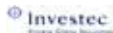


The global forces that drive SA's Financial markets from day to day

Presentation to ESSA Conference
Sept 2009
Brian Kantor

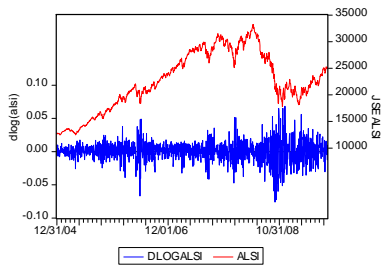


The dependent variables

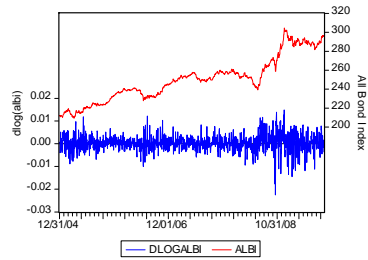
The markets – shares, bonds and the ZAR



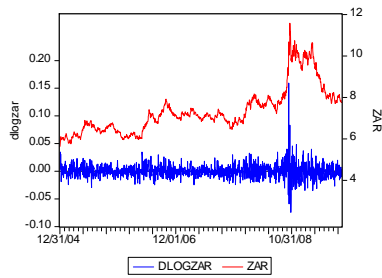
The JSE All Share Index Daily Data 2005 – Aug 2009



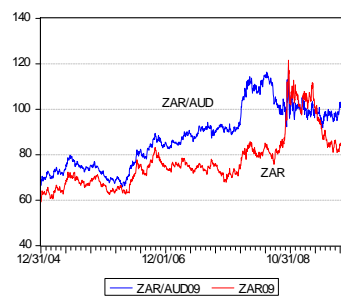
The SA All Bond Index Daily data 2005-Aug 2009 (Total Returns)



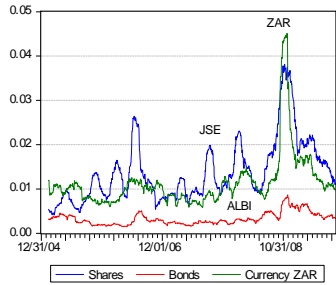
The ZAR Daily data 2005 – Aug 2009



The rand Vs the USD and the AUD Daily data (Jan 1st 2009=100)



Volatility- SD of daily returns- 30 day moving average

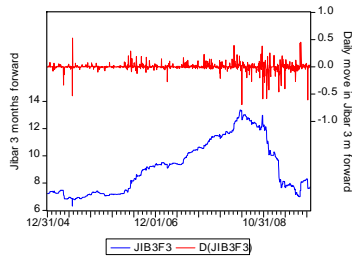


The independent variables

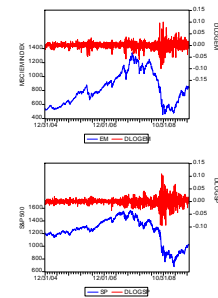
- Expected short term interest rates (JIBAR 3 month forward Jib3f30) Expected Resbank policy action
- Off shore share markets – The S&P 500 (SP) and the MSCI Emerging market Index (EM)
- Off shore bond markets US 10 year T bonds (USTB10)
- Commodity markets CRB Commodity Price Index USD (CRB) and the Australian/USD exchange rate



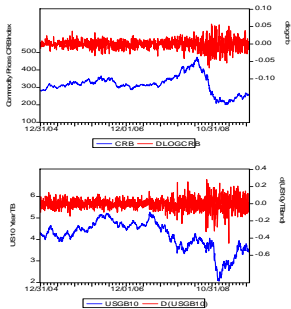
Expected short term interest rates (Jibar 3 month forward)



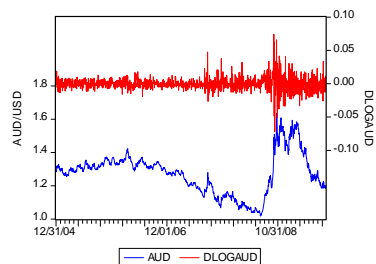
Emerging markets EM and the S&P 500 Daily levels and % movement 2005-2009



