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## LAMPIRAN

Lampiran. 1 Kuesioner Kontestasi Aktor

**PEDOMAN WAWANCARA KONTESTASI AKTOR**
**SUPPLY CHAIN AYAM BROILER**

**KUESIONER PETERNAK PLASMA**

1. Sudah berapa tahun usaha budidaya ayam broiler dan menjadi plasma?
   .....
2. Ada berapa jumlah doc yang dipelihara setiap periodenya?
   .....
3. Supply DOC dan Pakan dikirim dari peternak inti mana?
   .....
4. Berapa rata-rata harga DOC dan Pakan saat ini yang dikirim dari peternak inti tersebut?
   .....
5. Apakah harga DOC terjadi fluktuasi setiap periode pengiriman?
   .....
6. Apakah harga pakan berfluktuasi atau terus meningkat?
   .....
7. Apakah peternak inti melakukan kontrak produksi setiap chick in per periodenya dengan peternak mitra?
   .....
8. Apakan didalam kontrak tersebut mencantumkan harga DOC, Pakan, Sapronak, dan harga pembelian Live Bird?
   .....
9. Apakah ada kesempatan menjual Live Bird ke luar Inti?
   .....
10. Apakah biaya produksi Live Bird perusahaan masih di bawah harga yang diberikan inti?
    .....
11. Permasalahan apa yang dirasakan dalam bisnis ayam broiler?

**Komponen-komponen Biaya**

**Biaya Fixed Cost**

| No | Komponen Fixed Cost | Satuan | Nilai (Rp) |
|---|---|---|---|
| 1 | Investasi kandang | Rp | |
| 2 | Investasi peralatan | Rp | |
| 3 | Pajak Bumi dan Bangunan | Rp/tahun | |
| | Total | | |

Biaya Variabel Cost

| No | Komponen Biaya | Satuan | Harga Rata-Rata |
|---|---|---|---|
| 1 | DOC | Rp/DOC | |
| 2 | Pakan | Rp/kg | |
| 3 | Vaksin dan obat2an | Rp/periode | |

**Komponen-komponen Biaya (tergantung skala usaha)**

**Biaya Fixed Cost**

| No | Komponen Fixed Cost | Satuan | Nilai (Rp) |
|---|---|---|---|
| 1 | Investasi kandang | Rp | |
| 2 | Investasi peralatan | Rp | |
| 3 | Pajak Bumi dan Bangunan | Rp/tahun | |
| | Total | | |

Biaya Variabel Cost

| No | Komponen Biaya | Satuan | Harga Rata-Rata |
|---|---|---|---|
| 1 | DOC | Rp/DOC | |
| 2 | Pakan | Rp/kg | |
| 3 | Vaksin dan obat2an | Rp/periode | |
| 4 | Sekam | Rp/kg | |
| 5 | Listrik | Rp/periode | |
| 6 | Gas | Rp/periode | |
| 7 | Tenaga Kerja | Rp/periode | |
| | Total | | |

**Penerimaan**

| No | Komponen Penerimaan | Satuan | Harga Rata-Rata |
|---|---|---|---|
| 1 | Harga jual | Rp/kg | |
| 2 | Pupuk kandang | Rp/kg | |

**KUESIONER PETERNAK MANDIRI/MANDIRI KEMITRAAN (Inti)**
**(Asosiasi/Koperasi tingkat Provinsi)**

1. Sudah berapa tahun usaha budidaya ayam broiler?
   .....
2. Ada berapa jumlah doc yang dipelihara setiap periodenya?
   .....
3. Supply DOC dan Pakan dikirim dari perusahaan mana?
   .....
4. Berapa rata-rata harga DOC dan Pakan saat ini yang dikirim dari perusahaan tersebut?
   .....
5. Apakah harga DOC terjadi fluktuasi setiap periode pengiriman?
   .....
6. Apakah harga pakan berfluktuasi atau terus meningkat?
   .....
7. Apakah perusahaan melakukan kontrak produksi setiap chick in per periodenya dengan peternak mitra?
   .....
8. Apakan didalam kontrak tersebut mencantumkan harga DOC, Pakan, Sapronak, dan harga pembelian Live Bird?
   .....
9. Setahun berapa kali produksi atau periode?
   .....
10. Pelaku pemasaran yang menjadi target penjualan live bird? Misal Broker, bandar/ pengumpul besar, RPHU/RPHU-SK/TPU
    .....
11. Apakah biaya produksi Live Bird perusahaan masih di bawah harga pasar?
    .....
12. Siapa yang menentukan harga jual Live Bird dipasar? Apakah perusahaan atau pedagang seperti Rumah Potong Hewan Unggas/ Tempat Potong Unggas / Bandar?
    .....
13. Apakah peternak bisa menentukan harga input (DOC dan Pakan) dan juga harga jual Live Bird ke pelaku pemasaran?
    .....
14. Apabila peternak mandiri memiliki kemitraan, berapa jumlah peternak yang terlibat pada kemitraan?
    .....
15. Permasalahan apa yang dirasakan dalam bisnis ayam broiler?
    .....

15. Bisa digambarkan aliran suplai dimulai dari DOC, Pakan, dan penjualan Live Bird beserta para pelaku yang tergabung dengan commercial farm! (Pada Kotak dibawah)
16. Apa permasalahan yang terjadi pada bisnis ayam broiler ini?

**Gambaran Supply Chain di Provinsi**

**KUESIONER COMMERCIAL FARM (head unit)**

**Analisis Konteks**

1. Ada berapa jumlah unit usaha budidaya ayam broiler di provinsi ini?
   .....
2. Supply DOC dan Pakan dikirim dari perusahaan mana?
   .....
3. Berapa rata-rata harga DOC dan Pakan saat ini yang dikirim dari perusahaan tersebut?
   .....
4. Berapa jumlah pelaku kemitraan yang tergabung dengan perusahaan ini?
   .....
5. Apakah harga DOC dan Pakan ditentukan perusahaan pengirim DOC dan Pakan tersebut?
   .....
6. Apakah perusahaan ini juga mendistribusikan DOC dan Pakan ke peternak kemitraan?
   .....
7. Apakah perusahaan ini juga menentukan harga DOC dan Pakan ke peternak kemitraan?
   .....
8. Apabila YA, berapa persen kenaikan harga DOC dan Pakan dibebankan ke peternak kemitraan?
   .....
9. Apakah perusahaan melakukan kontrak produksi setiap chick in per periodenya dengan peternak mitra?
   .....
10. Apakan didalam kontrak tersebut mencantumkan harga DOC, Pakan, Sapronak, dan harga pembelian Live Bird?
    .....
11. Bagaimana perusahaan menjual hasil Live bird, baik dari hasil internal perusahaan ataupun dari peternak mitra?
    .....
12. Pelaku pemasaran yang menjadi target penjualan live bird perusahaan, siapa saja, seperti Broker atau Bandar/Pengumpul Besar atau Rumah Potong Hewan Unggas atau Tempat Potong Unggas
    .....
13. Siapa yang menentukan harga jual Live Bird dipasar? Apakah perusahaan atau pedagang seperti Rumah Potong Hewan Unggas/ Tempat Potong Unggas / Bandar?
    .....
14. Apakah biaya produksi Live Bird perusahaan masih di bawah harga pasar?
    .....

