

Chinese RMB vs. U.S. Dollar

Exchange Rate Forecast for 12/31/2009

International Financial Management

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Introduction

On October 31, 2008 the Chinese RMB had appreciated at an annual rate of less than 1%, since our team had begun tracking its movements in early September. As we reviewed the most recent 5 year currency valuation history¹, we realized a story that would take an in depth analysis to uncover. In rendering our forecast of 6.7348 RMB versus the American Dollar on 12/31/2009, we have assumed and relied upon a number of individual resources, assumptions, and forecasting methods as detailed in the following analysis.

Technical Forecast Method

Using the technical forecasting method to predict exchange rates involves analyzing historical data in order to predict a trend in exchange rate adjustments. While technical analysis is often unreliable in the long-term, short-term indicators can sometimes suggest when a change or correction is likely. Additionally technical analysis is not useful on its own, but can be used to backup assumptions.

As shown in Appendix A, until mid 2005 the Chinese government was artificially stabilizing the exchange rate at about 8.3RMB to the dollar. Beginning in the second half of 2005 the Chinese government changed their monetary policy and began to allow the exchange rate to fall. Over the past 3 years the Chinese currency has steadily fallen to its current value of about RMB6.8/\$. Although there is only a short history of data, Appendix A clearly shows a steep downward trend and we can use this tendency to project what the rate would be in one year if the currency continues to fall at its current rate.

Appendix B shows the spot rate on December 31st for each year starting in 2004. We can see from the graph that there has been an increasingly rapid appreciation of the RMB/\$ rate starting with a -2.41% change in 2005 and ending with a -7% change for 2008.

If we forecast a continued depreciation of the dollar at -7.3% in 2009 we could expect a December 31st exchange rate of RMB 6.2117/\$. While this alone cannot give us an accurate estimate, it can serve as a starting point from which to base our projections upon. If we expect other economic factors over the next year to change we can adjust our estimate appropriately. Compared to the other forecast methods, this represents an aggressive depreciation of the dollar relative to the RMB.

Market Forecast Method

Using the market forecast method allows us to compare the relative risk free rates of return in the U.S. and China to estimate our expected change in exchange rate over the coming year. Based on the data in Appendix C, we can see that the Chinese Central Bank rate has risen and fallen consistently relative to other international inter-bank rates to its current value of 6.93%.

Comparing this figure to the U.S. risk free rate of 1.28% we can calculate and expected appreciation of the RMB at a rate of 5.28% to reach the level of RMB 6.3717/\$ by the end of

¹ Appendix A: Currency History: RMB to Dollar

2009². Note that all current figures are taken from 10/31/2008, and measured using daily rates to forecast a value for December 31, 2009.

Fundamental Forecast Method

Next in our analysis we examined how certain economic variables would affect the exchange rate of the RMB to US Dollars. Based on our research into China and its Key Develop Indicators, we selected 5 variables that had high correlation with the Chinese exchange rate. The variables selected were: Annual Inflation, Annual GDP Growth, Household Consumption Growth, Unemployment, and Exports of Goods & Services Growth.

To analyze each variable properly, we gathered both Chinese data and United States data for the above 5 variables and compared the two sets of data. We assumed that the differential between the Chinese figure and the US figure for the same year would be able to best determine the following year exchange rate on December 31st. We then set up a regression table to chart what affects each differential had on the historic exchange rate.³

From our analysis, we were able to determine that Unemployment and Exports of Goods & Services Growth were both relatively highly correlated with the historic exchange rate. Unemployment's regression boasted a low P-Value (0.007), and a relatively high R-squared (.3245). However, it had a coefficient of 53 which indicates that a 1% change in unemployment would cause a 53% change in the exchange rate. For this reason, we chose to abstain from using unemployment data as part of the forecast. Alternatively, Exports of Goods & Services Growth held a low P-Value (0.005), and a higher R-squared (.3468). It also held a coefficient of 7.44, which was much more accurate in predicting the value of the RMB currency. Exhibits G through K can be viewed to see how each variable related with the exchange rate.