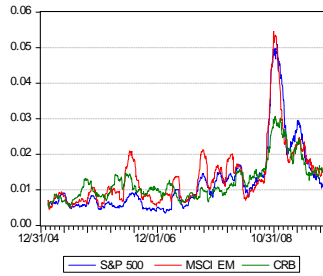
Commodity Prices and US TB yields



The Australian/USD exchange rate Daily data 2005-2009

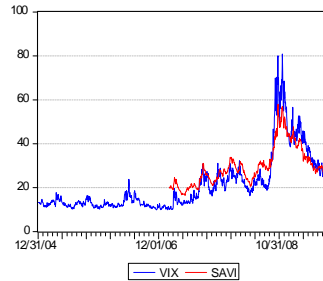


Volatility of Independent variables: Share and commodity markets SD 30 day moving average



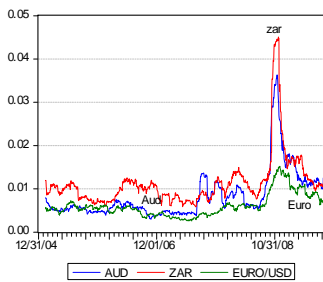
Investec

Implied volatility – The Vix (on the S&P) and Savi on the JSE



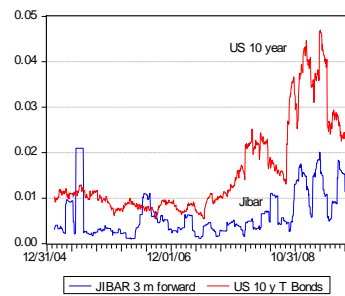
Investec

Exchange rate volatilities



Investec

Interest rate volatilities- SD 30 day moving average



Investec

Correlation of daily movements in share prices and velocity

	DLOGSP	DLOGALS	DLOGVIX	DLOGSAV
DLOGSP	1.00	0.38	-0.76	-0.28
DLOGALS	0.38	1.00	-0.32	-0.73
DLOGVIX	-0.76	-0.32	1.00	0.28
DLOGSAV	-0.28	-0.73	0.28	1.00

Investec

Daily moves in SA markets - correlations

	DLOGALS	DLOGALBI	DLOGZAR	D(JIB3F3)
DLOGALS	1.00	0.19	-0.33	-0.07
DLOGALBI	0.19	1.00	-0.34	-0.16
DLOGZAR	-0.33	-0.34	1.00	0.06
D(JIB3F3)	-0.07	-0.16	0.06	1.00
DLOGSP	0.35	0.09	-0.50	-0.08
DLOGEM	0.73	0.27	-0.51	-0.14
DLOGCRB	0.39	0.11	-0.36	-0.04
DLOGAUD	-0.49	-0.21	0.35	0.11
D(USGB10)	0.20	0.00	-0.18	-0.06

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Independent variables - correlations

	DLOGSP	DLOGEM	DLOGCRB	DLOGAUD	D(USGB10)
DLOGALSI	0.35	0.73	0.39	-0.49	0.20
DLOGALBI	0.09	0.27	0.11	-0.21	0.00
DLOGZAR	-0.50	-0.51	-0.36	0.35	-0.18
D(JIB3F3)	-0.08	-0.14	-0.04	0.11	-0.06
DLOGSP	1.00	0.46	0.30	-0.12	0.32
DLOGEM	0.46	1.00	0.44	-0.64	0.25
DLOGCRB	0.30	0.44	1.00	-0.31	0.22
DLOGAUD	-0.12	-0.64	-0.31	1.00	-0.07
D(USGB10)	0.32	0.25	0.22	-0.07	1.00



The model of the D log Alsi 2005-2009

Dependent Variable: DLOGALSI
 Method: Least Squares
 Sample(adjusted): 1/03/2005 8/31/2009
 Included observations: 1216 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000302	0.000298	1.012352	0.3116
DLOGEM	0.678898	0.022451	30.23898	0
DLOGCRB	0.118693	0.025051	4.737981	0
DLOG(ZAR)	0.085443	0.02744	3.113828	0.0019
R-squared	0.542224	Mean dependent var		0.000557
Adjusted R-squ	0.541091	S.D. dependent var		0.01533
S.E. of regressi	0.010385	Akaike info criterion		-6.293574
Sum squared re	0.130719	Schwarz criterion		-6.276787
Log likelihood	3830.493	F-statistic		478.5271
Durbin-Watson	2.241276	Prob(F-statistic)		0



The model of the D log Alsi 2006-2009

Dependent Variable: DLOGALSI
 Method: Least Squares
 Sample: 12/29/2006 8/31/2009
 Included observations: 697