- Pemilihan informan RPHU/RPHU-SK dan TPU dipilih satu perwakilan atau dua informan yang dapat mewakili

| No | Wilayah | RPHU/RPHU-SK dan TPU |
|---|---|---|
| 1 | Bogor | |
| 2 | Ciamis | |
| 3 | Kendal | |
| 4 | Solo Raya | |
| 5 | Malang | |
| 6 | Tulungagung | |
| 7 | Maros | |
| 8 | Gowa | |
| 9 | Serdang Bedagai | |
| 10 | Deli Serdang | |

- Pemilihan informan Bandar/Pengumpul dipilih satu perwakilan atau dua informan yang dapat mewakili

| No | Wilayah | Bandar/Pengumpul |
|---|---|---|
| 1 | Bogor | |
| 2 | Ciamis | |
| 3 | Kendal | |
| 4 | Solo Raya | |
| 5 | Malang | |
| 6 | Tulungagung | |
| 7 | Maros | |
| 8 | Gowa | |
| 9 | Serdang Bedagai | |
| 10 | Deli Serdang | |

- Pemilihan informan Peternak Mandiri Kemitraan yang memiliki Plasma dipilih satu perwakilan atau dua informan

| No | Wilayah | Peternak Mandiri Kemitraan |
|---|---|---|
| 1 | Bogor | |
| 2 | Ciamis | |
| 3 | Kendal | |
| 4 | Solo Raya | |
| 5 | Malang | |
| 6 | Tulungagung | |
| 7 | Maros | |
| 8 | Gowa | |
| 9 | Serdang Bedagai | |
| 10 | Deli Serdang | |

- Pemilihan informan Plasma dipilih satu perwakilan atau dua informan yang dapat mewakili

| No | Wilayah | Peternak Plasma |
|---|---|---|
| 1 | Bogor | |
| 2 | Ciamis | |
| 3 | Kendal | |
| 4 | Solo Raya | |
| 5 | Malang | |
| 6 | Tulungagung | |
| 7 | Maros | |
| 8 | Gowa | |
| 9 | Serdang Bedagai | |
| 10 | Deli Serdang | |

- Pemilihan informan Broker dipilih satu perwakilan atau dua informan yang dapat mewakili

| No | Wilayah | Broker (snowball) |
|---|---|---|
| 1 | Bogor | |
| 2 | Ciamis | |
| 3 | Kendal | |
| 4 | Solo Raya | |
| 5 | Malang | |
| 6 | Tulungagung | |
| 7 | Maros | |
| 8 | Gowa | |
| 9 | Serdang Bedagai | |
| 10 | Deli Serdang | |

## Penentuan Lokasi

1. Jawa Barat: Kabupaten Bogor dan Kab. Ciamis
2. Jawa Tengah: Kabupaten Kendal dan Solo Raya
3. Jawa Timur : Kabupaten Malang dan Tulungagung
4. Sulawesi Selatan: Maros dan Gowa
5. Sumatera Utara : Serdang Bedagai dan Deli Serdang

## Penentuan Informan

**A. Informan ditingkat Provinsi**

1. Commercial farm integrator (CP, Japfa, Suja dan Malindo)
2. Commercial farm non GPS (?) dipilih satu perwakilan perusahaan/provinsi

**B. Informan di tingkat kabupaten**

- Pemilihan informan Peternak Kemitraan Integrator dan Non GPS dipilih satu perwakilan atau dua informan

| No | Wilayah | Perusahaan/Peternak Kemitraan Integrator | Perusahaan/Peternak Kemitraan Non GPS |
|---|---|---|---|
| 1 | Bogor | | |
| 2 | Ciamis | Pasini Naratas (PT. Ciomas Adi Satwa-Japfa) | |
| 3 | Kendal | | |
| 4 | Solo Raya | | |
| 5 | Malang | | |
| 6 | Tulungagung | | |
| 7 | Maros | | |
| 8 | Gowa | | |
| 9 | Serdang Bedagai | | |
| 10 | Deli Serdang | | |

- Pemilihan informan Peternak Mandiri dipilih satu perwakilan atau dua informan

| No | Wilayah | Peternak Mandiri |
|---|---|---|
| 1 | Bogor | |
| 2 | Ciamis | |
| 3 | Kendal | |
| 4 | Solo Raya | |
| 5 | Malang | |
| 6 | Tulungagung | |
| 7 | Maros | |
| 8 | Gowa | |
| 9 | Serdang Bedagai | |
| 10 | Deli Serdang | |

| | | | |
|---|---|---|---|
| 4 | Sekam | Rp/kg | |
| 5 | Listrik | Rp/periode | |
| 6 | Gas | Rp/periode | |
| 7 | Tenaga Kerja | Rp/periode | |
| | Total | | |

**Penerimaan**

| No | Komponen Penerimaan | Satuan | Harga Rata-Rata |
|---|---|---|---|
| 1 | Harga jual | Rp/kg | |
| 2 | Pupuk kandang | Rp/kg | |

**Lampiran. 2 Analisa SEM-PLS**

**Hasil Akhir**

Koefisien Jalur

| | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | | | | |
| **Number of Chicks Production** | 0.504 | | | 0.449 |
| **Price of Chicken Cubs/Seeds** | 0.734 | | | 0.499 |
| **Supply Chain** | -0.197 | | | |

Efek Tidak Langsung

Total Pengaruh Tidak Langsung

| | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | | | | |
| **Number of Chicks Production** | -0.088 | | | |
| **Price of Chicken Cubs/Seeds** | -0.098 | | | |
| **Supply Chain** | | | | |

Efek Tidak Langsung Spesifik

| | Efek Tidak Langsung Spesifik |
|---|---|

| | |
|---|---|
| **Number of Chicks Production -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.088 |
| **Price of Chicken Cubs/Seeds -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.098 |

Pengaruh Total

| | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | | | | |
| **Number of Chicks Production** | 0.416 | | | 0.449 |
| **Price of Chicken Cubs/Seeds** | 0.636 | | | 0.499 |
| **Supply Chain** | -0.197 | | | |

