PERAMALAN SAHAM SYARIAH DENGAN MODEL ARIMAX-EGARCH

(Studi Kasus: Harga Penutupan Indeks Harga Saham Harian *Jakarta Islamic Index* (JII), Suku Bunga Bank Indonesi (BI), Inflasi, dan Kurs Dollar (USD) Periode 4 Maret 2013 – 30 September 2015)

SKRIPSI

Untuk memenuhi sebagian persyaratan
mencapai derajat Sarjana S-1

Program Studi Matematika

Disusun oleh
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PROGRAM STUDI MATEMATIKA
FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS ISLAM NEGERI SUNAN KALIJAGA
YOGYAKARTA
2016

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sudah dapat diajukan kembali kepada Program Studi Matematika Fakultas Sains dan Teknologi UIN Sunan Kalijaga Yogyakarta sebagai salah satu syarat untuk memperoleh gelar Sarjana Strata Satu dalam Matematika

Dengan ini kami mengharap agar skripsi/tugas akhir Saudara tersebut di atas dapat segera dimunaqsyahkan. Atas perhatiannya kami ucapkan terima kasih.

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Dengan ini saya menyatakan bahwa skripsi ini tidak terdapat karya yang pernah diajukan untuk memperoleh gelar kesarjanaan di suatu Perguruan Tinggi, dan sepanjang pengetahuan saya juga tidak terdapat karya atau pendapat yang pernah ditulis atau diterbitkan oleh orang lain, kecuali yang secara tertulis diacu dalam naskah ini dan disebutkan dalam daftar pustaka.

Yogyakarta, 18 Maret 2016

Yang menyatakan

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HALAMAN PERSEMBAHAN

Karya sederhana ini saya persembahkan untuk :

Untuk kedua orang tua saya yang tulus memberikan semua dukungan dalam bermacam-macam bentuk yang tak ternilai harganya,
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Untuk adik ku yang selalu menjadi semangat
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"…. Berdoalah kepada Allah SWT dan niscaya Allah SWT akan mengabulkannya….." (HR. Tirmidzi)

"Jangan pernah malu untuk maju, karena malu menjadikan kita takkan pernah mengetahui dan memahami segala sesuatu hal akan hidup ini"

"Jangan pernah membuang- buang waktu, karena waktu yang sudah terbuang tak kan bisa kembali lagi"

"Jadi diri sendiri, optimis, karena hidup terus mengalir dan kehidupan terus berputar sesekali liat ke belakang untuk melanjutkan perjalanan yang tiada berujung"

"Aku percaya bahwa apapun yang aku terima saat ini adalah yang terbaik dari Tuhan dan aku percaya Dia akan selalu memberikan yang terbaik untukku pada waktu yang telah Ia tetapkan"

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Penulis

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DAFTAR ISI

DAFTAR GAMBAR

DAFTAR TABEL

DAFTAR LAMPIRAN

ABSTRAK

PERAMALAN SAHAM SYARIAH DENGAN MODEL ARIMAX-EGARCH

(Studi Kasus: Harga Penutupan Indeks Harga Saham Harian *Jakarta Islamic Index* (JII), Suku Bunga Bank Indonesi (BI), Inflasi, dan Kurs Dolar (USD) Periode 4 Maret 2013 – 30 September 2015)

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Perubahan harga saham terjadi setiap hari dengan berbagai faktor yang mempengaruhi harga saham tersebut. Untuk mengatasi perubahan tersebut diperlukan alat yang dapat memprediksi harga saham yang akan datang. Alat untuk memprediksi kondisi masa yang akan datang berdasarkan data masa lampau disebut dengan *forecasting* (peramalan). Model ARIMAX-EGARCH merupakan model yang digunakan untuk menganalisis data runtun waktu yang bersifat heteroskedastisitas dan asimetris. Tujuan penelitian ini yaitu untuk mengetahui langkah-langkah melakukan peramalan model ARIMAX-EGARCH, menemukan model terbaik dalam peramalan model ARIMAX-EGARCH, dan peramalannya dalam indeks harga saham harian *Jakarta Islamic Index* (JII).

Penelitian ini membahas peramalan saham syariah dengan model ARIMAX-EGARCH. Langkah-langkah utama pada peramalan dengan model ARIMAX-EGARCH ini adalah menguji kestasioneran data, mengidentifikasi model ARIMAX, mengestimasi parameter model ARIMAX, menguji diagnostik model ARIMAX, mendeteksi ada tidaknya unsur ARCH atau unsur heteroskedastisitas, pengujian efek asimetris, mengestimasi model EGARCH, menguji diagnostik model EGARCH, dan melakukan peramalan dengan model ARIMAX-EGARCH. Adapun data yang digunakan adalah data harga penutupan indeks harga saham harian *Jakarta Islamic Index* (JII) periode 4 Maret 2013 – 30 September 2015 sebagai variabel dependent, data suku bunga, inflasi, dan kurs dolar periode 4 Maret 2013 – 30 September 2015 sebagai variabel eksogen dari model ARIMAX.

Hasil dari penelitian ini menunjukkan bahwa model terbaik adalah ARIMAX(2,1,1)-EGARCH(1,2). Pemilihan model terbaik untuk meramalkan data yang dipilih berdasarkan kriteria pemilihan MAPE 0,11% yang menunjukan perbedaan jarak antara data aktual dengan peramalan.

Kata Kunci : ARIMAX, Heteroskedastisitas, Asimetris, EGARCH, MAPE.

BAB I
PENDAHULUAN

1.1 Latar Belakang

Investasi menurut Islam merupakan kegiatan muamalah yang sangat dianjurkan, karena dengan berinvestasi harta atau aset yang dimiliki oleh seseorang menjadi produktif sehingga mampu mendatangkan manfaat bagi dirinya dan orang lain dengan berpedoman pada prinsip-prinsip syariah. Secara umum investasi memiliki 2 (dua) pilihan sektor aset, yaitu investasi *sector of real* (nyata) dan investasi *sector of finance* (keuangan). Investasi *sector of real* (nyata) adalah investasi yang asetnya memiliki wujud fisik, seperti emas batangan, bangunan dan lain sebagainya (Boodie, Kans dan Marus, 2005). Sedangkan investasi *sector of finance* (keuangan) adalah investasi yang wujud asetnya berupa lembaran kertas berharga sebagai klaim kepemilikan aset pada pihak yang menerbitkan, seperti saham dan obligasi. (Yohes, 2007)

Seorang investor dihadapkan dengan dua hal, yaitu tingkat pengembalian (*return*) dan juga tingkat resiko (*risk*) yang timbul akibat ketidakpastian (Tadeliin, 2010). *Return* atau keuntungan adalah hasil yang diperoleh dari berinvestasi dan itu yang diharapkan oleh para investor. Sedangkan *risk* atau resiko adalah hal yang tidak diinginkan oleh para investor. Resiko dapat dikelola dan diperkirakan menggunakan manajemen resiko, tujuanya untuk mengidentifikasi resiko dengan cara mengenal dan memahami semua resiko yang sudah ada, sehingga

mempermudah investor dalam penilaian terhadap kemungkinan kerugian yang akan dihadapi.

Bursa Efek Indonesia (BEI) membentuk beberapa indeks pasar modal yang bertujuan untuk memenuhi kebutuhan dalam berinvestasi di Indonesia. Suatu indeks diperlukan sebagai sebuah indikator untuk mengamati pergerakan harga dari sekuritas-sekuritas. Sementara untuk bidang investasi syariah telah dibentuk indeks pasar modal *Jakarta Islamic Index* (JII). JII dibuat oleh BEI bekerjasama dengan PT DIM. JII menggunakan basis tanggal 1 Januari 1995 dengan nilai awal sebesar 100. (Hartono, 2003)

Saham adalah tanda bukti penyertaan atau kepemilikan seseorang atau suatu institusi dalam suatu badan usaha atau perusahaan. Dengan menerbitkan saham, memungkinkan perusahaan-perusahaan yang membutuhkan pendanaan jangka panjang untuk menjual kepentingan dalam bisnis saham dengan imbalan uang tunai. Indikator atau cerminan harga saham disebut indeks harga saham. Indeks harga saham merupakan salah satu pedoman bagi investor untuk melakukan investasi di pasar modal, khususnya saham. (Darmadji dan Hendy, 2001)

Pada masalah saham apabila tidak diketahui berapa prediksi harga saham yang akan dibeli pada waktu yang akan datang, maka tidak akan diketahui pula berapa besar keuntungan yang akan diperoleh dari saham yang akan dibeli tersebut, sehingga data yang ada sekarang sangatlah penting sebagai alat untuk prediksi masa depan. Dalam ilmu statistika, alat untuk memprediksi kondisi masa yang akan datang berdasarkan data masa lampau disebut dengan *forecasting* (peramalan).

Peramalan (*forecasting)* ini bertujuan untuk memperkecil resiko dan faktor-faktor ketidakpastian dalam memprediksi masa depan. (Darmadji dan Hendy, 2001)

Terdapat dua metode dalam melakukan peramalan diantaranya yaitu analisis *cross-section* atau sebab akibat (*Causal Method*) dan analisis runtun waktu. Analisis *cross-section* atau sebab akibat (*Causal Method*) merupakan analisis variabel yang dicari dengan variabel bebas atau yang mempengaruhinya, sedangkan analisis runtun waktu (*time series*) dimana analisis antar variabel yang dicari dengan variabel waktu.

Analisis *time series* atau runtun waktu dapat diklasifikasikan menjadi dua yaitu model *univariat* dan model *multivariat*. Model *univariat* hanya mengamati satu variabel/individu runtun waktu. Sedang model *multivariat* lebih dari satu variabel/individu runtun waktu. Model *time series* yang paling populer dan banyak digunakan dalam peramalan data *time series univariat* adalah model *Autoregressive Integrated Moving Average* atau yang dikenal dengan model ARIMA. (Makridakis, 1999)

Pada perkembangan data runtun waktu, muncul perluasan dari ARIMA yang dikenal dengan model ARIMAX, yakni model ARIMA dengan variabel eksogen. Dalam model ini faktor-faktor yang mempengaruhi variabel dependen *Y* pada waktu ke-t tidak hanya dipengaruhi oleh fungsi variabel *T* dalam waktu, tetapi juga oleh variable-variabel independen lainnya pada waktu ke-t. Sebagai salah satu metode dalam analisis data *time series*, ARIMA dan ARIMAX menjadi metode yang dipakai secara luas dalam ekonometrika. Metode ini mensyaratkan beberapa kondisi yang harus dipenuhi, antara lain data harus stasioner, baik stasioner dalam

mean ataupun stasioner dalam varians. Selain itu, residual dari model tersebut harus bersifat *white noise* yaitu residual mempunyai mean nol dan mempunyai varians yang konstan (Box dan Jenkins, 1976). Data yang mempunyai volatilitas yang tinggi sangat beresiko untuk digunakan dalam melakukan peramalan.

Dalam melakukan peramalan tidak selalu berjalan dengan lancar. Terdapat banyak kendala yang dihadapi sehingga hasil peramalan yang diperoleh tidak akurat. Salah satu kendala yang sering dihadapi dalam kegiatan peramalan adalah data yang memiliki ragam yang cukup besar atau varians datanya tidak konstan. Dalam statistik, kejadian ini disebut dengan heteroskedastisitas. Masalah heteroskedastisitas biasanya terjadi pada data ekonomi.

Salah satu model peramalan yang dapat digunakan untuk data yang bersifat hetroskedastik adalah *Autoregressive Conditional Heterosskedasticity* (ARCH). Model ARCH pertama kali diperkenalkan oleh Engle pada bulan Juli tahun 1982. Model ini dikembangkan terutama untuk menjawab persoalan tentang adanya volatilitas (varians tak konstan) pada data ekonomi dan bisnis, khusunya dalam bidang keuangan. Varians residual yang berubah-ubah ini terjadi karena varians residual tidak hanya fungsi dari variabel independen tetapi tergantung seberapa besar residual di masa lalu sehingga varians residual yang terjadi saat ini akan sangat bergantung pada residual periode sebelumnya. Oleh karena itu, dalam model ini sebelum meramalkan variabel bebas dalam persamaan regresinya dilakukan pula permalan pada varians residualnya sehingga varians residual data akan berubah setiap waktu. (Engle, 1982)

Model ini kemudian dikembangkan oleh Bollerslev pada tahun 1986 menjadi *General Autoregressive Conditional Heteroskedasticity* (GARCH) yaitu varians residual tidak hanya bergantung dari residual periode lalu tetapi juga bergantung varians residual periode lalu. Metode ini juga mampu mengatasi *heteroskedastisitas* dalam data deret waktu sehingga nanti model yang diperoleh baik digunakan untuk melakukan peramalan. (Rukini dan Suhartano, 2013)

Model ARCH dan GARCH berguna hanya untuk data yang simetris. Pada dasarnya data return yang mendapatkan kondisi *bad news* dan *good news* akan memberikan pengaruh yang tidak simetris terhadap volatilitas data return tersebut. Model yang dapat digunakan untuk menghadapi data yang asimetris adalah *Exponential* GARCH yang diperkenalkan oleh Nelson di tahun 1991. Model EGARCH tidak membatasi nilai parameter yang non-negatif untuk menghasilkan variansi bersyarat non-negatif. Variansi *error* masa sekarang tidak hanya dipengaruhi oleh *error* masa lalu tetapi juga dipengaruhi oleh variansi *error* masa lalu. Model EGARCH dapat digunakan investor dalam memilih periode yang tepat saat ingin berinvestasi dan menjual saham. Adapun karakteristik model EGARCH dapat dilihat dari nilai volatilitas (tingkat perubahan dalam harga saham) yang menghadapi data perubahan asimetris, jika diprediksi nilai volatilitas tinggi maka menunjukan tingkat resiko yang tinggi sehingga investor akan meninggalkan pasar atau menjual aset guna meminimalkan resiko. Bagi orang awam nilai volatilitas berguna untuk mengetahui dan memahami gambaran umum tentang risiko dalam berinvestasi saham sehingga dapat menjadi pertimbangan dalam pengambilan keputusan dan kebijakan para pemegang saham. (Tsay, 2005)

Berdasarkan latar belakang diatas maka peneliti mengambil judul tentang "Peramalan Saham Syariah dengan Model ARIMAX-EGARCH (Studi Kasus: Harga Penutupan Indeks Harga Saham Harian *Jakarta Islamic Index* (JII), Suku Bunga Bank Indonesia (BI), Inflasi, dan Kurs Dollar (USD) Periode 4 Maret 2013 – 30 September 2015.

1.2 Batasan Masalah

Pembatasan masalah perlu dilakukan dengan tujuan agar pokok permasalahan yang diteliti tidak terlalu melebar dari yang sudah ditentukan. Peneliti dalam hal ini membatasi masalah sebagai berikut :

1. Estimasi parameter menggunakan kuadrat terkecil atau *Least Square* dan metode *Maximum Likelihood.*
2. Menggunakan bantuan *software* E-views 7.1 dan Ms. Excel.
3. Data saham yang diteliti saham – saham yang terdaftar di *Jakarta Islamic Index* (JII) periode 4 Maret 2013 – 30 September 2015, data suku bunga Bank Indonesia sebagai eksogen pertama dengan periode 4 Maret 2013 – 30 September 2015, data inflasi sebagai eksogen kedua dengan periode 4 Maret – 30 September 2015, dan data kurs dolar (USD) sebagai eksogen ketiga dengan periode 4 Maret 2013 – 30 September 2015 .

1.3 Rumusan Masalah

Berdasarkan latar belakang yang telah diuraikan, maka masalah yang akan dikaji pada penelitian ini adalah:

1. Bagaimana langkah-langkah peramalan dengan menggunakan model ARIMAX-EGARCH di *Jakarta Islamic Index* (JII) periode 4 Maret 2013 – 30 September 2015 ?
2. Bagaimana bentuk model ARIMAX-EGARCH yang terbaik untuk meramalkan indeks harga saham syariah *Jakarta Islamic Indeks* (JII) periode 4 Maret 2013 – 30 September 2015 ?
3. Bagaimana penerapan model ARIMAX-EGARCH untuk meramalkan indeks harga saham syariah *Jakarta Islamic Indeks* (JII) periode 4 Maret 2013 – 30 September 2015 ?

1.4 Tujuan penelitian

Berdasarkan dari rumusan masalah diatas, maka tujuan penelitian ini adalah:

1. Mengetahui langkah-langkah peramalan saham dengan menggunakan ARIMAX-EGARCH di *Jakarta Islamic Index* (JII) periode 4 Maret 2013 – 30 September 2015.
2. Mengetahui bentuk model ARIMAX-EGARCH yang terbaik untuk meramalkan indeks harga saham syariah di *Jakarta Islamic Indeks* (JII) periode 4 Maret 2013 – 30 September 2015.
3. Mengetahui penerapan model ARIMAX-EGARCH untuk meramalkan indeks harga saham syariah di *Jakarta Islamic Indeks* (JII) periode 4 Maret 2013 – 30 September 2015.

1.5 Manfaat Penelitian

1. Bagi penulis:
   a. Menambah pengetahuan dan wawasan tentang aplikasi Matematika pada bidang statistika dalam mengolah data runtun waktu.
   b. Menambah pengetahuan mengenai analsis resiko saham dengan model ARIMAX-EGARCH.
2. Bagi prodi matematika:
   a. Mengetahui sejauh mana kemampuan mahasiswa dalam menerapkan teori matematika khusunya dibidang statistika.
   b. Menambah referensi guna meningkatkan proses perkuliahan.
3. Bagi Investor:

   Hasil dari penelitian ini diharapkan dapat memberikan informasi dan dapat dijadikan masukan terhadap investor dalam mengambil keputusan investasi terutama dalam saham-saham JII di pasar modal dan pemerintah secara objektif tentang saham syariah yang potensial, sehingga banyak masyarakat yang berinvestasi pada pasar modal syariah.

1.6 Tinjauan Pustaka

Tinjauan pustaka yang digunakan oleh peneliti adalah beberapa penelitian yang relevan dengan tema yang diambil peneliti, antara lain disajikan pada tabel berikut:

Tabel 1.1 Tinjauan Pustaka

No.	Nama Peneliti	Judul	Objek
1.	Jurnal Rukini dan Suhartono (2013)	Model ARIMAX dan deteksi GARCH untuk peramalan inflasi kota Denpasar	Inflasi kota Denpasar
2.	Nurhasanah (2014)	Penerapan model *EXPONENTIAL GENERALIZED AUTOREGRESSIVE CONDITIONAL HETEROSCEDASTICITY* (EGARCH) pada analisis risiko dengan *Value at Risk* (Var)	Indeks harga saham syariah *Jakarta Islamic Index* (JII)
3.	Alvan Pratama.A.L (2015)	Peramalan data runtun waktu dengan model *ARIMAX-GARCH* dalam pasar modal syariah	Indeks harga saham syariah *Jakarta Islamic Index* (JII)

Terdapat kesamaan dan perbedaan antara dua penelitian di atas dengan penelitian yang sekarang, baik dari segi objek yang diteliti maupun model yang digunakan. Pada penelitian yang dilakukan oleh Rukini dan Suhartono, objek yang diteliti dan model yang digunakan berbeda, yaitu ARIMAX dan GARCH. Pada penelitian Alvan Pratama, objek yang diteliti sama yaitu Indeks Harga Saham Harian *Jakarta Islamic Index* (JII), cuma beda priodenya saja dan model yang digunakan juga berbeda, yaitu ARIMAX-EGARCH tetapi sama-sama menggunakan model ARIMAX . Sedangkan untuk penelitian yang dilakukan oleh Nurhasanah, objek yang diteliti adalah dari sumber yang sama yaitu indeks harga saham JII tetapi model yang digunakan berbeda, yaitu model VaR-EGARCH.