Using the fundamental method of forecasting, we determined the best strategy would be to use Exports of Goods & Services Growth as a predictor of future Chinese exchange rates. Using the regression trend data for Exports, we determined the forecast to be RMB 6.2003/\$ as of December 31, 2009⁴.

Mixed Forecasting Method

Finally, we used the mixed forecasting method to use a combination of the previously mentioned forecasting models. This allowed us to produce a forecast that was weighted more heavily towards those variables that we felt had better correlation with the actual exchange rate.

² Appendix E: Market Exchange Rate Forecast

³ Appendix F: Fundamental Forecast: Regression Results

⁴ Appendix L: Fundamental Forecast Projection

We determined a mixed forecast prediction of RMB 6.2883 as of December 31, 2009⁵. This forecast allowed us to continue with the trend of an overall upward appreciation of the RMB relative to the dollar as all of the forecast tools had indicated this path.

Environmental Factors^[e2]

China has a number of outside factors that significantly affect the path of the RMB relative to the dollar. China's economic situation has long been enviable, experiencing double digit GDP growth in each of the past 5 years, and as much as 11.9% growth in 2007.

Unemployment has been at a controllable 4% while inflation has averaged a low 2.6% over the past 5 years. Exports have been extremely impressive, growing at a 22% average year over year since 1997.

However, things are changing in China. As previously mentioned, after keeping the RMB tightly pegged to the dollar for years, in July 2005 the Chinese government allowed their currency to appreciate by 2.1% against the dollar. They moved from a peg on the dollar to referencing a basket of foreign currencies. Cumulative appreciation against the dollar reached 15% by January of 2008.

As the RMB has appreciated against foreign currencies, the actual price for Chinese goods and services has risen for its international customers. As a result, China is feeling more and more competition from other low cost producing countries. China's government will likely control the appreciation of the RMB in a fashion that allows its economy to grow, but at a more sustainable rate.

In tandem with an appreciation of the RMB, recent wage laws have changed the competitive outlook for China as a low cost manufacturer. As a result of these laws passed in 2007, Chinese firms have higher labor costs due to a change in standards for overtime hours, minimum wages, and guaranteed contracts.

Offsetting a loss in export growth is the fact that Chinese consumption is increasing. As wages rise and standards of living increase, the Chinese consumer is spending more of their disposable income. The past two years have seen double digit spending growth among domestic Chinese.

For the long term, there are a number of factors that will weigh important in the valuation of the Chinese currency. Appendix N displays the Economist Intelligence Unit's 5 year forecast for several key economic indicators. Most important to note are the high interest rates that will increase investment in the Chinese economy and place upward pressure on the dollar. Inflation is expected to remain steady at 4%, while the account balance is expected to decrease tremendously due to competitive pressures outside of China. Additionally, GDP growth is expected to moderate to levels around 8% year over year, a more sustainable level for the economy that will place less pressure on inflation.

⁵ Appendix M: Mixed Model Forecast

Recent Depreciation in the RMB

Although the Chinese government has allowed the partially floating RMB to appreciate since 2005, several recent factors have caused the RMB to depreciate against the dollar. In July this year the Chinese government temporarily changed its policy in response to concerns about China's economic stability.

The Chinese central bank announced that it would use its mid-point system and other indirect intervention to hold the exchange rate at a range just over 6.82 for the next several weeks and possibly months in order to protect the currency against global economic volatility and a slowing Chinese economy. In addition to this, the dollar has appreciated against other global currencies due to a possible oncoming economic recession. The U.S. presidential election has added to uncertainty in the currency market leading to an appreciation of the Dollar to RMB of 20 percent over the last six 5 months.^[e3]

Despite this recent appreciation of the dollar, most analysts believe that this is only a short-term phenomenon with many economic factors suggesting that the dollar will resume weakening against the RMB further into 2009. Volatile global financial markets, a weak U.S. economy and a change in U.S. government suggest that a continued dollar appreciation is unsustainable in the long-term.