Outer Loading

| | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| **BCBE1** | **0.863** | | | |
| **BCBE2** | **0.872** | | | |
| **BCBE3** | **0.813** | | | |
| **BCBE4** | **0.816** | | | |
| **BCBE5** | **0.829** | | | |
| **BCBE6** | **0.676** | | | |
| **BCBE7** | **0.805** | | | |
| **NCP1** | | **0.795** | | |
| **NCP2** | | **0.766** | | |

| | | | | |
|---|---|---|---|---|
| **NCP3** | | **0.905** | | |
| **NCP4** | | **0.860** | | |
| **NCP5** | | **0.841** | | |
| **NCP6** | | **0.756** | | |
| **PCC1** | | | **0.853** | |
| **PCC2** | | | **0.885** | |
| **PCC3** | | | **0.913** | |
| **PCC4** | | | **0.919** | |
| **PCC5** | | | **0.823** | |
| **PCC6** | | | **0.805** | |
| **SPC1** | | | | **0.789** |
| **SPC2** | | | | **0.744** |
| **SPC3** | | | | **0.752** |
| **SPC4** | | | | **0.814** |
| **SPC5** | | | | **0.785** |
| **SPC6** | | | | **0.770** |
| **SPC7** | | | | **0.783** |

Outer Weight

| | **Broiler Chicken Business Efficiency** | **Number of Chicks Production** | **Price of Chicken Cubs/Seeds** | **Supply Chain** |
|---|---|---|---|---|
| **BCBE1** | 0.189 | | | |
| **BCBE2** | 0.189 | | | |
| **BCBE3** | 0.176 | | | |
| **BCBE4** | 0.181 | | | |

| | | | | |
|---|---|---|---|---|
| **BCBE5** | 0.176 | | | |
| **BCBE6** | 0.141 | | | |
| **BCBE7** | 0.175 | | | |
| **NCP1** | | 0.221 | | |
| **NCP2** | | 0.181 | | |
| **NCP3** | | 0.218 | | |
| **NCP4** | | 0.194 | | |
| **NCP5** | | 0.190 | | |
| **NCP6** | | 0.214 | | |
| **PCC1** | | | 0.189 | |
| **PCC2** | | | 0.196 | |
| **PCC3** | | | 0.198 | |
| **PCC4** | | | 0.200 | |
| **PCC5** | | | 0.180 | |
| **PCC6** | | | 0.189 | |
| **SPC1** | | | | 0.191 |
| **SPC2** | | | | 0.140 |
| **SPC3** | | | | 0.159 |
| **SPC4** | | | | 0.178 |
| **SPC5** | | | | 0.173 |
| **SPC6** | | | | 0.217 |
| **SPC7** | | | | 0.227 |

Variabel Laten

Variabel Laten

| ID Kasus | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| 1 | 1.238 | 0.914 | 1.342 | 0.736 |
| 2 | 1.416 | 1.400 | 1.342 | 1.515 |
| 3 | 0.760 | 0.234 | 1.342 | 0.397 |
| 4 | -0.440 | -0.499 | 0.455 | 0.179 |
| 5 | 1.137 | 1.400 | 0.791 | 1.218 |
| 6 | 0.760 | -0.301 | 1.342 | 0.179 |
| 7 | -1.449 | -1.661 | -0.827 | -1.001 |
| 8 | -1.253 | -1.096 | -0.871 | -0.462 |
| 9 | -2.057 | -2.001 | -1.770 | -2.142 |
| 10 | 1.168 | 0.556 | 0.787 | -1.111 |
| 11 | -0.320 | -0.301 | -0.343 | -0.462 |
| 12 | -2.057 | -1.661 | -2.028 | -1.103 |
| 13 | -0.447 | 0.131 | -0.343 | 0.355 |
| 14 | -1.005 | -0.528 | -0.871 | -0.462 |
| 15 | 1.008 | 0.285 | 1.084 | 0.131 |
| 16 | 0.630 | 1.060 | 0.521 | 0.759 |
| 17 | -0.320 | 0.040 | -0.343 | 0.317 |
| 18 | 0.483 | 0.265 | 0.258 | -0.680 |
| 19 | -0.320 | -0.301 | -0.343 | -0.462 |
| 20 | -0.084 | -0.024 | -0.101 | -0.462 |
| 21 | 0.088 | 0.474 | -0.046 | 0.189 |
| 22 | -1.820 | -2.001 | -1.786 | -2.439 |

| | | | | |
|---|---|---|---|---|
| **23** | 0.524 | -0.043 | 1.100 | 0.986 |
| **24** | 1.416 | 1.400 | 1.342 | 1.515 |
| **25** | -0.498 | -0.805 | -0.601 | -0.759 |
| **26** | 1.168 | 0.814 | 1.084 | 1.218 |
| **27** | -0.320 | -0.301 | -0.343 | -0.462 |
| **28** | -0.320 | -0.301 | -0.343 | 0.006 |
| **29** | -0.041 | 0.297 | 0.506 | 1.515 |
| **30** | -0.026 | -0.301 | -0.035 | -0.462 |
| **31** | -1.762 | -2.001 | -1.720 | -2.439 |
| **32** | -0.320 | -0.301 | -0.343 | -0.462 |
| **33** | 0.236 | -0.507 | 0.479 | 0.874 |
| **34** | 0.204 | -0.012 | -0.035 | -0.462 |
| **35** | -0.320 | -0.301 | -0.343 | -0.462 |
| **36** | -0.320 | -0.301 | -0.343 | -0.462 |
| **37** | -0.320 | -0.301 | -0.343 | -0.462 |
| **38** | 1.416 | 1.400 | 1.342 | 1.515 |
| **39** | 1.416 | 1.400 | 1.342 | 1.515 |
| **40** | -0.863 | -0.887 | -0.651 | -0.462 |
| **41** | 1.416 | 1.400 | 1.342 | 1.515 |
| **42** | -0.050 | 0.234 | -0.056 | -0.462 |
| **43** | 1.416 | 1.400 | 1.342 | 1.515 |
| **44** | -0.320 | -0.301 | -0.343 | -0.462 |
| **45** | -0.320 | -0.043 | -0.343 | -0.174 |
| **46** | -0.320 | -0.301 | -0.343 | -0.462 |
| **47** | 1.416 | 1.400 | 1.342 | 1.515 |

| | | | | |
|---|---|---|---|---|
| **48** | 1.238 | 1.172 | 1.342 | 0.996 |
| **49** | 1.416 | 1.400 | 1.342 | 1.515 |
| **50** | -3.484 | -0.405 | -4.782 | -2.115 |
| **51** | 1.416 | 1.400 | 1.342 | 1.515 |
| **52** | -0.964 | -0.477 | -0.585 | -0.192 |
| **53** | 1.416 | 1.400 | 1.342 | 1.515 |
| **54** | 1.416 | 1.400 | 1.342 | 1.515 |
| **55** | 0.630 | 1.400 | -0.035 | 0.095 |
| **56** | -2.667 | -3.332 | -1.423 | -0.829 |
| **57** | 1.416 | 1.400 | 1.342 | 1.515 |
| **58** | -0.320 | -0.301 | -0.343 | -0.462 |
| **59** | -0.320 | -1.433 | -0.343 | -0.750 |
| **60** | -0.676 | -1.033 | -0.898 | -1.103 |
| **61** | -0.685 | -1.075 | -0.292 | -0.732 |
| **62** | 1.416 | 1.400 | 1.342 | 1.515 |
| **63** | -0.320 | -0.301 | -0.343 | -0.462 |
| **64** | -0.320 | -0.301 | -0.343 | -0.462 |
| **65** | -0.320 | -0.301 | -0.343 | -0.462 |
| **66** | 0.779 | 0.594 | 1.045 | -0.072 |
| **67** | -0.320 | -0.301 | -0.343 | -0.462 |
| **68** | -0.827 | -0.917 | -1.130 | -2.096 |
| **69** | 0.158 | 0.832 | -0.343 | 0.026 |
| **70** | 0.042 | 0.526 | -0.651 | 0.276 |
| **71** | 0.760 | 0.040 | 0.787 | 0.294 |
| **72** | -0.421 | -0.331 | -0.339 | -0.150 |