1.7 Sistematika Penulisan

Untuk memberikan gambaran dan mempermudah dalam penelitian mengenai analisis resiko investasi dengan ARIMAX-EGARCH, secara garis besar sistematika penulisannya sebagai berikut.

BAB I : PENDAHULUAN

Berisi latar belakang masalah, batasan masalah, rumusan masalah, tujuan penelitian, manfaat penelitian, tinjauan pustaka, dan sistematika penulisan.

BAB II : LANDASAN TEORI

Berisi tentang teori penunjang yang digunakan dalam pembahasan yaitu analisis resiko investasi dengan ARIMAX-EGARCH.

BAB III : METODE PENELITIAN

Berisi tentang penjelasan mengenai proses pelaksanaan penelitian ini, mulai jenis dan sumber data, metode pengumpulan data, variabel penelitian, metodelogi penelitian, metode analisis data, dan alat pengolahan data.

BAB IV : PEMBAHASAN

Berisi tentang pembahasan mengenai model analisis resiko investasi dengan ARIMAX-EGARCH

BAB V : STUDI KASUS

Berisi tentang penerapan dan aplikasi analisis resiko investasi dengan ARIMAX-EGARCH pada data indeks saham syariah JII dan memberikan intepretasi terhadap hasil yang diperoleh.

BAB VI : KESIMPULAN DAN SARAN

Berisi tentang kesimpulan yang diambil dari pembahasan permasalahan dan pemecahan masalah yang ada dan saran-saran yang berkaitan dengan penelitian sejenis untuk penelitian berikutn

BAB VI

PENUTUP

6.1 Kesimpulan

Berdasarkan pada permasalahan yang dikemukakan dalam penelitian ini, maka dapat diambil kesimpulan sebagai berikut:

1. Ada beberapa langkah-langkah dalam melakukan peramalan data runtun waktu dengan menggunakan metode ARIMAX-EGARCH yaitu menguji kestasioneran data, mengidentifikasi model ARIMAX, mengestimasi model ARIMAX, menguji diagnostik model ARIMAX, mendeteksi unsur ARCH dan unsur Asimetris data, estimasi model EGARCH , menguji diagnostik model EGARCH dengan mendeteksi kembali adanya unsur ARCH dan unsur asimetris data, menentukan model ARIMAX-EGARCH terbaik hingga melakukan peramalan dengan menggunakan model terbaik terhadap data runtun waktu.
2. Berdasarkan hasil estimasi signifikansi diperoleh 6 model yang signifikan, yaitu model ARIMAX(2,1,1)–EGARCH(1,0), ARIMAX(2,1,1)–EGARCH(1,2), ARIMAX(2,1,1)–EGARCH(1,3), ARIMAX(2,1,1)–EGARCH(2,3), ARIMAX(2,1,1)–EGARCH(3,1), ARIMAX(2,1,1)–EGARCH(3,3). Berdasarkan pemeriksaan diagnosa, kemudian dipilih juga model terbaik dari model tersebut yang berdasarkan kriteria statistik yaitu model ARIMAX(2,1,1)-EGARCH(1,2) ,dengan persamaan sebagai berikut:

- Persamaan ARIMAX (2,1,1) :

$$Y_t = EXP(Y_{t-1} + (0,624887)\Delta Y_{t-1} - (0,120189)\Delta Y_{t-2} + \varepsilon_t - (0,683805)\varepsilon_{t-1} - (0,565518)W_t)$$

- Persamaan EGARCH (1,2) :

$$\ln \sigma_t^2 = -0,476089 + 0,213336 \frac{\varepsilon_{t-i}}{\sigma_{t-i}^2} - 0,111511 \frac{\varepsilon_{t-i}}{\sigma_{t-i}^2} + (0,440033) \ln \sigma_{t-1}^2 + (0,523923) \ln \sigma_{t-2}^2$$

3. Setelah diketahui bahwa model ARIMAX(2,1,1)-EGARCH(1,2) adalah model yang terbaik, maka langkah selanjutnya adalah melakukan peramalan terhadap data indeks harga saham JII untuk beberapa periode berikutnya. Hasil peramalan tersebut menunjukkan perbedaan antara data aktual dengan data hasil peramalan dengan model ARIMAX-EGARCH. Data hasil peramalan menggambarkan bahwa nilai indeks harga saham periode 4 Maret 2015 sampai 31 September 2015 hampir menyerupai nilai indeks harga saham aktual atau sebenarnya. Dengan demikian model ARIMAX(2,1,1)-EGARCH(1,2) cukup akurat untuk meramalkan indeks harga saham yang akan datang dengan nilai kesalahan rata-rata sebesar 0,11% yang menunjukan perbedaan antara jarak nilai indeks aktual dengan peramalan. .

6.2 Saran

Berdasarkan pengalaman dan pertimbangan dalam studi literatur, saran-saran yang dapat ditulis peneliti adalah:

1. Model yang didapat pada pembahasan tugas akhir ini, peneliti mengharapkan dapat menjadi bahan pertimbangan bagi para investor.

2. Penerapan ARIMAX dalam penelitian ini menggunakan tiga variabel eksogen, meskipun saat peramalan yang signifikan hanya satu eksogen, sehingga dimungkinkan ada penelitian lebih lanjut dengan tiga variabel eksogen yang bisa signifikan semua.
3. Pemodelan ARIMAX-EGARCH adalah pemodelan data runtun waktu menggunakan ARIMAX dan memodelkan variansi residualnya yang bersifat heteroskedastisitas dan asimetris menggunakan model EGARCH, sehingga masih terbuka untuk dikembangkan dengan menggunakan pemodelan variansi residual yang lain, misalnya ARIMAX-TARCH, ARIMAX-GJR_GARCH, ARIMAX-APARCH atau analisis time series lain yang lebih kompleks.

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LAMPIRAN

Lampiran 1 :

Data Harga Saham Penutupan Saham JII, Data Suku Bunga Bank Indonesia, Data Inflasi, dan Data Kurs Dollar Periode 4 Maret 2013 – 30 September 2015.

Date	Saham	Kurs Beli Dollar	Inflasi	Suku Bunga BI
04/03/2013	646.86	9655	0.059	0.0575
05/03/2013	648.65	9656	0.059	0.0575
06/03/2013	661.12	9638	0.059	0.0575
07/03/2013	662.96	9649	0.059	0.0575
11/03/2013	668.46	9640	0.059	0.0575
13/03/2013	660.31	9650	0.059	0.0575
14/03/2013	656.21	9654	0.059	0.0575
15/03/2013	645.38	9651	0.059	0.0575
18/03/2013	648.64	9669	0.059	0.0575
19/03/2013	650.99	9656	0.059	0.0575
20/03/2013	650.02	9674	0.059	0.0575
21/03/2013	646.12	9677	0.059	0.0575
22/03/2013	630.61	9694	0.059	0.0575
26/03/2013	649.88	9696	0.059	0.0575
27/03/2013	660.33	9676	0.059	0.0575
28/03/2013	660.34	9670	0.059	0.0575
01/04/2013	658.05	9686	0.0557	0.0575
02/04/2013	662.15	9688	0.0557	0.0575
03/04/2013	669.78	9694	0.0557	0.0575
04/04/2013	659.34	9700	0.0557	0.0575
05/04/2013	656.54	9704	0.0557	0.0575
08/04/2013	655.31	9707	0.0557	0.0575
09/04/2013	656.95	9694	0.0557	0.0575
10/04/2013	653.38	9644	0.0557	0.0575
11/04/2013	660.09	9640	0.0557	0.0575
12/04/2013	660.70	9661	0.0557	0.0575
15/04/2013	655.73	9661	0.0557	0.0575
16/04/2013	667.89	9674	0.0557	0.0575
17/04/2013	673.00	9661	0.0557	0.0575

18/04/2013	674.02	9674	0.0557	0.0575
19/04/2013	672.39	9660	0.0557	0.0575
22/04/2013	674.38	9664	0.0557	0.0575
23/04/2013	673.49	9679	0.0557	0.0575
24/04/2013	678.95	9678	0.0557	0.0575
25/04/2013	671.85	9667	0.0557	0.0575
26/04/2013	664.64	9672	0.0557	0.0575
29/04/2013	670.94	9672	0.0557	0.0575
01/05/2013	682.85	9681	0.0547	0.0575
02/05/2013	674.96	9679	0.0547	0.0575
03/05/2013	665.41	9691	0.0547	0.0575
06/05/2013	673.55	9683	0.0547	0.0575
07/05/2013	677.04	9692	0.0547	0.0575
08/05/2013	683.67	9685	0.0547	0.0575
10/05/2013	684.84	9689	0.0547	0.0575
13/05/2013	679.32	9691	0.0547	0.0575
14/05/2013	682.21	9686	0.0547	0.0575
15/05/2013	681.71	9699	0.0547	0.0575
16/05/2013	681.49	9701	0.0547	0.0575
17/05/2013	696.58	9714	0.0547	0.0575
21/05/2013	703.32	9716	0.0547	0.0575
22/05/2013	708.10	9716	0.0547	0.0575
23/05/2013	694.79	9725	0.0547	0.0575
24/05/2013	701.25	9723	0.0547	0.0575
27/05/2013	685.35	9743	0.0547	0.0575
29/05/2013	705.97	9761	0.0547	0.0575
30/05/2013	690.00	9762	0.0547	0.0575
31/05/2013	676.58	9753	0.0547	0.0575
03/06/2013	665.63	9762	0.059	0.06
04/06/2013	677.35	9756	0.059	0.06
05/06/2013	674.40	9758	0.059	0.06
07/06/2013	647.28	9741	0.059	0.06
10/06/2013	634.29	9757	0.059	0.06
11/06/2013	608.88	9772	0.059	0.06
12/06/2013	635.10	9807	0.059	0.06
13/06/2013	618.57	9838	0.059	0.06
14/06/2013	640.22	9837	0.059	0.06
17/06/2013	642.79	9832	0.059	0.06
18/06/2013	649.35	9868	0.059	0.06

19/06/2013	642.42	9860	0.059	0.06
20/06/2013	618.39	9877	0.059	0.06
21/06/2013	596.67	9910	0.059	0.06
25/06/2013	583.40	9898	0.059	0.06
27/06/2013	634.27	9887	0.059	0.06
28/06/2013	660.16	9879	0.059	0.06
01/07/2013	648.25	9884	0.0861	0.065
02/07/2013	640.97	9890	0.0861	0.065
03/07/2013	618.62	9891	0.0861	0.065
04/07/2013	619.17	9891	0.0861	0.065
05/07/2013	626.55	9895	0.0861	0.065
08/07/2013	601.22	9910	0.0861	0.065
09/07/2013	597.70	9910	0.0861	0.065
10/07/2013	614.08	9920	0.0861	0.065
11/07/2013	633.03	9929	0.0861	0.065
12/07/2013	636.97	9930	0.0861	0.065
15/07/2013	637.70	9974	0.0861	0.065
16/07/2013	637.51	9986	0.0861	0.065
17/07/2013	641.93	9990	0.0861	0.065
19/07/2013	646.65	10020	0.0861	0.065
22/07/2013	637.00	10018	0.0861	0.065
23/07/2013	651.96	10171	0.0861	0.065
24/07/2013	642.41	10211	0.0861	0.065
25/07/2013	635.18	10212	0.0861	0.065
26/07/2013	629.95	10214	0.0861	0.065
30/07/2013	627.13	10226	0.0861	0.065
31/07/2013	623.75	10227	0.0861	0.065
01/08/2013	630.93	10237	0.0879	0.065
02/08/2013	630.16	10237	0.0879	0.065
12/08/2013	622.95	10236	0.0879	0.065
13/08/2013	633.38	10241	0.0879	0.065
14/08/2013	639.99	10246	0.0879	0.065
15/08/2013	634.57	10266	0.0879	0.065
16/08/2013	619.73	10340	0.0879	0.065
19/08/2013	580.13	10399	0.0879	0.065
20/08/2013	561.36	10451	0.0879	0.065
21/08/2013	572.63	10669	0.0879	0.065
22/08/2013	571.88	10741	0.0879	0.065
23/08/2013	572.60	10794	0.0879	0.065

26/08/2013	563.00	10787	0.0879	0.065
27/08/2013	541.03	10829	0.0879	0.065
28/08/2013	552.12	10895	0.0879	0.065
29/08/2013	568.92	10881	0.0879	0.065
30/08/2013	592.00	10869	0.0879	0.065
02/09/2013	574.59	10867	0.084	0.0725
03/09/2013	585.03	10928	0.084	0.0725
04/09/2013	568.37	11038	0.084	0.0725
05/09/2013	562.61	11069	0.084	0.0725
06/09/2013	569.30	11144	0.084	0.0725
09/09/2013	587.38	11132	0.084	0.0725
10/09/2013	611.05	11124	0.084	0.0725
11/09/2013	605.83	11381	0.084	0.0725
12/09/2013	600.72	11437	0.084	0.0725
13/09/2013	600.64	11338	0.084	0.0725
16/09/2013	627.06	11366	0.084	0.0725
17/09/2013	625.98	11394	0.084	0.0725
18/09/2013	618.20	11435	0.084	0.0725
19/09/2013	649.92	11222	0.084	0.0725
20/09/2013	635.91	11295	0.084	0.0725
23/09/2013	633.33	11378	0.084	0.0725
24/09/2013	613.54	11477	0.084	0.0725
25/09/2013	603.19	11511	0.084	0.0725
26/09/2013	602.20	11515	0.084	0.0725
27/09/2013	606.39	11474	0.084	0.0725
30/09/2013	585.59	11555	0.084	0.0725
01/10/2013	593.08	11535	0.0832	0.0725
02/10/2013	600.63	11510	0.0832	0.0725
03/10/2013	605.54	11477	0.0832	0.0725
04/10/2013	600.50	11498	0.0832	0.0725
07/10/2013	599.15	11474	0.0832	0.0725
08/10/2013	606.51	11480	0.0832	0.0725
09/10/2013	613.56	11482	0.0832	0.0725
10/10/2013	618.04	11484	0.0832	0.0725
11/10/2013	627.98	11418	0.0832	0.0725
16/10/2013	622.05	11259	0.0832	0.0725
17/10/2013	627.42	11294	0.0832	0.0725
18/10/2013	633.92	11251	0.0832	0.0725
21/10/2013	638.54	11296	0.0832	0.0725

22/10/2013	623.21	11284	0.0832	0.0725
23/10/2013	627.06	11202	0.0832	0.0725
24/10/2013	632.29	11212	0.0832	0.0725
25/10/2013	627.44	11086	0.0832	0.0725
28/10/2013	629.89	10963	0.0832	0.0725
29/10/2013	626.83	11021	0.0832	0.0725
30/10/2013	628.41	11105	0.0832	0.0725
31/10/2013	615.71	11178	0.0832	0.0725
01/11/2013	603.51	11297	0.0837	0.075
04/11/2013	603.92	11332	0.0837	0.075
06/11/2013	609.59	11357	0.0837	0.075
07/11/2013	616.11	11332	0.0837	0.075
08/11/2013	615.63	11347	0.0837	0.075
11/11/2013	610.50	11429	0.0837	0.075
12/11/2013	604.55	11520	0.0837	0.075
13/11/2013	590.93	11586	0.0837	0.075
14/11/2013	599.40	11488	0.0837	0.075
15/11/2013	590.73	11503	0.0837	0.075
18/11/2013	605.59	11569	0.0837	0.075
19/11/2013	608.25	11551	0.0837	0.075
20/11/2013	597.71	11573	0.0837	0.075
21/11/2013	595.13	11658	0.0837	0.075
22/11/2013	592.89	11647	0.0837	0.075
25/11/2013	592.72	11663	0.0837	0.075
26/11/2013	573.57	11706	0.0837	0.075
27/11/2013	580.20	11754	0.0837	0.075
28/11/2013	578.91	11870	0.0837	0.075
29/11/2013	579.87	11917	0.0837	0.075
02/12/2013	591.92	11886	0.0838	0.075
03/12/2013	584.71	11771	0.0838	0.075
04/12/2013	577.39	11900	0.0838	0.075
05/12/2013	573.88	11958	0.0838	0.075
06/12/2013	569.00	11900	0.0838	0.075
09/12/2013	576.23	11896	0.0838	0.075
10/12/2013	587.52	11925	0.0838	0.075
11/12/2013	586.11	11945	0.0838	0.075
12/12/2013	575.66	11965	0.0838	0.075
13/12/2013	568.15	12021	0.0838	0.075
16/12/2013	560.75	12044	0.0838	0.075

17/12/2013	567.51	12043	0.0838	0.075
18/12/2013	572.12	12090	0.0838	0.075
19/12/2013	579.32	12130	0.0838	0.075
20/12/2013	575.80	12184	0.0838	0.075
23/12/2013	572.59	12185	0.0838	0.075
24/12/2013	578.14	12154	0.0838	0.075
27/12/2013	578.64	12199	0.0838	0.075
30/12/2013	585.11	12209	0.0838	0.075
02/01/2014	596.15	12181	0.0822	0.075
03/01/2014	585.64	12165	0.0822	0.075
06/01/2014	579.93	12169	0.0822	0.075
07/01/2014	572.29	12201	0.0822	0.075
08/01/2014	576.41	12168	0.0822	0.075
09/01/2014	574.28	12202	0.0822	0.075
10/01/2014	582.38	12136	0.0822	0.075
13/01/2014	601.81	11987	0.0822	0.075
15/01/2014	609.90	12017	0.0822	0.075
16/01/2014	606.82	12056	0.0822	0.075
17/01/2014	603.06	12066	0.0822	0.075
20/01/2014	608.32	12049	0.0822	0.075
21/01/2014	609.11	12061	0.0822	0.075
22/01/2014	614.41	12088	0.0822	0.075
23/01/2014	614.97	12112	0.0822	0.075
24/01/2014	604.37	12116	0.0822	0.075
27/01/2014	583.88	12137	0.0822	0.075
28/01/2014	588.27	12206	0.0822	0.075
29/01/2014	601.54	12093	0.0822	0.075
30/01/2014	602.87	12165	0.0822	0.075
03/02/2014	595.62	12190	0.0775	0.075
04/02/2014	587.49	12187	0.0775	0.075
05/02/2014	594.50	12111	0.0775	0.075
06/02/2014	601.06	12098	0.0775	0.075
07/02/2014	606.22	12115	0.0775	0.075
10/02/2014	603.33	12105	0.0775	0.075
11/02/2014	604.70	12113	0.0775	0.075
12/02/2014	609.08	12054	0.0775	0.075
13/02/2014	607.22	12013	0.0775	0.075
14/02/2014	608.97	11827	0.0775	0.075
17/02/2014	615.61	11657	0.0775	0.075