The primary question is how long the Chinese government will continue to fix its exchange rate in order to ride out economic volatility. One-year dollar to RMB rate in the non-deliverable forwards (NDF) market where quoted this week at 6.9580 suggesting that a 1.93% depreciation in the RMB relative to the dollar. This rate represents a highly speculative outlook and many analysts predict that reservations around a global recession will continue into the middle of 2009 with a resumed RMB appreciation in the second half of next year.

Conclusion

Based on our analysis of economic indicators we derived an estimated 12/31/2009 spot rate of 6.2883. We believe that this represents an aggressive appreciation estimate for the RMB in that it largely assumes a continued appreciation at the same level we have seen over the last few years. While this can serve as a floor for our estimate, it is likely that political and governmental actions taken by the Chinese Central Bank will delay this appreciation somewhat to a value somewhere between 6.2883 and the speculative NDF rate of 6.9580.

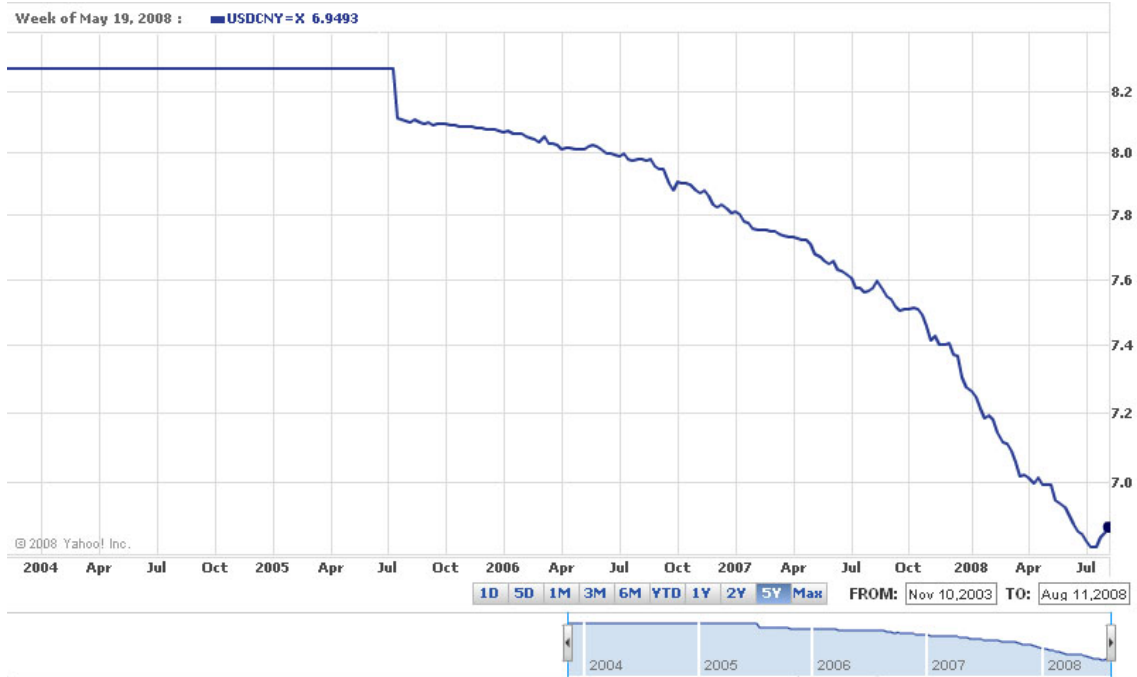
The extent to which the RMB/Dollar rate will be allowed to fall to what we believe is its more natural rate of 6.2883 will depend on how quickly the global economy stabilizes and on the specific actions of the Chinese government. Analysts currently predict that the RMB will depreciate through the first half 2009 and then resume its appreciation in the second half.