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.95E-05	0.000437	0.227721	0.8199
DLOGEM	0.643853	0.027489	23.42236	0
DLOGCRB	0.115239	0.03242	3.554513	0.0004
DLOG(ZAR)	0.022401	0.035318	0.634258	0.5261
R-squared	0.580592	Mean dependent var		-3.24E-06
Adjusted R-squ	0.578776	S.D. dependent var		0.017776
S.E. of regressi	0.011537	Akaike info criterion		-6.080856
Sum squared re	0.092234	Schwarz criterion		-6.054763
Log likelihood	2123.178	F-statistic		319.7764
Durbin-Watson	2.183061	Prob(F-statistic)		0



Model of dlog Alsi- CRB and ZAR independent of EM

Dependent Variable: DLOGALSI
 Method: Least Squares
 Sample(adjusted): 1/03/2005 8/31/2009
 Included observations: 1216 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.00031	0.000298	1.041386	0.2979
DLOGEM	0.687653	0.018327	37.52068	0
CRBEMORTH	0.118693	0.025051	4.737981	0
ZAREMORTH	0.085443	0.02744	3.113828	0.0019
R-squared	0.542224	Mean dependent var		0.000557
Adjusted R-squ	0.541091	S.D. dependent var		0.01533
S.E. of regressi	0.010385	Akaike info criterion		-6.293574
Sum squared re	0.130719	Schwarz criterion		-6.276787
Log likelihood	3830.493	F-statistic		478.5271
Durbin-Watson	2.241276	Prob(F-statistic)		0



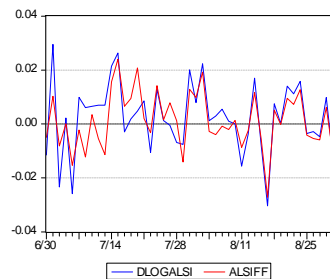
An out of sample forecasting exercise

Dependent Variable: DLOGALSI
 Method: Least Squares
 Sample: 6/30/2008 6/30/2009
 Included observations: 262

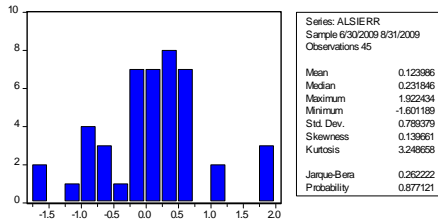
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.81E-05	0.000897	-0.098199	0.9219
DLOGEM	0.640429	0.041126	15.57226	0
DLOGCRB	0.113573	0.052581	2.159983	0.0317
DLOG(ZAR)	0.005451	0.052135	0.104562	0.9168
R-squared	0.634526	Mean dependent var		-0.001223
Adjusted R-squ	0.630277	S.D. dependent var		0.023681
S.E. of regressi	0.014399	Akaike info criterion		-5.628123
Sum squared re	0.053494	Schwarz criterion		-5.573644
Log likelihood	741.2841	F-statistic		149.311
Durbin-Watson	2.161249	Prob(F-statistic)		0



D log ALSI Out of sample forecast 1st July 2009- 31st August 2009 Correlation (0.79)



ALSI – actual less predicted (per cent)



A model of monthly moves in the Swix

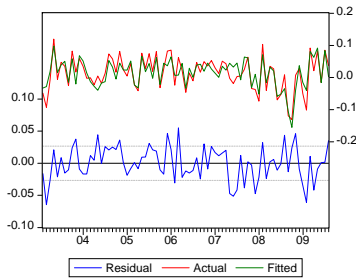
Dependent Variable: SWIX_RET
Method: Least Squares
Sample(adjusted): 2003:02 2009:08
Included observations: 79 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.007556	0.003053	2.475074	0.0155
MSCIEM_RET	0.531288	0.039741	13.36859	0
ZARORTH	0.411326	0.071141	5.781824	0

R-squared	0.740371	Mean dependent var	0.013814
Adjusted R-squared	0.733539	S.D. dependent var	0.051678
S.E. of regression	0.026676	Akaike info criterion	-4.37286
Sum squared resid	0.054083	Schwarz criterion	-4.28288
Log likelihood	175.728	F-statistic	108.3627
Durbin-Watson stat	1.723979	Prob(F-statistic)	0