| | | | | |
|---|---|---|---|---|
| **73** | 0.630 | 0.784 | 0.262 | -0.536 |
| **74** | -0.591 | 0.040 | -0.668 | -0.252 |
| **75** | -0.498 | -0.528 | -0.343 | -0.773 |
| **76** | 0.630 | 1.400 | -0.035 | 0.874 |
| **77** | -0.320 | -0.301 | -0.343 | -0.462 |
| **78** | -0.320 | -0.301 | -0.859 | -1.057 |
| **79** | 0.754 | 0.863 | 0.842 | 0.712 |
| **80** | -1.271 | -2.001 | -0.651 | -1.798 |
| **81** | -1.035 | -1.403 | -0.409 | -0.462 |
| **82** | -0.320 | -0.301 | -0.343 | -0.462 |
| **83** | 1.416 | 1.400 | 1.342 | 1.515 |
| **84** | 0.732 | 0.362 | 0.814 | 1.515 |
| **85** | 0.336 | 0.526 | -0.343 | 0.355 |
| **86** | 0.851 | 1.060 | 0.489 | 0.462 |
| **87** | -0.320 | -0.301 | -0.343 | -0.462 |
| **88** | -0.084 | 0.234 | -0.359 | -0.179 |
| **89** | -0.320 | -0.301 | -0.343 | 0.368 |
| **90** | -0.308 | 0.607 | -0.585 | 0.874 |
| **91** | -1.711 | -1.324 | -1.423 | -0.490 |
| **92** | -0.026 | 0.040 | 0.521 | 1.009 |
| **93** | 0.637 | 0.493 | 0.495 | 0.643 |
| **94** | -1.820 | -2.341 | -2.044 | -2.464 |
| **95** | 0.711 | 0.586 | 0.752 | 0.861 |
| **96** | 0.714 | 0.349 | 1.034 | 0.736 |
| **97** | -0.372 | -0.362 | -0.343 | -0.462 |

| | | | | |
|---|---|---|---|---|
| **98** | 0.673 | 0.914 | 0.192 | 0.006 |
| **99** | -0.534 | -1.485 | -0.298 | -0.462 |
| **100** | -0.320 | -0.301 | -0.343 | -0.462 |

Korelasi Variabel Laten

| | **Broiler Chicken Business Efficiency** | **Number of Chicks Production** | **Price of Chicken Cubs/Seeds** | **Supply Chain** |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 1.000 | 0.883 | 0.942 | 0.823 |
| **Number of Chicks Production** | 0.883 | 1.000 | 0.734 | 0.815 |
| **Price of Chicken Cubs/Seeds** | 0.942 | 0.734 | 1.000 | 0.829 |
| **Supply Chain** | 0.823 | 0.815 | 0.829 | 1.000 |

Kovarians Variabel Laten

| | **Broiler Chicken Business Efficiency** | **Number of Chicks Production** | **Price of Chicken Cubs/Seeds** | **Supply Chain** |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 1.000 | 0.883 | 0.942 | 0.823 |
| **Number of Chicks Production** | 0.883 | 1.000 | 0.734 | 0.815 |
| **Price of Chicken Cubs/Seeds** | 0.942 | 0.734 | 1.000 | 0.829 |
| **Supply Chain** | 0.823 | 0.815 | 0.829 | 1.000 |

Inner Model Korelasi Residual

| | Broiler Chicken Business Efficiency | Supply Chain |
|---|---|---|
| **Broiler Chicken Business Efficiency** | 1.000 | 0.000 |
| **Supply Chain** | 0.000 | 1.000 |

Deskripsi Residual Inner Model

| | Rata-Rata | Median | Minimum | Maksimum | Standar Deviasi | Kelebihan Kurtosis | Skewness | Jumlah Observasi Yang Digunakan |
|---|---|---|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.000 | -0.008 | -0.487 | 0.507 | 0.156 | 1.637 | 0.375 | 100.000 |
| **Supply Chain** | 0.000 | -0.001 | -1.753 | 1.377 | 0.470 | 1.917 | -0.255 | 100.000 |

**Kriteria Kualitas**

R Square

| | R Square | Adjusted R Square |
|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.976 | 0.975 |

| | | |
|---|---|---|
| **Supply Chain** | 0.779 | 0.775 |

f Square

| | **Broiler Chicken Business Efficiency** | **Number of Chicks Production** | **Price of Chicken Cubs/Seeds** | **Supply Chain** |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | | | | |
| **Number of Chicks Production** | **3.384** | | | **0.422** |
| **Price of Chicken Cubs/Seeds** | **6.714** | | | **0.519** |
| **Supply Chain** | **0.350** | | | |

Validitas dan Reliabilitas Konstruk

| | Cronbach's Alpha | rho_A | Reliabilitas Komposit | Rata-rata Varians Diekstrak (AVE) |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | **0.913** | **0.918** | **0.931** | **0.661** |
| **Number of Chicks Production** | **0.903** | **0.906** | **0.926** | **0.676** |
| **Price of Chicken Cubs/Seeds** | **0.934** | **0.935** | **0.948** | **0.752** |
| **Supply Chain** | **0.892** | **0.899** | **0.914** | **0.604** |

Validitas Diskriminan

Kriteria Fornell-Larcker

| | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.813 | | | |
| **Number of Chicks Production** | 0.883 | 0.822 | | |
| **Price of Chicken Cubs/Seeds** | 0.942 | 0.734 | 0.867 | |
| **Supply Chain** | 0.823 | 0.815 | 0.829 | 0.777 |