This means we can expect that between one half and one third of the disparity will be recovered by 12/31/2009 which Appendix O shows will yield a spot rate between 6.6213 and

6.7348⁶. Because of the current global instability, our recommendation is to rely on the more conservative RMB appreciation estimate of **6.7348** as our projected rate for **12/31/2009**.

⁶ Appendix O: Economic & Governmental Forecast

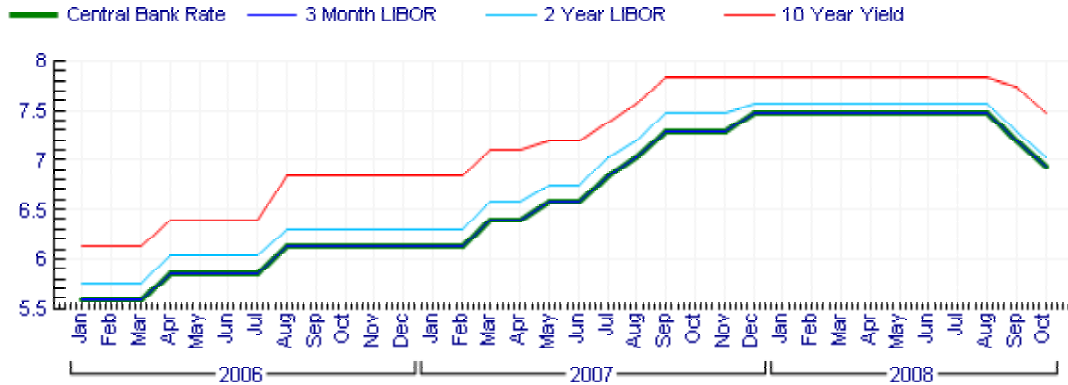
Appendix A: Currency History RMB to Dollar



Appendix B: Technical Exchange Rate Forecast

<u>Year</u>	<u>Exchange Rate</u>	<u>% Change</u>
12/31/2004	8.3	N/A
12/31/2005	8.1	-2.41%
12/31/2006	7.8	-3.70%
12/31/2007	7.3	-6.41%
10/31/2008	6.79	-7.00%
12/31/2009	6.2117	-7.30%

Appendix C: Chinese Interest Rates



Source: <http://www.tradingeconomics.com/Economics/Interest-Rate.aspx?Symbol=CNY>

Appendix D: US Treasury Rates

DATE	4 WEEKS		13 WEEKS		26 WEEKS		52 WEEKS	
	BANK DISCOUNT	COUPON EQUIVALENT	BANK DISCOUNT	COUPON EQUIVALENT	BANK DISCOUNT	COUPON EQUIVALENT	BANK DISCOUNT	COUPON EQUIVALENT
11/04/2008	0.29	0.29	0.48	0.49	1.02	1.04	1.25	1.28

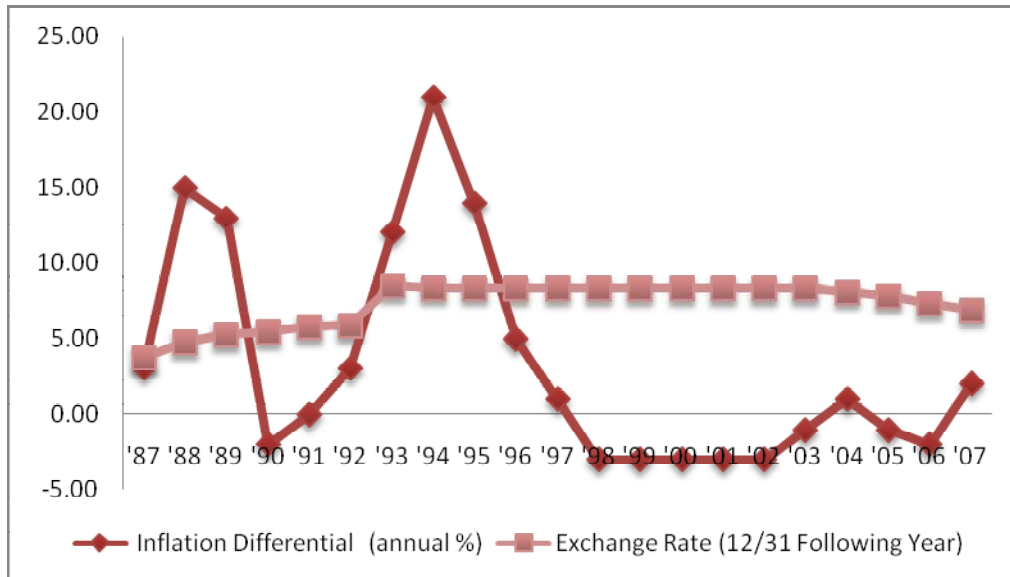
Appendix E: Market Exchange Rate Forecast