The Swix monthly model – estimation output



Model of daily moves in ZAR

Dependent Variable: DLOGZAR
Method: Least Squares
Sample(adjusted): 1/03/2005 8/31/2009
Included observations: 1216 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000342	0.0003	1.138774	0.255
DLOGEM	-0.27693	0.026503	-10.44896	0
DLOGCRB	-0.156145	0.025078	-6.226343	0
D(R157)	0.045544	0.004598	9.904269	0
D(USGB10)	-0.011272	0.004839	-2.329409	0.02
D(JIB3F3)	-0.006002	0.004065	-1.4764	0.1401
DLOG(AUD)	0.018385	0.039053	0.470778	0.6379

R-squared	0.33769	Mean dependent var	0.000264
Adjusted R-squ	0.334403	S.D. dependent var	0.012817
S.E. of regressi	0.010456	Akaike info criterion	-6.277452
Sum squared re	0.132189	Schwarz criterion	-6.248074
Log likelihood	3823.691	F-statistic	102.7382
Durbin-Watson	2.239936	Prob(F-statistic)	0



Model of ZAR adjusted for interdependencies

Dependent Variable: DLOGZAR
Method: Least Squares
Sample(adjusted): 1/03/2005 8/31/2009
Included observations: 1216 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000365	0.000303	1.201546	0.2298
DLOGEM	-0.340455	0.020193	-16.86001	0
CRBEMORTH	-0.14278	0.025237	-5.65761	0
AUDEMORTH	0.044836	0.039179	1.144397	0.2527
D(RISK)	0.029357	0.003503	8.390449	0
D(JIB3F3)	-0.00461	0.004103	-1.12373	0.2614

R-squared	0.322	Mean dependent var	0.000264
Adjusted R-squ	0.319198	S.D. dependent var	0.012817
S.E. of regressi	0.010575	Akaike info criterion	-6.255682
Sum squared re	0.135321	Schwarz criterion	-6.230501
Log likelihood	3809.455	F-statistic	114.932
Durbin-Watson	2.210253	Prob(F-statistic)	0



ZAR out of sample forecasting exercise

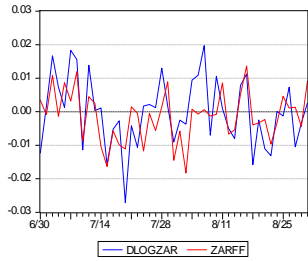
Dependent Variable: DLOGZAR
Method: Least Squares
Sample: 6/30/2008 6/30/2009
Included observations: 262

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0081	0.001053	-0.769183	0.4425
DLOGEM	-0.218078	0.046914	-4.648451	0
DLOGCRB	-0.252252	0.060097	-4.197422	0
D(RISK)	0.025209	0.008026	3.140763	0.0019

R-squared	0.332867	Mean dependent var	-8.74E-05
Adjusted R-squ	0.32511	S.D. dependent var	0.020542
S.E. of regressi	0.016875	Akaike info criterion	-5.310783
Sum squared re	0.073472	Schwarz criterion	-5.256304
Log likelihood	699.7125	F-statistic	42.90988
Durbin-Watson	2.317608	Prob(F-statistic)	0

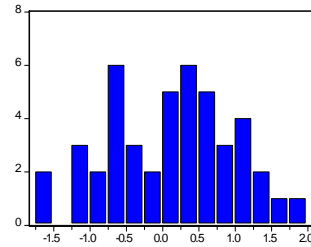


ZAR – out of sample actual and predicted values
R=0.56



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ZAR Actual – predicted (per cent)



Series: ZARERROR	
Sample	6/30/2009 8/31/2009
Observations	45
Mean	0.123823
Median	0.172551
Maximum	1.303541
Minimum	-1.801217
Std. Dev.	0.859446
Skewness	-0.063209
Kurtosis	2.280948
Jarque-Bera	0.999408
Probability	0.606710

Investec

Monthly model of dlog(zar) em, aud/usd, and SA risk as dependent variables

Dependent Variable: DLOG(ZAR)
Method: Least Squares
Sample: 1995:01 2009:08
Included observations: 176

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.005797	0.002966	1.954603	0.0523
DLOG(EM)	-0.15975	0.05312	-3.00736	0.003
DLOG(AU)	0.307698	0.115907	2.654697	0.0087
DGAP	0.019323	0.005626	3.434635	0.0007

R-squared	0.292819	Mean dependent var	0.004443
Adjusted R	0.280485	S.D. dependent var	0.046288
S.E. of reg	0.039264	Akaike info criterion	-3.61457
Sum squared	0.265162	Schwarz criterion	-3.54251
Log likelihood	322.082	F-statistic	23.73976
Durbin-Watson	2.037164	Prob(F-statistic)	0

