

# **PERAMALAN SAHAM SYARIAH DENGAN MODEL ARIMAX-APARCH**

(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 – 29 April 2016)

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Setelah membaca, meneliti, memberikan petunjuk dan mengoreksi serta mengadakan perbaikan seperlunya, maka kami selaku pembimbing berpendapat bahwa skripsi Saudara:

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Menyatakan dengan sesungguhnya bahwa skripsi ini merupakan hasil pekerjaan penulis sendiri dan sepanjang pengetahuan penulis tidak berisi materi yang dipublikasikan atau ditulis orang lain, dan atau telah digunakan sebagai persyaratan penyelesaian Tugas Akhir di Perguruan Tinggi lain, kecuali bagian tertentu yang penulis ambil sebagai bahan acuan. Apabila terbukti pernyataan ini tidak benar, sepenuhnya menjadi tanggung jawab penulis.

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## HALAMAN PERSEMBAHAN

Karya kecil ini kupersembahkan untuk

Orang Tuaku Tercinta

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Serta Adik ku dan Kakak ku

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## MOTTO

**“Anglaras ilining banyu, angeli nanging ora keli”**

**(Sunan Kalijaga)**

**\*\*\***

**“Kita tidak bisa mengubah hati orang lain untuk berbaik sangka kepada kita, tapi kita bisa melatih hati kita untuk berbaik sangka kepada orang lain”**

**\*\*\***

**“Yang penting bukan apakah kita menang atau kalah, tuhan tidak mewajibkan manusia untuk menang, sehingga kalahpun bukan dosa. Yang penting apakah seseorang berjuang atau tidak berjuang” (Cak Nun)**

**\*\*\***

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## ABSTRAK

### PERAMALAN SAHAM SYARIAH DENGAN MODEL ARIMAX-APARCH

(Studi Kasus: Harga Penutupan Indeks Harga Saham Harian *Jakarta Islamic Index* (JII), Suku Bunga Bank Indonesia (BI), Inflasi, dan Kurs Dolar (USD)  
Periode 4 Maret 2013 – 29 April 2016)

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Bentuk investasi yang banyak diminati kebanyakan investor adalah investasi saham di pasar modal. Kegiatan dalam berinvestasi perlu memperhatikan prediksi harga saham pada waktu yang akan datang untuk mengetahui besar keuntungan yang akan diperoleh dengan membeli saham tersebut. Perubahan volatilitas harga saham terjadi setiap hari yang dipengaruhi oleh berbagai faktor. Serta perubahan volatilitas saham yang tidak *konstan* dan data saham yang tidak simetris (asimetris). Oleh karena itu, 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 pada data *time series* adalah ARIMA. Sementara model ARIMAX-APARCH merupakan model yang digunakan untuk menganalisis data runtun waktu yang bersifat heteroskedastisitas dan asimetris.

Penelitian ini membahas peramalan saham syariah dengan model ARIMAX-APARCH. Langkah-langkah pada peramalan saham syariah dengan model ARIMAX-APARCH 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 APARCH, menguji diagnostik model APARCH, dan melakukan peramalan dengan model ARIMAX-APARCH. Adapun data yang digunakan adalah data harga penutupan indeks harga saham harian *Jakarta Islamic Index* (JII) periode 4 Maret 2013 – 29 April 2016 sebagai variabel *dependent*, data suku bunga, inflasi, dan kurs dolar periode 4 Maret 2013 – 29 April 2016 sebagai variabel eksogen dari model ARIMAX.

Hasil dari penelitian ini menunjukkan bahwa model ARIMAX(2,1,1)-APARCH(1,1) adalah model terbaik untuk meramalkan data yang dipilih berdasarkan kriteria pemilihan model terbaik dengan MAPE 0,0840%.

**Kata Kunci :** Peramalan (*forecasting*), Data *Time Series*, ARIMAX(p,d,q), *Heterocedasticity*, Asimetris, APARCH(p,q).

# **BAB I**

## **PENDAHULUAN**

### **1.1. Latar Belakang Masalah**

Pada saat ini telah terjadi globalisasi di bidang ekonomi yang telah menyebabkan berkembangnya sistem perekonomian ke arah yang lebih terbuka antar negara, yang membawa suatu dampak terjadinya perdagangan internasional antar negara-negara didunia. Banyak investor dari belahan dunia berinvestasi diberbagai bidang usaha. Investasi merupakan bentuk kegiatan penanaman modal yang dilakukan oleh investor, baik investor asing maupun domestik dalam berbagai bidang usaha yang terbuka untuk investasi, dengan tujuan memperoleh manfaat (keuntungan) dikemudian hari (Salim dan Sutrisno, 2008).

Jenis-jenis investasi dapat digolongkan berdasarkan asset, pengaruh, menurut sumbernya dan bentuknya. Investasi berdasarkan *asset*, merupakan penggolongan investasi dari aspek modal atau kekayaan. Investasi berdasarkan asset dibagi menjadi 2 (dua) jenis, yaitu *real asset* dan *financial asset*. Investasi *real asset* seperti gedung-gedung, kendaraan, perkebunan, perikanan dan lain sebagainya. Sedangkan investasi *financial asset* seperti dokumen (surat-surat) klaim tidak langsung dari pemegangannyaterhadap aktifitas riil pihak yang menerbitkan sekuritas tersebut. Jenis investasi berdasarkan menurut pengaruhnya merupakan investasi yang didasarkan pada faktor-faktor yang mempengaruhinya atau tidak berpengaruh dari kegiatan investasi. Investasi ini dapat dibagi menjadi 2 (dua) jenis, yaitu autonomus dan induces. Investasi autonomus seperti pembelian

surat-surat berharga. Sedangkan investasi induces seperti penghasilan transitori. Jenis investasi berdasarkan sumber pembiayaannya merupakan investasi yang didasarkan pada asal usul investasi yang diperoleh. jenis investasi berdasarkan bentuknya adalah investasi yang didasarkan pada cara menanamkan investasinya. Jenis investasi ini dapat dibagi menjadi dua macam, yaitu investasi portofolio dan investasi langsung. Investasi portofolio dilakukan melalui pasar modal dengan instrumen surat berharga, contohnya seperti saham dan obligai. Investasi langsung merupakan bentuk investasi yang dilakukan dengan membangun, membeli total suatu perusahaan (Salim HS dan Budi Sutrisno, 2008).

Bentuk investasi yang baru-baru ini atau yang lagi *trend*, yang banyak diminati kebanyakan investor adalah investasi saham dipasar modal. Di indonesia, terdapat sekumpulan saham perusahaan yang memenuhi kriteria investasi berdasarkan syariah yang tergabung dalam *Jakarta Islamic Index* (JII). Pada permasalahan dalam saham ketika kita tidak mengetahui prediksi atau kira-kira harga suatu saham yang akan dibeli maupun dijual pada waktu yang akan datang, maka kita tidak bisa mengetahui keuntungan dan kerugian yang akan kita dapatkan diwaktu yang akan datang, sehingga data masa lampau (sebelumnya) merupakan suatu data yang penting guna memprediksi data masa datang (yang akan datang). Dalam ilmu statistik prediksi data yang akan datang dengan menggunakan data sekarang atau data masa lampau disebut dengan peramalan. Dengan tujuan untuk mengetahui keuntungan dan kerugian atau resiko dalam memprediksi data yang akan datang.

Menurut Makridakis (1999), 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 runtun waktu, sedangkan model multivariat lebih dari satu variabel runtun waktu. Model *time series* yang paling populer dan banyak digunakan dalam peramalan data *time series* univariat adalah model *Autoregressive Integrated Moving Average* atau dikenal dengan model ARIMA (p,d,q) (Makridakis,1999).

Pada perkembangan data runtun waktu (*time series*), muncul perkembangan dari model ARIMA yaitu ARIMAX. Model ARIMAX adalah model ARIMA dengan X adalah variabel eksogen, dimana variabel eksogen yang mempengaruhi data *time series* bukan hanya dari T (waktu) melainkan dari unsur lain seperti, kurs dollar, inflasi dll. 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 stasioner dalam mean dan mempunyai variansi yang konstan (Box dan Jenkins, 1976). Data yang mempunyai volatilitas yang tinggi sangat beresiko untuk digunakan dalam melakukan peramalan.

Praktek pemodelan ARIMA atau ARIMAX pada suatu data saham atau data ekonomi sering kali data tidak simetris (asimetris). Pada tahun 1993, Ding, Granger dan Engle telah mengembangkan suatu model yang digunakan untuk memperbaiki kelemahan dari model ARCH dan GARCH dalam menangkap fenomena ketidak simetrisan (*asymmetric shock*) *good news* dan *bad news* dalam volatilitas yaitu *Asymmetric Power Autoregressive Conditional Heteroscedasticity* (APARCH). Ide pokok pada model APARCH adalah mengganti pangkat kedua order dari *error* dalam bentuk yang fleksibel dan mempunyai koefisien *asymmetric* pada perbedaan efek *good news* dan *bad news*. Sifat asimetris artinya menampakkan reaksi yang berbeda pada peningkatan harga maupun penurunan harga yang disebut *leverage effect*. *Bad news* berarti informasi akan berdampak negatif terhadap pergerakan volatilitas yaitu penurunan nilai volatilitas, contohnya kenaikan drastis harga bahan bakar dan kenaikan inflasi yang tajam. *Good news* berarti informasi akan berdampak positif terhadap pergerakan volatilitas yaitu kenaikan nilai volatilitas, contohnya kenaikan tajam penjualan, penurunan suku bunga kredit dan perluasan usaha.

Dari latar belakang di atas maka peneliti mengambil judul tentang **“Peramalan Saham Syariah dengan Model *Autoregressive Integrated Moving Average X* (Eksogen) – *Asyymmetric Power Autoregressive Conditional Heteroscedasticity* (ARIMAX – APARCH)”**.

## 1.2. Batasan Masalah

Pada penelitian ini terdapat beberapa batasan-batasan yang akan diteliti. Adanya pembatasan masalah sangatlah perlu dilakukan dengan tujuan agar pokok pembahasan yang diteliti tidak terlalu melebar dari yang sudah ditentukan atau hal yang akan dibahas. Peneliti hal ini membatasi masalah sebagai berikut:

1. Estimasi parameter menggunakan metode kuadrat terkecil atau *least square* dan *maximum likelihood*.
2. Objek yang akan diteliti adalah data dari indeks harga saham syariah di *Jakarta Islamic Index (JII)* dengan data kurs dollar, inflasi, dan suku bunga sebagai variabel eksogennya.
3. Menggunakan bantuan software E-Views dan Ms.Excel.

## 1.3. Rumusan Masalah

Berdasarkan penjabaran di atas, diambil rumusan masalah yang akan dikaji dalam penelitian ini adalah:

1. Bagaimana langkah-langkah peramalan saham syariah dengan model ARIMAX-APARCH ?
2. Bagaimana bentuk model terbaik ARIMAX-APARCH untuk meramalkan saham syariah pada indeks harga saham *Jakarta Islamic Index (JII)* ?
3. Bagaimana hasil peramalan dengan model ARIMAX-APARCH untuk saham syariah pada indeks harga saham *Jakarta Islamic Index (JII)*?

#### **1.4. Tujuan Penelitian**

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

1. Untuk mengetahui langkah-langkah peramalan saham syariah pada indeks harga saham JII dengan menggunakan model ARIMAX-APARCH.
2. Untuk mengetahui model terbaik ARIMAX-APARCH dalam meramalkan harga saham syariah pada indeks harga saham JII.
3. Untuk mengetahui penerapan model ARIMAX-APARCH dalam meramalkan harga saham syariah pada indeks harga saham JII.

#### **1.5. Manfaat Penelitian**

Dalam penelitian ini, manfaat yang dapat diambil bagi investor, peneliti (penulis) dan manfaat bagi prodi matematika sebagai berikut:

1. Manfaat bagi investor

Hasil dari penelitian ini diharapkan dapat dijadikan informasi dan masukan terhadap investor dalam meramalkan harga saham ataupun mengambil keputusan investasi dalam saham syariah pada indeks harga saham JII di pasar modal.

2. Manfaat bagi peneliti

Hasil dari penelitian ini bisa menjadi tambahan pengetahuan tentang peramalan saham syariah pada indeks harga saham JII dan menambah pengetahuan tentang aplikasi Matematika dan penerapannya khususnya Statistika.



### 3. Manfaat bagi prodi matematika

Hasil dari penelitian ini bisa dijadikan tolak ukur sejauh mana kemampuan mahasiswa dalam menerapkan teori matematika selama diperkuliahan khususnya dibidang statistika.

## 1.6. Tinjauan Pustaka

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

**Tabel 1.1** Tinjauan Pustaka

| No. | Nama Peneliti          | Judul  | Model              | Obyek  |
|-----|------------------------|--|--------------------|--|
| 1.  | Dewi Nur<br>Samsiah    | Analisis data runtun waktu menggunakan model ARIMA (p,d,q) dengan studi kasus data pendapatan pajak kendaraan bermotor diprovinsi DIY. | ARIMA(p,d,q)       | Data pajak kendaraan bermotor diprovinsi DIY |
| 2.  | Cindy Wahyu<br>Elvitra | Metode peramalan dengan menggunakan volatilitas Asymmetric Power ARCH  | Volatilitas APARCH | Data Kurs dollar                             |

|    |                         |  |                     |   |
|----|-------------------------|--|---------------------|---|
|    |                         | (APARCH) dengan studi kasus data return nilai tukar rupiah terhadap mata uang dollar.                                      |                     |   |
| 3. | Alvan<br>Pratama<br>A.L | Peramalan data runtun waktu dengan model ARIMAX-GARCH dalam pasar modal syariah dengan studi kasus harga indeks saham JII. | ARIMAX dan<br>GARCH | Harga indeks saham Jakarta Islamic Indeks (JII) |

Terdapat kesamaan dan perbedaan antara tiga peneliti diatas dengan peneliti (penulis) yang sekarang, baik dari dari segi studi kasus yang diteliti maupun model yang digunakan. Pada penelitian yang dilakukan oleh Alvan Pratama A.L, banyak kesamaan dari segi studi kasus atau objek maupun model, tapi pada model variansnya beda yang sama model peramalannya yaitu dengan metode ARIMAX. Pada peneliti Cindy Wahyu Elvitra studi kasus atau objek yang diteliti berbeda, model yang digunakan sama yaitu model APARCH. Sedangkan pada penelitian Dewi Nur Samsiah, objek atau studi kasus yang diteliti berbeda dan model yang digunakan juga berbeda tetapi merupakan asal dari model ARIMAX, yaitu ARIMA yang dikembangkan dengan tambahan X sebagai variabel eksogen.

## **1.7. Sistematika Penulisan**

Secara garis besar gambaran mengenai peramalan saham syariah dengan model ARIMAX-APARCH pada skripsi ini terdiri dari:

### **BAB I : PENDAHULUAN**

Dalam bab ini membahas tentang latar belakang masalah, batasan masalah, rumusan masalah, tujuan penelitian, manfaat penelitian, tinjauan pustaka dan sistematika penulisan.

### **BAB II : LANDASAN TEORI**

Dalam bab ini membahas tentang teori yang menunjang pembahasan dalam penelitian ini, yaitu peramalan saham syariah dengan model ARIMAX-APARCH.

### **BAB III : METODE PENELITIAN**

Dalam bab ini membahas berbagai penjelasan mengenai proses pelaksanaan penelitian ini, mulai dari sumber data dan jenisnya, metode pengumpulan data, variabel penelitian, metodologi penelitian, metode analisis data dan alat pengolahan data.

### **BAB IV : PEMBAHASAN**

Dalam bab ini membahas mengenai model peramalan saham syariah dengan model ARIMAX-APARCH serta estimasi parameter yang terdapat dalam model ARIMAX-APARCH.

## BAB V : STUDI KASUS

Dalam bab ini membahas tentang penerapan dan aplikasi peramalan saham syariah dengan model ARIMAX-APARCH pada data indeks saham syariah JII dan interpretasi terhadap hasil yang diperoleh.

## BAB VI : KESIMPULAN DAN SARAN

Dalam bab ini berisi tentang kesimpulan yang dapat diambil dari pembahasan permasalahan yang ada dan saran-saran yang membangun dari dosen penguji serta berkaitan dengan penelitian sejenis untuk penelitian berikutnya.

## **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-APARCH yaitu menguji kestasioneran data, mengidentifikasi model ARIMAX, mengestimasi model ARIMAX, menguji diagnostik model ARIMAX, mendeteksi unsur ARCH dan Asimetris data, estimasi model APARCH atau model ARIMAX-APARCH, menguji diagnostik model APARCH dengan mendeteksi kembali adanya unsur ARCH, menentukan model ARIMAX-APARCH terbaik hingga melakukan peramalan dengan menggunakan model terbaik terhadap data runtun waktu.
2. Berdasarkan hasil estimasi signifikansi, pemeriksaan diagnosa, uji asumsi klasik dan kriteria statistik atau MAPE diperoleh model terbaiknya yaitu model ARIMAX(2,1,1)-APARC(1,1), dengan persamaan sebagai berikut:

- Persamaan ARIMAX :

$$\begin{aligned} (1-\alpha_1 B^1 - \alpha_2 B^2)(1-B^1)^d Y_t &= (1+b_1 B^1) \varepsilon_t + s_t X_t \\ (1-(0,575806)B^1 - (-0,096074)B^2)(1-B^1)^1 Y_t &= (1+(-0,810551)B^1) \varepsilon_t + (-0,015314)S_t \\ (1-0,575806B^1 + 0,096074B^2) \Delta Y_t &= \varepsilon_t - (0,810551) \varepsilon_{t-1} - (0,015314)S_t \\ \Delta Y_t - (0,575806) \Delta Y_{t-1} + (0,096074) \Delta Y_{t-2} &= \varepsilon_t - (0,810551) \varepsilon_{t-1} - (0,015314)S_t \\ \Delta Y_t &= (0,575806) \Delta Y_{t-1} - (0,096074) \Delta Y_{t-2} + \varepsilon_t - (0,810551) \varepsilon_{t-1} - (0,015314)S_t \\ Y_t &= Y_{t-1} + (0,575806) \Delta Y_{t-1} - (0,096074) \Delta Y_{t-2} + \varepsilon_t - (0,810551) \varepsilon_{t-1} - (0,015314)S_t \end{aligned}$$

- Persamaan APARCH :

$$\sigma_t^2 = 0,093227 + 0,060434 (|\varepsilon_{t-1}| - (0,484619) \varepsilon_{t-1})^2 + (0,928225) \sigma_{t-1}^2$$

Setelah diketahui bahwa model ARIMAX(2,1,1)-APARCH(1,1) adalah merupakan 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-APARCH. Data hasil peramalan menunjukkan bahwa nilai indeks harga saham periode 4 Maret 2013 sampai 29 April 2016 cenderung lebih tinggi sedikit dibanding nilai aktual indeks harga saham. Dengan demikian model ARIMAX(2,1,1)-APARCH(1,1) cukup akurat untuk meramalkan indeks harga saham yang akan datang dengan nilai MAPE atau nilai kesalahan rata-rata sebesar 0,08340%.

## 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 hanya satu eksogen yang signifikan yaitu kurs dollar, sehingga dimungkinkan ada penelitian lebih lanjut dengan tiga variabel eksogen yang bisa signifikan semua.
3. Pemodelan ARIMAX-APARCH adalah pemodelan data runtun waktu menggunakan ARIMAX dan memodelkan variansi residualnya yang bersifat heteroskedastisitas dan asimetris menggunakan model APARCH, sehingga masih terbuka untuk dikembangkan dengan menggunakan pemodelan variansi residual yang lain, misalnya ARIMAX-TARCH, ARIMAX-GJR\_APARCH, Var ARIMAX-APARCH atau analisis *time series* lain yang lebih kompleks.