18/02/2014	615.10	11767	0.0775	0.075
19/02/2014	621.73	11791	0.0775	0.075
20/02/2014	622.16	11713	0.0775	0.075
21/02/2014	626.97	11733	0.0775	0.075
24/02/2014	621.94	11669	0.0775	0.075
25/02/2014	614.48	11562	0.0775	0.075
26/02/2014	606.03	11611	0.0775	0.075
27/02/2014	612.84	11617	0.0775	0.075
28/02/2014	626.86	11576	0.0775	0.075
03/03/2014	618.98	11538	0.0732	0.075
04/03/2014	620.05	11589	0.0732	0.075
05/03/2014	628.00	11522	0.0732	0.075
06/03/2014	631.00	11496	0.0732	0.075
07/03/2014	631.74	11338	0.0732	0.075
10/03/2014	632.91	11392	0.0732	0.075
11/03/2014	635.35	11327	0.0732	0.075
12/03/2014	633.17	11375	0.0732	0.075
13/03/2014	641.31	11330	0.0732	0.075
14/03/2014	661.74	11364	0.0732	0.075
17/03/2014	663.86	11216	0.0732	0.075
18/03/2014	651.32	11226	0.0732	0.075
19/03/2014	655.45	11256	0.0732	0.075
20/03/2014	634.17	11350	0.0732	0.075
21/03/2014	636.55	11374	0.0732	0.075
24/03/2014	637.79	11327	0.0732	0.075
25/03/2014	632.44	11300	0.0732	0.075
26/03/2014	636.48	11351	0.0732	0.075
27/03/2014	635.02	11381	0.0732	0.075
28/03/2014	640.41	11347	0.0732	0.075
01/04/2014	657.09	11215	0.0725	0.075
02/04/2014	655.27	11246	0.0725	0.075
03/04/2014	658.53	11253	0.0725	0.075
04/04/2014	653.27	11253	0.0725	0.075
07/04/2014	667.22	11226	0.0725	0.075
08/04/2014	666.52	11252	0.0725	0.075
09/04/2014	666.52	11252	0.0725	0.075
10/04/2014	643.15	11285	0.0725	0.075
11/04/2014	653.28	11393	0.0725	0.075
14/04/2014	659.71	11387	0.0725	0.075

15/04/2014	659.78	11377	0.0725	0.075
16/04/2014	657.86	11381	0.0725	0.075
17/04/2014	663.59	11361	0.0725	0.075
21/04/2014	663.52	11373	0.0725	0.075
22/04/2014	664.13	11429	0.0725	0.075
23/04/2014	664.14	11532	0.0725	0.075
24/04/2014	663.18	11550	0.0725	0.075
25/04/2014	663.21	11543	0.0725	0.075
28/04/2014	650.32	11510	0.0725	0.075
29/04/2014	645.25	11531	0.0725	0.075
30/04/2014	647.67	11474	0.0725	0.075
02/05/2014	646.25	11479	0.0732	0.075
05/05/2014	648.25	11453	0.0732	0.075
06/05/2014	647.04	11453	0.0732	0.075
07/05/2014	651.73	11469	0.0732	0.075
08/05/2014	652.80	11566	0.0732	0.075
09/05/2014	655.95	11505	0.0732	0.075
12/05/2014	662.47	11478	0.0732	0.075
13/05/2014	661.05	11467	0.0732	0.075
14/05/2014	672.60	11430	0.0732	0.075
16/05/2014	680.63	11358	0.0732	0.075
19/05/2014	678.08	11294	0.0732	0.075
20/05/2014	660.08	11384	0.0732	0.075
21/05/2014	664.78	11449	0.0732	0.075
22/05/2014	672.51	11457	0.0732	0.075
23/05/2014	672.11	11502	0.0732	0.075
26/05/2014	671.82	11575	0.0732	0.075
28/05/2014	673.96	11555	0.0732	0.075
30/05/2014	656.83	11553	0.0732	0.075
02/06/2014	658.90	11681	0.067	0.075
03/06/2014	662.61	11747	0.067	0.075
04/06/2014	661.62	11751	0.067	0.075
05/06/2014	663.03	11815	0.067	0.075
06/06/2014	666.40	11815	0.067	0.075
09/06/2014	658.99	11731	0.067	0.075
10/06/2014	669.18	11747	0.067	0.075
11/06/2014	672.99	11744	0.067	0.075
12/06/2014	666.65	11754	0.067	0.075
13/06/2014	665.27	11754	0.067	0.075

16/06/2014	655.90	11755	0.067	0.075
17/06/2014	661.51	11804	0.067	0.075
18/06/2014	658.05	11918	0.067	0.075
19/06/2014	654.36	11856	0.067	0.075
20/06/2014	652.97	11907	0.067	0.075
23/06/2014	653.44	11911	0.067	0.075
24/06/2014	654.65	11940	0.067	0.075
25/06/2014	651.63	11967	0.067	0.075
26/06/2014	656.69	12031	0.067	0.075
27/06/2014	651.89	12042	0.067	0.075
30/06/2014	655.00	11909	0.067	0.075
01/07/2014	656.35	11739	0.0453	0.075
02/07/2014	663.86	11795	0.0453	0.075
03/07/2014	661.79	11903	0.0453	0.075
04/07/2014	663.63	11828	0.0453	0.075
07/07/2014	679.41	11728	0.0453	0.075
08/07/2014	683.29	11637	0.0453	0.075
10/07/2014	692.85	11491	0.0453	0.075
11/07/2014	679.85	11569	0.0453	0.075
14/07/2014	679.71	11569	0.0453	0.075
15/07/2014	688.20	11650	0.0453	0.075
16/07/2014	694.49	11746	0.0453	0.075
17/07/2014	685.93	11610	0.0453	0.075
18/07/2014	689.79	11647	0.0453	0.075
21/07/2014	697.11	11519	0.0453	0.075
22/07/2014	692.33	11473	0.0453	0.075
23/07/2014	692.14	11441	0.0453	0.075
24/07/2014	692.46	11473	0.0453	0.075
25/07/2014	690.40	11533	0.0453	0.075
04/08/2014	701.23	11688	0.0399	0.075
05/08/2014	697.15	11674	0.0399	0.075
06/08/2014	687.88	11697	0.0399	0.075
07/08/2014	690.39	11707	0.0399	0.075
08/08/2014	686.73	11763	0.0399	0.075
11/08/2014	697.35	11669	0.0399	0.075
12/08/2014	700.19	11619	0.0399	0.075
13/08/2014	707.38	11625	0.0399	0.075
14/08/2014	703.81	11609	0.0399	0.075
15/08/2014	701.44	11635	0.0399	0.075

18/08/2014	702.47	11623	0.0399	0.075
19/08/2014	701.37	11624	0.0399	0.075
20/08/2014	706.22	11648	0.0399	0.075
21/08/2014	707.44	11658	0.0399	0.075
22/08/2014	704.21	11596	0.0399	0.075
25/08/2014	701.09	11655	0.0399	0.075
26/08/2014	696.00	11656	0.0399	0.075
27/08/2014	698.91	11649	0.0399	0.075
28/08/2014	701.52	11624	0.0399	0.075
29/08/2014	691.13	11658	0.0399	0.075
01/09/2014	699.50	11651	0.0453	0.075
02/09/2014	703.05	11675	0.0453	0.075
03/09/2014	707.22	11722	0.0453	0.075
04/09/2014	702.23	11701	0.0453	0.075
05/09/2014	702.85	11711	0.0453	0.075
08/09/2014	707.98	11663	0.0453	0.075
09/09/2014	698.21	11813	0.0453	0.075
10/09/2014	688.65	11723	0.0453	0.075
11/09/2014	683.32	11772	0.0453	0.075
12/09/2014	688.68	11772	0.0453	0.075
15/09/2014	691.60	11816	0.0453	0.075
16/09/2014	691.00	11843	0.0453	0.075
17/09/2014	699.09	11848	0.0453	0.075
18/09/2014	702.72	11970	0.0453	0.075
19/09/2014	704.71	11925	0.0453	0.075
22/09/2014	702.42	11912	0.0453	0.075
23/09/2014	696.19	11927	0.0453	0.075
24/09/2014	692.53	11916	0.0453	0.075
25/09/2014	695.00	11887	0.0453	0.075
26/09/2014	687.63	11947	0.0453	0.075
29/09/2014	689.48	12059	0.0453	0.075
30/09/2014	687.62	12151	0.0453	0.075
01/10/2014	682.39	12127	0.0483	0.075
02/10/2014	661.70	12075	0.0483	0.075
03/10/2014	658.99	12083	0.0483	0.075
06/10/2014	665.12	12151	0.0483	0.075
07/10/2014	671.01	12129	0.0483	0.075
08/10/2014	659.35	12180	0.0483	0.075
09/10/2014	662.82	12129	0.0483	0.075

10/10/2014	655.99	12146	0.0483	0.075
13/10/2014	647.24	12141	0.0483	0.075
14/10/2014	650.34	12134	0.0483	0.075
15/10/2014	652.77	12168	0.0483	0.075
16/10/2014	651.98	12146	0.0483	0.075
17/10/2014	663.57	12161	0.0483	0.075
20/10/2014	662.62	11981	0.0483	0.075
21/10/2014	661.88	11933	0.0483	0.075
22/10/2014	668.13	11966	0.0483	0.075
23/10/2014	671.07	11974	0.0483	0.075
24/10/2014	666.41	12005	0.0483	0.075
27/10/2014	658.70	11982	0.0483	0.075
28/10/2014	652.62	12097	0.0483	0.075
29/10/2014	667.80	12102	0.0483	0.075
30/10/2014	666.81	12104	0.0483	0.075
31/10/2014	670.44	12022	0.0483	0.075
03/11/2014	670.19	12044	0.0623	0.075
04/11/2014	664.45	12069	0.0623	0.075
05/11/2014	665.43	12032	0.0623	0.075
06/11/2014	662.14	12118	0.0623	0.075
07/11/2014	654.02	12088	0.0623	0.075
10/11/2014	649.65	12077	0.0623	0.075
11/11/2014	661.68	12102	0.0623	0.075
12/11/2014	663.92	12144	0.0623	0.075
13/11/2014	665.70	12130	0.0623	0.075
14/11/2014	665.84	12145	0.0623	0.075
17/11/2014	668.51	12132	0.0623	0.075
18/11/2014	675.76	12085	0.0623	0.075
19/11/2014	678.64	12063	0.0623	0.075
20/11/2014	672.59	12100	0.0623	0.075
21/11/2014	677.52	12100	0.0623	0.075
24/11/2014	686.49	12061	0.0623	0.075
25/11/2014	680.10	12105	0.0623	0.075
26/11/2014	681.60	12099	0.0623	0.075
27/11/2014	684.71	12118	0.0623	0.075
28/11/2014	683.02	12135	0.0623	0.075
01/12/2014	685.40	12203	0.0836	0.0775
02/12/2014	685.92	12215	0.0836	0.0775
03/12/2014	681.74	12234	0.0836	0.0775

04/12/2014	686.69	12256	0.0836	0.0775
05/12/2014	688.28	12235	0.0836	0.0775
08/12/2014	680.77	12290	0.0836	0.0775
09/12/2014	678.71	12285	0.0836	0.0775
10/12/2014	682.72	12274	0.0836	0.0775
11/12/2014	679.66	12274	0.0836	0.0775
12/12/2014	680.39	12370	0.0836	0.0775
15/12/2014	674.28	12536	0.0836	0.0775
16/12/2014	663.39	12835	0.0836	0.0775
17/12/2014	661.60	12656	0.0836	0.0775
18/12/2014	675.49	12502	0.0836	0.0775
19/12/2014	679.18	12437	0.0836	0.0775
29/12/2014	685.84	12372	0.0836	0.0775
30/12/2014	691.04	12374	0.0836	0.0775
31/12/2014	691.04	12378	0.0836	0.0775
02/01/2015	694.47	12412	0.0696	0.0775
05/01/2015	689.09	12526	0.0696	0.0775
06/01/2015	681.07	12595	0.0696	0.0775
07/01/2015	687.51	12668	0.0696	0.0775
08/01/2015	688.14	12667	0.0696	0.0775
09/01/2015	688.95	12577	0.0696	0.0775
12/01/2015	683.78	12505	0.0696	0.0775
13/01/2015	692.15	12545	0.0696	0.0775
14/01/2015	681.66	12517	0.0696	0.0775
15/01/2015	687.57	12554	0.0696	0.0775
16/01/2015	681.69	12530	0.0696	0.0775
19/01/2015	681.64	12549	0.0696	0.0775
20/01/2015	688.62	12596	0.0696	0.0775
21/01/2015	702.10	12494	0.0696	0.0775
22/01/2015	708.84	12389	0.0696	0.0775
23/01/2015	716.73	12382	0.0696	0.0775
26/01/2015	705.43	12454	0.0696	0.0775
27/01/2015	707.71	12431	0.0696	0.0775
28/01/2015	706.09	12436	0.0696	0.0775
29/01/2015	703.10	12452	0.0696	0.0775
30/01/2015	706.68	12452	0.0696	0.0775
02/02/2015	701.50	12636	0.0629	0.075
03/02/2015	704.64	12580	0.0629	0.075
04/02/2015	708.72	12546	0.0629	0.075

05/02/2015	700.40	12590	0.0629	0.075
06/02/2015	711.52	12550	0.0629	0.075
09/02/2015	710.89	12616	0.0629	0.075
10/02/2015	707.01	12581	0.0629	0.075
11/02/2015	712.14	12636	0.0629	0.075
12/02/2015	713.98	12730	0.0629	0.075
13/02/2015	721.53	12705	0.0629	0.075
16/02/2015	709.60	12678	0.0629	0.075
17/02/2015	714.34	12693	0.0629	0.075
18/02/2015	718.68	12740	0.0629	0.075
19/02/2015	718.68	12740	0.0629	0.075
20/02/2015	715.36	12785	0.0629	0.075
23/02/2015	718.39	12749	0.0629	0.075
24/02/2015	720.43	12802	0.0629	0.075
25/02/2015	727.44	12823	0.0629	0.075
26/02/2015	727.37	12798	0.0629	0.075
27/02/2015	722.10	12799	0.0629	0.075
02/03/2015	728.61	12928	0.0638	0.075
03/03/2015	730.20	12897	0.0638	0.075
04/03/2015	723.39	12898	0.0638	0.075
05/03/2015	722.09	12957	0.0638	0.075
06/03/2015	734.85	12918	0.0638	0.075
09/03/2015	724.65	12982	0.0638	0.075
10/03/2015	725.85	12994	0.0638	0.075
11/03/2015	720.53	13098	0.0638	0.075
12/03/2015	723.77	13110	0.0638	0.075
13/03/2015	723.68	13125	0.0638	0.075
16/03/2015	725.35	13171	0.0638	0.075
17/03/2015	724.68	13143	0.0638	0.075
18/03/2015	718.32	13098	0.0638	0.075
19/03/2015	724.86	12943	0.0638	0.075
20/03/2015	721.67	13010	0.0638	0.075
23/03/2015	721.00	13011	0.0638	0.075
24/03/2015	721.50	12907	0.0638	0.075
25/03/2015	711.03	12867	0.0638	0.075
26/03/2015	703.48	12867	0.0638	0.075
27/03/2015	709.98	12999	0.0638	0.075
30/03/2015	720.50	13021	0.0638	0.075
31/03/2015	728.20	13019	0.0638	0.075

01/04/2015	718.59	12978	0.0679	0.075
02/04/2015	716.80	12935	0.0679	0.075
06/04/2015	720.87	12877	0.0679	0.075
07/04/2015	727.56	12917	0.0679	0.075
08/04/2015	719.99	12937	0.0679	0.075
09/04/2015	723.85	12908	0.0679	0.075
10/04/2015	722.08	12845	0.0679	0.075
13/04/2015	717.43	12880	0.0679	0.075
14/04/2015	711.11	12914	0.0679	0.075
15/04/2015	711.09	12911	0.0679	0.075
16/04/2015	710.41	12774	0.0679	0.075
17/04/2015	709.33	12799	0.0679	0.075
20/04/2015	704.25	12811	0.0679	0.075
21/04/2015	717.98	12877	0.0679	0.075
22/04/2015	716.12	12887	0.0679	0.075
23/04/2015	718.85	12874	0.0679	0.075
24/04/2015	723.29	12876	0.0679	0.075
27/04/2015	698.24	12857	0.0679	0.075
28/04/2015	701.08	12913	0.0679	0.075
29/04/2015	674.87	12899	0.0679	0.075
30/04/2015	664.80	12872	0.0679	0.075
01/05/2015	664.80	12872	0.0715	0.075
04/05/2015	679.16	12956	0.0715	0.075
05/05/2015	686.25	12928	0.0715	0.075
06/05/2015	692.30	12975	0.0715	0.075
07/05/2015	685.97	13000	0.0715	0.075
08/05/2015	696.70	13111	0.0715	0.075
11/05/2015	696.16	13050	0.0715	0.075
12/05/2015	696.95	13137	0.0715	0.075
13/05/2015	706.03	13122	0.0715	0.075
15/05/2015	708.85	13025	0.0715	0.075
18/05/2015	708.51	13050	0.0715	0.075
19/05/2015	711.75	13117	0.0715	0.075
20/05/2015	714.80	13103	0.0715	0.075
21/05/2015	712.28	13084	0.0715	0.075
22/05/2015	711.77	13070	0.0715	0.075
25/05/2015	711.27	13120	0.0715	0.075
26/05/2015	719.30	13126	0.0715	0.075
27/05/2015	707.77	13163	0.0715	0.075

28/05/2015	707.16	13139	0.0715	0.075
29/05/2015	698.07	13145	0.0715	0.075
01/06/2015	700.65	13164	0.0726	0.075
03/06/2015	692.40	13130	0.0726	0.075
04/06/2015	685.29	13177	0.0726	0.075
05/06/2015	684.75	13222	0.0726	0.075
08/06/2015	672.87	13293	0.0726	0.075
09/06/2015	655.70	13295	0.0726	0.075
10/06/2015	664.75	13262	0.0726	0.075
11/06/2015	666.60	13226	0.0726	0.075
12/06/2015	665.66	13250	0.0726	0.075
15/06/2015	648.04	13266	0.0726	0.075
16/06/2015	653.03	13266	0.0726	0.075
17/06/2015	660.82	13300	0.0726	0.075
18/06/2015	665.06	13274	0.0726	0.075
19/06/2015	666.82	13257	0.0726	0.075
22/06/2015	661.64	13251	0.0726	0.075
23/06/2015	657.11	13249	0.0726	0.075
24/06/2015	666.37	13214	0.0726	0.075
25/06/2015	659.79	13256	0.0726	0.075
26/06/2015	658.85	13271	0.0726	0.075
29/06/2015	652.82	13289	0.0726	0.075
30/06/2015	656.99	13265	0.0726	0.075
01/07/2015	654.81	13265	0.0726	0.075
02/07/2015	662.42	13270	0.0726	0.075
03/07/2015	670.93	13249	0.0726	0.075
06/07/2015	661.37	13286	0.0726	0.075
07/07/2015	657.72	13246	0.0726	0.075
08/07/2015	653.25	13279	0.0726	0.075
09/07/2015	645.59	13280	0.0726	0.075
10/07/2015	648.74	13237	0.0726	0.075
13/07/2015	654.82	13242	0.0726	0.075
14/07/2015	655.90	13253	0.0726	0.075
15/07/2015	653.65	13262	0.0726	0.075
22/07/2015	658.39	13301	0.0726	0.075
23/07/2015	656.34	13327	0.0726	0.075
24/07/2015	646.94	13381	0.0726	0.075
27/07/2015	632.14	13386	0.0726	0.075
28/07/2015	628.63	13393	0.0726	0.075

