# Comparación de modelos GARCH y EGARCH en 4 acciones colombianas

Con el presente trabajo se busca hacer un acercamiento a la modelación de la volatilidad en 4 series de retornos de acciones financieras colombianas. Para ello se propondrá el mejor modelo EGARCH, basado en el criterio AIC.

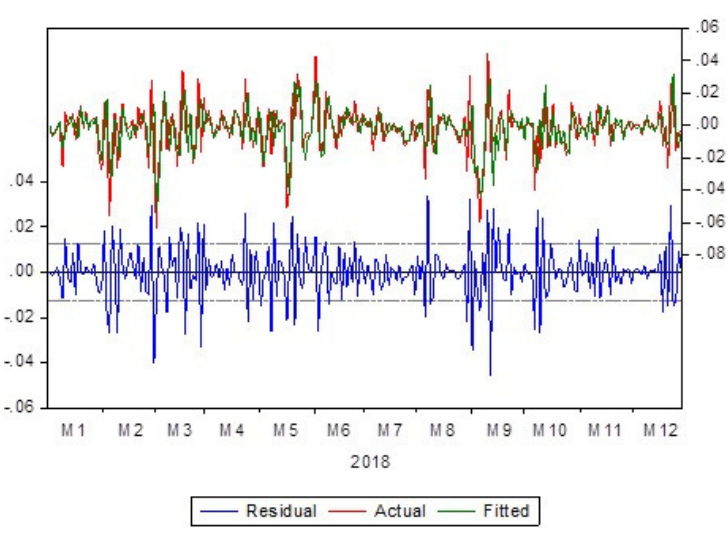
## ARGOS

### Prueba de Heteroscedasticidad

Heteroskedasticity Test: ARCH

| | | | |
|---|---|---|---|
| F-statistic | 18.70708 | Prob. F(1,240) | 0.0000 |
| Obs*R-squared | 17.49900 | Prob. Chi-Square(1) | 0.0000 |

### ARMA (10,9) - EGARCH (1,1,1)




| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|---|---|---|---|---|
| AR(3) | -0.585427 | 1.13E-05 | -51905.31 | 0.0000 |
| AR(7) | 0.368350 | 0.012505 | 29.45614 | 0.0000 |
| AR(8) | 0.021007 | 0.008886 | 2.364031 | 0.0181 |
| AR(10) | 0.761872 | 0.006419 | 118.6861 | 0.0000 |
| MA(2) | -0.788126 | 0.046877 | -16.81266 | 0.0000 |
| MA(5) | 0.475553 | 0.069227 | 6.869500 | 0.0000 |
| MA(6) | 1.242956 | 0.092948 | 13.37254 | 0.0000 |
| MA(7) | 1.294525 | 0.107158 | 12.08055 | 0.0000 |
| MA(8) | 1.816155 | 0.132709 | 13.68529 | 0.0000 |
| MA(9) | 1.557017 | 0.079593 | 19.56226 | 0.0000 |
| **Variance Equation** | | | | |
| C(11) | -5.061420 | 0.886257 | -5.711006 | 0.0000 |
| C(12) | 0.930039 | 0.171464 | 5.424111 | 0.0000 |
| C(13) | -0.042084 | 0.103987 | -0.404703 | 0.6857 |
| C(14) | 0.522457 | 0.092845 | 5.627189 | 0.0000 |