US (risk free)	1.28%	=	k_{us}
China (risk free)	6.93%	=	k_{ch}
Change %	-5.28%	=	$((k_{us}+1)/(k_{ch}+1))-1$
Daily Rate	-0.02%	=	$change\% / 360$
Current (r_{2008})	6.79	=	10/31/08 Exchange Rate
Projected	6.3717	=	$S_{2008} * (420 * Daily\ Rate + 1)$

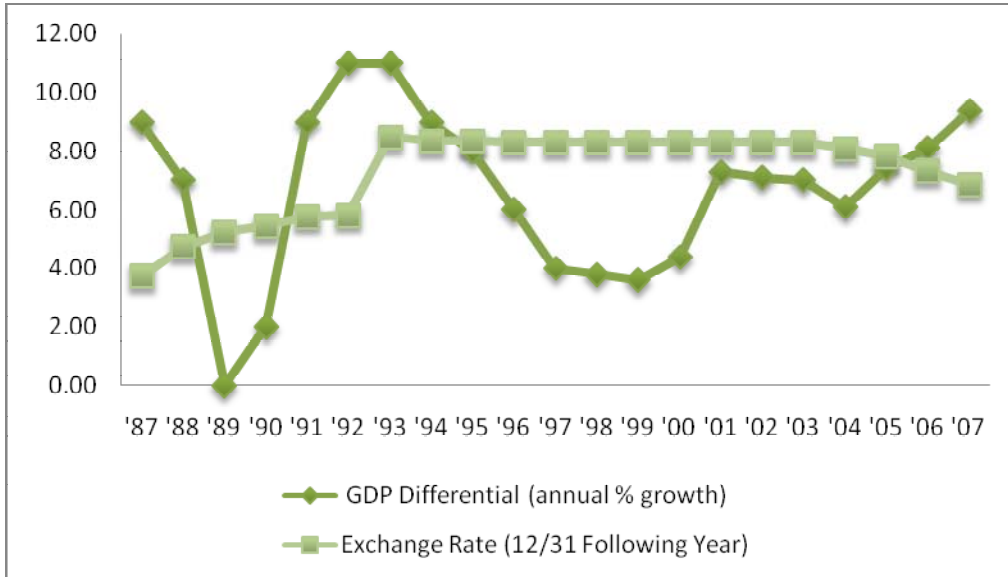
Appendix F: Fundamental Forecast: Regression Results

<i>R Square</i>	0.346825	=Regression Table
<i>P-Value</i>	0.004972	=Regression Table
<i>Coefficient</i>	0.074439	=Regression Table
<i>Daily Coefficient</i>	0.000207	=Coefficient/360
<i>420 Day Coefficient</i>	0.086845	=Daily Coefficient*420
<i>Exchange (RMB/\$)</i>	6.79	=Given
<i>Change Percentage</i>	-0.58968	=420 Day Coeff*Exchange
<i>12/31/2009</i>	6.20032	=Exchange-Change Percentage