29/07/2015	629.10	13377	0.0726	0.075
30/07/2015	628.90	13401	0.0726	0.075
31/07/2015	641.97	13414	0.0726	0.075
03/08/2015	636.99	13425	0.0718	0.075
04/08/2015	634.22	13428	0.0718	0.075
05/08/2015	644.25	13449	0.0718	0.075
06/08/2015	634.64	13461	0.0718	0.075
07/08/2015	631.77	13468	0.0718	0.075
10/08/2015	628.83	13468	0.0718	0.075
11/08/2015	607.75	13473	0.0718	0.075
12/08/2015	585.32	13689	0.0718	0.075
13/08/2015	605.30	13678	0.0718	0.075
14/08/2015	606.41	13694	0.0718	0.075
18/08/2015	597.19	13762	0.0718	0.075
19/08/2015	592.13	13755	0.0718	0.075
20/08/2015	587.99	13769	0.0718	0.075
21/08/2015	572.01	13826	0.0718	0.075
24/08/2015	544.39	13928	0.0718	0.075
25/08/2015	554.87	13997	0.0718	0.075
26/08/2015	553.09	14031	0.0718	0.075
27/08/2015	585.17	14057	0.0718	0.075
28/08/2015	586.09	13941	0.0718	0.075
31/08/2015	598.28	13957	0.0718	0.075
01/09/2015	584.10	14011	0.0683	0.075
02/09/2015	582.66	14056	0.0683	0.075
03/09/2015	590.89	14089	0.0683	0.075
04/09/2015	589.14	14107	0.0683	0.075
07/09/2015	565.33	14163	0.0683	0.075
08/09/2015	567.34	14214	0.0683	0.075
09/09/2015	574.99	14173	0.0683	0.075
10/09/2015	577.06	14250	0.0683	0.075
11/09/2015	584.90	14234	0.0683	0.075
14/09/2015	591.68	14250	0.0683	0.075
15/09/2015	580.28	14299	0.0683	0.075
16/09/2015	577.07	14370	0.0683	0.075
17/09/2015	584.43	14380	0.0683	0.075
18/09/2015	584.84	14391	0.0683	0.075
21/09/2015	583.28	14379	0.0683	0.075
22/09/2015	576.16	14414	0.0683	0.075

23/09/2015	561.53	14550	0.0683	0.075
25/09/2015	557.23	14617	0.0683	0.075
28/09/2015	542.00	14623	0.0683	0.075
29/09/2015	554.43	14654	0.0683	0.075
30/09/2015	556.09	14584	0.0683	0.075

Lampiran 2 : Hasil Uji ADF

Uji ADF JII

Augmented Dickey-Fuller Unit Root Test on SAHAM

Null Hypothesis: SAHAM has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.424964	0.5709
Test critical values:	1% level	-3.440754	
	5% level	-2.866021	
	10% level	-2.569215	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SAHAM)
Method: Least Squares
Date: 02/25/16 Time: 23:48
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAHAM(-1)	-0.012082	0.008479	-1.424964	0.1547
D(SAHAM(-1))	0.023584	0.040111	0.587965	0.5568
D(SAHAM(-2))	-0.071515	0.040009	-1.787461	0.0744
D(SAHAM(-3))	-0.174620	0.040199	-4.343869	0.0000
C	0.077934	0.054939	1.418545	0.1565

R-squared	0.043819	Mean dependent var	-0.000286
Adjusted R-squared	0.037549	S.D. dependent var	0.014462
S.E. of regression	0.014188	Akaike info criterion	-5.664711
Sum squared resid	0.122797	Schwarz criterion	-5.628763
Log likelihood	1746.899	Hannan-Quinn criter.	-5.650733
F-statistic	6.988679	Durbin-Watson stat	2.013810
Prob(F-statistic)	0.000017		

Uji ADF JII Differencing ke-1

Augmented Dickey-Fuller Unit Root Test on DSAHAM

Null Hypothesis: DSAHAM has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-17.95278	0.0000
Test critical values:	1% level	-3.440754	
	5% level	-2.866021	
	10% level	-2.569215	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DSAHAM)
Method: Least Squares
Date: 02/25/16 Time: 23:50
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DSAHAM(-1)	-1.244672	0.069330	-17.95278	0.0000
D(DSAHAM(-1))	0.260637	0.055256	4.716872	0.0000
D(DSAHAM(-2))	0.181599	0.039934	4.547530	0.0000
C	-0.000348	0.000573	-0.608089	0.5434

R-squared	0.506026	Mean dependent var	3.42E-07
Adjusted R-squared	0.503601	S.D. dependent var	0.020155
S.E. of regression	0.014200	Akaike info criterion	-5.664640
Sum squared resid	0.123205	Schwarz criterion	-5.635882
Log likelihood	1745.877	Hannan-Quinn criter.	-5.653457
F-statistic	208.6358	Durbin-Watson stat	2.016654

Uji ADF Suku Bunga Bank Indonesia

Augmented Dickey-Fuller Unit Root Test on SUKUBUNGA

Null Hypothesis: SUKUBUNGA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.731588	0.0693
Test critical values:	1% level	-3.440702	
	5% level	-2.865999	
	10% level	-2.569203	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(SUKUBUNGA)
Method: Least Squares
Date: 02/25/16 Time: 23:59
Sample (adjusted): 2 619
Included observations: 618 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SUKUBUNGA(-1)	-0.007654	0.002802	-2.731588	0.0065
C	-0.019699	0.007373	-2.671754	0.0077

R-squared	0.011968	Mean dependent var	0.000430
Adjusted R-squared	0.010364	S.D. dependent var	0.006149
S.E. of regression	0.006117	Akaike info criterion	-7.352277
Sum squared resid	0.023049	Schwarz criterion	-7.337952
Log likelihood	2273.854	Hannan-Quinn criter.	-7.346708
F-statistic	7.461571	Durbin-Watson stat	2.018629
Prob(F-statistic)	0.006484		

Uji ADF Suku Bunga Differencing 1

Augmented Dickey-Fuller Unit Root Test on ST

Null Hypothesis: ST has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-24.92113	0.0000
Test critical values:	1% level	-3.440719	
	5% level	-2.866006	
	10% level	-2.569207	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ST)
Method: Least Squares
Date: 02/26/16 Time: 00:00
Sample (adjusted): 3 619
Included observations: 617 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST(-1)	-1.004905	0.040323	-24.92113	0.0000
C	0.000433	0.000249	1.741092	0.0822

R-squared	0.502452	Mean dependent var	0.000000
Adjusted R-squared	0.501643	S.D. dependent var	0.008724
S.E. of regression	0.006159	Akaike info criterion	-7.338639
Sum squared resid	0.023327	Schwarz criterion	-7.324296
Log likelihood	2265.970	Hannan-Quinn criter.	-7.333063
F-statistic	621.0628	Durbin-Watson stat	2.000048

Uji ADF Inflasi

Augmented Dickey-Fuller Unit Root Test on INFLASI

Null Hypothesis: INFLASI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.891320	0.3365
Test critical values:	1% level	-3.440702	
	5% level	-2.865999	
	10% level	-2.569203	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFLASI)
Method: Least Squares
Date: 02/26/16 Time: 00:01
Sample (adjusted): 2 619
Included observations: 618 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFLASI(-1)	-0.011215	0.005930	-1.891320	0.0591
C	-0.030047	0.016058	-1.871159	0.0618

R-squared	0.005773	Mean dependent var	0.000237
S.D. dependent var	0.030238	S.E. of regression	0.030175
Akaike info criterion	-4.160359	Sum squared resid	0.560896
Schwarz criterion	-4.146034	Log likelihood	1287.551
Hannan-Quinn criter.	-4.154790	F-statistic	3.577092
Durbin-Watson stat	1.989302		

Uji ADF Inflasi Differencing ke-1

Augmented Dickey-Fuller Unit Root Test on UT

Null Hypothesis: UT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-24.80072	0.0000
Test critical values:	1% level	-3.440719	
	5% level	-2.866006	
	10% level	-2.569207	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(UT)
Method: Least Squares
Date: 02/26/16 Time: 00:02
Sample (adjusted): 3 619
Included observations: 617 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
UT(-1)	-1.000062	0.040324	-24.80072	0.0000
C	0.000237	0.001219	0.194567	0.8458

R-squared	0.500031	Mean dependent var	0.000000
Adjusted R-squared	0.499218	S.D. dependent var	0.042799
S.E. of regression	0.030287	Akaike info criterion	-4.152939
Sum squared resid	0.564153	Schwarz criterion	-4.138596
Log likelihood	1283.182	Hannan-Quinn criter.	-4.147362
F-statistic	615.0757	Durbin-Watson stat	2.000000
Prob(F-statistic)	0.000000		

Uji ADF Kurs Dolar

Augmented Dickey-Fuller Unit Root Test on KURS

Null Hypothesis: KURS has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.336374	0.9168
Test critical values:	1% level	-3.440702	
	5% level	-2.865999	
	10% level	-2.569203	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(KURS)
Method: Least Squares
Date: 02/26/16 Time: 00:04
Sample (adjusted): 2 619
Included observations: 618 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
KURS(-1)	-0.000638	0.001896	-0.336374	0.7367
C	0.006645	0.017773	0.373904	0.7086

R-squared	0.000184	Mean dependent var	0.000667
Adjusted R-squared	-0.001439	S.D. dependent var	0.004795
S.E. of regression	0.004798	Akaike info criterion	-7.837972
Sum squared resid	0.014181	Schwarz criterion	-7.823647
Log likelihood	2423.933	Hannan-Quinn criter.	-7.832403
F-statistic	0.113147	Durbin-Watson stat	1.834950
Prob(F-statistic)	0.736704		

Uji ADF Kurs Dolar Differencing ke-1

Augmented Dickey-Fuller Unit Root Test on WT

Null Hypothesis: WT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=18)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-22.83662	0.0000
Test critical values:	1% level	-3.440719	
	5% level	-2.866006	
	10% level	-2.569207	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(WT)
Method: Least Squares
Date: 02/26/16 Time: 00:05
Sample (adjusted): 3 619
Included observations: 617 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WT(-1)	-0.918781	0.040233	-22.83662	0.0000
C	0.000613	0.000195	3.151869	0.0017

R-squared	0.458870	Mean dependent var	-7.93E-06
Adjusted R-squared	0.457990	S.D. dependent var	0.006502
S.E. of regression	0.004787	Akaike info criterion	-7.842785
Sum squared resid	0.014090	Schwarz criterion	-7.828442
Log likelihood	2421.499	Hannan-Quinn criter.	-7.837209
F-statistic	521.5111	Durbin-Watson stat	1.988989

Lampiran 3 : Hasil Estimasi Model ARIMAX

Arimax (0,1,0) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:13
Sample (adjusted): 2 619
Included observations: 618 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000261	0.000575	0.453994	0.6500
ST	-0.263880	0.099236	-2.659117	0.0080
UT	0.010884	0.020191	0.539032	0.5901
WT	-0.591683	0.118662	-4.986279	0.0000

R-squared	0.049382	Mean dependent var	-0.000245
Adjusted R-squared	0.044738	S.D. dependent var	0.014449
S.E. of regression	0.014122	Akaike info criterion	-5.675686
Sum squared resid	0.122454	Schwarz criterion	-5.647035
Log likelihood	1757.787	Hannan-Quinn criter.	-5.664548
F-statistic	10.63193	Durbin-Watson stat	1.962348
Prob(F-statistic)	0.000001		

Arimax (0,1,0) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:13
Sample (adjusted): 2 619
Included observations: 618 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.260571	0.098904	-2.634587	0.0086
UT	0.010665	0.020172	0.528723	0.5972
WT	-0.584216	0.117441	-4.974552	0.0000

R-squared	0.049063	Mean dependent var	-0.000245
Adjusted R-squared	0.045971	S.D. dependent var	0.014449
S.E. of regression	0.014113	Akaike info criterion	-5.678586
Sum squared resid	0.122495	Schwarz criterion	-5.657099
Log likelihood	1757.683	Hannan-Quinn criter.	-5.670233
Durbin-Watson stat	1.961490		

Arimax (0,1,1) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:14
Sample (adjusted): 2 619
Included observations: 618 after adjustments
Convergence achieved after 6 iterations
MA Backcast: 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000259	0.000589	0.440144	0.6600
ST	-0.273106	0.099697	-2.739360	0.0063
UT	0.011602	0.020198	0.574403	0.5659
WT	-0.583024	0.119643	-4.873017	0.0000
MA(1)	0.023797	0.040821	0.582958	0.5601

R-squared	0.049810	Mean dependent var	-0.000245
Adjusted R-squared	0.043610	S.D. dependent var	0.014449
S.E. of regression	0.014131	Akaike info criterion	-5.672900
Sum squared resid	0.122399	Schwarz criterion	-5.637087
Log likelihood	1757.926	Hannan-Quinn criter.	-5.658977
F-statistic	8.033549	Durbin-Watson stat	2.003846
Prob(F-statistic)	0.000003		

Inverted MA Roots	-.02

Arimax (0,1,1) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:15
Sample (adjusted): 2 619
Included observations: 618 after adjustments
Convergence achieved after 6 iterations
MA Backcast: 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.270161	0.099391	-2.718161	0.0067
UT	0.011410	0.020179	0.565433	0.5720
WT	-0.575747	0.118434	-4.861323	0.0000
MA(1)	0.024295	0.040780	0.595757	0.5516

R-squared	0.049510	Mean dependent var	-0.000245
Adjusted R-squared	0.044866	S.D. dependent var	0.014449
S.E. of regression	0.014121	Akaike info criterion	-5.675820
Sum squared resid	0.122438	Schwarz criterion	-5.647170
Log likelihood	1757.828	Hannan-Quinn criter.	-5.664682
Durbin-Watson stat	2.003896		

Inverted MA Roots	-.02

Arimax (0,1,2) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:16
Sample (adjusted): 2 619
Included observations: 618 after adjustments
Convergence achieved after 12 iterations
MA Backcast: 0 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000261	0.000491	0.530864	0.5957
ST	-0.237569	0.099701	-2.382809	0.0175
UT	0.011246	0.019989	0.562620	0.5739
WT	-0.620426	0.118631	-5.229872	0.0000
MA(1)	-0.029728	0.040784	-0.728905	0.4663
MA(2)	-0.117878	0.040674	-2.898105	0.0039

R-squared	0.059173	Mean dependent var	-0.000245
Adjusted R-squared	0.051486	S.D. dependent var	0.014449
S.E. of regression	0.014072	Akaike info criterion	-5.679566
Sum squared resid	0.121193	Schwarz criterion	-5.636590
Log likelihood	1760.986	Hannan-Quinn criter.	-5.662858
F-statistic	7.698240	Durbin-Watson stat	1.954615
Prob(F-statistic)	0.000000		

Inverted MA Roots	.36	-.33

Arimax (0,1,2) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:17
Sample (adjusted): 2 619
Included observations: 618 after adjustments
Convergence achieved after 12 iterations
MA Backcast: 0 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.233850	0.099368	-2.353384	0.0189
UT	0.011008	0.019974	0.551102	0.5818
WT	-0.609831	0.116996	-5.212390	0.0000
MA(1)	-0.028613	0.040745	-0.702249	0.4828
MA(2)	-0.116881	0.040653	-2.875073	0.0042

R-squared	0.058740	Mean dependent var	-0.000245
Adjusted R-squared	0.052598	S.D. dependent var	0.014449
S.E. of regression	0.014064	Akaike info criterion	-5.682343
Sum squared resid	0.121249	Schwarz criterion	-5.646530
Log likelihood	1760.844	Hannan-Quinn criter.	-5.668420
Durbin-Watson stat	1.955107		

Inverted MA Roots	.36	-.33

Arimax (0,1,3) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:18
Sample (adjusted): 2 619
Included observations: 618 after adjustments
Convergence achieved after 8 iterations
MA Backcast: -1 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000254	0.000390	0.650323	0.5157
ST	-0.219620	0.095862	-2.291010	0.0223
UT	0.003530	0.019333	0.182603	0.8552
WT	-0.619658	0.115186	-5.379632	0.0000
MA(1)	-0.024913	0.040136	-0.620708	0.5350
MA(2)	-0.109536	0.039983	-2.739540	0.0063
MA(3)	-0.182568	0.040104	-4.552321	0.0000

R-squared	0.092370	Mean dependent var	-0.000245
Adjusted R-squared	0.083457	S.D. dependent var	0.014449
S.E. of regression	0.013833	Akaike info criterion	-5.712253
Sum squared resid	0.116917	Schwarz criterion	-5.662114
Log likelihood	1772.086	Hannan-Quinn criter.	-5.692761
F-statistic	10.36367	Durbin-Watson stat	1.982447
Prob(F-statistic)	0.000000		

Inverted MA Roots	.64	-.31-.44i	-.31+.44i

Arimax (0,1,3) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:19
Sample (adjusted): 2 619
Included observations: 618 after adjustments
Convergence achieved after 8 iterations
MA Backcast: -1 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.214275	0.095448	-2.244950	0.0251
UT	0.003221	0.019322	0.166691	0.8677
WT	-0.604543	0.112855	-5.356800	0.0000
MA(1)	-0.023662	0.040082	-0.590338	0.5552
MA(2)	-0.108536	0.039967	-2.715653	0.0068
MA(3)	-0.181921	0.040070	-4.540069	0.0000

R-squared	0.091745	Mean dependent var	-0.000245
Adjusted R-squared	0.084324	S.D. dependent var	0.014449
S.E. of regression	0.013826	Akaike info criterion	-5.714800
Sum squared resid	0.116997	Schwarz criterion	-5.671824
Log likelihood	1771.873	Hannan-Quinn criter.	-5.698093
Durbin-Watson stat	1.982763		

Inverted MA Roots	.64	-.31-.44i	-.31+.44i

Arimax (1,1,0) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:20
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000255	0.000588	0.434098	0.6644
ST	-0.271490	0.099858	-2.718775	0.0067
UT	0.011464	0.020216	0.567068	0.5709
WT	-0.584381	0.119730	-4.880815	0.0000
AR(1)	0.019615	0.040897	0.479607	0.6317

R-squared	0.049717	Mean dependent var	-0.000250
Adjusted R-squared	0.043506	S.D. dependent var	0.014460
S.E. of regression	0.014142	Akaike info criterion	-5.671227
Sum squared resid	0.122402	Schwarz criterion	-5.635369
Log likelihood	1754.573	Hannan-Quinn criter.	-5.657285
F-statistic	8.004674	Durbin-Watson stat	1.994610
Prob(F-statistic)	0.000003		

Inverted AR Roots	.02

Arimax (1,1,0) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:20
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.268549	0.099552	-2.697573	0.0072
UT	0.011271	0.020197	0.558073	0.5770
WT	-0.577191	0.118510	-4.870405	0.0000
AR(1)	0.020047	0.040858	0.490646	0.6239

R-squared	0.049425	Mean dependent var	-0.000250
Adjusted R-squared	0.044772	S.D. dependent var	0.014460
S.E. of regression	0.014133	Akaike info criterion	-5.674160
Sum squared resid	0.122440	Schwarz criterion	-5.645474
Log likelihood	1754.478	Hannan-Quinn criter.	-5.663007
Durbin-Watson stat	1.994555		

Inverted AR Roots	.02

Arimax (1,1,1) dengan kontansta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:22
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 15 iterations
MA Backcast: 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000253	0.000579	0.437007	0.6623
ST	-0.266500	0.099558	-2.676829	0.0076
UT	0.011295	0.020234	0.558188	0.5769
WT	-0.587448	0.119395	-4.920229	0.0000
AR(1)	-0.785866	0.460121	-1.707954	0.0882
MA(1)	0.793891	0.453378	1.751056	0.0804

R-squared	0.051186	Mean dependent var	-0.000250
Adjusted R-squared	0.043421	S.D. dependent var	0.014460
S.E. of regression	0.014143	Akaike info criterion	-5.669532
Sum squared resid	0.122213	Schwarz criterion	-5.626502
Log likelihood	1755.051	Hannan-Quinn criter.	-5.652802
F-statistic	6.592349	Durbin-Watson stat	1.975321
Prob(F-statistic)	0.000005		