Cross Loadings

| | Broiler Chicken Business Efficiency | Number of Chicks Production | Price of Chicken Cubs/Seeds | Supply Chain |
|---|---|---|---|---|
| **BCBE1** | 0.863 | 0.638 | 0.913 | 0.716 |
| **BCBE2** | 0.872 | 0.633 | 0.919 | 0.725 |
| **BCBE3** | 0.813 | 0.616 | 0.823 | 0.619 |
| **BCBE4** | 0.816 | 0.715 | 0.805 | 0.693 |
| **BCBE5** | 0.829 | 0.795 | 0.718 | 0.680 |
| **BCBE6** | 0.676 | 0.766 | 0.489 | 0.555 |
| **BCBE7** | 0.805 | 0.905 | 0.632 | 0.681 |
| **NCP1** | 0.829 | 0.795 | 0.718 | 0.680 |
| **NCP2** | 0.676 | 0.766 | 0.489 | 0.555 |
| **NCP3** | 0.805 | 0.905 | 0.632 | 0.681 |
| **NCP4** | 0.702 | 0.860 | 0.569 | 0.625 |
| **NCP5** | 0.652 | 0.841 | 0.537 | 0.644 |
| **NCP6** | 0.665 | 0.756 | 0.640 | 0.807 |
| **PCC1** | 0.744 | 0.606 | 0.853 | 0.770 |
| **PCC2** | 0.792 | 0.616 | 0.885 | 0.783 |
| **PCC3** | 0.863 | 0.638 | 0.913 | 0.716 |
| **PCC4** | 0.872 | 0.633 | 0.919 | 0.725 |
| **PCC5** | 0.813 | 0.616 | 0.823 | 0.619 |
| **PCC6** | 0.816 | 0.715 | 0.805 | 0.693 |
| **SPC1** | 0.649 | 0.712 | 0.603 | 0.789 |
| **SPC2** | 0.465 | 0.547 | 0.435 | 0.744 |

| | | | | |
|---|---|---|---|---|
| **SPC3** | 0.543 | 0.560 | 0.516 | 0.752 |
| **SPC4** | 0.601 | 0.665 | 0.559 | 0.814 |
| **SPC5** | 0.576 | 0.717 | 0.491 | 0.785 |
| **SPC6** | 0.744 | 0.606 | 0.853 | 0.770 |
| **SPC7** | 0.792 | 0.616 | 0.885 | 0.783 |

Rasio Heterotrait-Monotrait (HTMT)

| | **Broiler Chicken Business Efficiency** | **Number of Chicks Production** | **Price of Chicken Cubs/Seeds** | **Supply Chain** |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | | | | |
| **Number of Chicks Production** | **0.978** | | | |
| **Price of Chicken Cubs/Seeds** | **1.012** | **0.794** | | |

| | | | | |
|---|---|---|---|---|
| **Supply Chain** | 0.888 | 0.899 | 0.873 | |

Nilai Outer VIF

| | VIF |
|---|---|
| **BCBE1** | 4.199 |
| **BCBE2** | 4.857 |
| **BCBE3** | **2.774** |
| **BCBE4** | **2.373** |
| **BCBE5** | **2.517** |
| **BCBE6** | **2.047** |
| **BCBE7** | **2.868** |
| **NCP1** | **2.011** |
| **NCP2** | **2.044** |

| | |
|---|---|
| **NCP3** | 3.753 |
| **NCP4** | 3.034 |
| **NCP5** | **2.635** |
| **NCP6** | **1.781** |
| **PCC1** | **2.813** |
| **PCC2** | 3.288 |
| **PCC3** | 4.414 |
| **PCC4** | 4.853 |
| **PCC5** | **2.625** |
| **PCC6** | **2.188** |
| **SPC1** | **2.772** |
| **SPC2** | **2.315** |
| **SPC3** | **2.666** |
| **SPC4** | **2.633** |
| **SPC5** | **2.485** |
| **SPC6** | **2.850** |
| **SPC7** | **2.679** |

Nilai Inner VIF

| | **Broiler Chicken Business Efficiency** | **Number of Chicks Production** | **Price of Chicken Cubs/Seeds** | **Supply Chain** |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | | | | |

| | | | | |
|---|---|---|---|---|
| **Number of Chicks Production** | 3.087 | | | **2.171** |
| **Price of Chicken Cubs/Seeds** | 3.298 | | | **2.171** |
| **Supply Chain** | 4.535 | | | |

Fit_Model

| | **Model Saturated** | **Model Estimasi** |
|---|---|---|
| **SRMR** | 0.116 | 0.116 |
| **d_ULS** | 4.711 | 4.711 |
| **d_G** | Tidak digunakan | Tidak digunakan |
| **Chi-Square** | tidak terbatas | tidak terbatas |
| **NFI** | Tidak digunakan | Tidak digunakan |

rms Theta

| | |
|---|---|
| **rms Theta** | 0.227 |

Kriteria Seleksi Model

| | **AIC (Akaike's Informasi Kriteria)** | **AICu (Kriteria Informasi** | **AICc (Kriteria Informasi** | **BIC (Bayesian** | **HQ (Hannan Quinn Kriteria)** | **HQc (Kriteria Hannan-Quinn Dikoreksi)** |
|---|---|---|---|---|---|---|

| | | Akaikes tidak bias | Akaikes Dikorekasi) | Informasi Kriteria) | | |
|---|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | -364.493 | -360.411 | -261.855 | -354.073 | -360.276 | -359.496 |
| **Supply Chain** | -146.185 | -143.140 | -43.764 | -138.370 | -143.022 | -142.540 |

## Koefisien Jalur

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.504 | 0.517 | 0.059 | 8.584 | **0.000** |
| **Number of Chicks Production -> Supply Chain** | 0.449 | 0.449 | 0.080 | 5.626 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.734 | 0.718 | 0.063 | 11.635 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.499 | 0.499 | 0.066 | 7.576 | **0.000** |
| **Supply Chain -> Broiler Chicken Business Efficiency** | -0.197 | -0.198 | 0.040 | 4.954 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.504 | 0.517 | 0.382 | 0.614 |
| **Number of Chicks Production -> Supply Chain** | 0.449 | 0.449 | 0.290 | 0.573 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.734 | 0.718 | 0.593 | 0.829 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.499 | 0.499 | 0.379 | 0.626 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | -0.197 | -0.198 | -0.270 | -0.116 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.504 | 0.517 | 0.013 | 0.370 | 0.594 |
| **Number of Chicks Production -> Supply Chain** | 0.449 | 0.449 | 0.000 | 0.290 | 0.573 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.734 | 0.718 | -0.017 | 0.609 | 0.842 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.499 | 0.499 | 0.001 | 0.379 | 0.626 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | -0.197 | -0.198 | -0.002 | -0.268 | -0.112 |

Total Pengaruh Tidak Langsung

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | -0.088 | -0.088 | 0.022 | 4.065 | **0.000** |
| **Number of Chicks Production -> Supply Chain** | | | | | |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | -0.098 | -0.099 | 0.024 | 4.012 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | | | | | |
| **Supply Chain -> Broiler Chicken Business Efficiency** | | | | | |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | -0.088 | -0.088 | -0.136 | -0.054 |
| **Number of Chicks Production -> Supply Chain** | | | | |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | -0.098 | -0.099 | -0.145 | -0.057 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | | | | |
| **Supply Chain -> Broiler Chicken Business Efficiency** | | | | |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | -0.088 | -0.088 | 0.000 | -0.138 | -0.056 |
| **Number of Chicks Production -> Supply Chain** | | | | | |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | -0.098 | -0.099 | -0.001 | -0.145 | -0.057 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | | | | | |
| **Supply Chain -> Broiler Chicken Business Efficiency** | | | | | |

