



SIMULATING THE CURRENCY MARKETS WITH COMPUTATIONAL MARKET DYNAMICS

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Outline

Aim of the study

Simulation results

- JCM results

- KD results

- Comparison of models' performance

Conclusion



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These models suggests that, the psychological reaction of traders in a market may have a great influence on the exchange rate prices

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JCM results

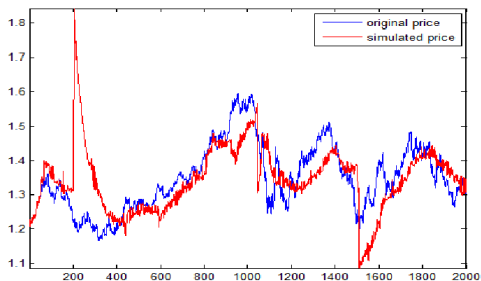


Figure : Time line plot for original and simulated exchange rate prices (Jablonska-Capasso-Morale model).



JCM results

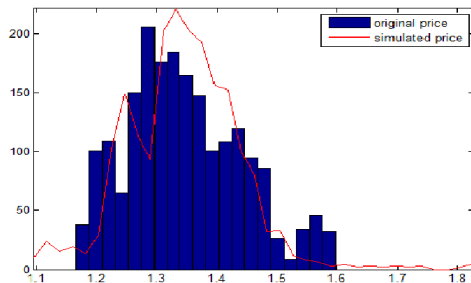


Figure : Histograms for original and simulated exchange rate prices (Jablonska-Capasso-Morale model).



JCM results

Table : Basic Statistics for original price vs simulated price by JCM model.

	Mean	St.Dev	Skewness	Kurtosis
Original Closing price	1.3474	0.0962	0.4473	2.6564
Simulated Closing price	1.3533	0.0972	0.5212	5.3528



JCM results

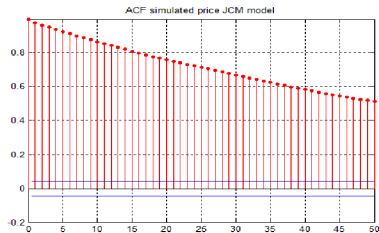
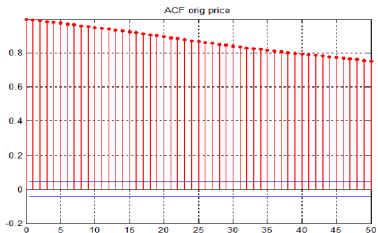


Figure : ACFs for original and Simulate exchange rate prices (JCM model).



JCM results

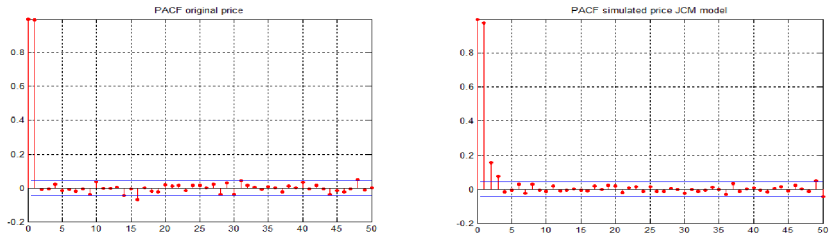


Figure : PACFs for original and simulated exchange rate prices (JCM model).



KD results

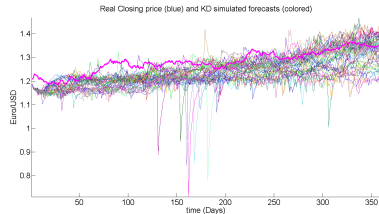
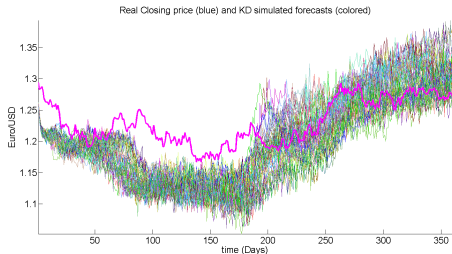


Figure : Original price (magenta), KD ensemble simulated prices (colored) for period 1 and 2.