Inverted AR Roots	-.79
Inverted MA Roots	-.79

Arimax (1,1,1) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:21
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 15 iterations
MA Backcast: 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.263373	0.099234	-2.654062	0.0082
UT	0.011092	0.020216	0.548696	0.5834
WT	-0.580227	0.118158	-4.910613	0.0000
AR(1)	-0.786341	0.459521	-1.711219	0.0875
MA(1)	0.794504	0.452636	1.755281	0.0797

R-squared	0.050889	Mean dependent var	-0.000250
Adjusted R-squared	0.044686	S.D. dependent var	0.014460
S.E. of regression	0.014134	Akaike info criterion	-5.672461
Sum squared resid	0.122251	Schwarz criterion	-5.636603
Log likelihood	1754.954	Hannan-Quinn criter.	-5.658520
Durbin-Watson stat	1.974789		

Inverted AR Roots	-.79
Inverted MA Roots	-.79

Arimax (1,1,2) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:23
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 14 iterations
MA Backcast: 1 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000242	0.000355	0.681320	0.4959
ST	-0.230279	0.098437	-2.339354	0.0196
UT	0.004100	0.019473	0.210527	0.8333
WT	-0.614152	0.114882	-5.345939	0.0000
AR(1)	0.617108	0.130322	4.735262	0.0000
MA(1)	-0.642829	0.131947	-4.871872	0.0000
MA(2)	-0.123939	0.048135	-2.574804	0.0103

R-squared	0.082122	Mean dependent var	-0.000250
Adjusted R-squared	0.073094	S.D. dependent var	0.014460
S.E. of regression	0.013922	Akaike info criterion	-5.699439
Sum squared resid	0.118228	Schwarz criterion	-5.649238
Log likelihood	1765.277	Hannan-Quinn criter.	-5.679922
F-statistic	9.096110	Durbin-Watson stat	1.981054
Prob(F-statistic)	0.000000		

Inverted AR Roots	.62	
Inverted MA Roots	.80	-.16

Arimax (1,1,2) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:24
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 14 iterations
MA Backcast: 1 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.224038	0.097796	-2.290876	0.0223
UT	0.003856	0.019469	0.198063	0.8431
WT	-0.597733	0.112310	-5.322175	0.0000
AR(1)	0.610861	0.133364	4.580391	0.0000
MA(1)	-0.635743	0.134746	-4.718069	0.0000
MA(2)	-0.124007	0.047993	-2.583867	0.0100

R-squared	0.081433	Mean dependent var	-0.000250
Adjusted R-squared	0.073917	S.D. dependent var	0.014460
S.E. of regression	0.013916	Akaike info criterion	-5.701931
Sum squared resid	0.118317	Schwarz criterion	-5.658901
Log likelihood	1765.046	Hannan-Quinn criter.	-5.685201
Durbin-Watson stat	1.980750		

Inverted AR Roots	.61	
Inverted MA Roots	.79	-.16

Arimax (1,1,3) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:25
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 13 iterations
MA Backcast: 0 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000246	0.000372	0.660713	0.5090
ST	-0.228671	0.097506	-2.345204	0.0193
UT	0.002493	0.019325	0.128983	0.8974
WT	-0.611637	0.114729	-5.331125	0.0000
AR(1)	0.236675	0.203895	1.160766	0.2462
MA(1)	-0.253123	0.201047	-1.259025	0.2085
MA(2)	-0.093055	0.042525	-2.188231	0.0290
MA(3)	-0.160316	0.050774	-3.157468	0.0017

R-squared	0.094611	Mean dependent var	-0.000250
Adjusted R-squared	0.084205	S.D. dependent var	0.014460
S.E. of regression	0.013838	Akaike info criterion	-5.709898
Sum squared resid	0.116620	Schwarz criterion	-5.652525
Log likelihood	1769.503	Hannan-Quinn criter.	-5.687592
F-statistic	9.091324	Durbin-Watson stat	1.994881
Prob(F-statistic)	0.000000		

Inverted AR Roots	.24		
Inverted MA Roots	.71	-.23+.42i	-.23-.42i

Arimax (1,1,3) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:26
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 13 iterations
MA Backcast: 0 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.222927	0.096958	-2.299214	0.0218
UT	0.002179	0.019313	0.112804	0.9102
WT	-0.595858	0.112260	-5.307824	0.0000
AR(1)	0.234660	0.204571	1.147080	0.2518
MA(1)	-0.250014	0.201679	-1.239662	0.2156
MA(2)	-0.092459	0.042419	-2.179652	0.0297
MA(3)	-0.159897	0.050595	-3.160309	0.0017

R-squared	0.093966	Mean dependent var	-0.000250
Adjusted R-squared	0.085054	S.D. dependent var	0.014460
S.E. of regression	0.013832	Akaike info criterion	-5.712426
Sum squared resid	0.116703	Schwarz criterion	-5.662225
Log likelihood	1769.283	Hannan-Quinn criter.	-5.692908
Durbin-Watson stat	1.994910		

Inverted AR Roots	.23		
Inverted MA Roots	.70	-.23+.42i	-.23-.42i

Arimax (2,1,0) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:27
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000226	0.000537	0.421959	0.6732
ST	-0.259593	0.100182	-2.591213	0.0098
UT	0.012984	0.020072	0.646851	0.5180
WT	-0.594065	0.119367	-4.976793	0.0000
AR(1)	0.019784	0.040765	0.485317	0.6276
AR(2)	-0.092442	0.041025	-2.253322	0.0246

R-squared	0.057435	Mean dependent var	-0.000281
Adjusted R-squared	0.049709	S.D. dependent var	0.014451
S.E. of regression	0.014087	Akaike info criterion	-5.677384
Sum squared resid	0.121057	Schwarz criterion	-5.634301
Log likelihood	1754.634	Hannan-Quinn criter.	-5.660633
F-statistic	7.434019	Durbin-Watson stat	2.035665
Prob(F-statistic)	0.000001		

Inverted AR Roots	.01-.30i	.01+.30i

Arimax (2,1,0) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:28
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.256596	0.099852	-2.569756	0.0104
UT	0.012785	0.020053	0.637562	0.5240
WT	-0.586399	0.117926	-4.972596	0.0000
AR(1)	0.020222	0.040725	0.496544	0.6197
AR(2)	-0.092136	0.040995	-2.247512	0.0250

R-squared	0.057160	Mean dependent var	-0.000281
Adjusted R-squared	0.050987	S.D. dependent var	0.014451
S.E. of regression	0.014078	Akaike info criterion	-5.680340
Sum squared resid	0.121092	Schwarz criterion	-5.644437
Log likelihood	1754.545	Hannan-Quinn criter.	-5.666380
Durbin-Watson stat	2.035557		

Inverted AR Roots	.01+.30i	.01-.30i

Arimax (2,1,1) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:28
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000239	0.000374	0.638389	0.5235
ST	-0.235169	0.097850	-2.403356	0.0165
UT	0.004726	0.019411	0.243458	0.8077
WT	-0.613451	0.115379	-5.316826	0.0000
AR(1)	0.699710	0.111899	6.253028	0.0000
AR(2)	-0.149463	0.043921	-3.402953	0.0007
MA(1)	-0.708799	0.107599	-6.587438	0.0000

R-squared	0.083946	Mean dependent var	-0.000281
Adjusted R-squared	0.074921	S.D. dependent var	0.014451
S.E. of regression	0.013899	Akaike info criterion	-5.702667
Sum squared resid	0.117652	Schwarz criterion	-5.652403
Log likelihood	1763.422	Hannan-Quinn criter.	-5.683124
F-statistic	9.301334	Durbin-Watson stat	2.018981
Prob(F-statistic)	0.000000		

Inverted AR Roots	.35+.16i	.35-.16i
Inverted MA Roots	.71	

Arimax (2,1,1) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:30
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.229698	0.097288	-2.361007	0.0185
UT	0.004499	0.019401	0.231889	0.8167
WT	-0.598431	0.112956	-5.297925	0.0000
AR(1)	0.694900	0.113894	6.101292	0.0000
AR(2)	-0.149891	0.043840	-3.419075	0.0007
MA(1)	-0.702887	0.109776	-6.402949	0.0000

R-squared	0.083339	Mean dependent var	-0.000281
Adjusted R-squared	0.075826	S.D. dependent var	0.014451
S.E. of regression	0.013892	Akaike info criterion	-5.705252
Sum squared resid	0.117730	Schwarz criterion	-5.662168
Log likelihood	1763.218	Hannan-Quinn criter.	-5.688500
Durbin-Watson stat	2.019407		

Inverted AR Roots	.35-.17i	.35+.17i
Inverted MA Roots	.70	

Arimax (2,1,2) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:33
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 12 iterations
MA Backcast: 2 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000240	0.000420	0.571346	0.5680
ST	-0.251770	0.096756	-2.602103	0.0095
UT	0.004921	0.019389	0.253816	0.7997
WT	-0.623275	0.116133	-5.366893	0.0000
AR(1)	1.066038	0.176330	6.045686	0.0000
AR(2)	-0.569091	0.144533	-3.937436	0.0001
MA(1)	-1.075999	0.190906	-5.636289	0.0000
MA(2)	0.445508	0.170465	2.613478	0.0092

R-squared	0.091798	Mean dependent var	-0.000281
Adjusted R-squared	0.081341	S.D. dependent var	0.014451
S.E. of regression	0.013851	Akaike info criterion	-5.708029
Sum squared resid	0.116644	Schwarz criterion	-5.650584
Log likelihood	1766.073	Hannan-Quinn criter.	-5.685693
F-statistic	8.779176	Durbin-Watson stat	2.016277
Prob(F-statistic)	0.000000		

Inverted AR Roots	.53-.53i	.53+.53i
Inverted MA Roots	.54-.40i	.54+.40i

Arimax (2,1,2) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:34
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 12 iterations
MA Backcast: 2 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.247127	0.096349	-2.564923	0.0106
UT	0.004681	0.019375	0.241586	0.8092
WT	-0.610633	0.114044	-5.354358	0.0000
AR(1)	1.064513	0.176166	6.042661	0.0000
AR(2)	-0.569372	0.144658	-3.935996	0.0001
MA(1)	-1.073650	0.190738	-5.628938	0.0000
MA(2)	0.445571	0.170428	2.614430	0.0092

R-squared	0.091312	Mean dependent var	-0.000281
Adjusted R-squared	0.082359	S.D. dependent var	0.014451
S.E. of regression	0.013843	Akaike info criterion	-5.710740
Sum squared resid	0.116706	Schwarz criterion	-5.660476
Log likelihood	1765.908	Hannan-Quinn criter.	-5.691197
Durbin-Watson stat	2.016198		

Inverted AR Roots	.53+.53i	.53-.53i
Inverted MA Roots	.54-.40i	.54+.40i

Arimax (2,1,3) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:35
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 1 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000237	0.000395	0.600883	0.5481
ST	-0.236050	0.096751	-2.439774	0.0150
UT	0.004690	0.019291	0.243119	0.8080
WT	-0.615798	0.115064	-5.351788	0.0000
AR(1)	0.500785	0.255279	1.961711	0.0503
AR(2)	-0.317744	0.197173	-1.611496	0.1076
MA(1)	-0.516926	0.254325	-2.032543	0.0425
MA(2)	0.226692	0.199442	1.136633	0.2561
MA(3)	-0.145675	0.056952	-2.557835	0.0108

R-squared	0.095983	Mean dependent var	-0.000281
Adjusted R-squared	0.084069	S.D. dependent var	0.014451
S.E. of regression	0.013830	Akaike info criterion	-5.709401
Sum squared resid	0.116106	Schwarz criterion	-5.644776
Log likelihood	1767.496	Hannan-Quinn criter.	-5.684274
F-statistic	8.055958	Durbin-Watson stat	2.000016
Prob(F-statistic)	0.000000		

Inverted AR Roots	.25+.51i	.25-.51i	
Inverted MA Roots	.57	-.03-.51i	-.03+.51i

Arimax (2,1,3) dengan konstanta tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:36
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 1 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.231136	0.096295	-2.400289	0.0167
UT	0.004441	0.019279	0.230327	0.8179
WT	-0.602104	0.112803	-5.337640	0.0000
AR(1)	0.500749	0.254588	1.966899	0.0496
AR(2)	-0.319479	0.197006	-1.621670	0.1054
MA(1)	-0.515880	0.253663	-2.033719	0.0424
MA(2)	0.228563	0.199128	1.147819	0.2515
MA(3)	-0.144958	0.056794	-2.552347	0.0109

R-squared	0.095448	Mean dependent var	-0.000281
Adjusted R-squared	0.085034	S.D. dependent var	0.014451
S.E. of regression	0.013823	Akaike info criterion	-5.712056
Sum squared resid	0.116175	Schwarz criterion	-5.654611
Log likelihood	1767.313	Hannan-Quinn criter.	-5.689720
Durbin-Watson stat	2.000220		

Inverted AR Roots	.25+.51i	.25-.51i	
Inverted MA Roots	.57	-.02-.51i	-.02+.51i

Arimax (3,1,0) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:37
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000230	0.000445	0.516001	0.6060
ST	-0.235919	0.097138	-2.428689	0.0154
UT	0.007657	0.019423	0.394230	0.6935
WT	-0.608719	0.116325	-5.232909	0.0000
AR(1)	-0.000851	0.040279	-0.021121	0.9832
AR(2)	-0.088329	0.040383	-2.187287	0.0291
AR(3)	-0.191446	0.040152	-4.767982	0.0000

R-squared	0.091537	Mean dependent var	-0.000286
Adjusted R-squared	0.082571	S.D. dependent var	0.014462
S.E. of regression	0.013852	Akaike info criterion	-5.709399
Sum squared resid	0.116669	Schwarz criterion	-5.659072
Log likelihood	1762.640	Hannan-Quinn criter.	-5.689830
F-statistic	10.21032	Durbin-Watson stat	2.024556
Prob(F-statistic)	0.000000		

Inverted AR Roots	.26+.54i	.26-.54i	-.53	

Arimax (3,1,0) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:38
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.231876	0.096748	-2.396691	0.0168
UT	0.007389	0.019406	0.380765	0.7035
WT	-0.598017	0.114438	-5.225669	0.0000
AR(1)	-0.000274	0.040238	-0.006809	0.9946
AR(2)	-0.087924	0.040357	-2.178661	0.0297
AR(3)	-0.191029	0.040117	-4.761835	0.0000

R-squared	0.091139	Mean dependent var	-0.000286
Adjusted R-squared	0.083677	S.D. dependent var	0.014462
S.E. of regression	0.013844	Akaike info criterion	-5.712214
Sum squared resid	0.116720	Schwarz criterion	-5.669076
Log likelihood	1762.506	Hannan-Quinn criter.	-5.695440
Durbin-Watson stat	2.024267		

Inverted AR Roots	.26+.54i	.26-.54i	-.53	

Arimax (3,1,1) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:39
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 7 iterations
MA Backcast: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000236	0.000402	0.586628	0.5577
ST	-0.238178	0.096655	-2.464215	0.0140
UT	0.003999	0.019303	0.207196	0.8359
WT	-0.616306	0.115283	-5.346046	0.0000
AR(1)	0.343739	0.173606	1.979997	0.0482
AR(2)	-0.093812	0.042796	-2.192070	0.0288
AR(3)	-0.159758	0.049333	-3.238338	0.0013
MA(1)	-0.359970	0.174648	-2.061122	0.0397

R-squared	0.096289	Mean dependent var	-0.000286
Adjusted R-squared	0.085868	S.D. dependent var	0.014462
S.E. of regression	0.013827	Akaike info criterion	-5.711393
Sum squared resid	0.116058	Schwarz criterion	-5.653876
Log likelihood	1764.253	Hannan-Quinn criter.	-5.689027
F-statistic	9.239299	Durbin-Watson stat	1.998604
Prob(F-statistic)	0.000000		

Inverted AR Roots	.37+.51i	.37-.51i	-.40
Inverted MA Roots	.36		

Arimax (3,1,1) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:39
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 8 iterations
MA Backcast: 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.233233	0.096193	-2.424627	0.0156
UT	0.003739	0.019288	0.193870	0.8463
WT	-0.603059	0.113073	-5.333346	0.0000
AR(1)	0.339993	0.174578	1.947513	0.0519
AR(2)	-0.093509	0.042723	-2.188750	0.0290
AR(3)	-0.159878	0.049237	-3.247115	0.0012
MA(1)	-0.355304	0.175630	-2.023027	0.0435

R-squared	0.095779	Mean dependent var	-0.000286
Adjusted R-squared	0.086856	S.D. dependent var	0.014462
S.E. of regression	0.013820	Akaike info criterion	-5.714080
Sum squared resid	0.116124	Schwarz criterion	-5.663753
Log likelihood	1764.080	Hannan-Quinn criter.	-5.694510
Durbin-Watson stat	1.998639		

Inverted AR Roots	.37+.51i	.37-.51i	-.40
Inverted MA Roots	.36		

Arimax (3,1,2) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 03/02/16 Time: 01:36
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 3 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000236	0.000401	0.588303	0.5565
ST	-0.237526	0.096935	-2.450354	0.0146
UT	0.003853	0.019330	0.199324	0.8421
WT	-0.616120	0.115365	-5.340632	0.0000
AR(1)	0.319769	0.306550	1.043122	0.2973
AR(2)	-0.070987	0.247638	-0.286658	0.7745
AR(3)	-0.162845	0.058028	-2.806293	0.0052
MA(1)	-0.335774	0.308948	-1.086828	0.2775
MA(2)	-0.023593	0.253011	-0.093250	0.9257

R-squared	0.096300	Mean dependent var	-0.000286
Adjusted R-squared	0.084370	S.D. dependent var	0.014462
S.E. of regression	0.013839	Akaike info criterion	-5.708152
Sum squared resid	0.116057	Schwarz criterion	-5.643446
Log likelihood	1764.257	Hannan-Quinn criter.	-5.682991
F-statistic	8.072051	Durbin-Watson stat	1.999154
Prob(F-statistic)	0.000000		

Inverted AR Roots	.37-.50i	.37+.50i	-.42
Inverted MA Roots	.40	-.06	

Arimax (3,1,2) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:41
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 3 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.232674	0.096480	-2.411618	0.0162
UT	0.003617	0.019317	0.187238	0.8515
WT	-0.602839	0.113143	-5.328091	0.0000
AR(1)	0.320312	0.306331	1.045640	0.2961
AR(2)	-0.074775	0.247510	-0.302108	0.7627
AR(3)	-0.162419	0.058029	-2.798944	0.0053
MA(1)	-0.335435	0.308701	-1.086603	0.2776
MA(2)	-0.019344	0.252600	-0.076579	0.9390

R-squared	0.095786	Mean dependent var	-0.000286
Adjusted R-squared	0.085358	S.D. dependent var	0.014462
S.E. of regression	0.013831	Akaike info criterion	-5.710836
Sum squared resid	0.116123	Schwarz criterion	-5.653319
Log likelihood	1764.082	Hannan-Quinn criter.	-5.688471
Durbin-Watson stat	1.999093		