## Efek Tidak Langsung Spesifik

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.088 | -0.088 | 0.022 | 4.065 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.098 | -0.099 | 0.024 | 4.012 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Number of Chicks Production -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.088 | -0.088 | -0.136 | -0.054 |
| **Price of Chicken Cubs/Seeds -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.098 | -0.099 | -0.145 | -0.057 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.088 | -0.088 | 0.000 | -0.138 | -0.056 |
| **Price of Chicken Cubs/Seeds -> Supply Chain -> Broiler Chicken Business Efficiency** | -0.098 | -0.099 | -0.001 | -0.145 | -0.057 |

## Pengaruh Total

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.416 | 0.429 | 0.057 | 7.259 | **0.000** |
| **Number of Chicks Production -> Supply Chain** | 0.449 | 0.449 | 0.080 | 5.626 | **0.000** |

| | | | | | |
|---|---|---|---|---|---|
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.636 | 0.619 | 0.069 | 9.250 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.499 | 0.499 | 0.066 | 7.576 | **0.000** |
| **Supply Chain -> Broiler Chicken Business Efficiency** | -0.197 | -0.198 | 0.040 | 4.954 | **0.000** |

Keyakinan Interval

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **2.5%** | **97.5%** |
|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.416 | 0.429 | 0.320 | 0.532 |
| **Number of Chicks Production -> Supply Chain** | 0.449 | 0.449 | 0.290 | 0.573 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.636 | 0.619 | 0.489 | 0.746 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.499 | 0.499 | 0.379 | 0.626 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | -0.197 | -0.198 | -0.270 | -0.116 |

Keyakinan Interval Bias-Dikoreksi

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Bias** | **2.5%** | **97.5%** |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.416 | 0.429 | 0.013 | 0.298 | 0.510 |
| **Number of Chicks Production -> Supply Chain** | 0.449 | 0.449 | 0.000 | 0.290 | 0.573 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.636 | 0.619 | -0.018 | 0.517 | 0.762 |

| | | | | | |
|---|---|---|---|---|---|
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.499 | 0.499 | 0.001 | 0.379 | 0.626 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | -0.197 | -0.198 | -0.002 | -0.268 | -0.112 |

## Outer Loading

Mean, STDEV, T-Values, P-Values

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Standar Deviasi (STDEV)** | **T Statistik (\| O/STDEV \|)** | **P Values** |
|---|---|---|---|---|---|
| **BCBE1 <- Broiler Chicken Business Efficiency** | 0.863 | 0.862 | 0.035 | 24.787 | **0.000** |
| **BCBE2 <- Broiler Chicken Business Efficiency** | 0.872 | 0.867 | 0.030 | 29.246 | **0.000** |
| **BCBE3 <- Broiler Chicken Business Efficiency** | 0.813 | 0.816 | 0.041 | 19.825 | **0.000** |
| **BCBE4 <- Broiler Chicken Business Efficiency** | 0.816 | 0.814 | 0.035 | 23.483 | **0.000** |
| **BCBE5 <- Broiler Chicken Business Efficiency** | 0.829 | 0.829 | 0.044 | 18.868 | **0.000** |
| **BCBE6 <- Broiler Chicken Business Efficiency** | 0.676 | 0.686 | 0.105 | 6.460 | **0.000** |
| **BCBE7 <- Broiler Chicken Business Efficiency** | 0.805 | 0.807 | 0.049 | 16.565 | **0.000** |
| **NCP1 <- Number of Chicks Production** | 0.795 | 0.809 | 0.060 | 13.175 | **0.000** |
| **NCP2 <- Number of Chicks Production** | 0.766 | 0.767 | 0.060 | 12.743 | **0.000** |
| **NCP3 <- Number of Chicks Production** | 0.905 | 0.904 | 0.017 | 53.453 | **0.000** |
| **NCP4 <- Number of Chicks Production** | 0.860 | 0.856 | 0.041 | 20.780 | **0.000** |
| **NCP5 <- Number of Chicks Production** | 0.841 | 0.840 | 0.034 | 25.091 | **0.000** |
| **NCP6 <- Number of Chicks Production** | 0.756 | 0.757 | 0.045 | 16.795 | **0.000** |

| | | | | | |
|---|---|---|---|---|---|
| **PCC1 <- Price of Chicken Cubs/Seeds** | 0.853 | 0.842 | 0.049 | 17.400 | **0.000** |
| **PCC2 <- Price of Chicken Cubs/Seeds** | 0.885 | 0.880 | 0.032 | 27.537 | **0.000** |
| **PCC3 <- Price of Chicken Cubs/Seeds** | 0.913 | 0.909 | 0.027 | 33.579 | **0.000** |
| **PCC4 <- Price of Chicken Cubs/Seeds** | 0.919 | 0.913 | 0.024 | 38.688 | **0.000** |
| **PCC5 <- Price of Chicken Cubs/Seeds** | 0.823 | 0.821 | 0.051 | 16.200 | **0.000** |
| **PCC6 <- Price of Chicken Cubs/Seeds** | 0.805 | 0.808 | 0.034 | 24.023 | **0.000** |
| **SPC1 <- Supply Chain** | 0.789 | 0.788 | 0.049 | 16.196 | **0.000** |
| **SPC2 <- Supply Chain** | 0.744 | 0.740 | 0.057 | 13.046 | **0.000** |
| **SPC3 <- Supply Chain** | 0.752 | 0.751 | 0.055 | 13.688 | **0.000** |
| **SPC4 <- Supply Chain** | 0.814 | 0.815 | 0.040 | 20.243 | **0.000** |
| **SPC5 <- Supply Chain** | 0.785 | 0.797 | 0.060 | 13.103 | **0.000** |
| **SPC6 <- Supply Chain** | 0.770 | 0.767 | 0.047 | 16.403 | **0.000** |
| **SPC7 <- Supply Chain** | 0.783 | 0.787 | 0.036 | 21.742 | **0.000** |