KD results

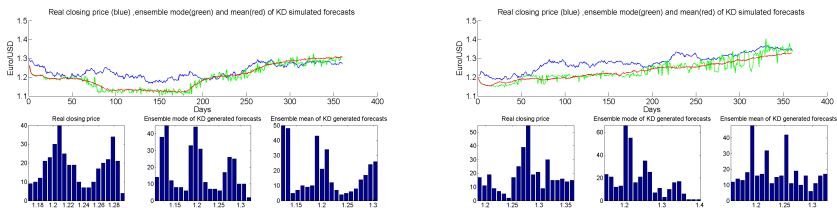


Figure : Original price (blue) , ensemble mode(green) and mean(red) of KD simulated forecasts for period 1 and 2.



KD results

Table : Basic Statistics for original price vs ensemble average simulated price by KD model for period 1.

	Mean	St.Dev	Skewness	Kurtosis
orig price	1.2302	0.0351	0.1934	1.7012
KD sim price	1.2018	0.0646	0.2846	1.9722

Table : Basic Statistics for original price vs ensemble average simulated price by KD model for period 2.

	Mean	St.Dev	Skewness	Kurtosis
orig price	1.2807	0.0462	-0.2437	2.4014
KD sim price	1.2349	0.0566	0.3483	3.2392



KD results

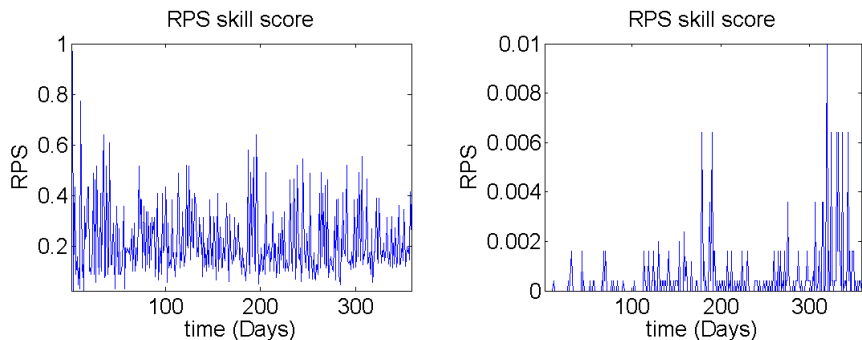


Figure : Ranked probability score for period 1 and 2.



Comparison of models' performance

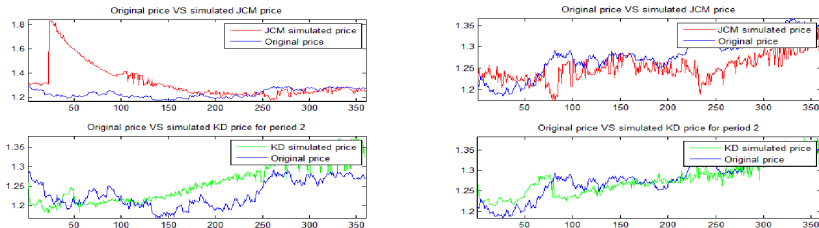


Figure : Time line plots of original price vs simulated prices(JCM and KD).



Comparison of models' performance

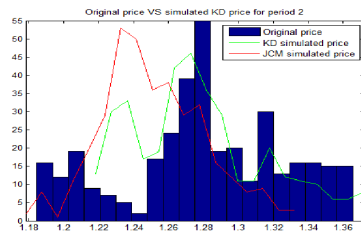
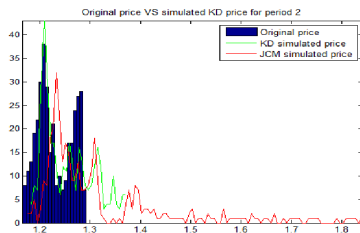


Figure : Histograms of original price vs simulated prices (JCM and KD).



Comparison of models' performance

Table : Basic Statistics of original price vs simulated prices for period 1 (JCM and KD).

	Mean	St.Dev	Skewness	Kurtosis
Orig price	1.2301	0.0350	0.1855	1.6901
JCM sim price	1.3246	0.1397	1.8576	5.9981
KD sim price	1.2578	0.0507	0.5515	2.1662

Table : Basic Statistics of original price vs simulated prices for period 2 (JCM and KD).