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## LAMPIRAN

### Lampiran 1 :

Data penutupan indeks harga saham JII, Data kurs dollar, Data Inflasi, dan Data Suku Bunga periode 4 Maret 2013 – 29 April 2016.

| Date      | Saham  | Kurs Beli Dollar | Inflasi | Suku Bunga BI |
|-----------|--------|------------------|---------|---------------|
| 3/4/2013  | 646.86 | 9,694.00         | 0.059   | 0.0575        |
| 3/5/2013  | 648.65 | 9,679.00         | 0.059   | 0.0575        |
| 3/6/2013  | 661.12 | 9,696.00         | 0.059   | 0.0575        |
| 3/7/2013  | 662.96 | 9,676.00         | 0.059   | 0.0575        |
| 3/8/2013  | 668.46 | 9,670.00         | 0.059   | 0.0575        |
| 3/11/2013 | 660.31 | 9,686.00         | 0.059   | 0.0575        |
| 3/13/2013 | 656.21 | 9,688.00         | 0.059   | 0.0575        |
| 3/14/2013 | 645.38 | 9,694.00         | 0.059   | 0.0575        |
| 3/15/2013 | 648.64 | 9,700.00         | 0.059   | 0.0575        |
| 3/18/2013 | 650.99 | 9,704.00         | 0.059   | 0.0575        |
| 3/19/2013 | 650.02 | 9,707.00         | 0.059   | 0.0575        |
| 3/21/2013 | 646.12 | 9,694.00         | 0.059   | 0.0575        |
| 3/22/2013 | 630.61 | 9,644.00         | 0.059   | 0.0575        |
| 3/26/2013 | 649.88 | 9,640.00         | 0.059   | 0.0575        |
| 3/27/2013 | 660.33 | 9,661.00         | 0.059   | 0.0575        |
| 3/28/2013 | 660.34 | 9,661.00         | 0.059   | 0.0575        |
| 4/1/2013  | 658.05 | 9,674.00         | 0.059   | 0.0575        |
| 4/2/2013  | 662.15 | 9,661.00         | 0.059   | 0.0575        |
| 4/3/2013  | 669.78 | 9,674.00         | 0.059   | 0.0575        |
| 4/4/2013  | 659.34 | 9,660.00         | 0.0557  | 0.0575        |
| 4/5/2013  | 656.54 | 9,664.00         | 0.0557  | 0.0575        |
| 4/8/2013  | 655.31 | 9,679.00         | 0.0557  | 0.0575        |
| 4/9/2013  | 656.95 | 9,678.00         | 0.0557  | 0.0575        |
| 4/10/2013 | 653.38 | 9,667.00         | 0.0557  | 0.0575        |
| 4/11/2013 | 660.09 | 9,672.00         | 0.0557  | 0.0575        |
| 4/12/2013 | 660.7  | 9,672.00         | 0.0557  | 0.0575        |

|           |        |          |        |        |
|-----------|--------|----------|--------|--------|
| 4/15/2013 | 655.73 | 9,673.00 | 0.0557 | 0.0575 |
| 4/16/2013 | 667.89 | 9,681.00 | 0.0557 | 0.0575 |
| 4/17/2013 | 673    | 9,679.00 | 0.0557 | 0.0575 |
| 4/18/2013 | 674.02 | 9,691.00 | 0.0557 | 0.0575 |
| 4/19/2013 | 672.39 | 9,683.00 | 0.0557 | 0.0575 |
| 4/22/2013 | 674.38 | 9,692.00 | 0.0557 | 0.0575 |
| 4/23/2013 | 673.49 | 9,685.00 | 0.0557 | 0.0575 |
| 4/24/2013 | 678.95 | 9,689.00 | 0.0557 | 0.0575 |
| 4/25/2013 | 671.85 | 9,691.00 | 0.0557 | 0.0575 |
| 4/26/2013 | 664.64 | 9,686.00 | 0.0557 | 0.0575 |
| 4/29/2013 | 670.94 | 9,699.00 | 0.0557 | 0.0575 |
| 5/1/2013  | 682.85 | 9,701.00 | 0.0557 | 0.0575 |
| 5/2/2013  | 674.96 | 9,714.00 | 0.0557 | 0.0575 |
| 5/3/2013  | 665.41 | 9,711.00 | 0.0557 | 0.0575 |
| 5/6/2013  | 673.55 | 9,716.00 | 0.0547 | 0.0575 |
| 5/7/2013  | 677.04 | 9,716.00 | 0.0547 | 0.0575 |
| 5/8/2013  | 683.67 | 9,725.00 | 0.0547 | 0.0575 |
| 5/10/2013 | 684.84 | 9,723.00 | 0.0547 | 0.0575 |
| 5/13/2013 | 679.32 | 9,743.00 | 0.0547 | 0.0575 |
| 5/14/2013 | 682.21 | 9,761.00 | 0.0547 | 0.0575 |
| 5/15/2013 | 681.71 | 9,761.00 | 0.0547 | 0.0575 |
| 5/16/2013 | 681.49 | 9,762.00 | 0.0547 | 0.0575 |
| 5/17/2013 | 696.58 | 9,753.00 | 0.0547 | 0.0575 |
| 5/21/2013 | 703.32 | 9,762.00 | 0.0547 | 0.0575 |
| 5/22/2013 | 708.1  | 9,756.00 | 0.0547 | 0.0575 |
| 5/23/2013 | 694.79 | 9,758.00 | 0.0547 | 0.0575 |
| 5/24/2013 | 701.25 | 9,741.00 | 0.0547 | 0.0575 |
| 5/27/2013 | 685.35 | 9,757.00 | 0.0547 | 0.0575 |
| 5/29/2013 | 705.97 | 9,772.00 | 0.0547 | 0.0575 |
| 5/30/2013 | 690    | 9,807.00 | 0.0547 | 0.0575 |
| 5/31/2013 | 676.58 | 9,838.00 | 0.0547 | 0.0575 |
| 6/3/2013  | 665.63 | 9,837.00 | 0.0547 | 0.0575 |
| 6/4/2013  | 677.35 | 9,832.00 | 0.0547 | 0.0575 |
| 6/5/2013  | 674.4  | 9,868.00 | 0.0547 | 0.0575 |
| 6/7/2013  | 647.28 | 9,860.00 | 0.059  | 0.0575 |
| 6/10/2013 | 634.29 | 9,877.00 | 0.059  | 0.0575 |

|           |        |           |        |        |
|-----------|--------|-----------|--------|--------|
| 6/11/2013 | 608.88 | 9,910.00  | 0.059  | 0.0575 |
| 6/12/2013 | 635.1  | 9,881.00  | 0.059  | 0.0575 |
| 6/13/2013 | 618.57 | 9,898.00  | 0.059  | 0.0575 |
| 6/14/2013 | 640.22 | 9,889.00  | 0.059  | 0.0575 |
| 6/17/2013 | 642.79 | 9,887.00  | 0.059  | 0.0575 |
| 6/18/2013 | 649.35 | 9,879.00  | 0.059  | 0.06   |
| 6/19/2013 | 642.42 | 9,884.00  | 0.059  | 0.06   |
| 6/20/2013 | 618.39 | 9,890.00  | 0.059  | 0.06   |
| 6/21/2013 | 596.67 | 9,891.00  | 0.059  | 0.06   |
| 6/25/2013 | 583.4  | 9,895.00  | 0.059  | 0.06   |
| 6/27/2013 | 634.27 | 9,895.00  | 0.059  | 0.06   |
| 6/28/2013 | 660.16 | 9,910.00  | 0.059  | 0.06   |
| 7/1/2013  | 648.25 | 9,910.00  | 0.059  | 0.06   |
| 7/2/2013  | 640.97 | 9,920.00  | 0.059  | 0.06   |
| 7/3/2013  | 618.62 | 9,929.00  | 0.059  | 0.06   |
| 7/4/2013  | 619.17 | 9,930.00  | 0.0861 | 0.06   |
| 7/5/2013  | 626.55 | 9,974.00  | 0.0861 | 0.06   |
| 7/8/2013  | 601.22 | 9,986.00  | 0.0861 | 0.06   |
| 7/9/2013  | 597.7  | 9,990.00  | 0.0861 | 0.06   |
| 7/10/2013 | 614.08 | 10,009.00 | 0.0861 | 0.06   |
| 7/11/2013 | 633.03 | 10,020.00 | 0.0861 | 0.06   |
| 7/12/2013 | 636.97 | 10,018.00 | 0.0861 | 0.06   |
| 7/15/2013 | 637.7  | 10,171.00 | 0.0861 | 0.06   |
| 7/16/2013 | 637.51 | 10,211.00 | 0.0861 | 0.065  |
| 7/17/2013 | 641.93 | 10,212.00 | 0.0861 | 0.065  |
| 7/19/2013 | 646.65 | 10,214.00 | 0.0861 | 0.065  |
| 7/22/2013 | 637    | 10,219.00 | 0.0861 | 0.065  |
| 7/23/2013 | 651.96 | 10,226.00 | 0.0861 | 0.065  |
| 7/24/2013 | 642.41 | 10,227.00 | 0.0861 | 0.065  |
| 7/25/2013 | 635.18 | 10,237.00 | 0.0861 | 0.065  |
| 7/26/2013 | 629.95 | 10,237.00 | 0.0861 | 0.065  |
| 7/30/2013 | 627.13 | 10,237.00 | 0.0861 | 0.065  |
| 7/31/2013 | 623.75 | 10,236.00 | 0.0861 | 0.065  |
| 8/1/2013  | 630.93 | 10,241.00 | 0.0861 | 0.065  |
| 8/2/2013  | 630.16 | 10,246.00 | 0.0861 | 0.065  |
| 8/12/2013 | 622.95 | 10,266.00 | 0.0861 | 0.065  |

|           |        |           |        |        |
|-----------|--------|-----------|--------|--------|
| 8/13/2013 | 633.38 | 10,340.00 | 0.0879 | 0.065  |
| 8/14/2013 | 639.99 | 10,399.00 | 0.0879 | 0.065  |
| 8/15/2013 | 634.57 | 10,451.00 | 0.0879 | 0.065  |
| 8/16/2013 | 619.73 | 10,669.00 | 0.0879 | 0.065  |
| 8/19/2013 | 580.13 | 10,741.00 | 0.0879 | 0.065  |
| 8/20/2013 | 561.36 | 10,794.00 | 0.0879 | 0.065  |
| 8/21/2013 | 572.63 | 10,787.00 | 0.0879 | 0.065  |
| 8/22/2013 | 571.88 | 10,829.00 | 0.0879 | 0.065  |
| 8/23/2013 | 572.6  | 10,895.00 | 0.0879 | 0.065  |
| 8/26/2013 | 563    | 10,881.00 | 0.0879 | 0.065  |
| 8/27/2013 | 541.03 | 10,869.00 | 0.0879 | 0.065  |
| 8/28/2013 | 552.12 | 10,867.00 | 0.0879 | 0.065  |
| 8/29/2013 | 568.92 | 10,928.00 | 0.0879 | 0.065  |
| 8/30/2013 | 592    | 11,038.00 | 0.0879 | 0.065  |
| 9/2/2013  | 574.59 | 11,069.00 | 0.0879 | 0.065  |
| 9/3/2013  | 585.03 | 11,144.00 | 0.0879 | 0.07   |
| 9/4/2013  | 568.37 | 11,132.00 | 0.0879 | 0.07   |
| 9/5/2013  | 562.61 | 11,124.00 | 0.084  | 0.07   |
| 9/6/2013  | 569.3  | 11,381.00 | 0.084  | 0.07   |
| 9/9/2013  | 587.38 | 11,437.00 | 0.084  | 0.07   |
| 9/10/2013 | 611.05 | 11,338.00 | 0.084  | 0.07   |
| 9/11/2013 | 605.83 | 11,366.00 | 0.084  | 0.07   |
| 9/12/2013 | 600.72 | 11,394.00 | 0.084  | 0.07   |
| 9/13/2013 | 600.64 | 11,435.00 | 0.084  | 0.07   |
| 9/16/2013 | 627.06 | 11,222.00 | 0.084  | 0.07   |
| 9/17/2013 | 625.98 | 11,295.00 | 0.084  | 0.0725 |
| 9/18/2013 | 618.2  | 11,378.00 | 0.084  | 0.0725 |
| 9/19/2013 | 649.92 | 11,477.00 | 0.084  | 0.0725 |
| 9/20/2013 | 635.91 | 11,511.00 | 0.084  | 0.0725 |
| 9/23/2013 | 633.33 | 11,515.00 | 0.084  | 0.0725 |
| 9/24/2013 | 613.54 | 11,474.00 | 0.084  | 0.0725 |
| 9/25/2013 | 603.19 | 11,555.00 | 0.084  | 0.0725 |
| 9/26/2013 | 602.2  | 11,535.00 | 0.084  | 0.0725 |
| 9/27/2013 | 606.39 | 11,510.00 | 0.084  | 0.0725 |
| 9/30/2013 | 585.59 | 11,477.00 | 0.084  | 0.0725 |
| 10/1/2013 | 593.08 | 11,498.00 | 0.084  | 0.0725 |

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|------------|--------|-----------|--------|--------|
| 10/2/2013  | 600.63 | 11,474.00 | 0.084  | 0.0725 |
| 10/3/2013  | 605.54 | 11,480.00 | 0.084  | 0.0725 |
| 10/4/2013  | 600.5  | 11,482.00 | 0.0832 | 0.0725 |
| 10/7/2013  | 599.15 | 11,484.00 | 0.0832 | 0.0725 |
| 10/8/2013  | 606.51 | 11,418.00 | 0.0832 | 0.0725 |
| 10/9/2013  | 613.56 | 11,259.00 | 0.0832 | 0.0725 |
| 10/10/2013 | 618.04 | 11,294.00 | 0.0832 | 0.0725 |
| 10/11/2013 | 627.98 | 11,251.00 | 0.0832 | 0.0725 |
| 10/16/2013 | 622.05 | 11,296.00 | 0.0832 | 0.0725 |
| 10/17/2013 | 627.42 | 11,284.00 | 0.0832 | 0.0725 |
| 10/18/2013 | 633.92 | 11,202.00 | 0.0832 | 0.0725 |
| 10/21/2013 | 638.54 | 11,212.00 | 0.0832 | 0.0725 |
| 10/22/2013 | 623.21 | 11,086.00 | 0.0832 | 0.0725 |
| 10/23/2013 | 627.06 | 10,963.00 | 0.0832 | 0.0725 |
| 10/24/2013 | 632.29 | 11,021.00 | 0.0832 | 0.0725 |
| 10/25/2013 | 627.44 | 11,105.00 | 0.0832 | 0.0725 |
| 10/28/2013 | 629.89 | 11,178.00 | 0.0832 | 0.0725 |
| 10/29/2013 | 626.83 | 11,297.00 | 0.0832 | 0.0725 |
| 10/30/2013 | 628.41 | 11,332.00 | 0.0832 | 0.0725 |
| 10/31/2013 | 615.71 | 11,357.00 | 0.0832 | 0.0725 |
| 11/1/2013  | 603.51 | 11,332.00 | 0.0832 | 0.0725 |
| 11/4/2013  | 603.92 | 11,347.00 | 0.0832 | 0.0725 |
| 11/6/2013  | 609.59 | 11,429.00 | 0.0832 | 0.0725 |
| 11/7/2013  | 616.11 | 11,520.00 | 0.0837 | 0.0725 |
| 11/8/2013  | 615.63 | 11,586.00 | 0.0837 | 0.0725 |
| 11/11/2013 | 610.5  | 11,488.00 | 0.0837 | 0.0725 |
| 11/12/2013 | 604.55 | 11,503.00 | 0.0837 | 0.0725 |
| 11/13/2013 | 590.93 | 11,569.00 | 0.0837 | 0.0725 |
| 11/14/2013 | 599.4  | 11,551.00 | 0.0837 | 0.0725 |
| 11/15/2013 | 590.73 | 11,573.00 | 0.0837 | 0.075  |
| 11/18/2013 | 605.59 | 11,658.00 | 0.0837 | 0.075  |
| 11/19/2013 | 608.25 | 11,647.00 | 0.0837 | 0.075  |
| 11/20/2013 | 597.71 | 11,663.00 | 0.0837 | 0.075  |
| 11/21/2013 | 595.13 | 11,706.00 | 0.0837 | 0.075  |
| 11/22/2013 | 592.89 | 11,754.00 | 0.0837 | 0.075  |
| 11/25/2013 | 592.72 | 11,870.00 | 0.0837 | 0.075  |

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|------------|--------|-----------|--------|-------|
| 11/26/2013 | 573.57 | 11,917.00 | 0.0837 | 0.075 |
| 11/27/2013 | 580.2  | 11,886.00 | 0.0837 | 0.075 |
| 11/28/2013 | 578.91 | 11,771.00 | 0.0837 | 0.075 |
| 11/29/2013 | 579.87 | 11,900.00 | 0.0837 | 0.075 |
| 12/2/2013  | 591.92 | 11,958.00 | 0.0837 | 0.075 |
| 12/3/2013  | 584.71 | 11,900.00 | 0.0837 | 0.075 |
| 12/4/2013  | 577.39 | 11,896.00 | 0.0837 | 0.075 |
| 12/5/2013  | 573.88 | 11,925.00 | 0.0838 | 0.075 |
| 12/6/2013  | 569    | 11,945.00 | 0.0838 | 0.075 |
| 12/9/2013  | 576.23 | 11,965.00 | 0.0838 | 0.075 |
| 12/10/2013 | 587.52 | 12,021.00 | 0.0838 | 0.075 |
| 12/11/2013 | 586.11 | 12,044.00 | 0.0838 | 0.075 |
| 12/12/2013 | 575.66 | 12,043.00 | 0.0838 | 0.075 |
| 12/13/2013 | 568.15 | 12,090.00 | 0.0838 | 0.075 |
| 12/16/2013 | 560.75 | 12,130.00 | 0.0838 | 0.075 |
| 12/17/2013 | 567.51 | 12,184.00 | 0.0838 | 0.075 |
| 12/18/2013 | 572.12 | 12,185.00 | 0.0838 | 0.075 |
| 12/19/2013 | 579.32 | 12,154.00 | 0.0838 | 0.075 |
| 12/20/2013 | 575.8  | 12,199.00 | 0.0838 | 0.075 |
| 12/23/2013 | 572.59 | 12,209.00 | 0.0838 | 0.075 |
| 12/24/2013 | 578.14 | 12,128.00 | 0.0838 | 0.075 |
| 12/27/2013 | 578.64 | 12,181.00 | 0.0838 | 0.075 |
| 12/30/2013 | 585.11 | 12,165.00 | 0.0838 | 0.075 |
| 1/2/2014   | 596.15 | 12,169.00 | 0.0838 | 0.075 |
| 1/3/2014   | 585.64 | 12,201.00 | 0.0838 | 0.075 |
| 1/6/2014   | 579.93 | 12,168.00 | 0.0838 | 0.075 |
| 1/7/2014   | 572.29 | 12,202.00 | 0.0882 | 0.075 |
| 1/8/2014   | 576.41 | 12,136.00 | 0.0882 | 0.075 |
| 1/9/2014   | 574.28 | 11,987.00 | 0.0882 | 0.075 |
| 1/10/2014  | 582.38 | 12,017.00 | 0.0882 | 0.075 |
| 1/13/2014  | 601.81 | 12,056.00 | 0.0882 | 0.075 |
| 1/15/2014  | 609.9  | 12,066.00 | 0.0882 | 0.075 |
| 1/16/2014  | 606.82 | 12,049.00 | 0.0882 | 0.075 |
| 1/17/2014  | 603.06 | 12,061.00 | 0.0882 | 0.075 |
| 1/20/2014  | 608.32 | 12,088.00 | 0.0882 | 0.075 |
| 1/21/2014  | 609.11 | 12,112.00 | 0.0882 | 0.075 |

|           |        |           |        |       |
|-----------|--------|-----------|--------|-------|
| 1/22/2014 | 614.41 | 12,116.00 | 0.0882 | 0.075 |
| 1/23/2014 | 614.97 | 12,137.00 | 0.0882 | 0.075 |
| 1/24/2014 | 604.37 | 12,206.00 | 0.0882 | 0.075 |
| 1/27/2014 | 583.88 | 12,093.00 | 0.0882 | 0.075 |
| 1/28/2014 | 588.27 | 12,165.00 | 0.0882 | 0.075 |
| 1/29/2014 | 601.54 | 12,190.00 | 0.0882 | 0.075 |
| 1/30/2014 | 602.87 | 12,187.00 | 0.0882 | 0.075 |
| 2/3/2014  | 595.62 | 12,111.00 | 0.0882 | 0.075 |
| 2/4/2014  | 587.49 | 12,098.00 | 0.0882 | 0.075 |
| 2/5/2014  | 594.5  | 12,115.00 | 0.0882 | 0.075 |
| 2/6/2014  | 601.06 | 12,105.00 | 0.0775 | 0.075 |
| 2/7/2014  | 606.22 | 12,113.00 | 0.0775 | 0.075 |
| 2/10/2014 | 603.33 | 12,054.00 | 0.0775 | 0.075 |
| 2/11/2014 | 604.7  | 12,013.00 | 0.0775 | 0.075 |
| 2/12/2014 | 609.08 | 11,827.00 | 0.0775 | 0.075 |
| 2/13/2014 | 607.22 | 11,657.00 | 0.0775 | 0.075 |
| 2/14/2014 | 608.97 | 11,767.00 | 0.0775 | 0.075 |
| 2/17/2014 | 615.61 | 11,791.00 | 0.0775 | 0.075 |
| 2/18/2014 | 615.1  | 11,713.00 | 0.0775 | 0.075 |
| 2/19/2014 | 621.73 | 11,733.00 | 0.0775 | 0.075 |
| 2/20/2014 | 622.16 | 11,669.00 | 0.0775 | 0.075 |
| 2/21/2014 | 626.97 | 11,562.00 | 0.0775 | 0.075 |
| 2/24/2014 | 621.94 | 11,611.00 | 0.0775 | 0.075 |
| 2/25/2014 | 614.48 | 11,617.00 | 0.0775 | 0.075 |
| 2/26/2014 | 606.03 | 11,576.00 | 0.0775 | 0.075 |
| 2/27/2014 | 612.84 | 11,538.00 | 0.0775 | 0.075 |
| 2/28/2014 | 626.86 | 11,589.00 | 0.0775 | 0.075 |
| 3/3/2014  | 618.98 | 11,522.00 | 0.0775 | 0.075 |
| 3/4/2014  | 620.05 | 11,496.00 | 0.0775 | 0.075 |
| 3/5/2014  | 628    | 11,338.00 | 0.0775 | 0.075 |
| 3/6/2014  | 631    | 11,392.00 | 0.0732 | 0.075 |
| 3/7/2014  | 631.74 | 11,327.00 | 0.0732 | 0.075 |
| 3/10/2014 | 632.91 | 11,375.00 | 0.0732 | 0.075 |
| 3/11/2014 | 635.35 | 11,330.00 | 0.0732 | 0.075 |
| 3/12/2014 | 633.17 | 11,364.00 | 0.0732 | 0.075 |
| 3/13/2014 | 641.31 | 11,216.00 | 0.0732 | 0.075 |



|           |        |           |        |       |
|-----------|--------|-----------|--------|-------|
| 3/14/2014 | 661.74 | 11,226.00 | 0.0732 | 0.075 |
| 3/17/2014 | 663.86 | 11,256.00 | 0.0732 | 0.075 |
| 3/18/2014 | 651.32 | 11,350.00 | 0.0732 | 0.075 |
| 3/19/2014 | 655.45 | 11,374.00 | 0.0732 | 0.075 |
| 3/20/2014 | 634.17 | 11,327.00 | 0.0732 | 0.075 |
| 3/21/2014 | 636.55 | 11,300.00 | 0.0732 | 0.075 |
| 3/24/2014 | 637.79 | 11,351.00 | 0.0732 | 0.075 |
| 3/25/2014 | 632.44 | 11,381.00 | 0.0732 | 0.075 |
| 3/26/2014 | 636.48 | 11,347.00 | 0.0732 | 0.075 |
| 3/27/2014 | 635.02 | 11,215.00 | 0.0732 | 0.075 |
| 3/28/2014 | 640.41 | 11,246.00 | 0.0732 | 0.075 |
| 4/1/2014  | 657.09 | 11,253.00 | 0.0732 | 0.075 |
| 4/2/2014  | 655.27 | 11,253.00 | 0.0732 | 0.075 |
| 4/3/2014  | 658.53 | 11,226.00 | 0.0732 | 0.075 |
| 4/4/2014  | 653.27 | 11,252.00 | 0.0725 | 0.075 |
| 4/7/2014  | 667.22 | 11,285.00 | 0.0725 | 0.075 |
| 4/8/2014  | 666.52 | 11,393.00 | 0.0725 | 0.075 |
| 4/9/2014  | 666.52 | 11,387.00 | 0.0725 | 0.075 |
| 4/10/2014 | 643.15 | 11,377.00 | 0.0725 | 0.075 |
| 4/11/2014 | 653.28 | 11,381.00 | 0.0725 | 0.075 |
| 4/14/2014 | 659.71 | 11,361.00 | 0.0725 | 0.075 |
| 4/15/2014 | 659.78 | 11,373.00 | 0.0725 | 0.075 |
| 4/16/2014 | 657.86 | 11,429.00 | 0.0725 | 0.075 |
| 4/17/2014 | 663.59 | 11,532.00 | 0.0725 | 0.075 |
| 4/21/2014 | 663.52 | 11,550.00 | 0.0725 | 0.075 |
| 4/22/2014 | 664.13 | 11,543.00 | 0.0725 | 0.075 |
| 4/23/2014 | 664.14 | 11,510.00 | 0.0725 | 0.075 |
| 4/24/2014 | 663.18 | 11,531.00 | 0.0725 | 0.075 |
| 4/25/2014 | 663.21 | 11,474.00 | 0.0725 | 0.075 |
| 4/28/2014 | 650.32 | 11,479.00 | 0.0725 | 0.075 |
| 4/29/2014 | 645.25 | 11,453.00 | 0.0725 | 0.075 |
| 4/30/2014 | 647.67 | 11,453.00 | 0.0725 | 0.075 |
| 5/2/2014  | 646.25 | 11,469.00 | 0.0725 | 0.075 |
| 5/5/2014  | 648.25 | 11,566.00 | 0.0725 | 0.075 |
| 5/6/2014  | 647.04 | 11,505.00 | 0.0732 | 0.075 |
| 5/7/2014  | 651.73 | 11,478.00 | 0.0732 | 0.075 |