Keyakinan Interval

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **2.5%** | **97.5%** |
|---|---|---|---|---|
| **BCBE1 <- Broiler Chicken Business Efficiency** | 0.863 | 0.862 | 0.794 | 0.915 |
| **BCBE2 <- Broiler Chicken Business Efficiency** | 0.872 | 0.867 | 0.791 | 0.908 |
| **BCBE3 <- Broiler Chicken Business Efficiency** | 0.813 | 0.816 | 0.730 | 0.883 |
| **BCBE4 <- Broiler Chicken Business Efficiency** | 0.816 | 0.814 | 0.744 | 0.874 |
| **BCBE5 <- Broiler Chicken Business Efficiency** | 0.829 | 0.829 | 0.733 | 0.910 |
| **BCBE6 <- Broiler Chicken Business Efficiency** | 0.676 | 0.686 | 0.441 | 0.847 |
| **BCBE7 <- Broiler Chicken Business Efficiency** | 0.805 | 0.807 | 0.710 | 0.877 |

| | | | | |
|---|---|---|---|---|
| **NCP1 <- Number of Chicks Production** | 0.795 | 0.809 | 0.696 | 0.904 |
| **NCP2 <- Number of Chicks Production** | 0.766 | 0.767 | 0.655 | 0.861 |
| **NCP3 <- Number of Chicks Production** | 0.905 | 0.904 | 0.865 | 0.934 |
| **NCP4 <- Number of Chicks Production** | 0.860 | 0.856 | 0.768 | 0.918 |
| **NCP5 <- Number of Chicks Production** | 0.841 | 0.840 | 0.767 | 0.894 |
| **NCP6 <- Number of Chicks Production** | 0.756 | 0.757 | 0.666 | 0.833 |
| **PCC1 <- Price of Chicken Cubs/Seeds** | 0.853 | 0.842 | 0.717 | 0.917 |
| **PCC2 <- Price of Chicken Cubs/Seeds** | 0.885 | 0.880 | 0.807 | 0.934 |
| **PCC3 <- Price of Chicken Cubs/Seeds** | 0.913 | 0.909 | 0.845 | 0.951 |
| **PCC4 <- Price of Chicken Cubs/Seeds** | 0.919 | 0.913 | 0.869 | 0.954 |
| **PCC5 <- Price of Chicken Cubs/Seeds** | 0.823 | 0.821 | 0.710 | 0.901 |
| **PCC6 <- Price of Chicken Cubs/Seeds** | 0.805 | 0.808 | 0.748 | 0.871 |
| **SPC1 <- Supply Chain** | 0.789 | 0.788 | 0.684 | 0.870 |
| **SPC2 <- Supply Chain** | 0.744 | 0.740 | 0.626 | 0.835 |
| **SPC3 <- Supply Chain** | 0.752 | 0.751 | 0.667 | 0.834 |
| **SPC4 <- Supply Chain** | 0.814 | 0.815 | 0.724 | 0.881 |
| **SPC5 <- Supply Chain** | 0.785 | 0.797 | 0.693 | 0.895 |
| **SPC6 <- Supply Chain** | 0.770 | 0.767 | 0.664 | 0.831 |
| **SPC7 <- Supply Chain** | 0.783 | 0.787 | 0.715 | 0.854 |

Mean, STDEV, T-Values, P-Values

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Standar Deviasi (STDEV)** | **T Statistik (\| O/STDEV \|)** | **P Values** |
|---|---|---|---|---|---|
| **BCBE1 <- Broiler Chicken Business Efficiency** | 0.189 | 0.187 | 0.009 | 21.610 | **0.000** |

| | | | | | |
|---|---|---|---|---|---|
| **BCBE2 <- Broiler Chicken Business Efficiency** | 0.189 | 0.187 | 0.009 | 21.280 | **0.000** |
| **BCBE3 <- Broiler Chicken Business Efficiency** | 0.176 | 0.176 | 0.012 | 15.281 | **0.000** |
| **BCBE4 <- Broiler Chicken Business Efficiency** | 0.181 | 0.179 | 0.010 | 17.430 | **0.000** |
| **BCBE5 <- Broiler Chicken Business Efficiency** | 0.176 | 0.176 | 0.009 | 19.013 | **0.000** |
| **BCBE6 <- Broiler Chicken Business Efficiency** | 0.141 | 0.142 | 0.020 | 7.129 | **0.000** |
| **BCBE7 <- Broiler Chicken Business Efficiency** | 0.175 | 0.174 | 0.010 | 17.754 | **0.000** |
| **NCP1 <- Number of Chicks Production** | 0.221 | 0.220 | 0.022 | 9.876 | **0.000** |
| **NCP2 <- Number of Chicks Production** | 0.181 | 0.181 | 0.012 | 15.412 | **0.000** |
| **NCP3 <- Number of Chicks Production** | 0.218 | 0.218 | 0.016 | 14.026 | **0.000** |
| **NCP4 <- Number of Chicks Production** | 0.194 | 0.193 | 0.011 | 17.320 | **0.000** |
| **NCP5 <- Number of Chicks Production** | 0.190 | 0.189 | 0.009 | 21.284 | **0.000** |
| **NCP6 <- Number of Chicks Production** | 0.214 | 0.213 | 0.017 | 12.668 | **0.000** |
| **PCC1 <- Price of Chicken Cubs/Seeds** | 0.189 | 0.188 | 0.009 | 20.660 | **0.000** |
| **PCC2 <- Price of Chicken Cubs/Seeds** | 0.196 | 0.198 | 0.009 | 21.203 | **0.000** |
| **PCC3 <- Price of Chicken Cubs/Seeds** | 0.198 | 0.199 | 0.008 | 25.718 | **0.000** |
| **PCC4 <- Price of Chicken Cubs/Seeds** | 0.200 | 0.201 | 0.007 | 26.930 | **0.000** |
| **PCC5 <- Price of Chicken Cubs/Seeds** | 0.180 | 0.182 | 0.010 | 17.896 | **0.000** |
| **PCC6 <- Price of Chicken Cubs/Seeds** | 0.189 | 0.190 | 0.010 | 18.968 | **0.000** |
| **SPC1 <- Supply Chain** | 0.191 | 0.190 | 0.017 | 11.508 | **0.000** |
| **SPC2 <- Supply Chain** | 0.140 | 0.139 | 0.022 | 6.382 | **0.000** |
| **SPC3 <- Supply Chain** | 0.159 | 0.158 | 0.019 | 8.559 | **0.000** |
| **SPC4 <- Supply Chain** | 0.178 | 0.178 | 0.011 | 15.955 | **0.000** |
| **SPC5 <- Supply Chain** | 0.173 | 0.176 | 0.019 | 9.210 | **0.000** |
| **SPC6 <- Supply Chain** | 0.217 | 0.213 | 0.022 | 9.730 | **0.000** |
| **SPC7 <- Supply Chain** | 0.227 | 0.226 | 0.021 | 11.053 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **BCBE1 <- Broiler Chicken Business Efficiency** | 0.189 | 0.187 | 0.172 | 0.205 |
| **BCBE2 <- Broiler Chicken Business Efficiency** | 0.189 | 0.187 | 0.170 | 0.202 |
| **BCBE3 <- Broiler Chicken Business Efficiency** | 0.176 | 0.176 | 0.155 | 0.197 |
| **BCBE4 <- Broiler Chicken Business Efficiency** | 0.181 | 0.179 | 0.159 | 0.196 |
| **BCBE5 <- Broiler Chicken Business Efficiency** | 0.176 | 0.176 | 0.157 | 0.191 |
| **BCBE6 <- Broiler Chicken Business Efficiency** | 0.141 | 0.142 | 0.092 | 0.173 |
| **BCBE7 <- Broiler Chicken Business Efficiency** | 0.175 | 0.174 | 0.153 | 0.192 |
| **NCP1 <- Number of Chicks Production** | 0.221 | 0.220 | 0.187 | 0.268 |
| **NCP2 <- Number of Chicks Production** | 0.181 | 0.181 | 0.155 | 0.200 |
| **NCP3 <- Number of Chicks Production** | 0.218 | 0.218 | 0.197 | 0.250 |
| **NCP4 <- Number of Chicks Production** | 0.194 | 0.193 | 0.169 | 0.211 |
| **NCP5 <- Number of Chicks Production** | 0.190 | 0.189 | 0.167 | 0.206 |
| **NCP6 <- Number of Chicks Production** | 0.214 | 0.213 | 0.188 | 0.250 |
| **PCC1 <- Price of Chicken Cubs/Seeds** | 0.189 | 0.188 | 0.171 | 0.205 |
| **PCC2 <- Price of Chicken Cubs/Seeds** | 0.196 | 0.198 | 0.183 | 0.216 |
| **PCC3 <- Price of Chicken Cubs/Seeds** | 0.198 | 0.199 | 0.184 | 0.215 |

