
2001	7.5	44,241	0.7
2002	8	52,700	-0.8
2003*	7.6	58,000	-0.2
2004*	7.8	62,000	0.5
2005*	7.9	64,000	0.9
2006*	8	67,000	1.2
2007*	8	73,000	1.4

\*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

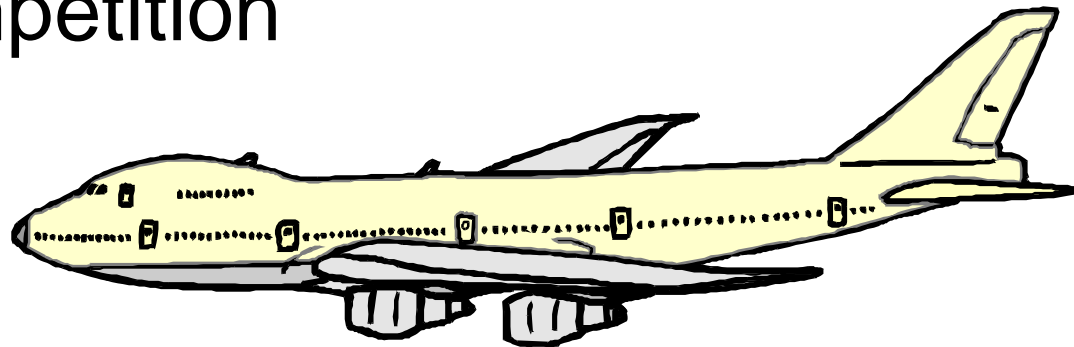
- Location of many regional headquarters of foreign companies
- Maximum Tax Rate: 15%
- Location of CEA Headquarters





# 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

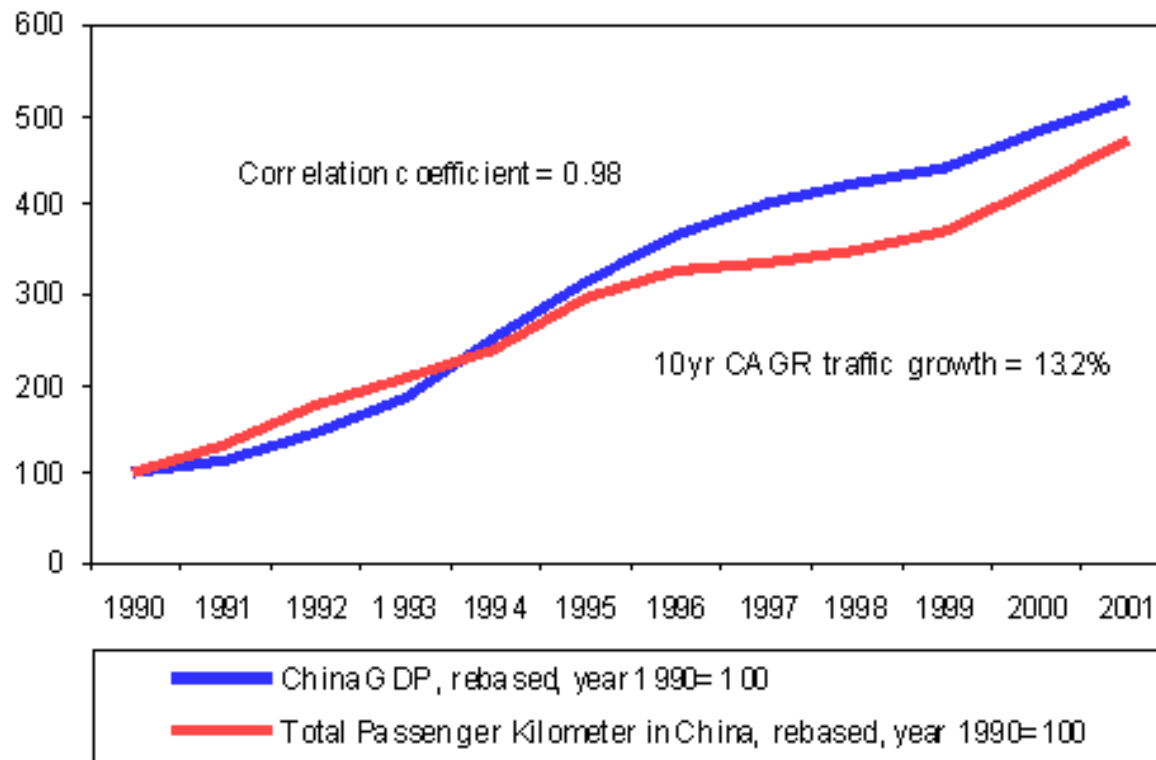
- Don't have to buy jet fuel from CAAC at a premium
  - Use of futures contract to hedge fuel prices
- Free to assemble their own optimal fleet
- Likely to reach efficiency of regional competitors