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|-----------|--------|-----------|--------|-------|
| 5/8/2014  | 652.8  | 11,467.00 | 0.0732 | 0.075 |
| 5/9/2014  | 655.95 | 11,430.00 | 0.0732 | 0.075 |
| 5/12/2014 | 662.47 | 11,358.00 | 0.0732 | 0.075 |
| 5/13/2014 | 661.05 | 11,294.00 | 0.0732 | 0.075 |
| 5/14/2014 | 672.6  | 11,384.00 | 0.0732 | 0.075 |
| 5/16/2014 | 680.63 | 11,449.00 | 0.0732 | 0.075 |
| 5/19/2014 | 678.08 | 11,457.00 | 0.0732 | 0.075 |
| 5/20/2014 | 660.08 | 11,502.00 | 0.0732 | 0.075 |
| 5/21/2014 | 664.78 | 11,575.00 | 0.0732 | 0.075 |
| 5/22/2014 | 672.51 | 11,555.00 | 0.0732 | 0.075 |
| 5/23/2014 | 672.11 | 11,553.00 | 0.0732 | 0.075 |
| 5/26/2014 | 671.82 | 11,681.00 | 0.0732 | 0.075 |
| 5/28/2014 | 673.96 | 11,747.00 | 0.0732 | 0.075 |
| 5/30/2014 | 656.83 | 11,751.00 | 0.0732 | 0.075 |
| 6/2/2014  | 658.9  | 11,815.00 | 0.0732 | 0.075 |
| 6/3/2014  | 662.61 | 11,764.00 | 0.0732 | 0.075 |
| 6/4/2014  | 661.62 | 11,731.00 | 0.067  | 0.075 |
| 6/5/2014  | 663.03 | 11,747.00 | 0.067  | 0.075 |
| 6/6/2014  | 666.4  | 11,744.00 | 0.067  | 0.075 |
| 6/9/2014  | 658.99 | 11,754.00 | 0.067  | 0.075 |
| 6/10/2014 | 669.18 | 11,722.00 | 0.067  | 0.075 |
| 6/11/2014 | 672.99 | 11,755.00 | 0.067  | 0.075 |
| 6/12/2014 | 666.65 | 11,804.00 | 0.067  | 0.075 |
| 6/13/2014 | 665.27 | 11,918.00 | 0.067  | 0.075 |
| 6/16/2014 | 655.9  | 11,856.00 | 0.067  | 0.075 |
| 6/17/2014 | 661.51 | 11,907.00 | 0.067  | 0.075 |
| 6/18/2014 | 658.05 | 11,911.00 | 0.067  | 0.075 |
| 6/19/2014 | 654.36 | 11,940.00 | 0.067  | 0.075 |
| 6/20/2014 | 652.97 | 11,967.00 | 0.067  | 0.075 |
| 6/23/2014 | 653.44 | 12,031.00 | 0.067  | 0.075 |
| 6/24/2014 | 654.65 | 12,042.00 | 0.067  | 0.075 |
| 6/25/2014 | 651.63 | 11,909.00 | 0.067  | 0.075 |
| 6/26/2014 | 656.69 | 11,739.00 | 0.067  | 0.075 |
| 6/27/2014 | 651.89 | 11,795.00 | 0.067  | 0.075 |
| 6/30/2014 | 655    | 11,903.00 | 0.067  | 0.075 |
| 7/1/2014  | 656.35 | 11,828.00 | 0.067  | 0.075 |

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|-----------|--------|-----------|--------|-------|
| 7/2/2014  | 663.86 | 11,728.00 | 0.067  | 0.075 |
| 7/3/2014  | 661.79 | 11,637.00 | 0.0453 | 0.075 |
| 7/4/2014  | 663.63 | 11,491.00 | 0.0453 | 0.075 |
| 7/7/2014  | 679.41 | 11,569.00 | 0.0453 | 0.075 |
| 7/8/2014  | 683.29 | 11,569.00 | 0.0453 | 0.075 |
| 7/10/2014 | 692.85 | 11,650.00 | 0.0453 | 0.075 |
| 7/11/2014 | 679.85 | 11,746.00 | 0.0453 | 0.075 |
| 7/14/2014 | 679.71 | 11,610.00 | 0.0453 | 0.075 |
| 7/15/2014 | 688.2  | 11,647.00 | 0.0453 | 0.075 |
| 7/16/2014 | 694.49 | 11,519.00 | 0.0453 | 0.075 |
| 7/17/2014 | 685.93 | 11,473.00 | 0.0453 | 0.075 |
| 7/18/2014 | 689.79 | 11,441.00 | 0.0453 | 0.075 |
| 7/21/2014 | 697.11 | 11,473.00 | 0.0453 | 0.075 |
| 7/22/2014 | 692.33 | 11,533.00 | 0.0453 | 0.075 |
| 7/23/2014 | 692.14 | 11,533.00 | 0.0453 | 0.075 |
| 7/24/2014 | 692.46 | 11,688.00 | 0.0453 | 0.075 |
| 7/25/2014 | 690.4  | 11,674.00 | 0.0453 | 0.075 |
| 8/4/2014  | 701.23 | 11,697.00 | 0.0453 | 0.075 |
| 8/5/2014  | 697.15 | 11,707.00 | 0.0453 | 0.075 |
| 8/6/2014  | 687.88 | 11,763.00 | 0.0399 | 0.075 |
| 8/7/2014  | 690.39 | 11,669.00 | 0.0399 | 0.075 |
| 8/8/2014  | 686.73 | 11,619.00 | 0.0399 | 0.075 |
| 8/11/2014 | 697.35 | 11,625.00 | 0.0399 | 0.075 |
| 8/12/2014 | 700.19 | 11,609.00 | 0.0399 | 0.075 |
| 8/13/2014 | 707.38 | 11,635.00 | 0.0399 | 0.075 |
| 8/14/2014 | 703.81 | 11,623.00 | 0.0399 | 0.075 |
| 8/15/2014 | 701.44 | 11,624.00 | 0.0399 | 0.075 |
| 8/18/2014 | 702.47 | 11,648.00 | 0.0399 | 0.075 |
| 8/19/2014 | 701.37 | 11,658.00 | 0.0399 | 0.075 |
| 8/20/2014 | 706.22 | 11,596.00 | 0.0399 | 0.075 |
| 8/21/2014 | 707.44 | 11,655.00 | 0.0399 | 0.075 |
| 8/22/2014 | 704.21 | 11,656.00 | 0.0399 | 0.075 |
| 8/25/2014 | 701.09 | 11,649.00 | 0.0399 | 0.075 |
| 8/26/2014 | 696    | 11,624.00 | 0.0399 | 0.075 |
| 8/27/2014 | 698.91 | 11,658.00 | 0.0399 | 0.075 |
| 8/28/2014 | 701.52 | 11,651.00 | 0.0399 | 0.075 |

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|------------|--------|-----------|--------|-------|
| 8/29/2014  | 691.13 | 11,675.00 | 0.0399 | 0.075 |
| 9/1/2014   | 699.5  | 11,722.00 | 0.0399 | 0.075 |
| 9/2/2014   | 703.05 | 11,701.00 | 0.0399 | 0.075 |
| 9/3/2014   | 707.22 | 11,711.00 | 0.0453 | 0.075 |
| 9/4/2014   | 702.23 | 11,663.00 | 0.0453 | 0.075 |
| 9/5/2014   | 702.85 | 11,695.00 | 0.0453 | 0.075 |
| 9/8/2014   | 707.98 | 11,723.00 | 0.0453 | 0.075 |
| 9/9/2014   | 698.21 | 11,772.00 | 0.0453 | 0.075 |
| 9/10/2014  | 688.65 | 11,772.00 | 0.0453 | 0.075 |
| 9/11/2014  | 683.32 | 11,816.00 | 0.0453 | 0.075 |
| 9/12/2014  | 688.68 | 11,843.00 | 0.0453 | 0.075 |
| 9/15/2014  | 691.6  | 11,848.00 | 0.0453 | 0.075 |
| 9/16/2014  | 691    | 11,970.00 | 0.0453 | 0.075 |
| 9/17/2014  | 699.09 | 11,925.00 | 0.0453 | 0.075 |
| 9/18/2014  | 702.72 | 11,912.00 | 0.0453 | 0.075 |
| 9/19/2014  | 704.71 | 11,927.00 | 0.0453 | 0.075 |
| 9/22/2014  | 702.42 | 11,916.00 | 0.0453 | 0.075 |
| 9/23/2014  | 696.19 | 11,887.00 | 0.0453 | 0.075 |
| 9/24/2014  | 692.53 | 11,947.00 | 0.0453 | 0.075 |
| 9/25/2014  | 695    | 12,059.00 | 0.0453 | 0.075 |
| 9/26/2014  | 687.63 | 12,151.00 | 0.0453 | 0.075 |
| 9/29/2014  | 689.48 | 12,127.00 | 0.0453 | 0.075 |
| 9/30/2014  | 687.62 | 12,075.00 | 0.0453 | 0.075 |
| 10/1/2014  | 682.39 | 12,083.00 | 0.0453 | 0.075 |
| 10/2/2014  | 661.7  | 12,151.00 | 0.0453 | 0.075 |
| 10/3/2014  | 658.99 | 12,129.00 | 0.0483 | 0.075 |
| 10/6/2014  | 665.12 | 12,180.00 | 0.0483 | 0.075 |
| 10/7/2014  | 671.01 | 12,129.00 | 0.0483 | 0.075 |
| 10/8/2014  | 659.35 | 12,146.00 | 0.0483 | 0.075 |
| 10/9/2014  | 662.82 | 12,141.00 | 0.0483 | 0.075 |
| 10/10/2014 | 655.99 | 12,134.00 | 0.0483 | 0.075 |
| 10/13/2014 | 647.24 | 12,168.00 | 0.0483 | 0.075 |
| 10/14/2014 | 650.34 | 12,146.00 | 0.0483 | 0.075 |
| 10/15/2014 | 652.77 | 12,161.00 | 0.0483 | 0.075 |
| 10/16/2014 | 651.98 | 11,981.00 | 0.0483 | 0.075 |
| 10/17/2014 | 663.57 | 11,933.00 | 0.0483 | 0.075 |

|            |        |           |        |        |
|------------|--------|-----------|--------|--------|
| 10/20/2014 | 662.62 | 11,966.00 | 0.0483 | 0.075  |
| 10/21/2014 | 661.88 | 11,974.00 | 0.0483 | 0.075  |
| 10/22/2014 | 668.13 | 12,005.00 | 0.0483 | 0.075  |
| 10/23/2014 | 671.07 | 11,982.00 | 0.0483 | 0.075  |
| 10/24/2014 | 666.41 | 12,097.00 | 0.0483 | 0.075  |
| 10/27/2014 | 658.7  | 12,102.00 | 0.0483 | 0.075  |
| 10/28/2014 | 652.62 | 12,104.00 | 0.0483 | 0.075  |
| 10/29/2014 | 667.8  | 12,022.00 | 0.0483 | 0.075  |
| 10/30/2014 | 666.81 | 12,044.00 | 0.0483 | 0.075  |
| 10/31/2014 | 670.44 | 12,069.00 | 0.0483 | 0.075  |
| 11/3/2014  | 670.19 | 12,032.00 | 0.0483 | 0.075  |
| 11/4/2014  | 664.45 | 12,118.00 | 0.0483 | 0.075  |
| 11/5/2014  | 665.43 | 12,088.00 | 0.0623 | 0.075  |
| 11/6/2014  | 662.14 | 12,077.00 | 0.0623 | 0.075  |
| 11/7/2014  | 654.02 | 12,102.00 | 0.0623 | 0.075  |
| 11/10/2014 | 649.65 | 12,144.00 | 0.0623 | 0.075  |
| 11/11/2014 | 661.68 | 12,130.00 | 0.0623 | 0.075  |
| 11/12/2014 | 663.92 | 12,145.00 | 0.0623 | 0.075  |
| 11/13/2014 | 665.7  | 12,132.00 | 0.0623 | 0.075  |
| 11/14/2014 | 665.84 | 12,085.00 | 0.0623 | 0.075  |
| 11/17/2014 | 668.51 | 12,063.00 | 0.0623 | 0.075  |
| 11/18/2014 | 675.76 | 12,100.00 | 0.0623 | 0.075  |
| 11/19/2014 | 678.64 | 12,100.00 | 0.0623 | 0.075  |
| 11/20/2014 | 672.59 | 12,061.00 | 0.0623 | 0.0775 |
| 11/21/2014 | 677.52 | 12,105.00 | 0.0623 | 0.0775 |
| 11/24/2014 | 686.49 | 12,099.00 | 0.0623 | 0.0775 |
| 11/25/2014 | 680.1  | 12,118.00 | 0.0623 | 0.0775 |
| 11/26/2014 | 681.6  | 12,135.00 | 0.0623 | 0.0775 |
| 11/27/2014 | 684.71 | 12,203.00 | 0.0623 | 0.0775 |
| 11/28/2014 | 683.02 | 12,215.00 | 0.0623 | 0.0775 |
| 12/1/2014  | 685.4  | 12,234.00 | 0.0623 | 0.0775 |
| 12/2/2014  | 685.92 | 12,256.00 | 0.0623 | 0.0775 |
| 12/3/2014  | 681.74 | 12,235.00 | 0.0836 | 0.0775 |
| 12/4/2014  | 686.69 | 12,290.00 | 0.0836 | 0.0775 |
| 12/5/2014  | 688.28 | 12,285.00 | 0.0836 | 0.0775 |
| 12/8/2014  | 680.77 | 12,274.00 | 0.0836 | 0.0775 |

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|------------|--------|-----------|--------|--------|
| 12/9/2014  | 678.71 | 12,274.00 | 0.0836 | 0.0775 |
| 12/10/2014 | 682.72 | 12,370.00 | 0.0836 | 0.0775 |
| 12/11/2014 | 679.66 | 12,536.00 | 0.0836 | 0.0775 |
| 12/12/2014 | 680.39 | 12,835.00 | 0.0836 | 0.0775 |
| 12/15/2014 | 674.28 | 12,656.00 | 0.0836 | 0.0775 |
| 12/16/2014 | 663.39 | 12,502.00 | 0.0836 | 0.0775 |
| 12/17/2014 | 661.6  | 12,437.00 | 0.0836 | 0.0775 |
| 12/18/2014 | 675.49 | 12,373.00 | 0.0836 | 0.0775 |
| 12/19/2014 | 679.18 | 12,394.00 | 0.0836 | 0.0775 |
| 12/29/2014 | 685.84 | 12,405.00 | 0.0836 | 0.0775 |
| 12/30/2014 | 691.04 | 12,372.00 | 0.0836 | 0.0775 |
| 12/31/2014 | 691.04 | 12,374.00 | 0.0836 | 0.0775 |
| 1/2/2015   | 694.47 | 12,378.00 | 0.0836 | 0.0775 |
| 1/5/2015   | 689.09 | 12,412.00 | 0.0836 | 0.0775 |
| 1/6/2015   | 681.07 | 12,526.00 | 0.0696 | 0.0775 |
| 1/7/2015   | 687.51 | 12,595.00 | 0.0696 | 0.0775 |
| 1/8/2015   | 688.14 | 12,668.00 | 0.0696 | 0.0775 |
| 1/9/2015   | 688.95 | 12,667.00 | 0.0696 | 0.0775 |
| 1/12/2015  | 683.78 | 12,577.00 | 0.0696 | 0.0775 |
| 1/13/2015  | 692.15 | 12,505.00 | 0.0696 | 0.0775 |
| 1/14/2015  | 681.66 | 12,545.00 | 0.0696 | 0.0775 |
| 1/15/2015  | 687.57 | 12,517.00 | 0.0696 | 0.0775 |
| 1/16/2015  | 681.69 | 12,554.00 | 0.0696 | 0.0775 |
| 1/19/2015  | 681.64 | 12,530.00 | 0.0696 | 0.0775 |
| 1/20/2015  | 688.62 | 12,549.00 | 0.0696 | 0.0775 |
| 1/21/2015  | 702.1  | 12,596.00 | 0.0696 | 0.0775 |
| 1/22/2015  | 708.84 | 12,494.00 | 0.0696 | 0.0775 |
| 1/23/2015  | 716.73 | 12,389.00 | 0.0696 | 0.0775 |
| 1/26/2015  | 705.43 | 12,382.00 | 0.0696 | 0.0775 |
| 1/27/2015  | 707.71 | 12,454.00 | 0.0696 | 0.0775 |
| 1/28/2015  | 706.09 | 12,431.00 | 0.0696 | 0.0775 |
| 1/29/2015  | 703.1  | 12,436.00 | 0.0696 | 0.0775 |
| 1/30/2015  | 706.68 | 12,452.00 | 0.0696 | 0.0775 |
| 2/2/2015   | 701.5  | 12,562.00 | 0.0696 | 0.0775 |
| 2/3/2015   | 704.64 | 12,636.00 | 0.0696 | 0.0775 |
| 2/4/2015   | 708.72 | 12,580.00 | 0.0629 | 0.0775 |

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|-----------|--------|-----------|--------|--------|
| 2/5/2015  | 700.4  | 12,546.00 | 0.0629 | 0.0775 |
| 2/6/2015  | 711.52 | 12,590.00 | 0.0629 | 0.0775 |
| 2/9/2015  | 710.89 | 12,550.00 | 0.0629 | 0.0775 |
| 2/10/2015 | 707.01 | 12,616.00 | 0.0629 | 0.0775 |
| 2/11/2015 | 712.14 | 12,581.00 | 0.0629 | 0.0775 |
| 2/12/2015 | 713.98 | 12,636.00 | 0.0629 | 0.0775 |
| 2/13/2015 | 721.53 | 12,730.00 | 0.0629 | 0.0775 |
| 2/16/2015 | 709.6  | 12,705.00 | 0.0629 | 0.0775 |
| 2/17/2015 | 714.34 | 12,678.00 | 0.0629 | 0.0775 |
| 2/18/2015 | 718.68 | 12,693.00 | 0.0629 | 0.0775 |
| 2/19/2015 | 718.68 | 12,740.00 | 0.0629 | 0.075  |
| 2/20/2015 | 715.36 | 12,785.00 | 0.0629 | 0.075  |
| 2/23/2015 | 718.39 | 12,749.00 | 0.0629 | 0.075  |
| 2/24/2015 | 720.43 | 12,802.00 | 0.0629 | 0.075  |
| 2/25/2015 | 727.44 | 12,823.00 | 0.0629 | 0.075  |
| 2/26/2015 | 727.37 | 12,798.00 | 0.0629 | 0.075  |
| 2/27/2015 | 722.1  | 12,799.00 | 0.0629 | 0.075  |
| 3/2/2015  | 728.61 | 12,928.00 | 0.0629 | 0.075  |
| 3/3/2015  | 730.2  | 12,897.00 | 0.0638 | 0.075  |
| 3/4/2015  | 723.39 | 12,898.00 | 0.0638 | 0.075  |
| 3/5/2015  | 722.09 | 12,957.00 | 0.0638 | 0.075  |
| 3/6/2015  | 734.85 | 12,918.00 | 0.0638 | 0.075  |
| 3/9/2015  | 724.65 | 12,982.00 | 0.0638 | 0.075  |
| 3/10/2015 | 725.85 | 12,994.00 | 0.0638 | 0.075  |
| 3/11/2015 | 720.53 | 13,098.00 | 0.0638 | 0.075  |
| 3/12/2015 | 723.77 | 13,110.00 | 0.0638 | 0.075  |
| 3/13/2015 | 723.68 | 13,125.00 | 0.0638 | 0.075  |
| 3/16/2015 | 725.35 | 13,171.00 | 0.0638 | 0.075  |
| 3/17/2015 | 724.68 | 13,143.00 | 0.0638 | 0.075  |
| 3/18/2015 | 718.32 | 13,098.00 | 0.0638 | 0.075  |
| 3/19/2015 | 724.86 | 12,943.00 | 0.0638 | 0.075  |
| 3/20/2015 | 721.67 | 13,010.00 | 0.0638 | 0.075  |
| 3/23/2015 | 721    | 13,011.00 | 0.0638 | 0.075  |
| 3/24/2015 | 721.5  | 12,907.00 | 0.0638 | 0.075  |
| 3/25/2015 | 711.03 | 12,867.00 | 0.0638 | 0.075  |
| 3/26/2015 | 703.48 | 12,938.00 | 0.0638 | 0.075  |