Investec

The ZAR monthly model 2003-2009

Dependent Variable: DLOG(ZAR)
Method: Least Squares
Sample: 2003:01 2009:08
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Full model t stat
C	0.004996	0.004728	1.056568	0.2941	0.005797 1.954603
DLOG(EM)	-0.40651	0.092644	-4.38788	0	-0.15975 -3.00736
DLOG(AU)	0.076886	0.171555	0.446888	0.6582	0.307698 2.654697
DGAP	0.023766	0.013047	1.821618	0.0724	0.019323 3.434635

R-squared	0.435755	Mean dependent var	-0.00122
Adjusted R	0.413483	S.D. dependent var	0.054355
S.E. of reg	0.041627	Akaike info criterion	-3.47141
Sum squared	0.131696	Schwarz criterion	-3.35231
Log likelihood	142.8565	F-statistic	19.56445
Durbin-Watson	2.457941	Prob(F-statistic)	0

Investec

The model of the ZAR 2003-2009 (EM only)

Dependent Variable: DLOG(ZAR)
Method: Least Squares
Sample: 2003:01 2009:08
Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.004964	0.004703	1.055619	0.2944
DLOG(EM)	-0.43578	0.06517	-6.68686	0
DGAP	0.022095	0.012434	1.776962	0.0795

R-squared	0.434273	Mean dependent var	-0.00122
Adjusted R	0.419578	S.D. dependent var	0.054355
S.E. of reg	0.04141	Akaike info criterion	-3.49379
Sum squared	0.132042	Schwarz criterion	-3.40446
Log likelihood	142.7515	F-statistic	29.55399
Durbin-Watson	2.44749	Prob(F-statistic)	0

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Bond market index – a model of daily movements

Dependent Variable: DLOG(ALBI)
Method: Least Squares
Sample(adjusted): 1/03/2005 8/31/2009
Included observations: 1216 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000298	9.55E-05	3.123599	0.0018
DLOG(ZAR)	-0.095667	0.007586	-12.61167	0
D(JIB3F3)	-0.006971	0.001273	-5.476215	0
D(USGB10)	-0.004085	0.001488	-2.744364	0.0062

R-squared	0.139923	Mean dependent var	0.000273
Adjusted R-squ	0.137794	S.D. dependent var	0.003586
S.E. of regressi	0.003329	Akaike info criterion	-8.568729
Sum squared re	0.013435	Schwarz criterion	-8.551941
Log likelihood	5213.787	F-statistic	65.72521
Durbin-Watson	1.831323	Prob(F-statistic)	0

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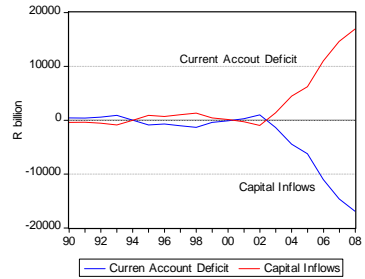
RSA Long bond yields- rand effects orthogonaalised

Dependent Variable: D(R157)
 Method: Least Squares
 Date: 09/06/09 Time: 16:49
 Sample(adjusted): 1/03/2005 8/31/2009
 Included observations: 1216 after adjusting endpoints

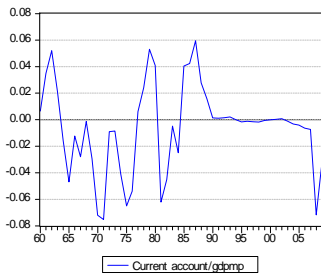
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000513	0.001807	0.283961	0.7765
ZAREMORTH	1.608784	0.164041	9.807187	0
D(JIB3F3)	0.122441	0.024232	5.052894	0
D(USG810)	0.107193	0.028646	3.741987	0.0002
DLOG(EM)	-1.188607	0.115739	-10.26974	0
R-squared	0.164581	Mean dependent var	5.35E-05	
Adjusted R-squ	0.161821	S.D. dependent var	0.068781	
S.E. of regressi	0.06297	Akaike info criterion	-2.686213	
Sum squared re	4.801883	Schwarz criterion	-2.667229	
Log likelihood	1639.434	F-statistic	59.64287	
Durbin-Watson	1.806418	Prob(F-statistic)	0	



The very different new South Africa



The current account deficit – a longer view



Finding the trend in SA HH consumption spending