Inverted AR Roots	.37-.50i	.37+.50i	-.42
Inverted MA Roots	.39	-.05	

Arimax (3,1,3) dengan konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:42
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 14 iterations
MA Backcast: 2 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000237	0.000405	0.585985	0.5581
ST	-0.240615	0.096948	-2.481908	0.0133
UT	0.003719	0.019348	0.192230	0.8476
WT	-0.616969	0.115597	-5.337244	0.0000
AR(1)	0.268296	0.324839	0.825935	0.4092
AR(2)	0.026866	0.351075	0.076524	0.9390
AR(3)	-0.240055	0.237147	-1.012263	0.3118
MA(1)	-0.284148	0.329249	-0.863019	0.3885
MA(2)	-0.123796	0.361427	-0.342519	0.7321
MA(3)	0.076778	0.231358	0.331859	0.7401

R-squared	0.096446	Mean dependent var	-0.000286
Adjusted R-squared	0.083005	S.D. dependent var	0.014462
S.E. of regression	0.013849	Akaike info criterion	-5.705062
Sum squared resid	0.116038	Schwarz criterion	-5.633166
Log likelihood	1764.307	Hannan-Quinn criter.	-5.677106
F-statistic	7.175364	Durbin-Watson stat	1.999242
Prob(F-statistic)	0.000000		

Inverted AR Roots	.41-.51i	.41+.51i	-.56
Inverted MA Roots	.36-.23i	.36+.23i	-.43

Arimax (3,1,3) tanpa konstanta

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 00:43
Sample (adjusted): 5 619
Included observations: 615 after adjustments
Convergence achieved after 14 iterations
MA Backcast: 2 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.235794	0.096502	-2.443422	0.0148
UT	0.003477	0.019335	0.179839	0.8573
WT	-0.603792	0.113407	-5.324120	0.0000
AR(1)	0.267492	0.325597	0.821544	0.4117
AR(2)	0.024717	0.351515	0.070316	0.9440
AR(3)	-0.240503	0.237921	-1.010850	0.3125
MA(1)	-0.282470	0.330010	-0.855946	0.3924
MA(2)	-0.121175	0.361656	-0.335055	0.7377
MA(3)	0.077469	0.231757	0.334267	0.7383

R-squared	0.095935	Mean dependent var	-0.000286
Adjusted R-squared	0.084001	S.D. dependent var	0.014462
S.E. of regression	0.013842	Akaike info criterion	-5.707749
Sum squared resid	0.116104	Schwarz criterion	-5.643043
Log likelihood	1764.133	Hannan-Quinn criter.	-5.682588
Durbin-Watson stat	1.999184		

Inverted AR Roots	.41-.51i	.41+.51i	-.56
Inverted MA Roots	.35+.24i	.35-.24i	-.43

Uji arimax 1,1,2 tanpa konstanta & ut(inflasi)

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 01:24
Sample (adjusted): 3 619
Included observations: 617 after adjustments
Convergence achieved after 15 iterations
MA Backcast: 1 2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.216822	0.091399	-2.372265	0.0180
WT	-0.597286	0.112116	-5.327397	0.0000
AR(1)	0.612371	0.132238	4.630824	0.0000
MA(1)	-0.638049	0.133646	-4.774158	0.0000
MA(2)	-0.123736	0.048002	-2.577760	0.0102

R-squared	0.081376	Mean dependent var	-0.000250
Adjusted R-squared	0.075372	S.D. dependent var	0.014460
S.E. of regression	0.013905	Akaike info criterion	-5.705109
Sum squared resid	0.118324	Schwarz criterion	-5.669251
Log likelihood	1765.026	Hannan-Quinn criter.	-5.691168
Durbin-Watson stat	1.980766		

Inverted AR Roots	.61	
Inverted MA Roots	.79	-.16

Uji arimax 2,1,1 tanpa konstanta & ut(inflasi)

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 01:25
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 10 iterations
MA Backcast: 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.221293	0.090895	-2.434594	0.0152
WT	-0.597904	0.112764	-5.302272	0.0000
AR(1)	0.696891	0.112725	6.182205	0.0000
AR(2)	-0.149463	0.043833	-3.409825	0.0007
MA(1)	-0.705818	0.108478	-6.506545	0.0000

R-squared	0.083261	Mean dependent var	-0.000281
Adjusted R-squared	0.077259	S.D. dependent var	0.014451
S.E. of regression	0.013882	Akaike info criterion	-5.708413
Sum squared resid	0.117740	Schwarz criterion	-5.672510
Log likelihood	1763.191	Hannan-Quinn criter.	-5.694453
Durbin-Watson stat	2.019391		

Inverted AR Roots	.35+.17i	.35-.17i
Inverted MA Roots	.71	

Uji arimax 2,1,2 tanpa konstanta & ut(inflasi)

Dependent Variable: DSAHAM
Method: Least Squares
Date: 02/26/16 Time: 01:26
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 12 iterations
MA Backcast: 2 3

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ST	-0.238632	0.089978	-2.652119	0.0082
WT	-0.610112	0.113865	-5.358196	0.0000
AR(1)	1.068482	0.175863	6.075643	0.0000
AR(2)	-0.569693	0.144203	-3.950628	0.0001
MA(1)	-1.078529	0.190379	-5.665155	0.0000
MA(2)	0.446662	0.170096	2.625939	0.0089

R-squared	0.091227	Mean dependent var	-0.000281
Adjusted R-squared	0.083778	S.D. dependent var	0.014451
S.E. of regression	0.013833	Akaike info criterion	-5.713894
Sum squared resid	0.116717	Schwarz criterion	-5.670811
Log likelihood	1765.879	Hannan-Quinn criter.	-5.697142
Durbin-Watson stat	2.016299		

Inverted AR Roots	.53-.53i	.53+.53i
Inverted MA Roots	.54-.39i	.54+.39i

Lampiran 4 : Uji Efek ARCH untuk Model Arimax terbaik

Uji efek arch arimax (2,1,1) tanpa ut (Inflasi)

Heteroskedasticity Test: ARCH

F-statistic	26.35309	Prob. F(1,613)	0.0000
Obs*R-squared	25.34929	Prob. Chi-Square(1)	0.0000

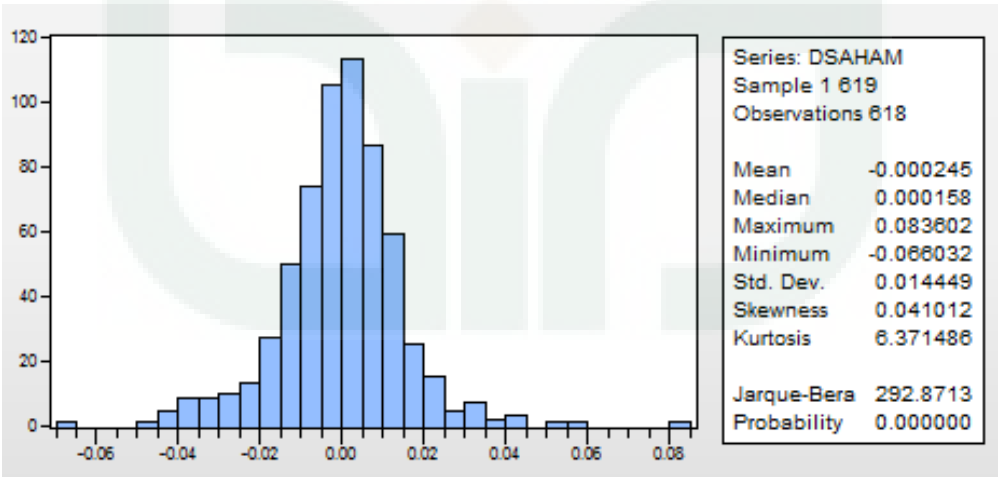
Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/26/16 Time: 01:33
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000153	1.86E-05	8.200757	0.0000
RESID^2(-1)	0.203013	0.039547	5.133526	0.0000

R-squared	0.041218	Mean dependent var	0.000191
Adjusted R-squared	0.039654	S.D. dependent var	0.000430
S.E. of regression	0.000422	Akaike info criterion	-12.70223
Sum squared resid	0.000109	Schwarz criterion	-12.68785
Log likelihood	3907.936	Hannan-Quinn criter.	-12.69664
F-statistic	26.35309	Durbin-Watson stat	2.041241
Prob(F-statistic)	0.000000		

Lampiran 5 : Uji Efek Asimetris

Uji efek asimetris



Lampiran 6 : Hasil Estimasi Model ARIMAX-EGARCH

ARIMAX-EGARCH (0,1)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:37
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 73 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*RESID(-1)/@SQRT(GARCH(-1)) + C(8)
*LOG(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.236592	0.148055	-1.597997	0.1100
WT	-0.498029	0.088772	-5.610214	0.0000
AR(1)	0.968249	0.039358	24.60108	0.0000
AR(2)	0.012996	0.040271	0.322705	0.7469
MA(1)	-0.994097	0.002352	-422.6485	0.0000
Variance Equation				
C(6)	-0.213085	0.071259	-2.990283	0.0028
C(7)	-0.129586	0.017414	-7.441370	0.0000
C(8)	0.974969	0.008312	117.2938	0.0000

R-squared	0.050594	Mean dependent var	-0.000281
Adjusted R-squared	0.044378	S.D. dependent var	0.014451
S.E. of regression	0.014127	Akaike info criterion	-5.882806
Sum squared resid	0.121935	Schwarz criterion	-5.825361
Log likelihood	1819.904	Hannan-Quinn criter.	-5.860470
Durbin-Watson stat	1.918285		

Inverted AR Roots	.98	-.01
Inverted MA Roots	.99	

ARIMAX-EGARCH (0,2)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:39
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 75 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*RESID(-1)/@SQRT(GARCH(-1)) + C(8)
*LOG(GARCH(-1)) + C(9)*LOG(GARCH(-2))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.235002	0.123316	-1.905699	0.0567
WT	-0.499638	0.088469	-5.647610	0.0000
AR(1)	0.967572	0.038938	24.84910	0.0000
AR(2)	0.013248	0.039384	0.336371	0.7366
MA(1)	-0.993933	0.002265	-438.7391	0.0000
Variance Equation				
C(6)	-0.241951	0.003446	-70.21611	0.0000
C(7)	-0.148615	0.018974	-7.832641	0.0000
C(8)	0.806037	0.003237	249.0126	0.0000
C(9)	0.165505	0.003294	50.24611	0.0000

R-squared	0.050594	Mean dependent var	-0.000281
Adjusted R-squared	0.044379	S.D. dependent var	0.014451
S.E. of regression	0.014127	Akaike info criterion	-5.880191
Sum squared resid	0.121935	Schwarz criterion	-5.815565
Log likelihood	1820.099	Hannan-Quinn criter.	-5.855063
Durbin-Watson stat	1.917652		

Inverted AR Roots	.98	-.01
Inverted MA Roots	.99	

ARIMAX-EGARCH (0,3)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 03/08/16 Time: 01:47
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence not achieved after 500 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*RESID(-1)/@SQRT(GARCH(-1)) + C(8)
*LOG(GARCH(-1)) + C(9)*LOG(GARCH(-2)) + C(10)*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.236128	0.142997	-1.651278	0.0987
WT	-0.484689	0.090056	-5.382064	0.0000
AR(1)	0.970557	0.039715	24.43812	0.0000
AR(2)	0.009237	0.040616	0.227420	0.8201
MA(1)	-0.993846	0.002334	-425.7935	0.0000
Variance Equation				
C(6)	-0.242086	0.099367	-2.436292	0.0148
C(7)	-0.148745	0.036420	-4.084110	0.0000
C(8)	1.224363	0.280051	4.371927	0.0000
C(9)	-0.704561	0.420866	-1.674075	0.0941
C(10)	0.451728	0.192077	2.351799	0.0187

R-squared	0.050565	Mean dependent var	-0.000281
Adjusted R-squared	0.044350	S.D. dependent var	0.014451
S.E. of regression	0.014127	Akaike info criterion	-5.882817
Sum squared resid	0.121939	Schwarz criterion	-5.811011
Log likelihood	1821.908	Hannan-Quinn criter.	-5.854898
Durbin-Watson stat	1.921674		

Inverted AR Roots	.98	-.01
Inverted MA Roots	.99	

ARIMAX-EGARCH (1,0)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:41
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 25 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*RESID(-1)/@SQRT(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.179906	0.105765	-1.700993	0.0889
WT	-0.480850	0.101638	-4.731017	0.0000
AR(1)	0.849751	0.058561	14.51043	0.0000
AR(2)	-0.081236	0.036250	-2.241001	0.0250
MA(1)	-0.883166	0.043896	-20.11954	0.0000
Variance Equation				
C(6)	-8.988460	0.064465	-139.4318	0.0000
C(7)	0.456669	0.069902	6.533020	0.0000
C(8)	-0.212309	0.047884	-4.433785	0.0000

R-squared	0.076262	Mean dependent var	-0.000281
Adjusted R-squared	0.070214	S.D. dependent var	0.014451
S.E. of regression	0.013935	Akaike info criterion	-5.790110
Sum squared resid	0.118639	Schwarz criterion	-5.732665
Log likelihood	1791.354	Hannan-Quinn criter.	-5.767774
Durbin-Watson stat	1.950034		

Inverted AR Roots	.74	.11
Inverted MA Roots	.88	

ARIMAX-EGARCH (1,1)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:42
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Failure to improve Likelihood after 6 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*RESID(-1)/@SQRT(GARCH(-1)) + C(9)*LOG(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.131538	0.126428	-1.040424	0.2981
WT	-0.568511	0.084842	-6.700826	0.0000
AR(1)	0.889016	0.045124	19.70170	0.0000
AR(2)	-0.048770	0.043972	-1.109115	0.2674
MA(1)	-0.921609	0.008602	-107.1392	0.0000
Variance Equation				
C(6)	-0.607231	0.155810	-3.897242	0.0001
C(7)	0.194639	0.050266	3.872211	0.0001
C(8)	-0.104520	0.022345	-4.677438	0.0000
C(9)	0.947597	0.015052	62.95558	0.0000

R-squared	0.071613	Mean dependent var	-0.000281
Adjusted R-squared	0.065535	S.D. dependent var	0.014451
S.E. of regression	0.013970	Akaike info criterion	-5.895843
Sum squared resid	0.119236	Schwarz criterion	-5.831217
Log likelihood	1824.920	Hannan-Quinn criter.	-5.870715
Durbin-Watson stat	1.959995		

ARIMAX-EGARCH (1,2)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:46
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 36 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*RESID(-1)/@SQRT(GARCH(-1)) + C(9)*LOG(GARCH(-1)) + C(10)
*LOG(GARCH(-2))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.052529	0.131536	-0.399347	0.6896
WT	-0.566903	0.088693	-6.391730	0.0000
AR(1)	0.628025	0.122073	5.144691	0.0000
AR(2)	-0.118736	0.052821	-2.247885	0.0246
MA(1)	-0.686344	0.114372	-6.001003	0.0000
Variance Equation				
C(6)	-0.462446	0.143228	-3.228747	0.0012
C(7)	0.210746	0.061094	3.449535	0.0006
C(8)	-0.110425	0.030202	-3.656214	0.0003
C(9)	0.440665	0.189057	2.330864	0.0198
C(10)	0.524584	0.182515	2.874195	0.0041

R-squared	0.076260	Mean dependent var	-0.000281
Adjusted R-squared	0.070212	S.D. dependent var	0.014451
S.E. of regression	0.013935	Akaike info criterion	-5.919170
Sum squared resid	0.118639	Schwarz criterion	-5.847364
Log likelihood	1833.104	Hannan-Quinn criter.	-5.891250
Durbin-Watson stat	1.939553		

Inverted AR Roots	.31-.14i	.31+.14i
Inverted MA Roots	.69	

ARIMAX-EGARCH (1,3)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:49
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 35 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*RESID(-1)/@SQRT(GARCH(-1)) + C(9)*LOG(GARCH(-1)) + C(10)
*LOG(GARCH(-2)) + C(11)*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.082438	0.129056	-0.638774	0.5230
WT	-0.553493	0.082820	-6.683078	0.0000
AR(1)	0.682381	0.085676	7.964707	0.0000
AR(2)	-0.114655	0.047873	-2.394971	0.0166
MA(1)	-0.749737	0.073716	-10.17063	0.0000
Variance Equation				
C(6)	-0.738408	0.225727	-3.271240	0.0011
C(7)	0.312432	0.057014	5.479912	0.0000
C(8)	-0.173304	0.028196	-6.146356	0.0000
C(9)	0.247703	0.026888	9.212465	0.0000
C(10)	-0.161197	0.023022	-7.001967	0.0000
C(11)	0.855965	0.027828	30.75906	0.0000

R-squared	0.076771	Mean dependent var	-0.000281
Adjusted R-squared	0.070727	S.D. dependent var	0.014451
S.E. of regression	0.013931	Akaike info criterion	-5.942531
Sum squared resid	0.118573	Schwarz criterion	-5.863544
Log likelihood	1841.299	Hannan-Quinn criter.	-5.911819
Durbin-Watson stat	1.912902		

Inverted AR Roots	.38	.30
Inverted MA Roots	.75	

ARIMAX-EGARCH (2,0)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:50
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 40 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*RESID(-1)
/@SQRT(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.173607	0.110984	-1.564255	0.1178
WT	-0.499605	0.102036	-4.896338	0.0000
AR(1)	0.834311	0.062045	13.44683	0.0000
AR(2)	-0.090656	0.037955	-2.388525	0.0169
MA(1)	-0.867559	0.047913	-18.10713	0.0000
Variance Equation				
C(6)	-9.030290	0.075176	-120.1223	0.0000
C(7)	0.451078	0.072855	6.191426	0.0000
C(8)	0.060563	0.047037	1.287567	0.1979
C(9)	-0.213387	0.048250	-4.422504	0.0000

R-squared	0.077645	Mean dependent var	-0.000281
Adjusted R-squared	0.071607	S.D. dependent var	0.014451
S.E. of regression	0.013924	Akaike info criterion	-5.788120
Sum squared resid	0.118461	Schwarz criterion	-5.723495
Log likelihood	1791.741	Hannan-Quinn criter.	-5.762992
Durbin-Watson stat	1.954999		

Inverted AR Roots	.71	.13
Inverted MA Roots	.87	

ARIMAX-EGARCH (2,1)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 03/16/16 Time: 22:06
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 36 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*RESID(-1)/@SQRT(GARCH(-1)) + C(9)*LOG(GARCH(-1)) + C(10)
*LOG(GARCH(-2))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.052529	0.131536	-0.399347	0.6896
WT	-0.566903	0.088693	-6.391730	0.0000
AR(1)	0.628025	0.122073	5.144691	0.0000
AR(2)	-0.118736	0.052821	-2.247885	0.0246
MA(1)	-0.686344	0.114372	-6.001003	0.0000
Variance Equation				
C(6)	-0.462446	0.143228	-3.228747	0.0012
C(7)	0.210746	0.061094	3.449535	0.0006
C(8)	-0.110425	0.030202	-3.656214	0.0003
C(9)	0.440665	0.189057	2.330864	0.0198
C(10)	0.524584	0.182515	2.874195	0.0041

R-squared	0.076260	Mean dependent var	-0.000281
Adjusted R-squared	0.070212	S.D. dependent var	0.014451
S.E. of regression	0.013935	Akaike info criterion	-5.919170
Sum squared resid	0.118639	Schwarz criterion	-5.847364
Log likelihood	1833.104	Hannan-Quinn criter.	-5.891250
Durbin-Watson stat	1.939553		