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|-----------|--------|-----------|--------|-------|
| 3/27/2015 | 709.98 | 12,999.00 | 0.0638 | 0.075 |
| 3/30/2015 | 720.5  | 13,021.00 | 0.0638 | 0.075 |
| 3/31/2015 | 728.2  | 13,019.00 | 0.0638 | 0.075 |
| 4/1/2015  | 718.59 | 12,978.00 | 0.0638 | 0.075 |
| 4/2/2015  | 716.8  | 12,935.00 | 0.0679 | 0.075 |
| 4/6/2015  | 720.87 | 12,877.00 | 0.0679 | 0.075 |
| 4/7/2015  | 727.56 | 12,917.00 | 0.0679 | 0.075 |
| 4/8/2015  | 719.99 | 12,937.00 | 0.0679 | 0.075 |
| 4/9/2015  | 723.85 | 12,908.00 | 0.0679 | 0.075 |
| 4/10/2015 | 722.08 | 12,845.00 | 0.0679 | 0.075 |
| 4/13/2015 | 717.43 | 12,880.00 | 0.0679 | 0.075 |
| 4/14/2015 | 711.11 | 12,914.00 | 0.0679 | 0.075 |
| 4/15/2015 | 711.09 | 12,911.00 | 0.0679 | 0.075 |
| 4/16/2015 | 710.41 | 12,774.00 | 0.0679 | 0.075 |
| 4/17/2015 | 709.33 | 12,799.00 | 0.0679 | 0.075 |
| 4/20/2015 | 704.25 | 12,811.00 | 0.0679 | 0.075 |
| 4/21/2015 | 717.98 | 12,877.00 | 0.0679 | 0.075 |
| 4/22/2015 | 716.12 | 12,887.00 | 0.0679 | 0.075 |
| 4/23/2015 | 718.85 | 12,874.00 | 0.0679 | 0.075 |
| 4/24/2015 | 723.29 | 12,876.00 | 0.0679 | 0.075 |
| 4/27/2015 | 698.24 | 12,857.00 | 0.0679 | 0.075 |
| 4/28/2015 | 701.08 | 12,913.00 | 0.0679 | 0.075 |
| 4/29/2015 | 674.87 | 12,899.00 | 0.0679 | 0.075 |
| 4/30/2015 | 664.8  | 12,872.00 | 0.0679 | 0.075 |
| 5/1/2015  | 664.8  | 12,956.00 | 0.0679 | 0.075 |
| 5/4/2015  | 679.16 | 12,928.00 | 0.0715 | 0.075 |
| 5/5/2015  | 686.25 | 12,975.00 | 0.0715 | 0.075 |
| 5/6/2015  | 692.3  | 13,000.00 | 0.0715 | 0.075 |
| 5/7/2015  | 685.97 | 13,111.00 | 0.0715 | 0.075 |
| 5/8/2015  | 696.7  | 13,050.00 | 0.0715 | 0.075 |
| 5/11/2015 | 696.16 | 13,137.00 | 0.0715 | 0.075 |
| 5/12/2015 | 696.95 | 13,122.00 | 0.0715 | 0.075 |
| 5/13/2015 | 706.03 | 13,025.00 | 0.0715 | 0.075 |
| 5/15/2015 | 708.85 | 13,050.00 | 0.0715 | 0.075 |
| 5/18/2015 | 708.51 | 13,117.00 | 0.0715 | 0.075 |
| 5/19/2015 | 711.75 | 13,103.00 | 0.0715 | 0.075 |



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|-----------|--------|-----------|--------|-------|
| 5/20/2015 | 714.8  | 13,084.00 | 0.0715 | 0.075 |
| 5/21/2015 | 712.28 | 13,070.00 | 0.0715 | 0.075 |
| 5/22/2015 | 711.77 | 13,120.00 | 0.0715 | 0.075 |
| 5/25/2015 | 711.27 | 13,126.00 | 0.0715 | 0.075 |
| 5/26/2015 | 719.3  | 13,163.00 | 0.0715 | 0.075 |
| 5/27/2015 | 707.77 | 13,139.00 | 0.0715 | 0.075 |
| 5/28/2015 | 707.16 | 13,145.00 | 0.0715 | 0.075 |
| 5/29/2015 | 698.07 | 13,164.00 | 0.0715 | 0.075 |
| 6/1/2015  | 700.65 | 13,130.00 | 0.0726 | 0.075 |
| 6/3/2015  | 692.4  | 13,177.00 | 0.0726 | 0.075 |
| 6/4/2015  | 685.29 | 13,222.00 | 0.0726 | 0.075 |
| 6/5/2015  | 684.75 | 13,293.00 | 0.0726 | 0.075 |
| 6/8/2015  | 672.87 | 13,295.00 | 0.0726 | 0.075 |
| 6/9/2015  | 655.7  | 13,262.00 | 0.0726 | 0.075 |
| 6/10/2015 | 664.75 | 13,226.00 | 0.0726 | 0.075 |
| 6/11/2015 | 666.6  | 13,250.00 | 0.0726 | 0.075 |
| 6/12/2015 | 665.66 | 13,266.00 | 0.0726 | 0.075 |
| 6/15/2015 | 648.04 | 13,266.00 | 0.0726 | 0.075 |
| 6/16/2015 | 653.03 | 13,300.00 | 0.0726 | 0.075 |
| 6/17/2015 | 660.82 | 13,274.00 | 0.0726 | 0.075 |
| 6/18/2015 | 665.06 | 13,257.00 | 0.0726 | 0.075 |
| 6/19/2015 | 666.82 | 13,251.00 | 0.0726 | 0.075 |
| 6/22/2015 | 661.64 | 13,249.00 | 0.0726 | 0.075 |
| 6/23/2015 | 657.11 | 13,214.00 | 0.0726 | 0.075 |
| 6/24/2015 | 666.37 | 13,256.00 | 0.0726 | 0.075 |
| 6/25/2015 | 659.79 | 13,271.00 | 0.0726 | 0.075 |
| 6/26/2015 | 658.85 | 13,289.00 | 0.0726 | 0.075 |
| 6/29/2015 | 652.82 | 13,265.00 | 0.0726 | 0.075 |
| 6/30/2015 | 656.99 | 13,264.00 | 0.0726 | 0.075 |
| 7/1/2015  | 654.81 | 13,270.00 | 0.0726 | 0.075 |
| 7/2/2015  | 662.42 | 13,249.00 | 0.0726 | 0.075 |
| 7/3/2015  | 670.93 | 13,286.00 | 0.0726 | 0.075 |
| 7/6/2015  | 661.37 | 13,246.00 | 0.0726 | 0.075 |
| 7/7/2015  | 657.72 | 13,279.00 | 0.0726 | 0.075 |
| 7/8/2015  | 653.25 | 13,280.00 | 0.0726 | 0.075 |
| 7/9/2015  | 645.59 | 13,237.00 | 0.0726 | 0.075 |

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|-----------|--------|-----------|--------|-------|
| 7/10/2015 | 648.74 | 13,242.00 | 0.0726 | 0.075 |
| 7/13/2015 | 654.82 | 13,253.00 | 0.0726 | 0.075 |
| 7/14/2015 | 655.9  | 13,262.00 | 0.0726 | 0.075 |
| 7/15/2015 | 653.65 | 13,301.00 | 0.0726 | 0.075 |
| 7/22/2015 | 658.39 | 13,327.00 | 0.0726 | 0.075 |
| 7/23/2015 | 656.34 | 13,381.00 | 0.0726 | 0.075 |
| 7/24/2015 | 646.94 | 13,386.00 | 0.0726 | 0.075 |
| 7/27/2015 | 632.14 | 13,393.00 | 0.0726 | 0.075 |
| 7/28/2015 | 628.63 | 13,377.00 | 0.0726 | 0.075 |
| 7/29/2015 | 629.1  | 13,401.00 | 0.0726 | 0.075 |
| 7/30/2015 | 628.9  | 13,414.00 | 0.0726 | 0.075 |
| 7/31/2015 | 641.97 | 13,425.00 | 0.0726 | 0.075 |
| 8/3/2015  | 636.99 | 13,428.00 | 0.0718 | 0.075 |
| 8/4/2015  | 634.22 | 13,449.00 | 0.0718 | 0.075 |
| 8/5/2015  | 644.25 | 13,461.00 | 0.0718 | 0.075 |
| 8/6/2015  | 634.64 | 13,468.00 | 0.0718 | 0.075 |
| 8/7/2015  | 631.77 | 13,468.00 | 0.0718 | 0.075 |
| 8/10/2015 | 628.83 | 13,473.00 | 0.0718 | 0.075 |
| 8/11/2015 | 607.75 | 13,689.00 | 0.0718 | 0.075 |
| 8/12/2015 | 585.32 | 13,678.00 | 0.0718 | 0.075 |
| 8/13/2015 | 605.3  | 13,694.00 | 0.0718 | 0.075 |
| 8/14/2015 | 606.41 | 13,762.00 | 0.0718 | 0.075 |
| 8/18/2015 | 597.19 | 13,755.00 | 0.0718 | 0.075 |
| 8/19/2015 | 592.13 | 13,769.00 | 0.0718 | 0.075 |
| 8/20/2015 | 587.99 | 13,826.00 | 0.0718 | 0.075 |
| 8/21/2015 | 572.01 | 13,928.00 | 0.0718 | 0.075 |
| 8/24/2015 | 544.39 | 13,997.00 | 0.0718 | 0.075 |
| 8/25/2015 | 554.87 | 14,031.00 | 0.0718 | 0.075 |
| 8/26/2015 | 553.09 | 14,057.00 | 0.0718 | 0.075 |
| 8/27/2015 | 585.17 | 13,941.00 | 0.0718 | 0.075 |
| 8/28/2015 | 586.09 | 13,957.00 | 0.0718 | 0.075 |
| 8/31/2015 | 598.28 | 14,011.00 | 0.0718 | 0.075 |
| 9/1/2015  | 584.1  | 14,056.00 | 0.0683 | 0.075 |
| 9/2/2015  | 582.66 | 14,089.00 | 0.0683 | 0.075 |
| 9/3/2015  | 590.89 | 14,107.00 | 0.0683 | 0.075 |
| 9/4/2015  | 589.14 | 14,163.00 | 0.0683 | 0.075 |

|            |        |           |        |       |
|------------|--------|-----------|--------|-------|
| 9/7/2015   | 565.33 | 14,214.00 | 0.0683 | 0.075 |
| 9/8/2015   | 567.34 | 14,173.00 | 0.0683 | 0.075 |
| 9/9/2015   | 574.99 | 14,250.00 | 0.0683 | 0.075 |
| 9/10/2015  | 577.06 | 14,234.00 | 0.0683 | 0.075 |
| 9/11/2015  | 584.9  | 14,250.00 | 0.0683 | 0.075 |
| 9/14/2015  | 591.68 | 14,299.00 | 0.0683 | 0.075 |
| 9/15/2015  | 580.28 | 14,370.00 | 0.0683 | 0.075 |
| 9/16/2015  | 577.07 | 14,380.00 | 0.0683 | 0.075 |
| 9/17/2015  | 584.43 | 14,391.00 | 0.0683 | 0.075 |
| 9/18/2015  | 584.84 | 14,379.00 | 0.0683 | 0.075 |
| 9/21/2015  | 583.28 | 14,414.00 | 0.0683 | 0.075 |
| 9/22/2015  | 576.16 | 14,550.00 | 0.0683 | 0.075 |
| 9/23/2015  | 561.53 | 14,617.00 | 0.0683 | 0.075 |
| 9/25/2015  | 557.23 | 14,623.00 | 0.0683 | 0.075 |
| 9/28/2015  | 542    | 14,654.00 | 0.0683 | 0.075 |
| 9/29/2015  | 554.43 | 14,584.00 | 0.0683 | 0.075 |
| 9/30/2015  | 556.09 | 14,581.00 | 0.0683 | 0.075 |
| 10/1/2015  | 563.06 | 14,635.00 | 0.0625 | 0.075 |
| 10/2/2015  | 553.87 | 14,531.00 | 0.0625 | 0.075 |
| 10/5/2015  | 576.34 | 14,310.00 | 0.0625 | 0.075 |
| 10/6/2015  | 596.68 | 13,995.00 | 0.0625 | 0.075 |
| 10/7/2015  | 602.55 | 13,740.00 | 0.0625 | 0.075 |
| 10/8/2015  | 601.15 | 13,453.00 | 0.0625 | 0.075 |
| 10/9/2015  | 615.43 | 13,399.00 | 0.0625 | 0.075 |
| 10/12/2015 | 619.08 | 13,489.00 | 0.0625 | 0.075 |
| 10/13/2015 | 592.98 | 13,222.00 | 0.0625 | 0.075 |
| 10/15/2015 | 599.48 | 13,466.00 | 0.0625 | 0.075 |
| 10/16/2015 | 602.01 | 13,495.00 | 0.0625 | 0.075 |
| 10/19/2015 | 612.11 | 13,566.00 | 0.0625 | 0.075 |
| 10/20/2015 | 612.84 | 13,628.00 | 0.0625 | 0.075 |
| 10/21/2015 | 616.93 | 13,572.00 | 0.0625 | 0.075 |
| 10/22/2015 | 611.34 | 13,424.00 | 0.0625 | 0.075 |
| 10/23/2015 | 620.24 | 13,575.00 | 0.0625 | 0.075 |
| 10/26/2015 | 623.61 | 13,558.00 | 0.0625 | 0.075 |
| 10/27/2015 | 620.94 | 13,562.00 | 0.0625 | 0.075 |
| 10/28/2015 | 610.9  | 13,494.00 | 0.0625 | 0.075 |

|            |        |           |        |       |
|------------|--------|-----------|--------|-------|
| 10/29/2015 | 586.97 | 13,571.00 | 0.0625 | 0.075 |
| 10/30/2015 | 586.1  | 13,614.00 | 0.0625 | 0.075 |
| 11/2/2015  | 593.58 | 13,526.00 | 0.0489 | 0.075 |
| 11/3/2015  | 599.47 | 13,394.00 | 0.0489 | 0.075 |
| 11/4/2015  | 610.47 | 13,535.00 | 0.0489 | 0.075 |
| 11/5/2015  | 605.23 | 13,482.00 | 0.0489 | 0.075 |
| 11/6/2015  | 603.79 | 13,619.00 | 0.0489 | 0.075 |
| 11/9/2015  | 591.37 | 13,551.00 | 0.0489 | 0.075 |
| 11/10/2015 | 582.21 | 13,508.00 | 0.0489 | 0.075 |
| 11/11/2015 | 584.88 | 13,507.00 | 0.0489 | 0.075 |
| 11/12/2015 | 582.48 | 13,565.00 | 0.0489 | 0.075 |
| 11/13/2015 | 587.55 | 13,663.00 | 0.0489 | 0.075 |
| 11/16/2015 | 581.53 | 13,642.00 | 0.0489 | 0.075 |
| 11/17/2015 | 589.3  | 13,694.00 | 0.0489 | 0.075 |
| 11/18/2015 | 593.79 | 13,718.00 | 0.0489 | 0.075 |
| 11/19/2015 | 596.86 | 13,670.00 | 0.0489 | 0.075 |
| 11/20/2015 | 604.54 | 13,628.00 | 0.0489 | 0.075 |
| 11/23/2015 | 595.6  | 13,654.00 | 0.0489 | 0.075 |
| 11/24/2015 | 594.88 | 13,605.00 | 0.0489 | 0.075 |
| 11/25/2015 | 599.28 | 13,664.00 | 0.0489 | 0.075 |
| 11/26/2015 | 601.79 | 13,678.00 | 0.0489 | 0.075 |
| 11/27/2015 | 601.04 | 13,771.00 | 0.0489 | 0.075 |
| 11/30/2015 | 579.8  | 13,739.00 | 0.0489 | 0.075 |
| 12/1/2015  | 598.03 | 13,688.00 | 0.0335 | 0.075 |
| 12/2/2015  | 596.9  | 13,776.00 | 0.0335 | 0.075 |
| 12/3/2015  | 596.57 | 13,764.00 | 0.0335 | 0.075 |
| 12/4/2015  | 592.9  | 13,768.00 | 0.0335 | 0.075 |
| 12/7/2015  | 595.72 | 13,784.00 | 0.0335 | 0.075 |
| 12/8/2015  | 582.21 | 13,884.00 | 0.0335 | 0.075 |
| 12/10/2015 | 578.3  | 13,867.00 | 0.0335 | 0.075 |
| 12/11/2015 | 565.09 | 14,006.00 | 0.0335 | 0.075 |
| 12/14/2015 | 565.63 | 13,995.00 | 0.0335 | 0.075 |
| 12/15/2015 | 573.18 | 13,980.00 | 0.0335 | 0.075 |
| 12/16/2015 | 583.17 | 13,958.00 | 0.0335 | 0.075 |
| 12/17/2015 | 600.52 | 13,962.00 | 0.0335 | 0.075 |
| 12/18/2015 | 588.22 | 13,803.00 | 0.0335 | 0.075 |

|            |        |           |        |        |
|------------|--------|-----------|--------|--------|
| 12/21/2015 | 591.69 | 13,547.00 | 0.0335 | 0.075  |
| 12/22/2015 | 595.6  | 13,576.00 | 0.0335 | 0.075  |
| 12/23/2015 | 593.25 | 13,571.00 | 0.0335 | 0.075  |
| 12/28/2015 | 597.28 | 13,590.00 | 0.0335 | 0.075  |
| 12/29/2015 | 599.44 | 13,725.00 | 0.0335 | 0.075  |
| 12/30/2015 | 603.35 | 13,726.00 | 0.0335 | 0.075  |
| 1/4/2016   | 592.11 | 13,829.00 | 0.0414 | 0.075  |
| 1/5/2016   | 597.26 | 13,861.00 | 0.0414 | 0.075  |
| 1/6/2016   | 612.22 | 13,794.00 | 0.0414 | 0.075  |
| 1/7/2016   | 599.38 | 13,876.00 | 0.0414 | 0.075  |
| 1/8/2016   | 600.48 | 13,805.00 | 0.0414 | 0.075  |
| 1/11/2016  | 586.71 | 13,865.00 | 0.0414 | 0.075  |
| 1/12/2016  | 596.04 | 13,766.00 | 0.0414 | 0.075  |
| 1/13/2016  | 601.86 | 13,792.00 | 0.0414 | 0.075  |
| 1/14/2016  | 594.12 | 13,808.00 | 0.0414 | 0.0725 |
| 1/15/2016  | 594.64 | 13,817.00 | 0.0414 | 0.0725 |
| 1/18/2016  | 587.5  | 13,861.00 | 0.0414 | 0.0725 |
| 1/19/2016  | 592.4  | 13,851.00 | 0.0414 | 0.0725 |
| 1/20/2016  | 582.8  | 13,827.00 | 0.0414 | 0.0725 |
| 1/21/2016  | 581.78 | 13,830.00 | 0.0414 | 0.0725 |
| 1/22/2016  | 590.67 | 13,805.00 | 0.0414 | 0.0725 |
| 1/25/2016  | 595.41 | 13,775.00 | 0.0414 | 0.0725 |
| 1/26/2016  | 594.95 | 13,834.00 | 0.0414 | 0.0725 |
| 1/27/2016  | 605.23 | 13,802.00 | 0.0414 | 0.0725 |
| 1/28/2016  | 607.75 | 13,820.00 | 0.0414 | 0.0725 |
| 1/29/2016  | 612.75 | 13,777.00 | 0.0414 | 0.0725 |
| 2/1/2016   | 611.1  | 13,631.00 | 0.0442 | 0.0725 |
| 2/2/2016   | 603.72 | 13,553.00 | 0.0442 | 0.0725 |
| 2/3/2016   | 610.23 | 13,688.00 | 0.0442 | 0.0725 |
| 2/4/2016   | 621.98 | 13,594.00 | 0.0442 | 0.0725 |
| 2/5/2016   | 642.55 | 13,585.00 | 0.0442 | 0.0725 |
| 2/9/2016   | 636.13 | 13,621.00 | 0.0442 | 0.0725 |
| 2/10/2016  | 634.17 | 13,470.00 | 0.0442 | 0.0725 |
| 2/11/2016  | 643.98 | 13,302.00 | 0.0442 | 0.0725 |
| 2/12/2016  | 630.49 | 13,404.00 | 0.0442 | 0.0725 |
| 2/15/2016  | 633.97 | 13,409.00 | 0.0442 | 0.0725 |

|           |        |           |        |        |
|-----------|--------|-----------|--------|--------|
| 2/16/2016 | 635.29 | 13,266.00 | 0.0442 | 0.0725 |
| 2/17/2016 | 638.29 | 13,436.00 | 0.0442 | 0.0725 |
| 2/18/2016 | 641.42 | 13,412.00 | 0.0442 | 0.07   |
| 2/19/2016 | 631.06 | 13,481.00 | 0.0442 | 0.07   |
| 2/22/2016 | 631.76 | 13,393.00 | 0.0442 | 0.07   |
| 2/23/2016 | 623.53 | 13,330.00 | 0.0442 | 0.07   |
| 2/24/2016 | 620.82 | 13,379.00 | 0.0442 | 0.07   |
| 2/25/2016 | 623.93 | 13,349.00 | 0.0442 | 0.07   |
| 2/26/2016 | 636.62 | 13,333.00 | 0.0442 | 0.07   |
| 2/29/2016 | 641.86 | 13,328.00 | 0.0442 | 0.07   |
| 3/1/2016  | 648.92 | 13,300.00 | 0.0445 | 0.07   |
| 3/2/2016  | 660    | 13,247.00 | 0.0445 | 0.07   |
| 3/3/2016  | 657.37 | 13,194.00 | 0.0445 | 0.07   |
| 3/4/2016  | 654.52 | 13,093.00 | 0.0445 | 0.07   |
| 3/7/2016  | 650.56 | 12,964.00 | 0.0445 | 0.07   |
| 3/8/2016  | 648.36 | 13,062.00 | 0.0445 | 0.07   |
| 3/10/2016 | 649.18 | 13,083.00 | 0.0445 | 0.07   |
| 3/11/2016 | 653.01 | 13,022.00 | 0.0445 | 0.07   |
| 3/14/2016 | 665.47 | 12,955.00 | 0.0445 | 0.07   |
| 3/15/2016 | 658.03 | 13,022.00 | 0.0445 | 0.07   |
| 3/16/2016 | 661.67 | 13,103.00 | 0.0445 | 0.07   |
| 3/17/2016 | 668.14 | 13,100.00 | 0.0445 | 0.0675 |
| 3/18/2016 | 669.3  | 12,983.00 | 0.0445 | 0.0675 |
| 3/21/2016 | 668.26 | 13,094.00 | 0.0445 | 0.0675 |
| 3/22/2016 | 664.19 | 13,109.00 | 0.0445 | 0.0675 |
| 3/23/2016 | 656.99 | 13,101.00 | 0.0445 | 0.0675 |
| 3/24/2016 | 653.18 | 13,184.00 | 0.0445 | 0.0675 |
| 3/28/2016 | 646.07 | 13,256.00 | 0.0445 | 0.0675 |
| 3/29/2016 | 645    | 13,296.00 | 0.0445 | 0.0675 |
| 3/30/2016 | 650.67 | 13,292.00 | 0.0445 | 0.0675 |
| 3/31/2016 | 652.69 | 13,210.00 | 0.0445 | 0.0675 |
| 4/1/2016  | 657.01 | 13,134.00 | 0.036  | 0.0675 |
| 4/4/2016  | 662.13 | 13,079.00 | 0.036  | 0.0675 |
| 4/5/2016  | 658.55 | 13,151.00 | 0.036  | 0.0675 |
| 4/6/2016  | 660.39 | 13,157.00 | 0.036  | 0.0675 |
| 4/7/2016  | 661.06 | 13,131.00 | 0.036  | 0.0675 |

|           |        |           |       |        |
|-----------|--------|-----------|-------|--------|
| 4/8/2016  | 660.43 | 13,103.00 | 0.036 | 0.0675 |
| 4/11/2016 | 650.17 | 13,068.00 | 0.036 | 0.0675 |
| 4/12/2016 | 658.74 | 13,057.00 | 0.036 | 0.0675 |
| 4/13/2016 | 661.89 | 13,031.00 | 0.036 | 0.0675 |
| 4/14/2016 | 654.91 | 13,172.00 | 0.036 | 0.0675 |
| 4/15/2016 | 667.81 | 13,100.00 | 0.036 | 0.0675 |
| 4/18/2016 | 673.35 | 13,138.00 | 0.036 | 0.0675 |
| 4/19/2016 | 679.51 | 13,084.00 | 0.036 | 0.0675 |
| 4/20/2016 | 678.59 | 13,067.00 | 0.036 | 0.0675 |
| 4/21/2016 | 682.56 | 13,116.00 | 0.036 | 0.0675 |
| 4/22/2016 | 683.12 | 13,103.00 | 0.036 | 0.0675 |
| 4/25/2016 | 678.81 | 13,169.00 | 0.036 | 0.0675 |
| 4/26/2016 | 666.42 | 13,149.00 | 0.036 | 0.0675 |
| 4/27/2016 | 663.19 | 13,107.00 | 0.036 | 0.0675 |
| 4/28/2016 | 656.41 | 13,138.00 | 0.036 | 0.0675 |
| 4/29/2016 | 653.26 | 13,138.00 | 0.036 | 0.0675 |