# Market Outlook

### High Correlation of GDP & Passenger



Source: China Stat. Yearbook



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# Market Outlook

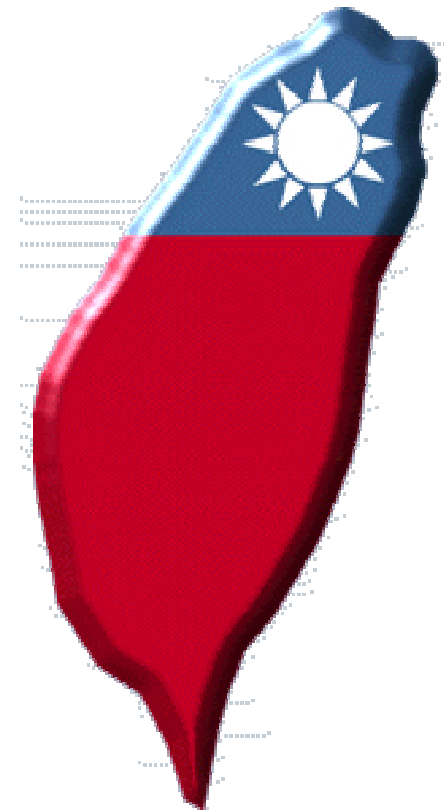
- More efficient operations
  - Reduction of overcapacity
  - Optimizing fleet configuration
- Code sharing
  - Needs to meet international quality standards





## 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





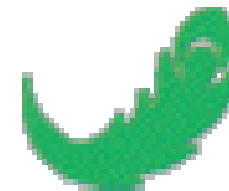
# China Eastern Airlines

- 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

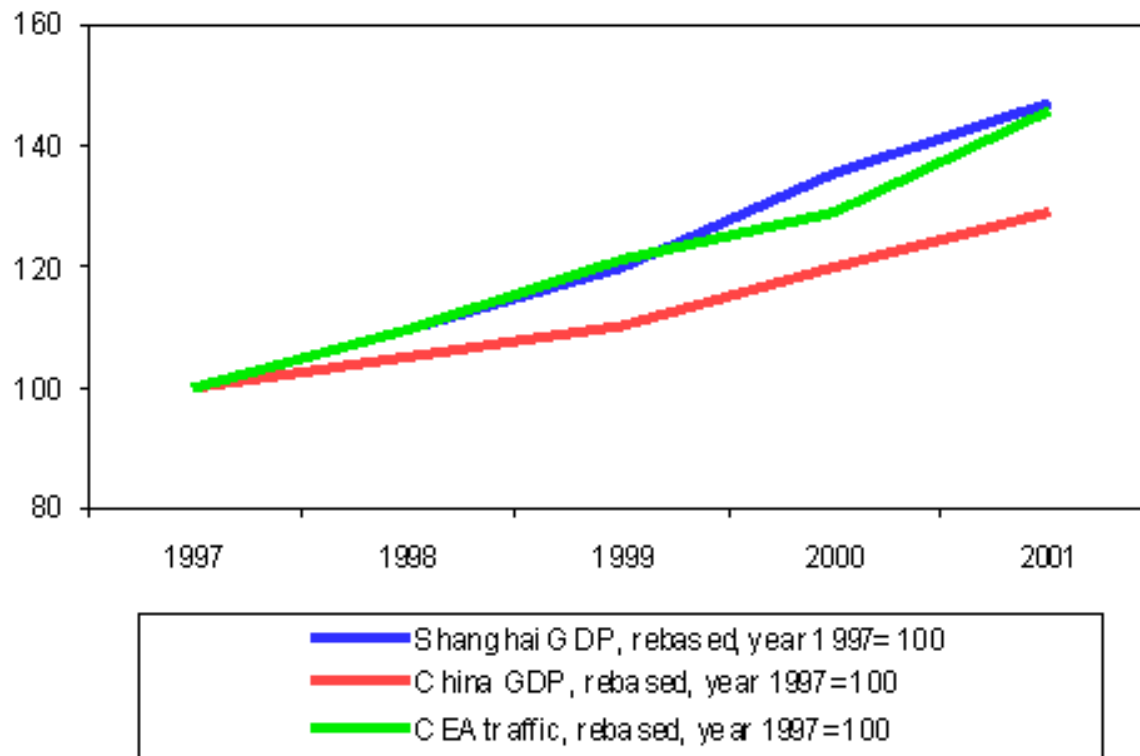
- Simultaneous IPO on HKSE and NYSE in 1997
- Trades as ADR on NYSE
  - 1 ADR = 10 underlying shares
- Also listed in Shanghai
  - Part of the Shanghai 30 index





# CEA and Shanghai

Capture the Growth of Shanghai's Economy



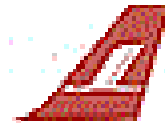
Source: China Stat. Yearbook, SHK Research Data





# 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

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### Solutions

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# Agenda

- 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%
- $K_d = (\text{risk free rate} + \text{spread}) * (1 - \text{tax rate})$   
 $K_d = (.0368 + .135) * (1 - .15)$   
 $K_d = 14.60\%$
- CEA after tax cost of debt is 14.60%