	Mean	St.Dev	Skewness	Kurtosis
orig price	1.2807	0.0462	-0.2408	2.3956
JCM sim price	1.2513	0.0297	0.3061	3.1297
KD sim price	1.2778	0.0389	0.5628	2.7075



Comparison of models' performance

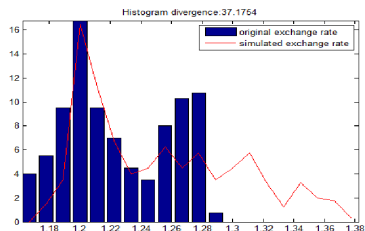
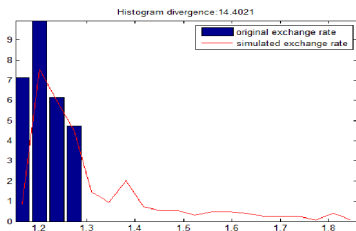


Figure : Histogram divergence for period 1 (JCM and KD).



Comparison of models' performance

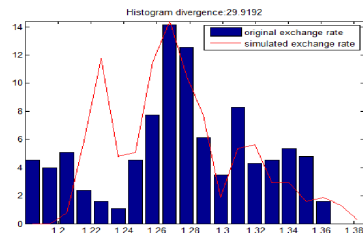
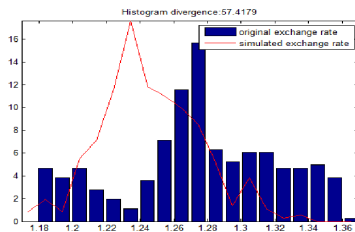


Figure : histogram divergence for period 2 (JCM and KD).



Comparison of models' performance

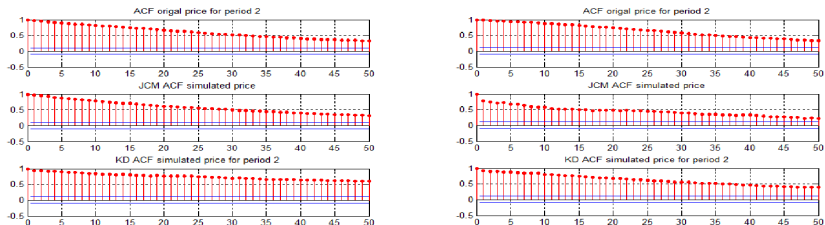


Figure : ACF of original price vs simulated prices for period 1 and 2 (JCM and KD)



Comparison of models' performance

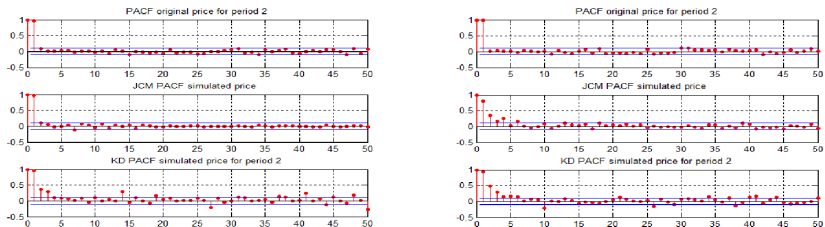


Figure : PACF of original vs simulated prices for period 1 and 2 (JCM and KD)



Comparison of models' performance

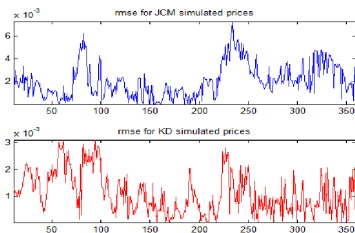
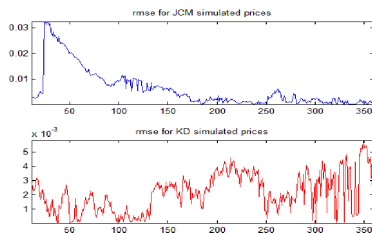


Figure : rmse of JCM and KD for period 1 and 2.



Comparison of models' performance

Table : RMSE statistics for the KD and JCM models for period 1 and period 2.

Period 1	mean	st.dev
JCM	0.0060	0.0074
KD	0.0022	0.0013
Period 2	mean	st.dev
JCM	0.0020	0.0015
KD	0.0011	0.0008

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Conclusion

The models were able to capture the dynamics of the exchange rate prices with the same ability.



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The suggested hypothesis that the psychological factors may drive the currency markets may be true.

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