## Lampiran 2 : Hasil Uji ADF

### 1. Uji ADF saham JII

Null Hypothesis: SAHAM has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.790479   | 0.0601 |
| Test critical values:                  |             |        |
| 1% level                               | -3.438716   |        |
| 5% level                               | -2.865123   |        |
| 10% level                              | -2.568733   |        |

### 2. Uji ADF saham JII differencing ke-1

Null Hypothesis: DSAHAM has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=19)

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -19.22405   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.438750   |        |
| 5% level                               | -2.865138   |        |
| 10% level                              | -2.568741   |        |

### 3. Uji ADF Kurs dollar

Null Hypothesis: KURS has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.886139   | 0.3390 |
| Test critical values:                  |             |        |
| 1% level                               | -3.438716   |        |
| 5% level                               | -2.865123   |        |
| 10% level                              | -2.568733   |        |

### 4. Uji ADF kurs dollar differencing ke-1

Null Hypothesis: ST has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -25.16687   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.438728   |        |
| 5% level                               | -2.865128   |        |
| 10% level                              | -2.568736   |        |



## 5. Uji ADF Inflasi

Null Hypothesis: INFLASI has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|   | t-Statistic      | Prob.*        |
|---|------------------|---------------|
| <b>Augmented Dickey-Fuller test statistic</b> | <b>-1.325305</b> | <b>0.6194</b> |
| Test critical values:                         |                  |               |
| 1% level                                      | -3.438716        |               |
| 5% level                                      | -2.865123        |               |
| 10% level                                     | -2.568733        |               |

## 6. Uji ADF Inflasi differencing ke-1

Null Hypothesis: UT has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|   | t-Statistic      | Prob.*        |
|---|------------------|---------------|
| <b>Augmented Dickey-Fuller test statistic</b> | <b>-27.53809</b> | <b>0.0000</b> |
| Test critical values:                         |                  |               |
| 1% level                                      | -3.438728        |               |
| 5% level                                      | -2.865128        |               |
| 10% level                                     | -2.568736        |               |

## 7. Uji ADF Suku Bunga

Null Hypothesis: SUKUBUNGA has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|   | t-Statistic      | Prob.*        |
|---|------------------|---------------|
| <b>Augmented Dickey-Fuller test statistic</b> | <b>-2.594494</b> | <b>0.0945</b> |
| Test critical values:                         |                  |               |
| 1% level                                      | -3.438716        |               |
| 5% level                                      | -2.865123        |               |
| 10% level                                     | -2.568733        |               |

## 8. Uji ADF Suku Bunga differencing ke-1

Null Hypothesis: WT has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=19)

|   | t-Statistic      | Prob.*        |
|---|------------------|---------------|
| <b>Augmented Dickey-Fuller test statistic</b> | <b>-27.56810</b> | <b>0.0000</b> |
| Test critical values:                         |                  |               |
| 1% level                                      | -3.438728        |               |
| 5% level                                      | -2.865128        |               |
| 10% level                                     | -2.568736        |               |

### Lampiran 3 : Hasil Estimasi Model ARIMAX

#### 1. ARIMAX(0,1,0) dengan konstanta

Dependent Variable: DSAHAM

Method: Least Squares

Date: 05/13/16 Time: 23:49

Sample (adjusted): 2 762

Included observations: 761 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.056439    | 0.324061              | 0.174162    | 0.8618   |
| ST                 | -0.012453   | 0.004993              | -2.494258   | 0.0128   |
| UT                 | -143.0603   | 161.4842              | -0.885909   | 0.3759   |
| WT                 | 304.6933    | 892.1733              | 0.341518    | 0.7328   |
| R-squared          | 0.009398    | Mean dependent var    |             | 0.008410 |
| Adjusted R-squared | 0.005473    | S.D. dependent var    |             | 8.935971 |
| S.E. of regression | 8.911485    | Akaike info criterion |             | 7.217801 |
| Sum squared resid  | 60116.83    | Schwarz criterion     |             | 7.242162 |
| Log likelihood     | -2742.373   | Hannan-Quinn criter.  |             | 7.227182 |
| F-statistic        | 2.394051    | Durbin-Watson stat    |             | 1.989509 |
| Prob(F-statistic)  | 0.067177    |                       |             |          |

#### 2. ARIMAX(0,1,0) tanpa konstanta

Dependent Variable: DSAHAM

Method: Least Squares

Date: 05/13/16 Time: 23:28

Sample (adjusted): 2 762

Included observations: 761 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.012393   | 0.004978              | -2.489764   | 0.0130   |
| UT                 | -143.5294   | 161.3585              | -0.889507   | 0.3740   |
| WT                 | 309.9746    | 891.0873              | 0.347861    | 0.7280   |
| R-squared          | 0.009359    | Mean dependent var    |             | 0.008410 |
| Adjusted R-squared | 0.006745    | S.D. dependent var    |             | 8.935971 |
| S.E. of regression | 8.905783    | Akaike info criterion |             | 7.215213 |
| Sum squared resid  | 60119.24    | Schwarz criterion     |             | 7.233484 |
| Log likelihood     | -2742.389   | Hannan-Quinn criter.  |             | 7.222248 |
| Durbin-Watson stat | 1.989325    |                       |             |          |

## 3. ARIMAX(0,1,1) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:55  
 Sample (adjusted): 2 762  
 Included observations: 761 after adjustments  
 Convergence achieved after 7 iterations  
 MA Backcast: 1

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| C                  | 0.055967    | 0.326291              | 0.171524    | 0.8639 |
| ST                 | -0.012352   | 0.005000              | -2.470245   | 0.0137 |
| UT                 | -142.1192   | 161.7479              | -0.878646   | 0.3799 |
| WT                 | 306.9258    | 892.7917              | 0.343782    | 0.7311 |
| MA(1)              | 0.006275    | 0.036426              | 0.172266    | 0.8633 |
| R-squared          | 0.009430    | Mean dependent var    | 0.008410    |        |
| Adjusted R-squared | 0.004189    | S.D. dependent var    | 8.935971    |        |
| S.E. of regression | 8.917233    | Akaike info criterion | 7.220397    |        |
| Sum squared resid  | 60114.89    | Schwarz criterion     | 7.250848    |        |
| Log likelihood     | -2742.361   | Hannan-Quinn criter.  | 7.232122    |        |
| F-statistic        | 1.799329    | Durbin-Watson stat    | 2.000823    |        |
| Prob(F-statistic)  | 0.127037    |                       |             |        |

## 4. ARIMAX(0,1,1) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:34  
 Sample (adjusted): 2 762  
 Included observations: 761 after adjustments  
 Convergence achieved after 7 iterations  
 MA Backcast: 1

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| ST                 | -0.012291   | 0.004985              | -2.465527   | 0.0139 |
| UT                 | -142.5609   | 161.6231              | -0.882058   | 0.3780 |
| WT                 | 312.1364    | 891.7066              | 0.350044    | 0.7264 |
| MA(1)              | 0.006385    | 0.036401              | 0.175408    | 0.8608 |
| R-squared          | 0.009392    | Mean dependent var    | 0.008410    |        |
| Adjusted R-squared | 0.005466    | S.D. dependent var    | 8.935971    |        |
| S.E. of regression | 8.911515    | Akaike info criterion | 7.217808    |        |
| Sum squared resid  | 60117.22    | Schwarz criterion     | 7.242169    |        |
| Log likelihood     | -2742.376   | Hannan-Quinn criter.  | 7.227188    |        |
| Durbin-Watson stat | 2.000843    |                       |             |        |

## 5. ARIMAX(0,1,2) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:56  
 Sample (adjusted): 2 762  
 Included observations: 761 after adjustments  
 Convergence achieved after 12 iterations  
 MA Backcast: 0 1

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.065096    | 0.271574              | 0.239701    | 0.8106   |
| ST                 | -0.015848   | 0.004923              | -3.219388   | 0.0013   |
| UT                 | -201.4963   | 159.7571              | -1.261266   | 0.2076   |
| WT                 | 626.3121    | 886.0807              | 0.706834    | 0.4799   |
| MA(1)              | -0.041459   | 0.036220              | -1.144635   | 0.2527   |
| MA(2)              | -0.118891   | 0.036411              | -3.265194   | 0.0011   |
| R-squared          | 0.019065    | Mean dependent var    |             | 0.008410 |
| Adjusted R-squared | 0.012569    | S.D. dependent var    |             | 8.935971 |
| S.E. of regression | 8.879636    | Akaike info criterion |             | 7.213251 |
| Sum squared resid  | 59530.19    | Schwarz criterion     |             | 7.249792 |
| Log likelihood     | -2738.642   | Hannan-Quinn criter.  |             | 7.227322 |
| F-statistic        | 2.934778    | Durbin-Watson stat    |             | 1.958064 |
| Prob(F-statistic)  | 0.012408    |                       |             |          |

## 6. ARIMAX(0,1,2) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:36  
 Sample (adjusted): 2 762  
 Included observations: 761 after adjustments  
 Convergence achieved after 12 iterations  
 MA Backcast: 0 1

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.015738   | 0.004904              | -3.209573   | 0.0014   |
| UT                 | -202.0588   | 159.6372              | -1.265738   | 0.2060   |
| WT                 | 633.5745    | 884.9363              | 0.715955    | 0.4742   |
| MA(1)              | -0.041132   | 0.036196              | -1.136355   | 0.2562   |
| MA(2)              | -0.118577   | 0.036386              | -3.258824   | 0.0012   |
| R-squared          | 0.018991    | Mean dependent var    |             | 0.008410 |
| Adjusted R-squared | 0.013800    | S.D. dependent var    |             | 8.935971 |
| S.E. of regression | 8.874098    | Akaike info criterion |             | 7.210699 |
| Sum squared resid  | 59534.71    | Schwarz criterion     |             | 7.241150 |
| Log likelihood     | -2738.671   | Hannan-Quinn criter.  |             | 7.222425 |
| Durbin-Watson stat | 1.958219    |                       |             |          |

## 7. ARIMAX(0,1,3) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:57  
 Sample (adjusted): 2 762  
 Included observations: 761 after adjustments  
 Convergence achieved after 9 iterations  
 MA Backcast: -1 1

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.080429    | 0.210229              | 0.382578    | 0.7021   |
| ST                 | -0.019194   | 0.004729              | -4.058749   | 0.0001   |
| UT                 | -205.9226   | 154.2919              | -1.334630   | 0.1824   |
| WT                 | 689.5278    | 854.5156              | 0.806922    | 0.4200   |
| MA(1)              | -0.041599   | 0.035939              | -1.157496   | 0.2474   |
| MA(2)              | -0.114456   | 0.035823              | -3.195058   | 0.0015   |
| MA(3)              | -0.185913   | 0.035841              | -5.187114   | 0.0000   |
| R-squared          | 0.051287    | Mean dependent var    |             | 0.008410 |
| Adjusted R-squared | 0.043737    | S.D. dependent var    |             | 8.935971 |
| S.E. of regression | 8.738368    | Akaike info criterion |             | 7.182480 |
| Sum squared resid  | 57574.74    | Schwarz criterion     |             | 7.225111 |
| Log likelihood     | -2725.934   | Hannan-Quinn criter.  |             | 7.198895 |
| F-statistic        | 6.793467    | Durbin-Watson stat    |             | 1.983364 |
| Prob(F-statistic)  | 0.000000    |                       |             |          |

## 8. ARIMAX(0,1,3) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:37  
 Sample (adjusted): 2 762  
 Included observations: 761 after adjustments  
 Convergence achieved after 9 iterations  
 MA Backcast: -1 1

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.018977   | 0.004703              | -4.035143   | 0.0001   |
| UT                 | -207.2742   | 154.1886              | -1.344290   | 0.1793   |
| WT                 | 702.1776    | 853.4264              | 0.822775    | 0.4109   |
| MA(1)              | -0.041027   | 0.035914              | -1.142360   | 0.2537   |
| MA(2)              | -0.113935   | 0.035797              | -3.182819   | 0.0015   |
| MA(3)              | -0.185455   | 0.035817              | -5.177892   | 0.0000   |
| R-squared          | 0.051103    | Mean dependent var    |             | 0.008410 |
| Adjusted R-squared | 0.044819    | S.D. dependent var    |             | 8.935971 |
| S.E. of regression | 8.733423    | Akaike info criterion |             | 7.180045 |
| Sum squared resid  | 57585.87    | Schwarz criterion     |             | 7.216586 |
| Log likelihood     | -2726.007   | Hannan-Quinn criter.  |             | 7.194115 |
| Durbin-Watson stat | 1.983509    |                       |             |          |

## 9. ARIMAX(1,1,0) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:58  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 5 iterations

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.053940    | 0.326399              | 0.165257    | 0.8688   |
| ST                 | -0.012358   | 0.005003              | -2.470011   | 0.0137   |
| UT                 | -142.2831   | 161.8532              | -0.879087   | 0.3796   |
| WT                 | 306.6290    | 893.3648              | 0.343229    | 0.7315   |
| AR(1)              | 0.005231    | 0.036450              | 0.143521    | 0.8859   |
| R-squared          | 0.009413    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.004165    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.922983    | Akaike info criterion |             | 7.221695 |
| Sum squared resid  | 60112.81    | Schwarz criterion     |             | 7.252177 |
| Log likelihood     | -2739.244   | Hannan-Quinn criter.  |             | 7.233433 |
| F-statistic        | 1.793542    | Durbin-Watson stat    |             | 1.996955 |
| Prob(F-statistic)  | 0.128184    |                       |             |          |

## 10. ARIMAX(1,1,0) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:37  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 5 iterations

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.012300   | 0.004988              | -2.465791   | 0.0139   |
| UT                 | -142.7118   | 161.7279              | -0.882419   | 0.3778   |
| WT                 | 311.6515    | 892.2758              | 0.349277    | 0.7270   |
| AR(1)              | 0.005323    | 0.036425              | 0.146126    | 0.8839   |
| R-squared          | 0.009377    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.005446    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.917240    | Akaike info criterion |             | 7.219099 |
| Sum squared resid  | 60114.99    | Schwarz criterion     |             | 7.243485 |
| Log likelihood     | -2739.258   | Hannan-Quinn criter.  |             | 7.228490 |
| Durbin-Watson stat | 1.996950    |                       |             |          |

## 11. ARIMAX(1,1,1) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:59  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 18 iterations  
 MA Backcast: 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.052448    | 0.326555              | 0.160611    | 0.8724   |
| ST                 | -0.012457   | 0.005002              | -2.490554   | 0.0130   |
| UT                 | -144.5350   | 161.6835              | -0.893938   | 0.3716   |
| WT                 | 351.9926    | 893.4209              | 0.393983    | 0.6937   |
| AR(1)              | -0.807411   | 0.359858              | -2.243696   | 0.0251   |
| MA(1)              | 0.818763    | 0.351049              | 2.332331    | 0.0199   |
| R-squared          | 0.011471    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.004916    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.919618    | Akaike info criterion |             | 7.222247 |
| Sum squared resid  | 59987.92    | Schwarz criterion     |             | 7.258825 |
| Log likelihood     | -2738.454   | Hannan-Quinn criter.  |             | 7.236332 |
| F-statistic        | 1.749873    | Durbin-Watson stat    |             | 2.009069 |
| Prob(F-statistic)  | 0.120931    |                       |             |          |

## 12. ARIMAX(1,1,1) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:38  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 19 iterations  
 MA Backcast: 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.012401   | 0.004986              | -2.486991   | 0.0131   |
| UT                 | -144.9651   | 161.5580              | -0.897294   | 0.3698   |
| WT                 | 357.0141    | 892.3323              | 0.400091    | 0.6892   |
| AR(1)              | -0.807655   | 0.359362              | -2.247467   | 0.0249   |
| MA(1)              | 0.819038    | 0.350527              | 2.336592    | 0.0197   |
| R-squared          | 0.011437    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.006200    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.913861    | Akaike info criterion |             | 7.219649 |
| Sum squared resid  | 59989.97    | Schwarz criterion     |             | 7.250132 |
| Log likelihood     | -2738.467   | Hannan-Quinn criter.  |             | 7.231387 |
| Durbin-Watson stat | 2.008967    |                       |             |          |

## 13. ARIMAX(1,1,2) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:00  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 13 iterations  
 MA Backcast: 1 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.072023    | 0.187375              | 0.384378    | 0.7008   |
| ST                 | -0.018989   | 0.004762              | -3.987340   | 0.0001   |
| UT                 | -186.8218   | 155.2532              | -1.203336   | 0.2292   |
| WT                 | 729.7336    | 867.9725              | 0.840733    | 0.4008   |
| AR(1)              | 0.620508    | 0.110091              | 5.636309    | 0.0000   |
| MA(1)              | -0.663280   | 0.112687              | -5.886024   | 0.0000   |
| MA(2)              | -0.116738   | 0.044715              | -2.610735   | 0.0092   |
| R-squared          | 0.043189    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.035565    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.781178    | Akaike info criterion |             | 7.192266 |
| Sum squared resid  | 58063.14    | Schwarz criterion     |             | 7.234941 |
| Log likelihood     | -2726.061   | Hannan-Quinn criter.  |             | 7.208700 |
| F-statistic        | 5.664869    | Durbin-Watson stat    |             | 1.983784 |
| Prob(F-statistic)  | 0.000009    |                       |             |          |

## 14. ARIMAX(1,1,2) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:40  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 13 iterations  
 MA Backcast: 1 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.018740   | 0.004730              | -3.961644   | 0.0001   |
| UT                 | -188.4308   | 155.1590              | -1.214437   | 0.2250   |
| WT                 | 748.2463    | 866.3230              | 0.863704    | 0.3880   |
| AR(1)              | 0.618844    | 0.110987              | 5.575819    | 0.0000   |
| MA(1)              | -0.661121   | 0.113513              | -5.824185   | 0.0000   |
| MA(2)              | -0.116695   | 0.044648              | -2.613697   | 0.0091   |
| R-squared          | 0.043003    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.036657    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.776205    | Akaike info criterion |             | 7.189829 |
| Sum squared resid  | 58074.42    | Schwarz criterion     |             | 7.226408 |
| Log likelihood     | -2726.135   | Hannan-Quinn criter.  |             | 7.203915 |
| Durbin-Watson stat | 1.983725    |                       |             |          |



## 15. ARIMAX(1,1,3) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:20  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 9 iterations  
 MA Backcast: 0 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.076907    | 0.198299              | 0.387832    | 0.6983   |
| ST                 | -0.019363   | 0.004723              | -4.099816   | 0.0000   |
| UT                 | -188.0478   | 154.2584              | -1.219044   | 0.2232   |
| WT                 | 746.3527    | 852.6935              | 0.875288    | 0.3817   |
| AR(1)              | 0.242908    | 0.179110              | 1.356194    | 0.1754   |
| MA(1)              | -0.277571   | 0.177188              | -1.566536   | 0.1176   |
| MA(2)              | -0.097975   | 0.038974              | -2.513843   | 0.0122   |
| MA(3)              | -0.155889   | 0.046861              | -3.326613   | 0.0009   |
| R-squared          | 0.053430    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.044619    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.739863    | Akaike info criterion |             | 7.184137 |
| Sum squared resid  | 57441.68    | Schwarz criterion     |             | 7.232908 |
| Log likelihood     | -2721.972   | Hannan-Quinn criter.  |             | 7.202918 |
| F-statistic        | 6.063885    | Durbin-Watson stat    |             | 1.995542 |
| Prob(F-statistic)  | 0.000001    |                       |             |          |

## 16. ARIMAX(1,1,3) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:40  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 9 iterations  
 MA Backcast: 0 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.019129   | 0.004694              | -4.075212   | 0.0001   |
| UT                 | -189.6080   | 154.1524              | -1.230004   | 0.2191   |
| WT                 | 760.2544    | 851.5047              | 0.892836    | 0.3722   |
| AR(1)              | 0.242233    | 0.179482              | 1.349625    | 0.1775   |
| MA(1)              | -0.276367   | 0.177557              | -1.556497   | 0.1200   |
| MA(2)              | -0.097623   | 0.038909              | -2.509003   | 0.0123   |
| MA(3)              | -0.155572   | 0.046774              | -3.326038   | 0.0009   |
| R-squared          | 0.053242    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.045698    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.734927    | Akaike info criterion |             | 7.181704 |
| Sum squared resid  | 57453.11    | Schwarz criterion     |             | 7.224379 |
| Log likelihood     | -2722.048   | Hannan-Quinn criter.  |             | 7.198138 |
| Durbin-Watson stat | 1.995558    |                       |             |          |

## 17. ARIMAX(2,1,0) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:21  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 8 iterations