Inverted AR Roots	.31-.14i	.31+.14i
Inverted MA Roots	.69	

ARIMAX-EGARCH (2,2)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:52
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 35 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*RESID(-1)
/@SQRT(GARCH(-1)) + C(10)*LOG(GARCH(-1)) + C(11)*LOG(GARCH(
-2))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.047701	0.131798	-0.361922	0.7174
WT	-0.560574	0.088769	-6.314988	0.0000
AR(1)	0.632852	0.123796	5.112067	0.0000
AR(2)	-0.119673	0.053160	-2.251209	0.0244
MA(1)	-0.688853	0.115067	-5.986521	0.0000
Variance Equation				
C(6)	-0.418008	0.162134	-2.578169	0.0099
C(7)	0.248072	0.099712	2.487893	0.0129
C(8)	-0.058265	0.114554	-0.508627	0.6110
C(9)	-0.104569	0.034916	-2.994846	0.0027
C(10)	0.545099	0.318982	1.708869	0.0875
C(11)	0.423417	0.309164	1.369554	0.1708

R-squared	0.076056	Mean dependent var	-0.000281
Adjusted R-squared	0.070008	S.D. dependent var	0.014451
S.E. of regression	0.013936	Akaike info criterion	-5.916512
Sum squared resid	0.118665	Schwarz criterion	-5.837526
Log likelihood	1833.286	Hannan-Quinn criter.	-5.885801
Durbin-Watson stat	1.944314		

Inverted AR Roots	.32+.14i	.32-.14i
Inverted MA Roots	.69	

ARIMAX-EGARCH (2,3)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:54
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 44 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*RESID(-1)
/@SQRT(GARCH(-1)) + C(10)*LOG(GARCH(-1)) + C(11)*LOG(GARCH(
-2)) + C(12)*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.076039	0.124518	-0.610665	0.5414
WT	-0.575128	0.078152	-7.359057	0.0000
AR(1)	0.703705	0.079500	8.851640	0.0000
AR(2)	-0.130009	0.046138	-2.817815	0.0048
MA(1)	-0.767714	0.067245	-11.41661	0.0000
Variance Equation				
C(6)	-0.811165	0.247531	-3.277030	0.0010
C(7)	0.293953	0.054594	5.384333	0.0000
C(8)	0.086757	0.041115	2.110105	0.0348
C(9)	-0.160007	0.028934	-5.529979	0.0000
C(10)	0.206674	0.025253	8.184145	0.0000
C(11)	-0.148804	0.020869	-7.130415	0.0000
C(12)	0.982360	0.022251	39.65510	0.0000

R-squared	0.075894	Mean dependent var	-0.000281
Adjusted R-squared	0.069844	S.D. dependent var	0.014451
S.E. of regression	0.013937	Akaike info criterion	-5.941509
Sum squared resid	0.118686	Schwarz criterion	-5.855342
Log likelihood	1841.985	Hannan-Quinn criter.	-5.908006
Durbin-Watson stat	1.921122		

Inverted AR Roots	.35+.08i	.35-.08i
Inverted MA Roots	.77	

ARIMAX-EGARCH (3,0)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:55
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 33 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*ABS(RESID(-3)
/@SQRT(GARCH(-3))) + C(10)*RESID(-1)/@SQRT(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.109083	0.096701	-1.128036	0.2593
WT	-0.578785	0.099169	-5.836342	0.0000
AR(1)	0.668528	0.082671	8.086568	0.0000
AR(2)	-0.137295	0.038497	-3.566424	0.0004
MA(1)	-0.708918	0.082010	-8.644309	0.0000
Variance Equation				
C(6)	-9.237464	0.087450	-105.6310	0.0000
C(7)	0.299546	0.064543	4.641034	0.0000
C(8)	0.095951	0.052231	1.837039	0.0662
C(9)	0.344817	0.063912	5.395207	0.0000
C(10)	-0.194316	0.042859	-4.533814	0.0000

R-squared	0.080283	Mean dependent var	-0.000281
Adjusted R-squared	0.074262	S.D. dependent var	0.014451
S.E. of regression	0.013904	Akaike info criterion	-5.817528
Sum squared resid	0.118122	Schwarz criterion	-5.745722
Log likelihood	1801.799	Hannan-Quinn criter.	-5.789609
Durbin-Watson stat	1.969887		

Inverted AR Roots	.33-.16i	.33+.16i
Inverted MA Roots	.71	

ARIMAX-EGARCH (3,1)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:57
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 34 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*ABS(RESID(-3)
/@SQRT(GARCH(-3))) + C(10)*RESID(-1)/@SQRT(GARCH(-1)) +
C(11)*LOG(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.046488	0.130787	-0.355451	0.7223
WT	-0.567702	0.087941	-6.455524	0.0000
AR(1)	0.621621	0.121695	5.108038	0.0000
AR(2)	-0.128042	0.050166	-2.552348	0.0107
MA(1)	-0.674355	0.113726	-5.929646	0.0000
Variance Equation				
C(6)	-0.370968	0.099030	-3.745996	0.0002
C(7)	0.221118	0.095835	2.307280	0.0210
C(8)	-0.235660	0.095428	-2.469511	0.0135
C(9)	0.172398	0.063149	2.730011	0.0063
C(10)	-0.079448	0.021421	-3.708954	0.0002
C(11)	0.971245	0.009643	100.7216	0.0000

R-squared	0.076238	Mean dependent var	-0.000281
Adjusted R-squared	0.070190	S.D. dependent var	0.014451
S.E. of regression	0.013935	Akaike info criterion	-5.918773
Sum squared resid	0.118642	Schwarz criterion	-5.839786
Log likelihood	1833.982	Hannan-Quinn criter.	-5.888061
Durbin-Watson stat	1.952901		

Inverted AR Roots	.31-.18i	.31+.18i
Inverted MA Roots	.67	

ARIMAX-EGARCH (3,2)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:58
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 40 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*ABS(RESID(-3)
/@SQRT(GARCH(-3))) + C(10)*RESID(-1)/@SQRT(GARCH(-1)) +
C(11)*LOG(GARCH(-1)) + C(12)*LOG(GARCH(-2))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.046790	0.129447	-0.361460	0.7178
WT	-0.571787	0.088052	-6.493779	0.0000
AR(1)	0.622911	0.123771	5.032754	0.0000
AR(2)	-0.126412	0.050850	-2.485951	0.0129
MA(1)	-0.676003	0.115822	-5.836548	0.0000
Variance Equation				
C(6)	-0.428432	0.177208	-2.417676	0.0156
C(7)	0.212772	0.098546	2.159121	0.0308
C(8)	-0.180402	0.139014	-1.297727	0.1944
C(9)	0.147502	0.080659	1.828709	0.0674
C(10)	-0.094652	0.035829	-2.641783	0.0082
C(11)	0.802411	0.369110	2.173906	0.0297
C(12)	0.164164	0.357647	0.459010	0.6462

R-squared	0.076297	Mean dependent var	-0.000281
Adjusted R-squared	0.070250	S.D. dependent var	0.014451
S.E. of regression	0.013934	Akaike info criterion	-5.916191
Sum squared resid	0.118634	Schwarz criterion	-5.830023
Log likelihood	1834.187	Hannan-Quinn criter.	-5.882687
Durbin-Watson stat	1.952409		

Inverted AR Roots	.31-.17i	.31+.17i
Inverted MA Roots	.68	

ARIMAX-EGARCH (3,3)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 01:59
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 60 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(6) + C(7)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(8)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(9)*ABS(RESID(-3)
/@SQRT(GARCH(-3))) + C(10)*RESID(-1)/@SQRT(GARCH(-1)) +
C(11)*LOG(GARCH(-1)) + C(12)*LOG(GARCH(-2)) + C(13)
*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ST	-0.058174	0.131969	-0.440818	0.6593
WT	-0.555657	0.084788	-6.553478	0.0000
AR(1)	0.657253	0.110145	5.967162	0.0000
AR(2)	-0.124273	0.045977	-2.702918	0.0069
MA(1)	-0.700665	0.100954	-6.940459	0.0000
Variance Equation				
C(6)	-0.979419	0.335344	-2.920638	0.0035
C(7)	0.271453	0.075318	3.604112	0.0003
C(8)	-0.155562	0.059056	-2.634121	0.0084
C(9)	0.270039	0.082216	3.284508	0.0010
C(10)	-0.176341	0.036415	-4.842557	0.0000
C(11)	0.503072	0.089344	5.630740	0.0000
C(12)	-0.353168	0.102526	-3.444680	0.0006
C(13)	0.771979	0.083497	9.245590	0.0000

R-squared	0.077347	Mean dependent var	-0.000281
Adjusted R-squared	0.071307	S.D. dependent var	0.014451
S.E. of regression	0.013926	Akaike info criterion	-5.936687
Sum squared resid	0.118499	Schwarz criterion	-5.843339
Log likelihood	1841.500	Hannan-Quinn criter.	-5.900391
Durbin-Watson stat	1.967873		

Inverted AR Roots	.33-.13i	.33+.13i
Inverted MA Roots	.70	

ARIMAX-EGARCH (1,0) tanpa *st* (suku bunga)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 02:42
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 21 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(5) + C(6)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(7)
*RESID(-1)/@SQRT(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WT	-0.501436	0.101300	-4.950007	0.0000
AR(1)	0.802824	0.060406	13.29046	0.0000
AR(2)	-0.078269	0.037502	-2.087071	0.0369
MA(1)	-0.854453	0.049994	-17.09125	0.0000
Variance Equation				
C(5)	-8.986905	0.063279	-142.0206	0.0000
C(6)	0.461670	0.069655	6.627955	0.0000
C(7)	-0.197425	0.047934	-4.118685	0.0000

R-squared	0.068549	Mean dependent var	-0.000281
Adjusted R-squared	0.063983	S.D. dependent var	0.014451
S.E. of regression	0.013981	Akaike info criterion	-5.785934
Sum squared resid	0.119629	Schwarz criterion	-5.735670
Log likelihood	1789.068	Hannan-Quinn criter.	-5.766390
Durbin-Watson stat	1.944219		

Inverted AR Roots	.69	.11
Inverted MA Roots	.85	

ARIMAX-EGARCH (1,2) tanpa *st* (suku bunga)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 02:43
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 20 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(5) + C(6)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(7)
*RESID(-1)/@SQRT(GARCH(-1)) + C(8)*LOG(GARCH(-1)) + C(9)
*LOG(GARCH(-2))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WT	-0.565518	0.088596	-6.383108	0.0000
AR(1)	0.624887	0.121214	5.155253	0.0000
AR(2)	-0.120188	0.052992	-2.268049	0.0233
MA(1)	-0.683805	0.113806	-6.008524	0.0000
Variance Equation				
C(5)	-0.476089	0.142095	-3.350500	0.0008
C(6)	0.213336	0.061090	3.492148	0.0005
C(7)	-0.111511	0.030471	-3.659581	0.0003
C(8)	0.440033	0.186252	2.362566	0.0181
C(9)	0.523923	0.179779	2.914260	0.0036

R-squared	0.072639	Mean dependent var	-0.000281
Adjusted R-squared	0.068093	S.D. dependent var	0.014451
S.E. of regression	0.013950	Akaike info criterion	-5.921944
Sum squared resid	0.119104	Schwarz criterion	-5.857319
Log likelihood	1832.959	Hannan-Quinn criter.	-5.896817
Durbin-Watson stat	1.946137		

Inverted AR Roots	.31-.15i	.31+.15i
Inverted MA Roots	.68	

ARIMAX-EGARCH (1,3) tanpa *st* (suku bunga)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 02:44
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 27 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(5) + C(6)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(7)
*RESID(-1)/@SQRT(GARCH(-1)) + C(8)*LOG(GARCH(-1)) + C(9)
*LOG(GARCH(-2)) + C(10)*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WT	-0.561681	0.082632	-6.797422	0.0000
AR(1)	0.674480	0.085557	7.883384	0.0000
AR(2)	-0.114397	0.047748	-2.395846	0.0166
MA(1)	-0.746197	0.073848	-10.10448	0.0000
Variance Equation				
C(5)	-0.778097	0.221913	-3.506311	0.0005
C(6)	0.315640	0.057467	5.492570	0.0000
C(7)	-0.176105	0.028063	-6.275434	0.0000
C(8)	0.243168	0.026238	9.267784	0.0000
C(9)	-0.160218	0.022148	-7.234088	0.0000
C(10)	0.855348	0.027346	31.27840	0.0000

R-squared	0.071487	Mean dependent var	-0.000281
Adjusted R-squared	0.066936	S.D. dependent var	0.014451
S.E. of regression	0.013959	Akaike info criterion	-5.944784
Sum squared resid	0.119252	Schwarz criterion	-5.872978
Log likelihood	1840.993	Hannan-Quinn criter.	-5.916864
Durbin-Watson stat	1.917286		

Inverted AR Roots	.34-.03i	.34+.03i
Inverted MA Roots	.75	

ARIMAX-EGARCH (2,3) tanpa *st* (suku bunga)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 02:45
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 34 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(5) + C(6)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(7)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(8)*RESID(-1)
/@SQRT(GARCH(-1)) + C(9)*LOG(GARCH(-1)) + C(10)*LOG(GARCH(
-2)) + C(11)*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WT	-0.580822	0.078827	-7.368280	0.0000
AR(1)	0.692610	0.079813	8.677862	0.0000
AR(2)	-0.132636	0.045361	-2.924029	0.0035
MA(1)	-0.758733	0.067995	-11.15873	0.0000
Variance Equation				
C(5)	-0.841075	0.245226	-3.429797	0.0006
C(6)	0.295831	0.055082	5.370708	0.0000
C(7)	0.086963	0.040927	2.124807	0.0336
C(8)	-0.161568	0.028639	-5.641636	0.0000
C(9)	0.203381	0.023400	8.691472	0.0000
C(10)	-0.149153	0.020020	-7.450074	0.0000
C(11)	0.882856	0.021837	40.42947	0.0000

R-squared	0.071090	Mean dependent var	-0.000281
Adjusted R-squared	0.066537	S.D. dependent var	0.014451
S.E. of regression	0.013962	Akaike info criterion	-5.943845
Sum squared resid	0.119303	Schwarz criterion	-5.864858
Log likelihood	1841.704	Hannan-Quinn criter.	-5.913133
Durbin-Watson stat	1.929451		

Inverted AR Roots	.35-.11i	.35+.11i
Inverted MA Roots	.76	

ARIMAX-EGARCH (3,1) tanpa *st* (suku bunga)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 02:47
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 24 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(5) + C(6)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(7)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(8)*ABS(RESID(-3)
/@SQRT(GARCH(-3))) + C(9)*RESID(-1)/@SQRT(GARCH(-1)) + C(10)
*LOG(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WT	-0.567709	0.087581	-6.482101	0.0000
AR(1)	0.618858	0.120889	5.119231	0.0000
AR(2)	-0.129263	0.050246	-2.572590	0.0101
MA(1)	-0.672462	0.113071	-5.947272	0.0000
Variance Equation				
C(5)	-0.378112	0.098540	-3.837154	0.0001
C(6)	0.225148	0.095844	2.349101	0.0188
C(7)	-0.239440	0.094998	-2.520464	0.0117
C(8)	0.173015	0.063121	2.741006	0.0061
C(9)	-0.080264	0.021700	-3.698788	0.0002
C(10)	0.970528	0.009435	102.8598	0.0000

R-squared	0.072946	Mean dependent var	-0.000281
Adjusted R-squared	0.068401	S.D. dependent var	0.014451
S.E. of regression	0.013948	Akaike info criterion	-5.921656
Sum squared resid	0.119065	Schwarz criterion	-5.849851
Log likelihood	1833.870	Hannan-Quinn criter.	-5.893737
Durbin-Watson stat	1.958180		

Inverted AR Roots	.31-.18i	.31+.18i
Inverted MA Roots	.67	

ARIMAX-EGARCH (3,3)

Dependent Variable: DSAHAM
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 02/26/16 Time: 02:48
Sample (adjusted): 4 619
Included observations: 616 after adjustments
Convergence achieved after 45 iterations
MA Backcast: 3
Presample variance: backcast (parameter = 0.7)
LOG(GARCH) = C(5) + C(6)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(7)
*ABS(RESID(-2)/@SQRT(GARCH(-2))) + C(8)*ABS(RESID(-3)
/@SQRT(GARCH(-3))) + C(9)*RESID(-1)/@SQRT(GARCH(-1)) + C(10)
*LOG(GARCH(-1)) + C(11)*LOG(GARCH(-2)) + C(12)*LOG(GARCH(-3))

Variable	Coefficient	Std. Error	z-Statistic	Prob.
WT	-0.560092	0.084273	-6.646195	0.0000
AR(1)	0.654281	0.108754	6.016173	0.0000
AR(2)	-0.124705	0.046152	-2.702035	0.0069
MA(1)	-0.700134	0.099638	-7.026789	0.0000
Variance Equation				
C(5)	-1.004557	0.334105	-3.006716	0.0026
C(6)	0.277134	0.075630	3.664327	0.0002
C(7)	-0.154803	0.059654	-2.594994	0.0095
C(8)	0.269500	0.083742	3.218203	0.0013
C(9)	-0.177472	0.036615	-4.846986	0.0000
C(10)	0.497494	0.089501	5.558543	0.0000
C(11)	-0.348288	0.102939	-3.383445	0.0007
C(12)	0.770388	0.082981	9.283961	0.0000

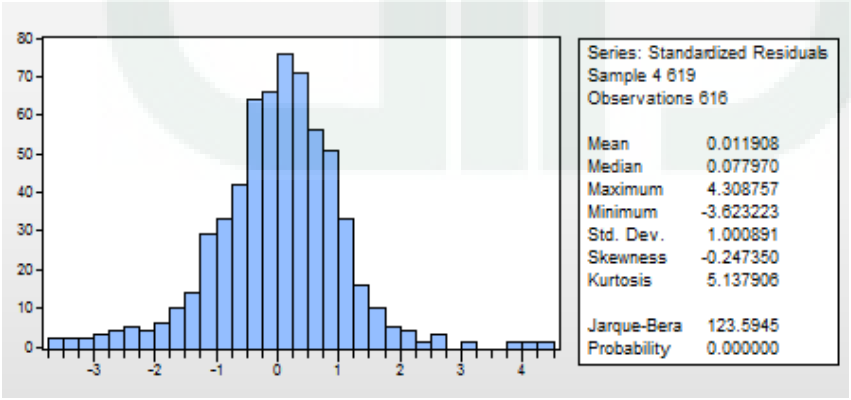
R-squared	0.073329	Mean dependent var	-0.000281
Adjusted R-squared	0.068786	S.D. dependent var	0.014451
S.E. of regression	0.013945	Akaike info criterion	-5.939459
Sum squared resid	0.119016	Schwarz criterion	-5.853292
Log likelihood	1841.353	Hannan-Quinn criter.	-5.905955
Durbin-Watson stat	1.972100		

Inverted AR Roots	.33-.13i	.33+.13i
Inverted MA Roots	.70	

Lampiran 7 : Pemeriksaan diagnosa untuk model ARIMAX-EGARCH

ARIMAX (2,1,1) – EGARCH (1,0)

Uji normalitas



Uji autokorelasi

Date: 02/26/16 Time: 03:01
Sample: 4 619
Included observations: 616
Q-statistic probabilities adjusted for 3 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.025	0.025	0.3727	
		2	0.020	0.020	0.6276	
		3	-0.054	-0.055	2.4374	
		4	0.029	0.031	2.9633	0.085
		5	0.066	0.067	5.6830	0.058
		6	0.057	0.050	7.7032	0.053
		7	0.024	0.022	8.0534	0.090
		8	-0.013	-0.010	8.1578	0.148
		9	0.066	0.068	10.879	0.092
		10	-0.045	-0.053	12.137	0.096
		11	-0.003	-0.014	12.144	0.145
		12	0.019	0.025	12.382	0.193
		13	-0.031	-0.043	13.004	0.223
		14	0.014	0.009	13.131	0.285
		15	-0.000	0.003	13.131	0.360
		16	-0.022	-0.025	13.436	0.415
		17	0.024	0.031	13.808	0.464
		18	-0.015	-0.019	13.947	0.530
		19	-0.039	-0.035	14.942	0.529
		20	-0.045	-0.039	16.217	0.509
		21	-0.018	-0.021	16.424	0.563