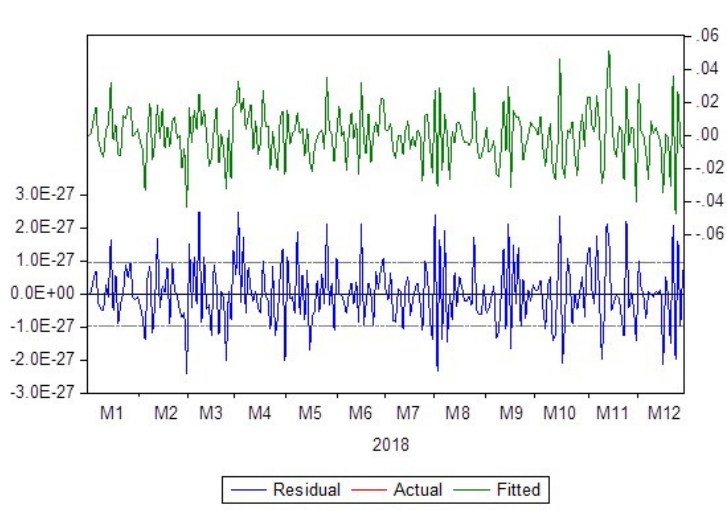
## BANCOLOMBIA

### Prueba de Heteroscedasticidad

Heteroskedasticity Test: ARCH

| | | | |
|---|---|---|---|
| F-statistic | 5.793416 | Prob. F(1,240) | 0.0168 |
| Obs*R-squared | 5.704004 | Prob. Chi-Square(1) | 0.0169 |

### ARMA (10,10) - EGARCH (1,1,1)




| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|---|---|---|---|---|
| AR(1) | 0.233688 | 0.001197 | 195.3061 | 0.0000 |
| AR(4) | -0.219186 | 0.000835 | -262.4283 | 0.0000 |
| AR(5) | -0.146181 | 0.001018 | -143.5648 | 0.0000 |
| AR(10) | 0.270343 | 0.001615 | 167.3644 | 0.0000 |
| MA(5) | 1.20E+25 | 7.82E+23 | 15.38875 | 0.0000 |
| MA(10) | 1.90E+25 | 1.24E+24 | 15.39208 | 0.0000 |
| **Variance Equation** | | | | |
| C(7) | -9.756410 | 0.014408 | -677.1475 | 0.0000 |
| C(8) | 0.365351 | 0.001916 | 190.7212 | 0.0000 |
| C(9) | -0.610955 | 0.001664 | -367.1063 | 0.0000 |
| C(10) | 0.930170 | 8.47E-05 | 10976.30 | 0.0000 |

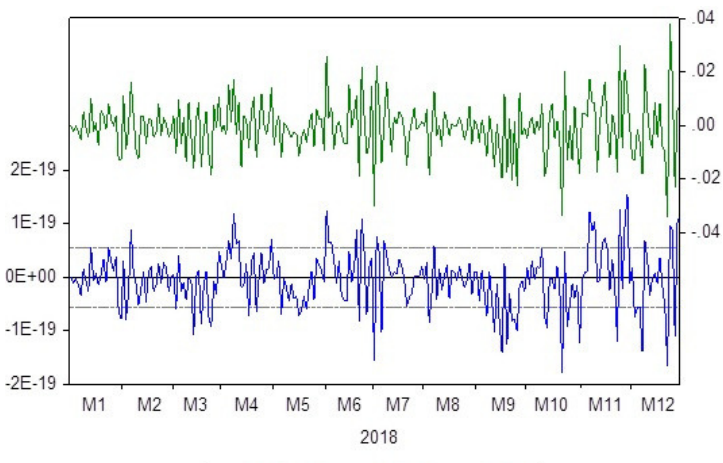
## NUTRESA

### Prueba de Heteroscedasticidad

Heteroskedasticity Test: ARCH

| | | | |
|---|---|---|---|
| F-statistic | 23.18131 | Prob. F(1,240) | 0.0000 |
| Obs*R-squared | 21.31563 | Prob. Chi-Square(1) | 0.0000 |