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.043849    | 0.298701              | 0.146799    | 0.8833    |
| ST                 | -0.014123   | 0.004967              | -2.843249   | 0.0046    |
| UT                 | -183.3252   | 160.6215              | -1.141349   | 0.2541    |
| WT                 | 512.7951    | 889.2507              | 0.576660    | 0.5643    |
| AR(1)              | 0.003486    | 0.036315              | 0.095986    | 0.9236    |
| AR(2)              | -0.087738   | 0.036414              | -2.409414   | 0.0162    |
| R-squared          | 0.016840    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.010311    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.889852    | Akaike info criterion |             | 7.215572  |
| Sum squared resid  | 59509.19    | Schwarz criterion     |             | 7.252188  |
| Log likelihood     | -2732.309   | Hannan-Quinn criter.  |             | 7.229673  |
| F-statistic        | 2.579476    | Durbin-Watson stat    |             | 2.030610  |
| Prob(F-statistic)  | 0.025190    |                       |             |           |

## 18. ARIMAX(2,1,0) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:31  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 10 iterations  
 MA Backcast: 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019182   | 0.004728              | -4.057574   | 0.0001    |
| UT                 | -189.1042   | 154.7741              | -1.221808   | 0.2222    |
| WT                 | 881.2951    | 863.1564              | 1.021014    | 0.3076    |
| AR(1)              | 0.718563    | 0.088142              | 8.152368    | 0.0000    |
| AR(2)              | -0.133361   | 0.040349              | -3.305157   | 0.0010    |
| MA(1)              | -0.748590   | 0.083234              | -8.993782   | 0.0000    |
| R-squared          | 0.044214    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.037868    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.765216    | Akaike info criterion |             | 7.187333  |
| Sum squared resid  | 57852.25    | Schwarz criterion     |             | 7.223950  |
| Log likelihood     | -2721.593   | Hannan-Quinn criter.  |             | 7.201434  |
| Durbin-Watson stat | 2.012871    |                       |             |           |

## 19. ARIMAX(2,1,1) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/15/16 Time: 00:08  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 10 iterations  
 MA Backcast: 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.073490    | 0.194357              | 0.378118    | 0.7054    |
| ST                 | -0.019415   | 0.004757              | -4.081362   | 0.0000    |
| UT                 | -187.3703   | 154.8723              | -1.209837   | 0.2267    |
| WT                 | 864.1021    | 864.6418              | 0.999376    | 0.3179    |
| AR(1)              | 0.720807    | 0.087274              | 8.259166    | 0.0000    |
| AR(2)              | -0.133105   | 0.040379              | -3.296391   | 0.0010    |
| MA(1)              | -0.751390   | 0.082254              | -9.134997   | 0.0000    |
| R-squared          | 0.044394    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.036769    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.770217    | Akaike info criterion |             | 7.189780  |
| Sum squared resid  | 57841.37    | Schwarz criterion     |             | 7.232499  |
| Log likelihood     | -2721.522   | Hannan-Quinn criter.  |             | 7.206232  |
| F-statistic        | 5.822526    | Durbin-Watson stat    |             | 2.012698  |
| Prob(F-statistic)  | 0.000006    |                       |             |           |

## 20. ARIMAX(2,1,1) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:31  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 10 iterations  
 MA Backcast: 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019182   | 0.004728              | -4.057574   | 0.0001    |
| UT                 | -189.1042   | 154.7741              | -1.221808   | 0.2222    |
| WT                 | 881.2951    | 863.1564              | 1.021014    | 0.3076    |
| AR(1)              | 0.718563    | 0.088142              | 8.152368    | 0.0000    |
| AR(2)              | -0.133361   | 0.040349              | -3.305157   | 0.0010    |
| MA(1)              | -0.748590   | 0.083234              | -8.993782   | 0.0000    |
| R-squared          | 0.044214    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.037868    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.765216    | Akaike info criterion |             | 7.187333  |
| Sum squared resid  | 57852.25    | Schwarz criterion     |             | 7.223950  |
| Log likelihood     | -2721.593   | Hannan-Quinn criter.  |             | 7.201434  |
| Durbin-Watson stat | 2.012871    |                       |             |           |

## 21. ARIMAX(2,1,2) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:22  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 14 iterations  
 MA Backcast: 2 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.068329    | 0.217314              | 0.314425    | 0.7533    |
| ST                 | -0.020029   | 0.004772              | -4.196887   | 0.0000    |
| UT                 | -176.3351   | 154.9731              | -1.137843   | 0.2555    |
| WT                 | 1097.526    | 863.5098              | 1.271005    | 0.2041    |
| AR(1)              | 1.057314    | 0.200288              | 5.278976    | 0.0000    |
| AR(2)              | -0.488483   | 0.156715              | -3.117018   | 0.0019    |
| MA(1)              | -1.089207   | 0.211884              | -5.140593   | 0.0000    |
| MA(2)              | 0.381647    | 0.185646              | 2.055775    | 0.0401    |
| R-squared          | 0.048774    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.039908    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.755919    | Akaike info criterion |             | 7.187821  |
| Sum squared resid  | 57576.25    | Schwarz criterion     |             | 7.236643  |
| Log likelihood     | -2719.778   | Hannan-Quinn criter.  |             | 7.206623  |
| F-statistic        | 5.501060    | Durbin-Watson stat    |             | 2.010615  |
| Prob(F-statistic)  | 0.000003    |                       |             |           |

## 22. ARIMAX(2,1,2) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:42  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 14 iterations  
 MA Backcast: 2 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019856   | 0.004747              | -4.182634   | 0.0000    |
| UT                 | -177.5281   | 154.8622              | -1.146362   | 0.2520    |
| WT                 | 1107.875    | 862.3148              | 1.284769    | 0.1993    |
| AR(1)              | 1.057221    | 0.199981              | 5.286610    | 0.0000    |
| AR(2)              | -0.489284   | 0.156550              | -3.125429   | 0.0018    |
| MA(1)              | -1.088728   | 0.211589              | -5.145487   | 0.0000    |
| MA(2)              | 0.382422    | 0.185362              | 2.063112    | 0.0394    |
| R-squared          | 0.048649    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.041059    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.750668    | Akaike info criterion |             | 7.185317  |
| Sum squared resid  | 57583.79    | Schwarz criterion     |             | 7.228036  |
| Log likelihood     | -2719.828   | Hannan-Quinn criter.  |             | 7.201769  |
| Durbin-Watson stat | 2.010639    |                       |             |           |

## 23. ARIMAX(2,1,3) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:23  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 9 iterations  
 MA Backcast: 1 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.070827    | 0.205672              | 0.344368    | 0.7307    |
| ST                 | -0.019637   | 0.004737              | -4.145890   | 0.0000    |
| UT                 | -194.7941   | 154.5132              | -1.260696   | 0.2078    |
| WT                 | 842.0789    | 861.3868              | 0.977585    | 0.3286    |
| AR(1)              | 0.386114    | 0.287956              | 1.340878    | 0.1804    |
| AR(2)              | -0.162304   | 0.214677              | -0.756038   | 0.4499    |
| MA(1)              | -0.421059   | 0.286738              | -1.468442   | 0.1424    |
| MA(2)              | 0.065616    | 0.220835              | 0.297125    | 0.7665    |
| MA(3)              | -0.146089   | 0.052761              | -2.768898   | 0.0058    |
| R-squared          | 0.052996    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.042895    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.742288    | Akaike info criterion |             | 7.186008  |
| Sum squared resid  | 57320.69    | Schwarz criterion     |             | 7.240933  |
| Log likelihood     | -2718.090   | Hannan-Quinn criter.  |             | 7.207160  |
| F-statistic        | 5.246417    | Durbin-Watson stat    |             | 1.998914  |
| Prob(F-statistic)  | 0.000002    |                       |             |           |

## 24. ARIMAX(2,1,3) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:43  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 10 iterations  
 MA Backcast: 1 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019439   | 0.004710              | -4.127362   | 0.0000    |
| UT                 | -196.2435   | 154.4040              | -1.270974   | 0.2041    |
| WT                 | 854.4502    | 860.1246              | 0.993403    | 0.3208    |
| AR(1)              | 0.386688    | 0.287490              | 1.345046    | 0.1790    |
| AR(2)              | -0.164077   | 0.214467              | -0.765043   | 0.4445    |
| MA(1)              | -0.421172   | 0.286285              | -1.471165   | 0.1417    |
| MA(2)              | 0.067613    | 0.220507              | 0.306625    | 0.7592    |
| MA(3)              | -0.145726   | 0.052679              | -2.766302   | 0.0058    |
| R-squared          | 0.052847    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.044019    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.737152    | Akaike info criterion |             | 7.183530  |
| Sum squared resid  | 57329.71    | Schwarz criterion     |             | 7.232352  |
| Log likelihood     | -2718.150   | Hannan-Quinn criter.  |             | 7.202332  |
| Durbin-Watson stat | 1.999000    |                       |             |           |

## 25. ARIMAX(3,1,0) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:24  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 8 iterations

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.060322    | 0.249120              | 0.242140    | 0.8087    |
| ST                 | -0.017539   | 0.004803              | -3.651546   | 0.0003    |
| UT                 | -218.5908   | 156.1372              | -1.399992   | 0.1619    |
| WT                 | 601.0627    | 865.8770              | 0.694166    | 0.4878    |
| AR(1)              | -0.016413   | 0.036036              | -0.455455   | 0.6489    |
| AR(2)              | -0.092373   | 0.035910              | -2.572381   | 0.0103    |
| AR(3)              | -0.175608   | 0.036002              | -4.877769   | 0.0000    |
| R-squared          | 0.046546    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.038929    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.765917    | Akaike info criterion |             | 7.188811  |
| Sum squared resid  | 57707.82    | Schwarz criterion     |             | 7.231575  |
| Log likelihood     | -2717.559   | Hannan-Quinn criter.  |             | 7.205281  |
| F-statistic        | 6.110465    | Durbin-Watson stat    |             | 2.021597  |
| Prob(F-statistic)  | 0.000003    |                       |             |           |

## 26. ARIMAX(3,1,0) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:44  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 8 iterations

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.017430   | 0.004782              | -3.644747   | 0.0003    |
| UT                 | -219.2685   | 156.0127              | -1.405453   | 0.1603    |
| WT                 | 609.0679    | 864.7118              | 0.704359    | 0.4814    |
| AR(1)              | -0.016233   | 0.036012              | -0.450758   | 0.6523    |
| AR(2)              | -0.092216   | 0.035885              | -2.569756   | 0.0104    |
| AR(3)              | -0.175419   | 0.035977              | -4.875844   | 0.0000    |
| R-squared          | 0.046472    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.040132    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.760428    | Akaike info criterion |             | 7.186251  |
| Sum squared resid  | 57712.32    | Schwarz criterion     |             | 7.222905  |
| Log likelihood     | -2717.589   | Hannan-Quinn criter.  |             | 7.200367  |
| Durbin-Watson stat | 2.021519    |                       |             |           |

## 27. ARIMAX(3,1,1) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:25  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 10 iterations  
 MA Backcast: 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.070199    | 0.214251              | 0.327649    | 0.7433    |
| ST                 | -0.019879   | 0.004744              | -4.190171   | 0.0000    |
| UT                 | -186.3020   | 154.7010              | -1.204271   | 0.2289    |
| WT                 | 944.2372    | 858.6886              | 1.099627    | 0.2718    |
| AR(1)              | 0.432642    | 0.147178              | 2.939581    | 0.0034    |
| AR(2)              | -0.095008   | 0.039472              | -2.406942   | 0.0163    |
| AR(3)              | -0.130908   | 0.045747              | -2.861559   | 0.0043    |
| MA(1)              | -0.469065   | 0.146821              | -3.194807   | 0.0015    |
| R-squared          | 0.052655    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.043813    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.743616    | Akaike info criterion |             | 7.185023  |
| Sum squared resid  | 57338.12    | Schwarz criterion     |             | 7.233895  |
| Log likelihood     | -2715.124   | Hannan-Quinn criter.  |             | 7.203845  |
| F-statistic        | 5.955118    | Durbin-Watson stat    |             | 1.996070  |
| Prob(F-statistic)  | 0.000001    |                       |             |           |

## 28. ARIMAX(3,1,1) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:47  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 9 iterations  
 MA Backcast: 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019694   | 0.004718              | -4.173839   | 0.0000    |
| UT                 | -187.7014   | 154.5867              | -1.214215   | 0.2250    |
| WT                 | 953.9883    | 857.5345              | 1.112478    | 0.2663    |
| AR(1)              | 0.430312    | 0.147843              | 2.910594    | 0.0037    |
| AR(2)              | -0.094886   | 0.039411              | -2.407626   | 0.0163    |
| AR(3)              | -0.131078   | 0.045708              | -2.867723   | 0.0043    |
| MA(1)              | -0.466300   | 0.147515              | -3.161039   | 0.0016    |
| R-squared          | 0.052520    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.044950    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.738415    | Akaike info criterion |             | 7.182527  |
| Sum squared resid  | 57346.29    | Schwarz criterion     |             | 7.225290  |
| Log likelihood     | -2715.178   | Hannan-Quinn criter.  |             | 7.198996  |
| Durbin-Watson stat | 1.996118    |                       |             |           |

## 29. ARIMAX(3,1,2) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:26  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 17 iterations  
 MA Backcast: 3 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 0.071556    | 0.210715              | 0.339586    | 0.7343    |
| ST                 | -0.019811   | 0.004749              | -4.171735   | 0.0000    |
| UT                 | -185.8563   | 154.6065              | -1.202125   | 0.2297    |
| WT                 | 901.4307    | 860.9036              | 1.047075    | 0.2954    |
| AR(1)              | 0.307755    | 0.325336              | 0.945961    | 0.3445    |
| AR(2)              | 0.016499    | 0.254793              | 0.064753    | 0.9484    |
| AR(3)              | -0.145242   | 0.052968              | -2.742055   | 0.0063    |
| MA(1)              | -0.343091   | 0.327803              | -1.046638   | 0.2956    |
| MA(2)              | -0.117031   | 0.266826              | -0.438605   | 0.6611    |
| R-squared          | 0.052960    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.042844    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.748042    | Akaike info criterion |             | 7.187339  |
| Sum squared resid  | 57319.65    | Schwarz criterion     |             | 7.242321  |
| Log likelihood     | -2715.002   | Hannan-Quinn criter.  |             | 7.208514  |
| F-statistic        | 5.235628    | Durbin-Watson stat    |             | 1.998526  |
| Prob(F-statistic)  | 0.000002    |                       |             |           |

## 30. ARIMAX(3,1,2) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:48  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 16 iterations  
 MA Backcast: 3 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019618   | 0.004723              | -4.153985   | 0.0000    |
| UT                 | -187.3307   | 154.4951              | -1.212535   | 0.2257    |
| WT                 | 912.6316    | 859.7063              | 1.061562    | 0.2888    |
| AR(1)              | 0.307519    | 0.325237              | 0.945523    | 0.3447    |
| AR(2)              | 0.014639    | 0.254665              | 0.057484    | 0.9542    |
| AR(3)              | -0.145170   | 0.052949              | -2.741701   | 0.0063    |
| MA(1)              | -0.342419   | 0.327698              | -1.044923   | 0.2964    |
| MA(2)              | -0.114900   | 0.266530              | -0.431098   | 0.6665    |
| R-squared          | 0.052815    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.043974    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.742877    | Akaike info criterion |             | 7.184854  |
| Sum squared resid  | 57328.42    | Schwarz criterion     |             | 7.233726  |
| Log likelihood     | -2715.060   | Hannan-Quinn criter.  |             | 7.203676  |
| Durbin-Watson stat | 1.998546    |                       |             |           |



## 31. ARIMAX(3,1,3) dengan konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/14/16 Time: 00:27  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 11 iterations  
 MA Backcast: 2 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| C                  | 0.072061    | 0.207875              | 0.346654    | 0.7289 |
| ST                 | -0.019713   | 0.004753              | -4.147059   | 0.0000 |
| UT                 | -190.2897   | 155.0038              | -1.227646   | 0.2200 |
| WT                 | 857.2665    | 862.7954              | 0.993592    | 0.3207 |
| AR(1)              | 0.312161    | 0.338788              | 0.921405    | 0.3571 |
| AR(2)              | -0.047115   | 0.369391              | -0.127549   | 0.8985 |
| AR(3)              | -0.076019   | 0.231788              | -0.327967   | 0.7430 |
| MA(1)              | -0.347018   | 0.338900              | -1.023952   | 0.3062 |
| MA(2)              | -0.052112   | 0.379424              | -0.137346   | 0.8908 |
| MA(3)              | -0.075352   | 0.226645              | -0.332468   | 0.7396 |
| R-squared          | 0.053105    | Mean dependent var    | -0.012797   |        |
| Adjusted R-squared | 0.041712    | S.D. dependent var    | 8.941689    |        |
| S.E. of regression | 8.753215    | Akaike info criterion | 7.189824    |        |
| Sum squared resid  | 57310.84    | Schwarz criterion     | 7.250915    |        |
| Log likelihood     | -2714.943   | Hannan-Quinn criter.  | 7.213352    |        |
| F-statistic        | 4.661166    | Durbin-Watson stat    | 1.998814    |        |
| Prob(F-statistic)  | 0.000005    |                       |             |        |

## 32. ARIMAX(3,1,3) tanpa konstanta

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/13/16 Time: 23:49  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 11 iterations  
 MA Backcast: 2 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| ST                 | -0.019516   | 0.004727              | -4.128559   | 0.0000 |
| UT                 | -191.7402   | 154.8940              | -1.237881   | 0.2161 |
| WT                 | 870.2310    | 861.5071              | 1.010126    | 0.3128 |
| AR(1)              | 0.312236    | 0.339506              | 0.919679    | 0.3580 |
| AR(2)              | -0.048126   | 0.369994              | -0.130074   | 0.8965 |
| AR(3)              | -0.077429   | 0.232316              | -0.333291   | 0.7390 |
| MA(1)              | -0.346658   | 0.339655              | -1.020616   | 0.3078 |
| MA(2)              | -0.050839   | 0.379971              | -0.133797   | 0.8936 |
| MA(3)              | -0.073677   | 0.226912              | -0.324693   | 0.7455 |
| R-squared          | 0.052954    | Mean dependent var    | -0.012797   |        |
| Adjusted R-squared | 0.042839    | S.D. dependent var    | 8.941689    |        |
| S.E. of regression | 8.748067    | Akaike info criterion | 7.187345    |        |
| Sum squared resid  | 57319.98    | Schwarz criterion     | 7.242327    |        |
| Log likelihood     | -2715.004   | Hannan-Quinn criter.  | 7.208520    |        |
| Durbin-Watson stat | 1.998819    |                       |             |        |

## 33. Uji ARIMAX(1,1,1) tanpa konstanta, Inflasi (Ut) dan Suku bunga (Wt)

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/15/16 Time: 16:08  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 14 iterations  
 MA Backcast: 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.012426   | 0.004979              | -2.495803   | 0.0128   |
| AR(1)              | -0.799111   | 0.386476              | -2.067687   | 0.0390   |
| MA(1)              | 0.808987    | 0.378761              | 2.135875    | 0.0330   |
| R-squared          | 0.010177    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.007562    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.907748    | Akaike info criterion |             | 7.215659 |
| Sum squared resid  | 60066.41    | Schwarz criterion     |             | 7.233949 |
| Log likelihood     | -2738.951   | Hannan-Quinn criter.  |             | 7.222702 |
| Durbin-Watson stat | 2.004285    |                       |             |          |
| Inverted AR Roots  | -.80        |                       |             |          |
| Inverted MA Roots  | -.81        |                       |             |          |

## 34. Uji ARIMAX(1,1,2) tanpa konstanta, Inflasi (Ut) dan Suku bunga (Wt)

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/15/16 Time: 16:09  
 Sample (adjusted): 3 762  
 Included observations: 760 after adjustments  
 Convergence achieved after 12 iterations  
 MA Backcast: 1 2

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| ST                 | -0.018363   | 0.004717              | -3.893227   | 0.0001   |
| AR(1)              | 0.642713    | 0.106112              | 6.056927    | 0.0000   |
| MA(1)              | -0.681568   | 0.109116              | -6.246290   | 0.0000   |
| MA(2)              | -0.110650   | 0.044018              | -2.513746   | 0.0122   |
| R-squared          | 0.040267    | Mean dependent var    |             | 0.006066 |
| Adjusted R-squared | 0.036458    | S.D. dependent var    |             | 8.941621 |
| S.E. of regression | 8.777110    | Akaike info criterion |             | 7.187421 |
| Sum squared resid  | 58240.47    | Schwarz criterion     |             | 7.211807 |
| Log likelihood     | -2727.220   | Hannan-Quinn criter.  |             | 7.196811 |
| Durbin-Watson stat | 1.984528    |                       |             |          |
| Inverted AR Roots  | .64         |                       |             |          |
| Inverted MA Roots  | .82         | -.14                  |             |          |

## 35. Uji ARIMAX(2,1,1) tanpa konstanta, Inflasi (Ut) dan Suku bunga (Wt)

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/15/16 Time: 16:10  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 8 iterations  
 MA Backcast: 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.018671   | 0.004716              | -3.958871   | 0.0001    |
| AR(1)              | 0.742903    | 0.084964              | 8.743711    | 0.0000    |
| AR(2)              | -0.124427   | 0.039939              | -3.115386   | 0.0019    |
| MA(1)              | -0.770115   | 0.079437              | -9.694623   | 0.0000    |
| R-squared          | 0.041119    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.037308    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.767763    | Akaike info criterion |             | 7.185297  |
| Sum squared resid  | 58039.62    | Schwarz criterion     |             | 7.209708  |
| Log likelihood     | -2722.820   | Hannan-Quinn criter.  |             | 7.194698  |
| Durbin-Watson stat | 2.011273    |                       |             |           |
| Inverted AR Roots  | .49         | .26                   |             |           |
| Inverted MA Roots  | .77         |                       |             |           |

## 36. Uji ARIMAX(2,1,2) tanpa konstanta, Inflasi (Ut) dan Suku bunga (Wt)

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/15/16 Time: 16:11  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 14 iterations  
 MA Backcast: 2 3

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019178   | 0.004748              | -4.039103   | 0.0001    |
| AR(1)              | 1.066084    | 0.209937              | 5.078110    | 0.0000    |
| AR(2)              | -0.483033   | 0.165531              | -2.918079   | 0.0036    |
| MA(1)              | -1.092740   | 0.221512              | -4.933101   | 0.0000    |
| MA(2)              | 0.380096    | 0.194261              | 1.956621    | 0.0508    |
| R-squared          | 0.044963    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.039897    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.755968    | Akaike info criterion |             | 7.183914  |
| Sum squared resid  | 57806.90    | Schwarz criterion     |             | 7.214428  |
| Log likelihood     | -2721.295   | Hannan-Quinn criter.  |             | 7.195665  |
| Durbin-Watson stat | 2.012016    |                       |             |           |