## WACC: International Cost of Capital

- Goldman Integrated Model:  $R = r_f + \text{SYS} + \hat{\alpha}_m$
- *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 (B)*
  - 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:
  - $R = .0368 + -.0087 + 0.69 * 0.08$
- CEA's international cost of capital = 8.33%





# Calculating WACC

- Debt equity ratio is 2.15  
(\$16,460M/\$7639M)
- Plugging into WACC
  - $WACC = K_d \cdot (1 - T_c) \cdot (D/V) + K_e \cdot (E/V)$
- $WACC = 12.61\%$



# Operating Cash Flow

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

	Base Year 2001	2002	2003	2004	2005	2006	2007
Shanghai GDP	0.14	0.14	0.14	0.14	0.14	0.14	0.14
Revenue	1468.1	1673.63	1907.94	2175.05	2479.56	2826.7	3222.44





## 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:

	2003	2004	2005	2006	2007
Revenues	1907.94	2175.05	2479.56	2826.7	3222.44
PBT/Rev Ratio Growth	4.70%	6.90%	9.10%	11.20%	13.40%
Profit Before Taxes	90.43	150.03	224.54	316.97	430.89



# 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:

	2003	2004	2005	2006	2007
Profit Before Taxes	90.43	150.03	224.54	316.97	430.89
Tax Expenses	-13.56	-22.5	-33.68	-47.55	-64.63
D&A	299.29	341.19	388.95	443.41	505.49
OCF	376.15	468.71	579.81	712.84	871.74





# 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 ( $CF/(WACC-LTg)$ )
- Terminal value of \$3937.43M
- DCF Cash Flows:

	2003	2004	2005	2006	2007	Terminal value
OCF	376.15	468.71	579.81	712.84	871.74	
Cap Ex	236.92	270.09	307.9	351	400.14	
NWC	134.35	153.15	174.6	199.04	226.9	
	4.89	45.47	97.32	162.79	244.69	3937.43
CF	4.89	45.47	97.32	162.79	4182.12	





## 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

	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%
4.20%	405.04	106.78	-191.48	-489.74	-788	-1,086.25	-1,384.51	-1,682.77	-1,981.03	-2,279.29	-2,577.54
4.40%	449.49	146.08	-157.32	-460.73	-764.14	-1,067.54	-1,370.95	-1,674.35	-1,977.76	-2,281.17	-2,584.57
4.60%	496.16	187.35	-121.46	-430.27	-739.09	-1,047.90	-1,356.71	-1,665.52	-1,974.33	-2,283.14	-2,591.95
4.80%	545.22	230.72	-83.77	-398.26	-712.75	-1,027.25	-1,341.74	-1,656.23	-1,970.72	-2,285.21	-2,599.71
5.00%	596.85	276.38	-44.09	-364.57	-685.04	-1,005.51	-1,325.98	-1,646.45	-1,966.93	-2,287.40	-2,607.87
5.20%	651.27	324.5	-2.28	-329.05	-655.83	-982.6	-1,309.38	-1,636.15	-1,962.93	-2,289.70	-2,616.47
5.40%	708.71	375.28	41.86	-291.57	-625	-958.42	-1,291.85	-1,625.28	-1,958.70	-2,292.13	-2,625.56
5.60%	769.42	428.96	88.51	-251.95	-592.41	-932.87	-1,273.32	-1,613.78	-1,954.24	-2,294.70	-2,635.16
5.80%	833.7	485.8	137.9	-210.01	-557.91	-905.81	-1,253.71	-1,601.61	-1,949.51	-2,297.42	-2,645.32
6.00%	901.86	546.07	190.27	-165.52	-521.32	-877.12	-1,232.91	-1,588.71	-1,944.50	-2,300.30	-2,656.09
6.20%	974.28	610.1	245.91	-118.27	-482.45	-846.63	-1,210.81	-1,575.00	-1,939.18	-2,303.36	-2,667.54
6.40%	1,051.35	678.25	305.14	-67.97	-441.08	-814.19	-1,187.30	-1,560.40	-1,933.51	-2,306.62	-2,679.73
6.60%	1,133.56	750.93	368.3	-14.33	-396.96	-779.59	-1,162.21	-1,544.84	-1,927.47	-2,310.10	-2,692.73
6.80%	1,221.41	828.61	435.81	43	-349.8	-742.6	-1,135.41	-1,528.21	-1,921.01	-2,313.81	-2,706.62
7.00%	1,315.53	911.83	508.12	104.42	-299.28	-702.98	-1,106.69	-1,510.39	-1,914.09	-2,317.79	-2,721.50
7.20%	1,416.60	1,001.19	585.78	170.37	-245.03	-660.44	-1,075.85	-1,491.25	-1,906.66	-2,322.07	-2,737.48
7.40%	1,525.42	1,097.41	669.4	241.39	-186.62	-614.63	-1,042.64	-1,470.65	-1,898.66	-2,326.67	-2,754.68