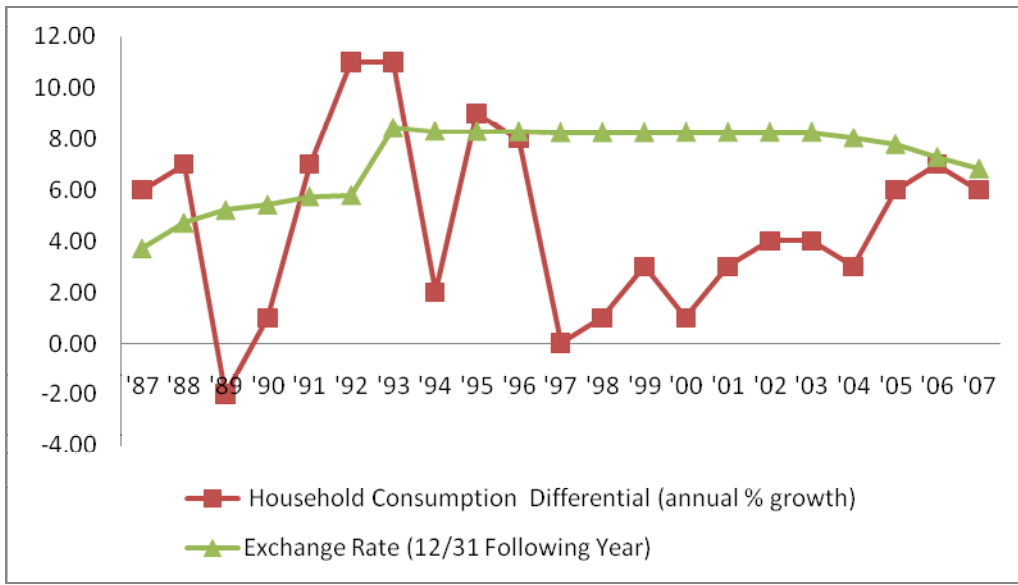
Appendix G: Inflation vs. RMB Valuation



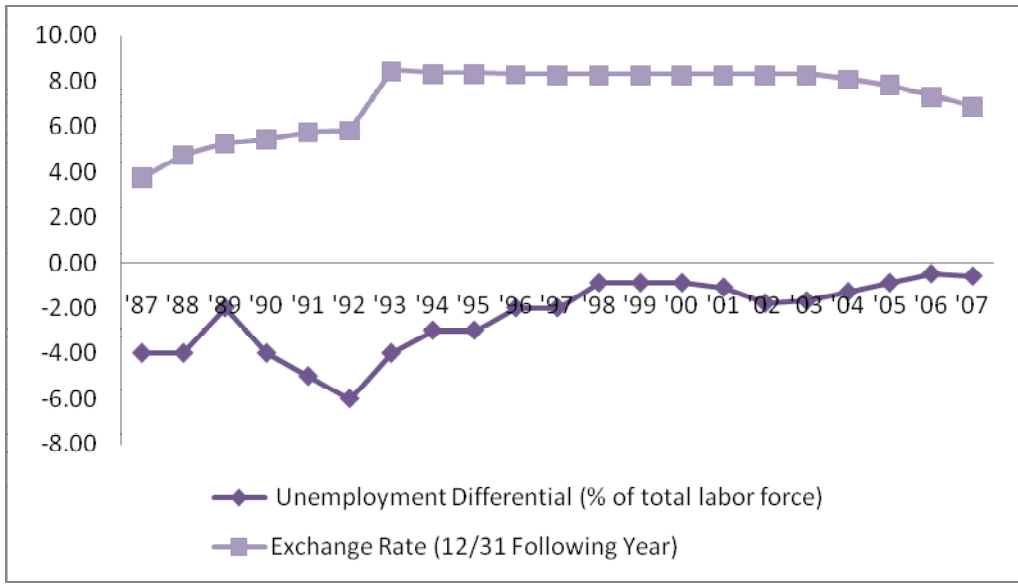
Appendix H: GDP Growth vs. RMB Valuation