37. Uji ARIMAX(3,1,1) tanpa konstanta, Inflasi ( $U_t$ ) dan Suku bunga ( $W_t$ )

Dependent Variable: DSAHAM  
 Method: Least Squares  
 Date: 05/15/16 Time: 16:12  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments  
 Convergence achieved after 8 iterations  
 MA Backcast: 4

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.019159   | 0.004718              | -4.060982   | 0.0001    |
| AR(1)              | 0.437407    | 0.150194              | 2.912283    | 0.0037    |
| AR(2)              | -0.086312   | 0.039378              | -2.191871   | 0.0287    |
| AR(3)              | -0.130318   | 0.045073              | -2.891251   | 0.0039    |
| MA(1)              | -0.469509   | 0.150023              | -3.129576   | 0.0018    |
| R-squared          | 0.049174    | Mean dependent var    |             | -0.012797 |
| Adjusted R-squared | 0.044123    | S.D. dependent var    |             | 8.941689  |
| S.E. of regression | 8.742196    | Akaike info criterion |             | 7.180774  |
| Sum squared resid  | 57548.77    | Schwarz criterion     |             | 7.211320  |
| Log likelihood     | -2716.513   | Hannan-Quinn criter.  |             | 7.192538  |
| Durbin-Watson stat | 1.995662    |                       |             |           |
| Inverted AR Roots  | .40-.46i    | .40+.46i              |             | -.35      |
| Inverted MA Roots  | .47         |                       |             |           |

#### Lampiran 4 : Uji Efek ARCH untuk Model ARIMAX terbaik

Uji efek ARCH untuk model ARIMAX(2,1,1) tanpa konstanta, Inflasi (Ut) dan Suku bunga (Wt)

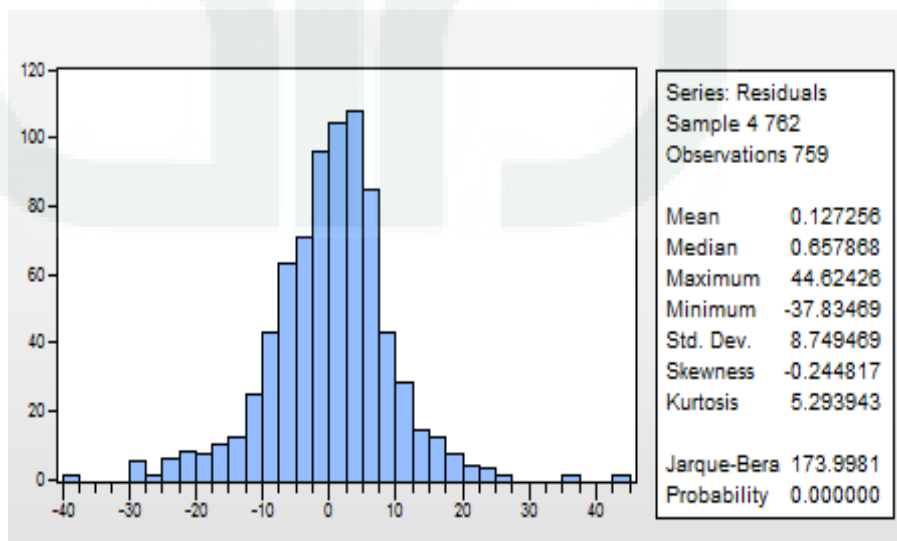
##### Heteroskedasticity Test: ARCH

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 27.32121 | Prob. F(1,756)      | 0.0000 |
| Obs*R-squared | 26.43804 | Prob. Chi-Square(1) | 0.0000 |

Test Equation:  
 Dependent Variable: RESID^2  
 Method: Least Squares  
 Date: 05/16/16 Time: 02:17  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| C                  | 62.27083    | 6.281018              | 9.914130    | 0.0000 |
| RESID^2(-1)        | 0.186746    | 0.035727              | 5.226970    | 0.0000 |
| R-squared          | 0.034879    | Mean dependent var    | 76.56399    |        |
| Adjusted R-squared | 0.033602    | S.D. dependent var    | 158.3627    |        |
| S.E. of regression | 155.6793    | Akaike info criterion | 12.93611    |        |
| Sum squared resid  | 18322461    | Schwarz criterion     | 12.94833    |        |
| Log likelihood     | -4900.785   | Hannan-Quinn criter.  | 12.94081    |        |
| F-statistic        | 27.32121    | Durbin-Watson stat    | 2.030667    |        |
| Prob(F-statistic)  | 0.000000    |                       |             |        |

#### Lampiran 5 : Uji Efek Asimetris



## Lampiran 6 : Hasil Estimasi Model ARIMAX-APARCH

### 1. ARIMAX(2,1,1)-APARCH(1,0)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 07:53  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 59 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  
 $@SQRT(GARCH)^*C(8) = C(5) + C(6)*(ABS(RESID(-1)) - C(7)*RESID(-1))^*C(8)$

| Variable | Coefficient | Std. Error | z-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ST       | -0.012448   | 0.003202   | -3.887118   | 0.0001 |
| AR(1)    | 0.850135    | 0.056059   | 15.16499    | 0.0000 |
| AR(2)    | -0.093204   | 0.035677   | -2.612436   | 0.0090 |
| MA(1)    | -0.871811   | 0.043244   | -20.16005   | 0.0000 |

| Variance Equation |          |          |          |        |
|-------------------|----------|----------|----------|--------|
| C(5)              | 5.884598 | 4.534011 | 1.297879 | 0.1943 |
| C(6)              | 0.245961 | 0.045668 | 5.385806 | 0.0000 |
| C(7)              | 0.383309 | 0.132021 | 2.903402 | 0.0037 |
| C(8)              | 0.918615 | 0.367543 | 2.499337 | 0.0124 |

|                    |           |                       |           |
|--------------------|-----------|-----------------------|-----------|
| R-squared          | 0.037062  | Mean dependent var    | -0.010356 |
| Adjusted R-squared | 0.033236  | S.D. dependent var    | 8.936042  |
| S.E. of regression | 8.786289  | Akaike info criterion | 7.127853  |
| Sum squared resid  | 58285.16  | Schwarz criterion     | 7.176675  |
| Log likelihood     | -2697.020 | Hannan-Quinn criter.  | 7.146655  |
| Durbin-Watson stat | 1.996691  |                       |           |

### 2. ARIMAX(2,1,1)-APARCH(1,1)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 07:57  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 84 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  
 $@SQRT(GARCH)^*C(9) = C(5) + C(6)*(ABS(RESID(-1)) - C(7)*RESID(-1))^*C(9) + C(8)*@SQRT(GARCH(-1))^*C(9)$

| Variable | Coefficient | Std. Error | z-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ST       | -0.015314   | 0.003944   | -3.882595   | 0.0001 |
| AR(1)    | 0.757806    | 0.080040   | 9.467823    | 0.0000 |
| AR(2)    | -0.096074   | 0.042733   | -2.248251   | 0.0246 |
| MA(1)    | -0.810551   | 0.070457   | -11.50426   | 0.0000 |

| Variance Equation |          |          |          |        |
|-------------------|----------|----------|----------|--------|
| C(5)              | 0.093227 | 0.055812 | 1.670384 | 0.0948 |
| C(6)              | 0.060434 | 0.013270 | 4.554178 | 0.0000 |
| C(7)              | 0.484619 | 0.163631 | 2.961655 | 0.0031 |
| C(8)              | 0.928225 | 0.014392 | 64.49764 | 0.0000 |
| C(9)              | 0.595089 | 0.257311 | 2.312726 | 0.0207 |

|                    |           |                       |           |
|--------------------|-----------|-----------------------|-----------|
| R-squared          | 0.039421  | Mean dependent var    | -0.010356 |
| Adjusted R-squared | 0.035605  | S.D. dependent var    | 8.936042  |
| S.E. of regression | 8.775519  | Akaike info criterion | 7.055612  |
| Sum squared resid  | 58142.34  | Schwarz criterion     | 7.110537  |
| Log likelihood     | -2668.605 | Hannan-Quinn criter.  | 7.076764  |
| Durbin-Watson stat | 1.946733  |                       |           |

## 3. ARIMAX(2,1,1)-APARCH(1,2)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 07:59  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 65 iterations  
 MA Backcast: 3

Presample variance: backcast (parameter = 0.7)

$$\text{@SQRT(GARCH)}^{\wedge}C(10) = C(5) + C(6)*(\text{ABS}(\text{RESID}(-1)) - C(7)*\text{RESID}(-1))^{\wedge}C(10) + C(8)*\text{@SQRT(GARCH}(-1))^{\wedge}C(10) + C(9)*\text{@SQRT(GARCH}(-2))^{\wedge}C(10)$$

| Variable           | Coefficient | Std. Error            | z-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| ST                 | -0.015198   | 0.003888              | -3.908946   | 0.0001 |
| AR(1)              | 0.762572    | 0.076404              | 9.980819    | 0.0000 |
| AR(2)              | -0.113251   | 0.042108              | -2.689519   | 0.0072 |
| MA(1)              | -0.805429   | 0.066336              | -12.14166   | 0.0000 |
| Variance Equation  |             |                       |             |        |
| C(5)               | 0.127442    | 0.083216              | 1.531460    | 0.1257 |
| C(6)               | 0.091237    | 0.024591              | 3.710195    | 0.0002 |
| C(7)               | 0.438665    | 0.161162              | 2.721897    | 0.0065 |
| C(8)               | 0.379285    | 0.258336              | 1.468183    | 0.1421 |
| C(9)               | 0.513306    | 0.239221              | 2.145737    | 0.0319 |
| C(10)              | 0.570571    | 0.243003              | 2.347999    | 0.0189 |
| R-squared          | 0.039621    | Mean dependent var    | -0.010356   |        |
| Adjusted R-squared | 0.035804    | S.D. dependent var    | 8.936042    |        |
| S.E. of regression | 8.774609    | Akaike info criterion | 7.055273    |        |
| Sum squared resid  | 58130.29    | Schwarz criterion     | 7.116300    |        |
| Log likelihood     | -2667.476   | Hannan-Quinn criter.  | 7.078775    |        |
| Durbin-Watson stat | 1.966968    |                       |             |        |

## 4. ARIMAX(2,1,1)-APARCH(1,3)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 08:01  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 38 iterations  
 MA Backcast: 3

Presample variance: backcast (parameter = 0.7)

$$\text{@SQRT(GARCH)}^{\wedge}C(11) = C(5) + C(6)*(\text{ABS}(\text{RESID}(-1)) - C(7)*\text{RESID}(-1))^{\wedge}C(11) + C(8)*\text{@SQRT(GARCH}(-1))^{\wedge}C(11) + C(9)*\text{@SQRT(GARCH}(-2))^{\wedge}C(11) + C(10)*\text{@SQRT(GARCH}(-3))^{\wedge}C(11)$$

| Variable           | Coefficient | Std. Error            | z-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| ST                 | -0.016084   | 0.002272              | -7.079483   | 0.0000 |
| AR(1)              | 0.722301    | 0.025966              | 27.81770    | 0.0000 |
| AR(2)              | -0.093203   | 0.015653              | -5.954150   | 0.0000 |
| MA(1)              | -0.794686   | 0.028035              | -28.34644   | 0.0000 |
| Variance Equation  |             |                       |             |        |
| C(5)               | 0.146347    | 0.081427              | 1.797269    | 0.0723 |
| C(6)               | 0.129375    | 0.022383              | 5.780140    | 0.0000 |
| C(7)               | 0.401907    | 0.109425              | 3.672894    | 0.0002 |
| C(8)               | 0.225885    | 0.033454              | 6.752106    | 0.0000 |
| C(9)               | -0.224135   | 0.036811              | -6.088780   | 0.0000 |
| C(10)              | 0.845064    | 0.034106              | 24.77724    | 0.0000 |
| C(11)              | 0.486883    | 0.180034              | 2.704401    | 0.0068 |
| R-squared          | 0.038275    | Mean dependent var    | -0.010356   |        |
| Adjusted R-squared | 0.034453    | S.D. dependent var    | 8.936042    |        |
| S.E. of regression | 8.780756    | Akaike info criterion | 7.036840    |        |
| Sum squared resid  | 58211.76    | Schwarz criterion     | 7.103971    |        |
| Log likelihood     | -2659.481   | Hannan-Quinn criter.  | 7.062693    |        |
| Durbin-Watson stat | 1.908979    |                       |             |        |

## 5. ARIMAX(2,1,1)-APARCH(2,0)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 08:32  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 50 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  
 @SQRT(GARCH)^C(9) = C(5) + C(6)\*(ABS(RESID(-1)) - C(7)\*RESID(-1))^C(9) + C(8)\*ABS(RESID(-2))^C(9)

| Variable | Coefficient | Std. Error | z-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ST       | -0.013094   | 0.003363   | -3.893700   | 0.0001 |
| AR(1)    | 0.836656    | 0.062459   | 13.39526    | 0.0000 |
| AR(2)    | -0.087726   | 0.036382   | -2.411237   | 0.0159 |
| MA(1)    | -0.863921   | 0.049768   | -17.35900   | 0.0000 |

| Variance Equation |          |          |          |        |
|-------------------|----------|----------|----------|--------|
| C(5)              | 7.736801 | 6.693639 | 1.155844 | 0.2477 |
| C(6)              | 0.232465 | 0.048974 | 4.746680 | 0.0000 |
| C(7)              | 0.399856 | 0.145539 | 2.747412 | 0.0060 |
| C(8)              | 0.046874 | 0.028528 | 1.643122 | 0.1004 |
| C(9)              | 1.062168 | 0.412432 | 2.575379 | 0.0100 |

|                    |           |                       |           |
|--------------------|-----------|-----------------------|-----------|
| R-squared          | 0.037773  | Mean dependent var    | -0.010356 |
| Adjusted R-squared | 0.033949  | S.D. dependent var    | 8.936042  |
| S.E. of regression | 8.783046  | Akaike info criterion | 7.128466  |
| Sum squared resid  | 58242.14  | Schwarz criterion     | 7.183390  |
| Log likelihood     | -2696.253 | Hannan-Quinn criter.  | 7.149617  |
| Durbin-Watson stat | 1.988139  |                       |           |

## 6. ARIMAX(2,1,1)-APARCH(2,1)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 08:33  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 48 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  
 @SQRT(GARCH)^C(10) = C(5) + C(6)\*(ABS(RESID(-1)) - C(7)\*RESID(-1))^C(10) + C(8)\*ABS(RESID(-2))^C(10) + C(9)\*@SQRT(GARCH(-1))^C(10)

| Variable | Coefficient | Std. Error | z-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ST       | -0.014485   | 0.003894   | -3.720007   | 0.0002 |
| AR(1)    | 0.760034    | 0.080419   | 9.450965    | 0.0000 |
| AR(2)    | -0.100826   | 0.043991   | -2.291985   | 0.0219 |
| MA(1)    | -0.806572   | 0.070719   | -11.40536   | 0.0000 |

| Variance Equation |           |          |           |        |
|-------------------|-----------|----------|-----------|--------|
| C(5)              | 0.085544  | 0.054846 | 1.559712  | 0.1188 |
| C(6)              | 0.112967  | 0.044987 | 2.511125  | 0.0120 |
| C(7)              | 0.228367  | 0.125397 | 1.821157  | 0.0686 |
| C(8)              | -0.062304 | 0.045498 | -1.369374 | 0.1709 |
| C(9)              | 0.940878  | 0.013595 | 69.20638  | 0.0000 |
| C(10)             | 0.666819  | 0.281670 | 2.367378  | 0.0179 |

|                    |           |                       |           |
|--------------------|-----------|-----------------------|-----------|
| R-squared          | 0.039396  | Mean dependent var    | -0.010356 |
| Adjusted R-squared | 0.035579  | S.D. dependent var    | 8.936042  |
| S.E. of regression | 8.775634  | Akaike info criterion | 7.055700  |
| Sum squared resid  | 58143.87  | Schwarz criterion     | 7.116727  |
| Log likelihood     | -2667.638 | Hannan-Quinn criter.  | 7.079202  |
| Durbin-Watson stat | 1.957130  |                       |           |



## 7. ARIMAX(2,1,1)-APARCH(2,2)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 08:35  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 59 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  

$$\begin{aligned} @SQRT(GARCH)^{\wedge}C(11) = & C(5) + C(6)*(ABS(RESID(-1)) - C(7)*RESID(-1))^{\wedge}C(11) \\ & + C(8)*ABS(RESID(-2))^{\wedge}C(11) + C(9)*@SQRT(GARCH(-1))^{\wedge}C(11) \\ & + C(10)*@SQRT(GARCH(-2))^{\wedge}C(11) \end{aligned}$$

| Variable           | Coefficient | Std. Error            | z-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| ST                 | -0.015102   | 0.003871              | -3.901350   | 0.0001 |
| AR(1)              | 0.747529    | 0.081796              | 9.138933    | 0.0000 |
| AR(2)              | -0.124016   | 0.041103              | -3.017221   | 0.0026 |
| MA(1)              | -0.779338   | 0.071638              | -10.87876   | 0.0000 |
| Variance Equation  |             |                       |             |        |
| C(5)               | 0.124578    | 0.079366              | 1.569664    | 0.1165 |
| C(6)               | 0.120569    | 0.043165              | 2.793227    | 0.0052 |
| C(7)               | 0.308126    | 0.183213              | 1.681791    | 0.0926 |
| C(8)               | -0.044257   | 0.053321              | -0.830002   | 0.4065 |
| C(9)               | 0.498927    | 0.311429              | 1.602056    | 0.1091 |
| C(10)              | 0.410438    | 0.283432              | 1.448101    | 0.1476 |
| C(11)              | 0.630005    | 0.261104              | 2.412853    | 0.0158 |
| R-squared          | 0.040182    | Mean dependent var    | -0.010356   |        |
| Adjusted R-squared | 0.036368    | S.D. dependent var    | 8.936042    |        |
| S.E. of regression | 8.772044    | Akaike info criterion | 7.056584    |        |
| Sum squared resid  | 58096.31    | Schwarz criterion     | 7.123715    |        |
| Log likelihood     | -2666.974   | Hannan-Quinn criter.  | 7.082437    |        |
| Durbin-Watson stat | 1.990914    |                       |             |        |

## 8. ARIMAX(2,1,1)-APARCH(2,3)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 08:36  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 54 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  

$$\begin{aligned} @SQRT(GARCH)^{\wedge}C(12) = & C(5) + C(6)*(ABS(RESID(-1)) - C(7)*RESID(-1))^{\wedge}C(12) \\ & + C(8)*ABS(RESID(-2))^{\wedge}C(12) + C(9)*@SQRT(GARCH(-1))^{\wedge}C(12) \\ & + C(10)*@SQRT(GARCH(-2))^{\wedge}C(12) + C(11)*@SQRT(GARCH(-3))^{\wedge}C(12) \end{aligned}$$

| Variable           | Coefficient | Std. Error            | z-Statistic | Prob.  |
|--------------------|-------------|-----------------------|-------------|--------|
| ST                 | -0.015832   | 0.002970              | -5.331297   | 0.0000 |
| AR(1)              | 0.729869    | 0.054305              | 13.44009    | 0.0000 |
| AR(2)              | -0.092314   | 0.015928              | -5.795774   | 0.0000 |
| MA(1)              | -0.801561   | 0.049348              | -16.24311   | 0.0000 |
| Variance Equation  |             |                       |             |        |
| C(5)               | 0.106467    | 0.067486              | 1.577611    | 0.1147 |
| C(6)               | 0.115425    | 0.018517              | 6.233498    | 0.0000 |
| C(7)               | 0.202196    | 0.094227              | 2.145842    | 0.0319 |
| C(8)               | 0.026423    | 0.015619              | 1.691765    | 0.0907 |
| C(9)               | 0.188712    | 0.015228              | 12.39226    | 0.0000 |
| C(10)              | -0.248931   | 0.013302              | -18.71419   | 0.0000 |
| C(11)              | 0.912702    | 0.016953              | 53.83695    | 0.0000 |
| C(12)              | 0.527404    | 0.154251              | 3.419121    | 0.0006 |
| R-squared          | 0.038155    | Mean dependent var    | -0.010356   |        |
| Adjusted R-squared | 0.034333    | S.D. dependent var    | 8.936042    |        |
| S.E. of regression | 8.781303    | Akaike info criterion | 7.032456    |        |
| Sum squared resid  | 58219.01    | Schwarz criterion     | 7.105689    |        |
| Log likelihood     | -2656.817   | Hannan-Quinn criter.  | 7.060658    |        |
| Durbin-Watson stat | 1.909342    |                       |             |        |

## 9. ARIMAX(2,1,1)-APARCH(3,0)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 17:51  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 25 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  

$$\text{@SQRT(GARCH)}^{\wedge}C(10) = C(5) + C(6)*\text{ABS(RESID(-1))} - C(7)*\text{RESID}(-1)^{\wedge}C(10) + C(8)*\text{ABS(RESID(-2))}^{\wedge}C(10) + C(9)*\text{ABS(RESID(-3))}^{\wedge}C(10)$$

| Variable | Coefficient | Std. Error | z-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ST       | -0.011662   | 0.003296   | -3.537985   | 0.0004 |
| AR(1)    | 0.780764    | 0.075109   | 10.39508    | 0.0000 |
| AR(2)    | -0.073407   | 0.043844   | -1.674256   | 0.0941 |
| MA(1)    | -0.836497   | 0.062468   | -13.39082   | 0.0000 |

## Variance Equation

|       | Coefficient | Std. Error | z-Statistic | Prob.  |
|-------|-------------|------------|-------------|--------|
| C(5)  | 414.7370    | 864.5347   | 0.479723    | 0.6314 |
| C(6)  | 0.153680    | 0.061278   | 2.507925    | 0.0121 |
| C(7)  | 0.300957    | 0.130591   | 2.304575    | 0.0212 |
| C(8)  | 0.027326    | 0.024713   | 1.105727    | 0.2688 |
| C(9)  | 0.080910    | 0.048374   | 1.672601    | 0.0944 |
| C(10) | 3.054903    | 1.016127   | 3.006419    | 0.0026 |

|                    |           |                       |           |
|--------------------|-----------|-----------------------|-----------|
| R-squared          | 0.036486  | Mean dependent var    | -0.010356 |
| Adjusted R-squared | 0.032657  | S.D. dependent var    | 8.936042  |
| S.E. of regression | 8.788919  | Akaike info criterion | 7.104711  |
| Sum squared resid  | 58320.05  | Schwarz criterion     | 7.165738  |
| Log likelihood     | -2686.238 | Hannan-Quinn criter.  | 7.128213  |
| Durbin-Watson stat | 1.928037  |                       |           |