### ARMA (10,4) - EGARCH (1,0,1)




| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|---|---|---|---|---|
| AR(1) | -0.104535 | 0.000415 | -251.8820 | 0.0000 |
| AR(2) | 0.280469 | 2.52E-05 | 11132.25 | 0.0000 |
| AR(3) | -0.258761 | 0.000630 | -410.9077 | 0.0000 |
| AR(4) | 0.282320 | 0.000161 | 1752.728 | 0.0000 |
| AR(5) | 0.062099 | 0.000770 | 80.60009 | 0.0000 |
| AR(7) | 0.095573 | 0.001250 | 76.48284 | 0.0000 |
| AR(8) | -0.099546 | 0.000666 | -149.5547 | 0.0000 |
| AR(9) | 0.051976 | 0.000695 | 74.76765 | 0.0000 |
| AR(10) | 0.133754 | 0.000901 | 148.4812 | 0.0000 |
| MA(1) | 1.18E+17 | 9.27E+12 | 12740.12 | 0.0000 |
| MA(2) | 9.55E+16 | 1.50E+13 | 6375.077 | 0.0000 |
| MA(3) | -1.55E+17 | 1.25E+14 | -1247.123 | 0.0000 |
| MA(4) | 1.15E+16 | 7.98E+12 | 1446.338 | 0.0000 |
| **Variance Equation** | | | | |
| C(14) | -92.76780 | 0.000186 | -499783.1 | 0.0000 |
| C(15) | 3.242245 | 0.000462 | 7023.806 | 0.0000 |
| C(16) | -1.390353 | 0.003174 | -438.0840 | 0.0000 |

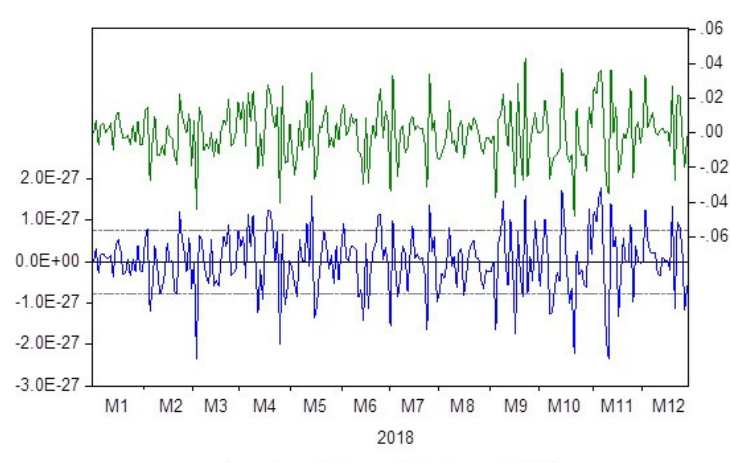
## ISA

### Prueba de Heteroscedasticidad

Heteroskedasticity Test: ARCH

| | | | |
|---|---|---|---|
| F-statistic | 5.802581 | Prob. F(1,240) | 0.0168 |
| Obs*R-squared | 5.712815 | Prob. Chi-Square(1) | 0.0168 |

### ARMA (10,9) - EGARCH (1,1,1)




| Variable | Coefficient | Std. Error | z-Statistic | Prob. |
|---|---|---|---|---|
| AR(1) | 0.009033 | 0.002106 | 4.288521 | 0.0000 |
| AR(2) | -0.340847 | 0.003159 | -107.9105 | 0.0000 |
| AR(3) | 0.169879 | 0.001420 | 119.6371 | 0.0000 |
| AR(5) | 0.074096 | 0.000551 | 134.5936 | 0.0000 |
| AR(8) | 0.036030 | 0.001508 | 23.88484 | 0.0000 |
| AR(10) | -0.137063 | 0.000566 | -242.0242 | 0.0000 |
| MA(3) | -2.13E+25 | 1.40E+24 | -15.19107 | 0.0000 |
| MA(4) | 1.87E+24 | 1.39E+23 | 13.50160 | 0.0000 |
| MA(5) | -8.48E+24 | 5.58E+23 | -15.18894 | 0.0000 |
| MA(7) | 7.62E+23 | 5.97E+22 | 12.75447 | 0.0000 |
| MA(9) | -3.99E+24 | 2.64E+23 | -15.10308 | 0.0000 |
| **Variance Equation** | | | | |
| C(12) | -57.00788 | 0.177369 | -321.4082 | 0.0000 |
| C(13) | 2.055478 | 0.016463 | 124.8522 | 0.0000 |
| C(14) | 0.053986 | 0.008279 | 6.520519 | 0.0000 |
| C(15) | 0.573398 | 0.001321 | 434.1735 | 0.0000 |