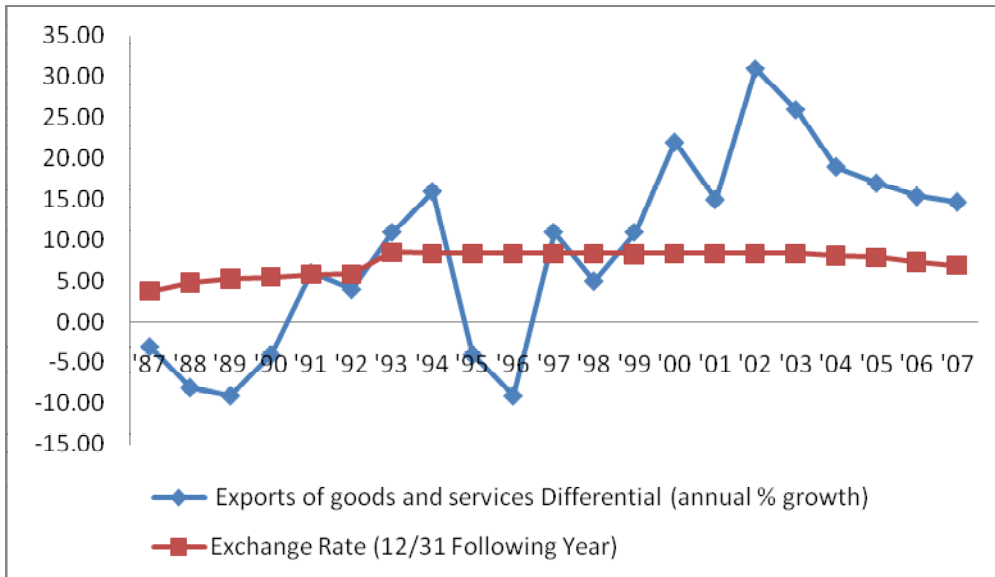
Appendix I: Consumption vs. RMB Valuation



Appendix J: Unemployment vs. RMB Valuation



Appendix K: Exports vs. RMB Valuation



Appendix L: Fundamental Forecast

<i>Coefficient</i>	0.074439	=Regression Table
<i>Daily Coefficient</i>	0.000207	=Coefficient/360
<i>420 Day Coefficient</i>	0.086845	=Daily Coefficient*420
<i>Exchange (RMB/¥)10/31/08</i>	6.79	=Given
<i>Change Percentage</i>	-0.58968	=420 Day Coeff*Exchange
<i>12/31/2009</i>	6.2003	=Exchange-Change Percentage

Appendix M: Mixed Model Forecast

<i>Method</i>	<i>Forecast</i>	<i>Weight</i>	<i>Score</i>
<i>Technical</i>	6.2117	20%	1.2423
<i>Fundamental</i>	6.2003	30%	1.8601
<i>Market</i>	6.3717	50%	3.1859
<i>Mixed</i>	na	100%	6.2883

Appendix N: Economist Intelligence Unit Forecast

Key indicators	2008	2009	2010	2011	2012	2013
Real GDP growth (%)	9.8	8.5	8.7	8.6	8.4	8.2
Consumer price inflation (%; av)	6.4	4.1	4	4.2	4.1	4.1
Budget balance (% of GDP)	0.4	0.4	0.5	0.4	0.4	0.5
Current-account balance (% of GDP)	8.5	6.6	5.7	4.5	3.4	2.6
Commercial bank prime rate (%; year-end)	7.2	7.5	7.7	8.1	8.1	8.1
Exchange rate Rmb:US\$ (av)	6.94	6.74	6.53	6.4	6.31	6.25
Exchange rate Rmb:¥100 (av)	6.55	6.54	6.65	6.75	6.73	6.67

Appendix O: Economic & Governmental Forecast

Economic Forecast: 6.2883

1Year NDF rate: 6.9580

Disparity: $6.9580 - 6.2883 = 0.6697$

Aggressive

$0.6697 / 2 = .33485$

$6.9580 - .33485 = \mathbf{6.6213}$

Conservative

$0.6697 / 3 = .2232$

$6.9580 - .2232 = \mathbf{6.7348}$