## 10. ARIMAX(2,1,1)-APARCH(3,1)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 17:53  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 46 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  

$$\text{@SQRT(GARCH)}^{\wedge}C(11) = C(5) + C(6)*\text{ABS(RESID(-1))} - C(7)*\text{RESID}(-1)^{\wedge}C(11) + C(8)*\text{ABS(RESID(-2))}^{\wedge}C(11) + C(9)*\text{ABS(RESID(-3))}^{\wedge}C(11) + C(10)*\text{@SQRT(GARCH(-1))}^{\wedge}C(11)$$

| Variable | Coefficient | Std. Error | z-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ST       | -0.014087   | 0.003792   | -3.714813   | 0.0002 |
| AR(1)    | 0.756037    | 0.077070   | 9.809747    | 0.0000 |
| AR(2)    | -0.104613   | 0.040778   | -2.565415   | 0.0103 |
| MA(1)    | -0.801067   | 0.067720   | -11.82911   | 0.0000 |

## Variance Equation

|       | Coefficient | Std. Error | z-Statistic | Prob.  |
|-------|-------------|------------|-------------|--------|
| C(5)  | 0.097452    | 0.056754   | 1.717113    | 0.0860 |
| C(6)  | 0.113795    | 0.042949   | 2.649526    | 0.0081 |
| C(7)  | 0.257251    | 0.135082   | 1.904409    | 0.0569 |
| C(8)  | -0.111375   | 0.048440   | -2.299237   | 0.0215 |
| C(9)  | 0.055493    | 0.028910   | 1.919518    | 0.0549 |
| C(10) | 0.928041    | 0.018243   | 50.86967    | 0.0000 |
| C(11) | 0.592990    | 0.242944   | 2.440844    | 0.0147 |

|                    |           |                       |           |
|--------------------|-----------|-----------------------|-----------|
| R-squared          | 0.039274  | Mean dependent var    | -0.010356 |
| Adjusted R-squared | 0.035456  | S.D. dependent var    | 8.936042  |
| S.E. of regression | 8.776194  | Akaike info criterion | 7.056141  |
| Sum squared resid  | 58151.29  | Schwarz criterion     | 7.123272  |
| Log likelihood     | -2666.806 | Hannan-Quinn criter.  | 7.081994  |
| Durbin-Watson stat | 1.959249  |                       |           |

## 11. ARIMAX(2,1,1)-APARCH(3,2)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 17:55  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Convergence achieved after 45 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  

$$\text{@SQRT(GARCH)}^{\wedge}C(12) = C(5) + C(6)*(\text{ABS}(\text{RESID}(-1)) - C(7)*\text{RESID}(-1))^{\wedge}C(12) + C(8)*\text{ABS}(\text{RESID}(-2))^{\wedge}C(12) + C(9)*\text{ABS}(\text{RESID}(-3))^{\wedge}C(12) + C(10)*\text{@SQRT(GARCH}(-1))^{\wedge}C(12) + C(11)*\text{@SQRT(GARCH}(-2))^{\wedge}C(12)$$

| Variable           | Coefficient | Std. Error            | z-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.010104   | 0.003345              | -3.020414   | 0.0025    |
| AR(1)              | 0.786140    | 0.082104              | 9.574912    | 0.0000    |
| AR(2)              | -0.080047   | 0.045889              | -1.744349   | 0.0811    |
| MA(1)              | -0.832902   | 0.069718              | -11.94672   | 0.0000    |
| Variance Equation  |             |                       |             |           |
| C(5)               | 53.28220    | 65.78248              | 0.809976    | 0.4180    |
| C(6)               | 0.113417    | 0.055093              | 2.058663    | 0.0395    |
| C(7)               | 0.229569    | 0.171269              | 1.340397    | 0.1801    |
| C(8)               | -0.063301   | 0.042483              | -1.490027   | 0.1362    |
| C(9)               | 0.100779    | 0.042987              | 2.344412    | 0.0191    |
| C(10)              | 0.564639    | 0.253674              | 2.225847    | 0.0260    |
| C(11)              | 0.041599    | 0.199998              | 0.207995    | 0.8352    |
| C(12)              | 2.654916    | 0.550390              | 4.823699    | 0.0000    |
| R-squared          | 0.035788    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.031957    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.792100    | Akaike info criterion |             | 7.071021  |
| Sum squared resid  | 58362.27    | Schwarz criterion     |             | 7.144254  |
| Log likelihood     | -2671.452   | Hannan-Quinn criter.  |             | 7.099223  |
| Durbin-Watson stat | 1.941620    |                       |             |           |

## 12. ARIMAX(2,1,1)-APARCH(3,3)

Dependent Variable: DSAHAM  
 Method: ML - ARCH (Marquardt) - Normal distribution  
 Date: 05/16/16 Time: 17:56  
 Sample (adjusted): 4 762  
 Included observations: 759 after adjustments  
 Failure to improve Likelihood after 12 iterations  
 MA Backcast: 3  
 Presample variance: backcast (parameter = 0.7)  

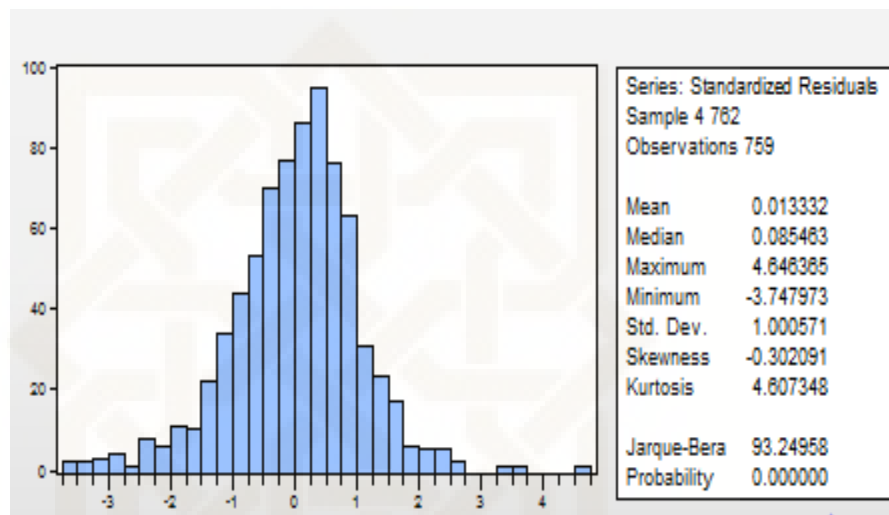
$$\text{@SQRT(GARCH)}^{\wedge}C(13) = C(5) + C(6)*(\text{ABS}(\text{RESID}(-1)) - C(7)*\text{RESID}(-1))^{\wedge}C(13) + C(8)*\text{ABS}(\text{RESID}(-2))^{\wedge}C(13) + C(9)*\text{ABS}(\text{RESID}(-3))^{\wedge}C(13) + C(10)*\text{@SQRT(GARCH}(-1))^{\wedge}C(13) + C(11)*\text{@SQRT(GARCH}(-2))^{\wedge}C(13) + C(12)*\text{@SQRT(GARCH}(-3))^{\wedge}C(13)$$

| Variable           | Coefficient | Std. Error            | z-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| ST                 | -0.008605   | 0.003755              | -2.291649   | 0.0219    |
| AR(1)              | 0.697060    | 0.106134              | 6.567723    | 0.0000    |
| AR(2)              | -0.107815   | 0.048535              | -2.221369   | 0.0263    |
| MA(1)              | -0.737916   | 0.095982              | -7.688047   | 0.0000    |
| Variance Equation  |             |                       |             |           |
| C(5)               | 106.2980    | 151.3556              | 0.702306    | 0.4825    |
| C(6)               | 0.146617    | 0.055633              | 2.635428    | 0.0084    |
| C(7)               | 0.180115    | 0.112727              | 1.597802    | 0.1101    |
| C(8)               | -0.055173   | 0.041477              | -1.330218   | 0.1834    |
| C(9)               | 0.097837    | 0.046421              | 2.107609    | 0.0351    |
| C(10)              | 0.440142    | 0.272722              | 1.613882    | 0.1066    |
| C(11)              | -0.186645   | 0.224316              | -0.832066   | 0.4054    |
| C(12)              | 0.251567    | 0.163756              | 1.536233    | 0.1245    |
| C(13)              | 2.905924    | 0.617764              | 4.703936    | 0.0000    |
| R-squared          | 0.034948    | Mean dependent var    |             | -0.010356 |
| Adjusted R-squared | 0.031114    | S.D. dependent var    |             | 8.936042  |
| S.E. of regression | 8.795927    | Akaike info criterion |             | 7.067452  |
| Sum squared resid  | 58413.09    | Schwarz criterion     |             | 7.146788  |
| Log likelihood     | -2669.098   | Hannan-Quinn criter.  |             | 7.098005  |
| Durbin-Watson stat | 1.951799    |                       |             |           |

## Lampiran 7 : Pemeriksaan diagnose untuk model ARIMAX-APARCH

### 1. ARIMAX(2,1,1)-APARCH(1,0)

#### a. Uji Normalitas



#### b. Uji Autokorelasi

| Correlogram of Standardized Residuals Squared         |                     |    |        |        |        |       |
|---|---------------------|----|--------|--------|--------|-------|
| Date: 05/22/16 Time: 12:36                            |                     |    |        |        |        |       |
| Sample: 4 762   |                     |    |        |        |        |       |
| Included observations: 759                            |                     |    |        |        |        |       |
| Q-statistic probabilities adjusted for 3 ARMA term(s) |                     |    |        |        |        |       |
| Autocorrelation                                       | Partial Correlation | AC | PAC    | Q-Stat | Prob   |       |
|   |                     | 1  | -0.026 | -0.026 | 0.5038 |       |
|   |                     | 2  | 0.036  | 0.035  | 1.4700 |       |
|   |                     | 3  | 0.174  | 0.176  | 24.603 |       |
|   |                     | 4  | 0.078  | 0.090  | 29.315 | 0.000 |
|   |                     | 5  | 0.024  | 0.018  | 29.740 | 0.000 |
|   |                     | 6  | 0.043  | 0.008  | 31.168 | 0.000 |
|   |                     | 7  | 0.222  | 0.202  | 69.102 | 0.000 |
|   |                     | 8  | 0.029  | 0.036  | 69.739 | 0.000 |
|   |                     | 9  | 0.022  | -0.000 | 70.108 | 0.000 |
|   |                     | 10 | 0.112  | 0.040  | 79.784 | 0.000 |
|   |                     | 11 | 0.088  | 0.062  | 85.746 | 0.000 |
|   |                     | 12 | 0.050  | 0.044  | 87.708 | 0.000 |
|   |                     | 13 | -0.012 | -0.053 | 87.815 | 0.000 |
|   |                     | 14 | 0.096  | 0.015  | 95.022 | 0.000 |
|   |                     | 15 | 0.029  | 0.003  | 95.681 | 0.000 |
|   |                     | 16 | 0.010  | 0.005  | 95.758 | 0.000 |
|   |                     | 17 | 0.031  | -0.022 | 96.495 | 0.000 |
|   |                     | 18 | 0.054  | 0.009  | 98.777 | 0.000 |

## c. Uji Heterokedastisitas

## Heteroskedasticity Test: ARCH

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 0.500456 | Prob. F(1,756)      | 0.4795 |
| Obs*R-squared | 0.501448 | Prob. Chi-Square(1) | 0.4789 |

## Test Equation:

Dependent Variable: WGT\_RESID^2

Method: Least Squares

Date: 05/22/16 Time: 12:37

Sample (adjusted): 5 762

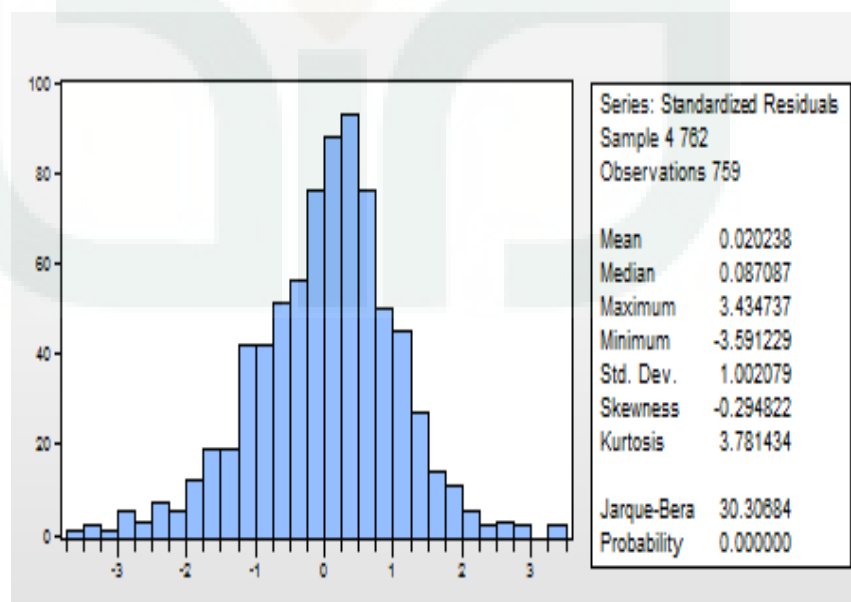
Included observations: 758 after adjustments

| Variable        | Coefficient | Std. Error | t-Statistic | Prob.  |
|-----------------|-------------|------------|-------------|--------|
| C               | 1.027060    | 0.077946   | 13.17662    | 0.0000 |
| WGT_RESID^2(-1) | -0.025719   | 0.036355   | -0.707429   | 0.4795 |

|                    |           |                       |          |
|--------------------|-----------|-----------------------|----------|
| R-squared          | 0.000662  | Mean dependent var    | 1.001313 |
| Adjusted R-squared | -0.000660 | S.D. dependent var    | 1.897065 |
| S.E. of regression | 1.897691  | Akaike info criterion | 4.121788 |
| Sum squared resid  | 2722.532  | Schwarz criterion     | 4.134006 |
| Log likelihood     | -1560.158 | Hannan-Quinn criter.  | 4.126494 |
| F-statistic        | 0.500456  | Durbin-Watson stat    | 1.998257 |
| Prob(F-statistic)  | 0.479518  |                       |          |

## 2. ARIMAX(2,1,1)-APARCH(1,1)

## a. Uji Normalitas



## b. Uji Autokorelasi

| Correlogram of Standardized Residuals Squared         |                     |    |        |        |        |       |
|---|---------------------|----|--------|--------|--------|-------|
| Included observations: 758                            |                     |    |        |        |        |       |
| Q-statistic probabilities adjusted for 3 ARMA term(s) |                     |    |        |        |        |       |
| Autocorrelation                                       | Partial Correlation | AC | PAC    | Q-Stat | Prob   |       |
|   |                     | 1  | 0.039  | 0.039  | 1.1791 |       |
|   |                     | 2  | -0.002 | -0.004 | 1.1833 |       |
|   |                     | 3  | 0.007  | 0.008  | 1.2242 |       |
|   |                     | 4  | 0.014  | 0.014  | 1.3790 | 0.240 |
|   |                     | 5  | -0.024 | -0.025 | 1.8187 | 0.403 |
|   |                     | 6  | 0.008  | 0.010  | 1.8642 | 0.601 |
|   |                     | 7  | 0.084  | 0.083  | 7.2931 | 0.121 |
|   |                     | 8  | -0.036 | -0.043 | 8.3063 | 0.140 |
|   |                     | 9  | -0.029 | -0.025 | 8.9548 | 0.176 |
|   |                     | 10 | -0.023 | -0.023 | 9.3523 | 0.228 |
|   |                     | 11 | 0.057  | 0.058  | 11.877 | 0.157 |
|   |                     | 12 | -0.007 | -0.007 | 11.917 | 0.218 |
|   |                     | 13 | -0.061 | -0.064 | 14.806 | 0.139 |
|   |                     | 14 | 0.034  | 0.032  | 15.716 | 0.152 |
|   |                     | 15 | -0.014 | -0.012 | 15.862 | 0.198 |
|   |                     | 16 | -0.030 | -0.023 | 16.584 | 0.219 |
|   |                     | 17 | -0.014 | -0.010 | 16.726 | 0.271 |
|   |                     | 18 | 0.012  | -0.003 | 16.835 | 0.329 |
|   |                     | 19 | -0.001 | 0.007  | 16.836 | 0.396 |
|   |                     | 20 | -0.010 | 0.002  | 16.909 | 0.461 |

## c. Uji Heterokedastisitas

## Heteroskedasticity Test: ARCH

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 1.172290 | Prob. F(1,756)      | 0.2793 |
| Obs*R-squared | 1.173572 | Prob. Chi-Square(1) | 0.2787 |

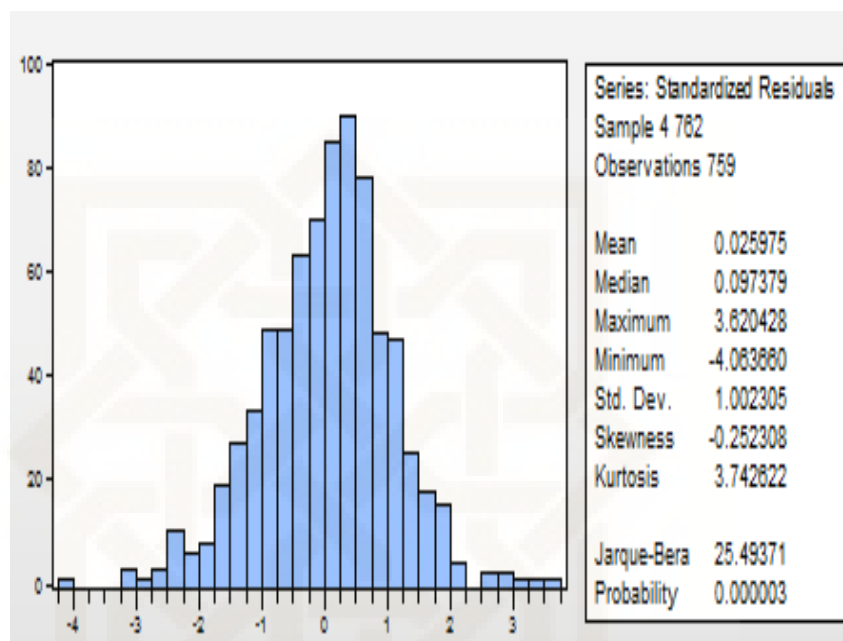
Test Equation:  
 Dependent Variable: WGT\_RESID^2  
 Method: Least Squares  
 Date: 05/22/16 Time: 14:50  
 Sample (adjusted): 5 762  
 Included observations: 758 after adjustments

| Variable        | Coefficient | Std. Error | t-Statistic | Prob.  |
|-----------------|-------------|------------|-------------|--------|
| C               | 0.965024    | 0.070703   | 13.64894    | 0.0000 |
| WGT_RESID^2(-1) | 0.039342    | 0.036336   | 1.082723    | 0.2793 |

|                    |           |                       |          |
|--------------------|-----------|-----------------------|----------|
| R-squared          | 0.001548  | Mean dependent var    | 1.004523 |
| Adjusted R-squared | 0.000228  | S.D. dependent var    | 1.667641 |
| S.E. of regression | 1.667451  | Akaike info criterion | 3.863104 |
| Sum squared resid  | 2101.977  | Schwarz criterion     | 3.875322 |
| Log likelihood     | -1462.116 | Hannan-Quinn criter.  | 3.867810 |
| F-statistic        | 1.172290  | Durbin-Watson stat    | 1.999804 |
| Prob(F-statistic)  | 0.279276  |                       |          |

## 3. ARIMAX(2,1,1)-APARCH(1,3)

## a. Uji Normalitas



## b. Uji Autokorelasi

| Correlogram of Standardized Residuals Squared         |                     |    |        |        |        |       |
|---|---------------------|----|--------|--------|--------|-------|
| Date: 05/22/16 Time: 14:53                            |                     |    |        |        |        |       |
| Sample: 4 762   |                     |    |        |        |        |       |
| Included observations: 759                            |                     |    |        |        |        |       |
| Q-statistic probabilities adjusted for 3 ARMA term(s) |                     |    |        |        |        |       |
| Autocorrelation                                       | Partial Correlation | AC | PAC    | Q-Stat | Prob   |       |
|   |                     | 1  | 0.014  | 0.014  | 0.1570 |       |
|   |                     | 2  | 0.044  | 0.044  | 1.6471 |       |
|   |                     | 3  | 0.043  | 0.042  | 3.0472 |       |
|   |                     | 4  | -0.022 | -0.025 | 3.4174 | 0.065 |
|   |                     | 5  | -0.014 | -0.018 | 3.5761 | 0.167 |
|   |                     | 6  | 0.064  | 0.065  | 6.6765 | 0.083 |
|   |                     | 7  | 0.056  | 0.059  | 9.1127 | 0.058 |
|   |                     | 8  | -0.038 | -0.045 | 10.224 | 0.069 |
|   |                     | 9  | 0.012  | 0.002  | 10.340 | 0.111 |
|   |                     | 10 | -0.010 | -0.008 | 10.418 | 0.166 |
|   |                     | 11 | 0.031  | 0.040  | 11.166 | 0.192 |
|   |                     | 12 | 0.031  | 0.026  | 11.889 | 0.220 |

## c. Uji Heterokedastisits

## Heteroskedasticity Test: ARCH

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 0.155843 | Prob. F(1,756)      | 0.6931 |
| Obs*R-squared | 0.156223 | Prob. Chi-Square(1) | 0.6927 |

Test Equation:

Dependent Variable: WGT\_RESID^2

Method: Least Squares

Date: 05/22/16 Time: 14:54

Sample (adjusted): 5 762

Included observations: 758 after adjustments

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.    |
|--------------------|-------------|-----------------------|-------------|----------|
| C                  | 0.990813    | 0.070409              | 14.07228    | 0.0000   |
| WGT_RESID^2(-1)    | 0.014354    | 0.036360              | 0.394769    | 0.6931   |
| R-squared          | 0.000206    | Mean dependent var    |             | 1.005234 |
| Adjusted R-squared | -0.001116   | S.D. dependent var    |             | 1.656223 |
| S.E. of regression | 1.657147    | Akaike info criterion |             | 3.850707 |
| Sum squared resid  | 2076.079    | Schwarz criterion     |             | 3.862925 |
| Log likelihood     | -1457.418   | Hannan-Quinn criter.  |             | 3.855413 |
| F-statistic        | 0.155843    | Durbin-Watson stat    |             | 2.001375 |
| Prob(F-statistic)  | 0.693124    |                       |             |          |



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