Uji homokedastisitas

Heteroskedasticity Test: ARCH

F-statistic	0.000406	Prob. F(1,613)	0.9839
Obs*R-squared	0.000407	Prob. Chi-Square(1)	0.9839

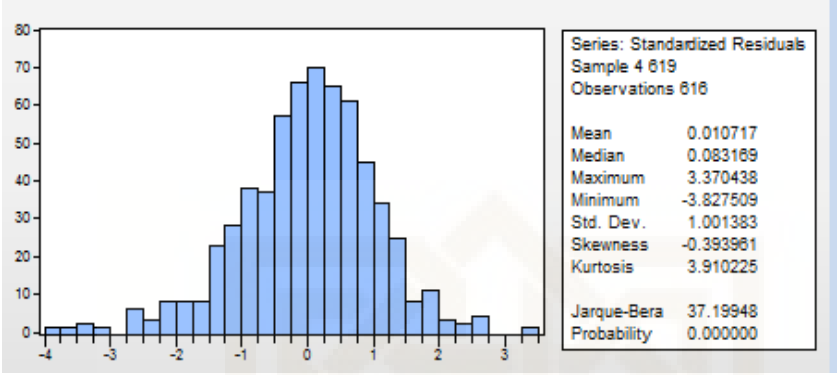
Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 02/26/16 Time: 03:02
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.001110	0.091538	10.93659	0.0000
WGT_RESID^2(-1)	0.000813	0.040388	0.020141	0.9839

R-squared	0.000001	Mean dependent var	1.001925
Adjusted R-squared	-0.001631	S.D. dependent var	2.034650
S.E. of regression	2.036308	Akaike info criterion	4.263401
Sum squared resid	2541.835	Schwarz criterion	4.277780
Log likelihood	-1308.996	Hannan-Quinn criter.	4.268992
F-statistic	0.000406	Durbin-Watson stat	2.000203
Prob(F-statistic)	0.983938		

Arimax(2,1,1) – egarch (1,2)

Uji normalitas



Uji autokorelasi

Date: 02/26/16 Time: 03:05
Sample: 4 619
Included observations: 616
Q-statistic probabilities adjusted for 3 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.000	0.000	9.E-05	
		2	0.013	0.013	0.1070	
		3	-0.004	-0.004	0.1178	
		4	0.028	0.028	0.6105	0.435
		5	-0.023	-0.023	0.9463	0.623
		6	-0.006	-0.006	0.9671	0.809
		7	0.090	0.091	6.0543	0.195
		8	-0.030	-0.031	6.6058	0.252
		9	-0.010	-0.012	6.6735	0.352
		10	-0.012	-0.011	6.7694	0.453
		11	0.040	0.035	7.7991	0.453
		12	-0.031	-0.026	8.4171	0.493
		13	-0.048	-0.049	9.8681	0.452
		14	0.051	0.045	11.505	0.402
		15	-0.021	-0.018	11.785	0.463
		16	-0.013	-0.011	11.895	0.536
		17	-0.023	-0.019	12.234	0.588
		18	0.003	-0.009	12.241	0.661
		19	-0.007	0.004	12.273	0.725
		20	0.020	0.027	12.520	0.768

Uji homokedastisitas

Heteroskedasticity Test: ARCH

F-statistic	8.57E-05	Prob. F(1,613)	0.9926
Obs*R-squared	8.59E-05	Prob. Chi-Square(1)	0.9926

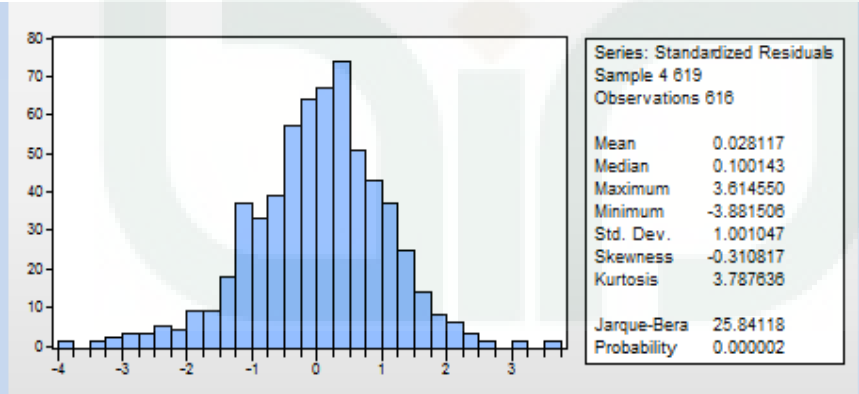
Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 02/26/16 Time: 03:06
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.002358	0.079857	12.55186	0.0000
WGT_RESID^2(-1)	0.000374	0.040389	0.009255	0.9926

R-squared	0.000000	Mean dependent var	1.002733
Adjusted R-squared	-0.001631	S.D. dependent var	1.705433
S.E. of regression	1.706824	Akaike info criterion	3.910392
Sum squared resid	1785.820	Schwarz criterion	3.924771
Log likelihood	-1200.446	Hannan-Quinn criter.	3.915983
F-statistic	8.57E-05	Durbin-Watson stat	1.999935
Prob(F-statistic)	0.992618		

ARIMAX (2,1,1) – EGARCH (1,3)

Uji normalitas



Uji autokorelasi

Date: 02/26/16 Time: 03:09
Sample: 4 619
Included observations: 616
Q-statistic probabilities adjusted for 3 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.015	-0.015	0.1380	
		2	0.067	0.066	2.8965	
		3	0.034	0.036	3.6109	
		4	-0.015	-0.019	3.7581	0.053
		5	0.002	-0.003	3.7611	0.153
		6	0.041	0.043	4.8225	0.185
		7	0.076	0.079	8.3954	0.078
		8	-0.016	-0.020	8.5538	0.128
		9	0.049	0.035	10.061	0.122
		10	0.011	0.011	10.137	0.181
		11	0.024	0.023	10.488	0.232
		12	0.021	0.015	10.765	0.292
		13	-0.049	-0.058	12.310	0.265
		14	0.038	0.030	13.242	0.278
		15	-0.010	-0.003	13.306	0.347
		16	-0.024	-0.033	13.684	0.396
		17	-0.016	-0.024	13.856	0.460

Uji homokedastisitas

Heteroskedasticity Test: ARCH

F-statistic	0.136853	Prob. F(1,613)	0.7116
Obs*R-squared	0.137269	Prob. Chi-Square(1)	0.7110

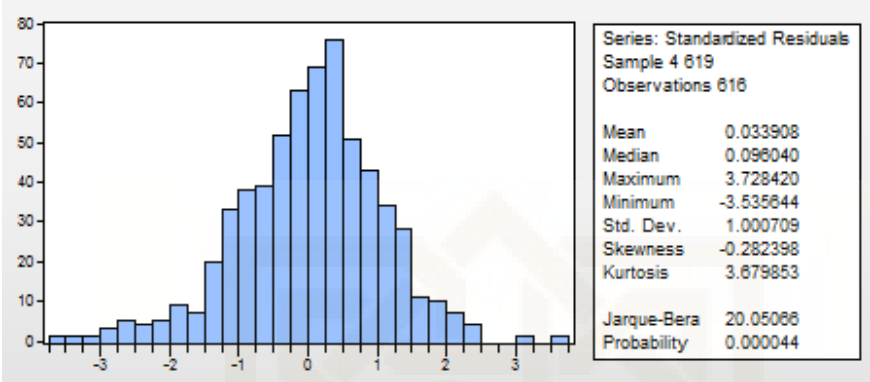
Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 02/26/16 Time: 03:09
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.017811	0.078381	12.98545	0.0000
WGT_RESID^2(-1)	-0.014939	0.040384	-0.369936	0.7116

R-squared	0.000223	Mean dependent var	1.002830
Adjusted R-squared	-0.001408	S.D. dependent var	1.663099
S.E. of regression	1.664269	Akaike info criterion	3.859896
Sum squared resid	1697.882	Schwarz criterion	3.874275
Log likelihood	-1184.918	Hannan-Quinn criter.	3.865487
F-statistic	0.136853	Durbin-Watson stat	1.997909
Prob(F-statistic)	0.711558		

ARIMAX (2,1,1) – EGARCH (2,3)

Uji normalitas



Uji Autokorelasi

Date: 02/26/16 Time: 03:12
Sample: 4 619
Included observations: 616
Q-statistic probabilities adjusted for 3 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.007	-0.007	0.0345	
		2	0.033	0.033	0.7071	
		3	0.020	0.021	0.9648	
		4	-0.008	-0.008	1.0007	0.317
		5	-0.011	-0.012	1.0750	0.584
		6	0.019	0.019	1.3013	0.729
		7	0.079	0.081	5.1960	0.268
		8	-0.024	-0.024	5.5553	0.352
		9	0.044	0.037	6.7608	0.344
		10	0.013	0.012	6.8621	0.443
		11	0.014	0.014	6.9769	0.539
		12	0.019	0.019	7.2159	0.615
		13	-0.047	-0.051	8.6045	0.570
		14	0.024	0.018	8.9695	0.625
		15	-0.005	-0.000	8.9885	0.704
		16	-0.028	-0.035	9.4879	0.735
		17	-0.021	-0.023	9.7674	0.779

Uji Homokedastisitas

Heteroskedasticity Test: ARCH

F-statistic	0.034181	Prob. F(1,613)	0.8534
Obs*R-squared	0.034290	Prob. Chi-Square(1)	0.8531

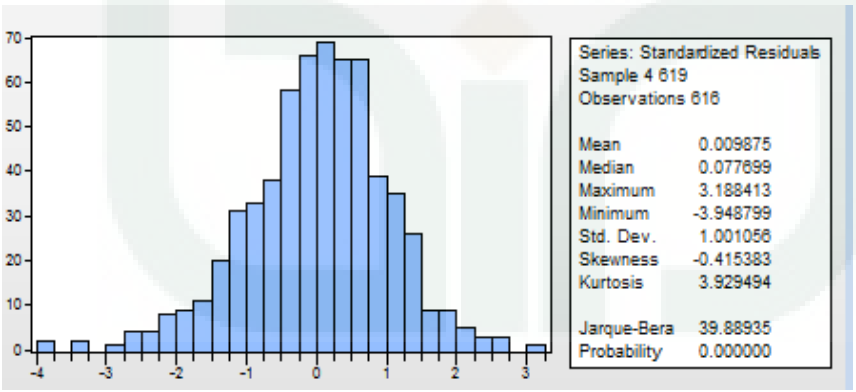
Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 02/26/16 Time: 03:12
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.010002	0.077189	13.08486	0.0000
WGT_RESID^2(-1)	-0.007467	0.040387	-0.184881	0.8534

R-squared	0.000056	Mean dependent var	1.002518
Adjusted R-squared	-0.001575	S.D. dependent var	1.628539
S.E. of regression	1.629821	Akaike info criterion	3.818064
Sum squared resid	1628.322	Schwarz criterion	3.832444
Log likelihood	-1172.055	Hannan-Quinn criter.	3.823656
F-statistic	0.034181	Durbin-Watson stat	1.999397
Prob(F-statistic)	0.853384		

ARIMAX (2,1,1) – EGARCH (3,1)

Uji Normalitas



Uji Autokorelasi

Date: 02/26/16 Time: 03:34
Sample: 4 619
Included observations: 616
Q-statistic probabilities adjusted for 3 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.006	0.006	0.0247	
		2	0.051	0.051	1.6391	
		3	-0.004	-0.005	1.6500	
		4	0.011	0.009	1.7275	0.189
		5	-0.025	-0.025	2.1184	0.347
		6	-0.005	-0.006	2.1350	0.545
		7	0.075	0.078	5.6449	0.227
		8	-0.033	-0.034	6.3258	0.276
		9	-0.011	-0.018	6.4013	0.380
		10	-0.019	-0.015	6.6228	0.469
		11	0.030	0.030	7.1958	0.516
		12	-0.036	-0.030	7.9902	0.535
		13	-0.041	-0.045	9.0735	0.525
		14	0.042	0.040	10.190	0.513
		15	-0.023	-0.016	10.526	0.570
		16	-0.011	-0.012	10.597	0.645
		17	-0.020	-0.017	10.861	0.697

Uji Homokedastisitas

Heteroskedasticity Test: ARCH

F-statistic	0.024503	Prob. F(1,613)	0.8757
Obs*R-squared	0.024582	Prob. Chi-Square(1)	0.8754

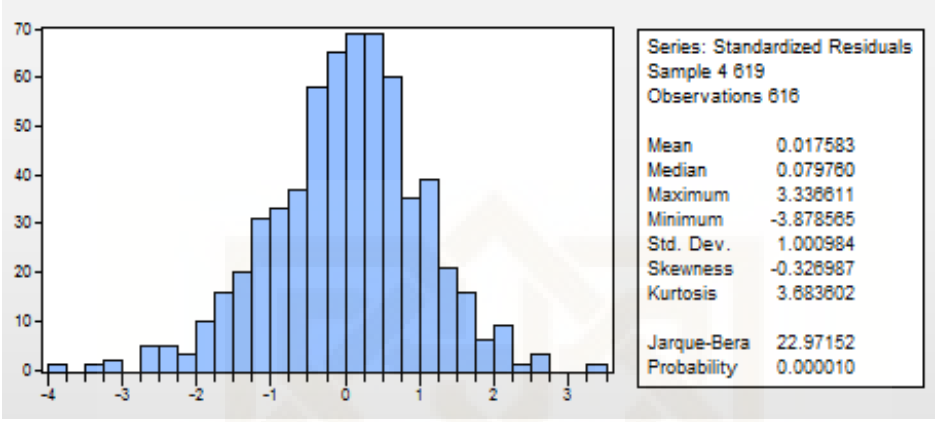
Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 02/26/16 Time: 03:35
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.995701	0.080004	12.44560	0.0000
WGT_RESID^2(-1)	0.006322	0.040389	0.156536	0.8757

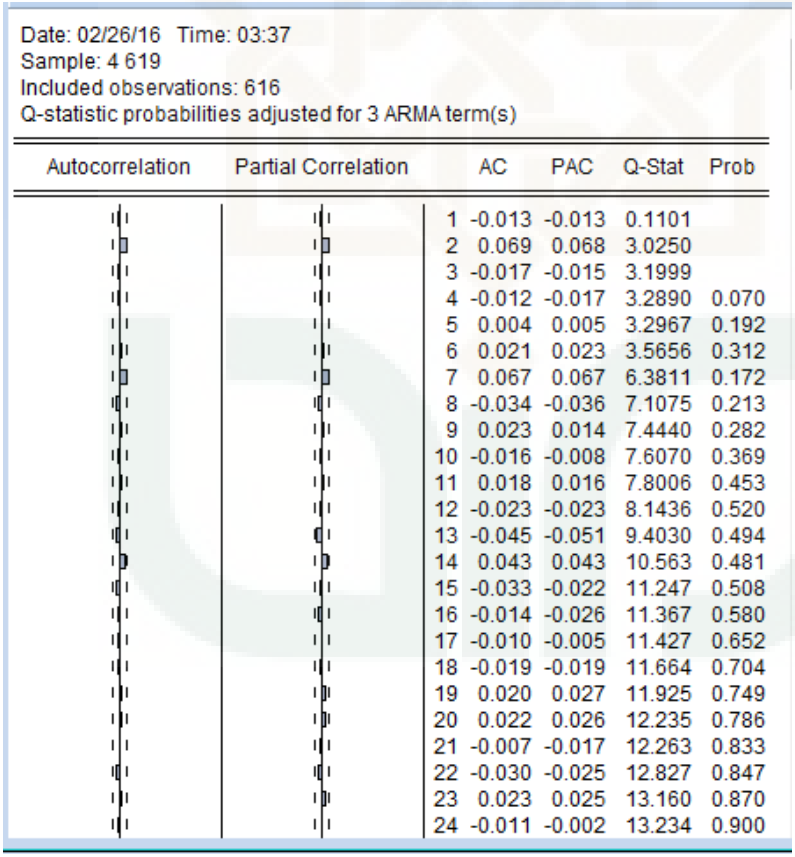
R-squared	0.000040	Mean dependent var	1.002036
Adjusted R-squared	-0.001591	S.D. dependent var	1.710120
S.E. of regression	1.711480	Akaike info criterion	3.915841
Sum squared resid	1795.578	Schwarz criterion	3.930221
Log likelihood	-1202.121	Hannan-Quinn criter.	3.921433
F-statistic	0.024503	Durbin-Watson stat	2.000577
Prob(F-statistic)	0.875662		

ARIMAX (2,1,1) – EGARCH (3,3)

Uji Normalitas



Uji Autokorelasi



Date: 02/26/16 Time: 03:37
Sample: 4 619
Included observations: 616
Q-statistic probabilities adjusted for 3 ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.013	-0.013	0.1101	
		2	0.069	0.068	3.0250	
		3	-0.017	-0.015	3.1999	
		4	-0.012	-0.017	3.2890	0.070
		5	0.004	0.005	3.2967	0.192
		6	0.021	0.023	3.5656	0.312
		7	0.067	0.067	6.3811	0.172
		8	-0.034	-0.036	7.1075	0.213
		9	0.023	0.014	7.4440	0.282
		10	-0.016	-0.008	7.6070	0.369
		11	0.018	0.016	7.8006	0.453
		12	-0.023	-0.023	8.1436	0.520
		13	-0.045	-0.051	9.4030	0.494
		14	0.043	0.043	10.563	0.481
		15	-0.033	-0.022	11.247	0.508
		16	-0.014	-0.026	11.367	0.580
		17	-0.010	-0.005	11.427	0.652
		18	-0.019	-0.019	11.664	0.704
		19	0.020	0.027	11.925	0.749
		20	0.022	0.026	12.235	0.786
		21	-0.007	-0.017	12.263	0.833
		22	-0.030	-0.025	12.827	0.847
		23	0.023	0.025	13.160	0.870
		24	-0.011	-0.002	13.234	0.900

Uji Homokedastisitas

Heteroskedasticity Test: ARCH

F-statistic	0.109191	Prob. F(1,613)	0.7412
Obs*R-squared	0.109528	Prob. Chi-Square(1)	0.7407

Test Equation:
Dependent Variable: WGT_RESID^2
Method: Least Squares
Date: 02/26/16 Time: 03:38
Sample (adjusted): 5 619
Included observations: 615 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.015511	0.077376	13.12439	0.0000
WGT_RESID^2(-1)	-0.013345	0.040385	-0.330440	0.7412

R-squared	0.000178	Mean dependent var	1.002139
Adjusted R-squared	-0.001453	S.D. dependent var	1.634313
S.E. of regression	1.635499	Akaike info criterion	3.825020
Sum squared resid	1639.688	Schwarz criterion	3.839399
Log likelihood	-1174.194	Hannan-Quinn criter.	3.830612
F-statistic	0.109191	Durbin-Watson stat	1.998149
Prob(F-statistic)	0.741180		

DAFTAR RIWAYAT HIDUP

Nama	: Fery Andri Istianto
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