| | | | | |
|---|---|---|---|---|
| **PCC4 <- Price of Chicken Cubs/Seeds** | 0.200 | 0.201 | 0.184 | 0.215 |
| **PCC5 <- Price of Chicken Cubs/Seeds** | 0.180 | 0.182 | 0.163 | 0.204 |
| **PCC6 <- Price of Chicken Cubs/Seeds** | 0.189 | 0.190 | 0.174 | 0.208 |
| **SPC1 <- Supply Chain** | 0.191 | 0.190 | 0.153 | 0.216 |
| **SPC2 <- Supply Chain** | 0.140 | 0.139 | 0.094 | 0.173 |
| **SPC3 <- Supply Chain** | 0.159 | 0.158 | 0.124 | 0.192 |
| **SPC4 <- Supply Chain** | 0.178 | 0.178 | 0.155 | 0.199 |
| **SPC5 <- Supply Chain** | 0.173 | 0.176 | 0.141 | 0.214 |
| **SPC6 <- Supply Chain** | 0.217 | 0.213 | 0.175 | 0.252 |
| **SPC7 <- Supply Chain** | 0.227 | 0.226 | 0.188 | 0.266 |

## • Kriteria Kualitas

R Square

Mean, STDEV, T-Values, P-Values

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Standar Deviasi (STDEV)** | **T Statistik (\| O/STDEV \|)** | **P Values** |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.976 | 0.977 | 0.005 | 185.328 | **0.000** |
| **Supply Chain** | 0.779 | 0.790 | 0.035 | 22.406 | **0.000** |

Keyakinan Interval

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **2.5%** | **97.5%** |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.976 | 0.977 | 0.965 | 0.986 |
| **Supply Chain** | 0.779 | 0.790 | 0.724 | 0.859 |

Keyakinan Interval Bias-Dikoreksi

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Bias** | **2.5%** | **97.5%** |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.976 | 0.977 | 0.001 | 0.963 | 0.983 |
| **Supply Chain** | 0.779 | 0.790 | 0.011 | 0.709 | 0.824 |

## Adjusted R Square

Mean, STDEV, T-Values, P-Values

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Standar Deviasi (STDEV)** | **T Statistik (\| O/STDEV \|)** | **P Values** |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.975 | 0.976 | 0.005 | 179.572 | **0.000** |
| **Supply Chain** | 0.775 | 0.786 | 0.036 | 21.825 | **0.000** |

Keyakinan Interval

| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **2.5%** | **97.5%** |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.975 | 0.976 | 0.964 | 0.985 |
| **Supply Chain** | 0.775 | 0.786 | 0.718 | 0.857 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.975 | 0.976 | 0.001 | 0.962 | 0.982 |
| **Supply Chain** | 0.775 | 0.786 | 0.011 | 0.703 | 0.821 |

f Square

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 3.384 | 3.542 | 1.028 | 3.292 | **0.001** |
| **Number of Chicks Production -> Supply Chain** | 0.422 | 0.467 | 0.255 | 1.652 | **0.102** |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 6.714 | 6.936 | 3.310 | 2.029 | **0.045** |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.519 | 0.525 | 0.160 | 3.240 | **0.002** |
| **Supply Chain -> Broiler Chicken Business Efficiency** | 0.350 | 0.392 | 0.187 | 1.869 | **0.065** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 3.384 | 3.542 | 1.999 | 5.457 |
| **Number of Chicks Production -> Supply Chain** | 0.422 | 0.467 | 0.108 | 1.047 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 6.714 | 6.936 | 3.035 | 15.242 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.519 | 0.525 | 0.227 | 0.868 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | 0.350 | 0.392 | 0.092 | 0.791 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 3.384 | 0.517 | -2.866 | 0.370 | 0.370 |
| **Number of Chicks Production -> Supply Chain** | 0.422 | 0.449 | 0.028 | 0.264 | 0.542 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 6.714 | 0.718 | -5.997 | 0.573 | 0.573 |
| **Price of Chicken Cubs/Seeds -> Supply Chain** | 0.519 | 0.499 | -0.020 | 0.412 | 0.631 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | 0.350 | -0.198 | -0.548 | -0.290 | -0.290 |

Rata-rata Varians Diekstrak
(AVE)

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.661 | 0.665 | 0.032 | 20.517 | **0.000** |
| **Number of Chicks Production** | 0.676 | 0.681 | 0.046 | 14.732 | **0.000** |
| **Price of Chicken Cubs/Seeds** | 0.752 | 0.746 | 0.042 | 17.991 | **0.000** |
| **Supply Chain** | 0.604 | 0.608 | 0.047 | 12.935 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.661 | 0.665 | 0.609 | 0.727 |
| **Number of Chicks Production** | 0.676 | 0.681 | 0.591 | 0.756 |
| **Price of Chicken Cubs/Seeds** | 0.752 | 0.746 | 0.637 | 0.827 |
| **Supply Chain** | 0.604 | 0.608 | 0.513 | 0.698 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.661 | 0.665 | 0.004 | 0.609 | 0.722 |
| **Number of Chicks Production** | 0.676 | 0.681 | 0.005 | 0.568 | 0.754 |
| **Price of Chicken Cubs/Seeds** | 0.752 | 0.746 | -0.006 | 0.672 | 0.832 |
| **Supply Chain** | 0.604 | 0.608 | 0.004 | 0.543 | 0.698 |

Reliabilitas Komposit

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.931 | 0.932 | 0.009 | 99.800 | **0.000** |
| **Number of Chicks Production** | 0.926 | 0.926 | 0.015 | 63.000 | **0.000** |
| **Price of Chicken Cubs/Seeds** | 0.948 | 0.946 | 0.011 | 82.597 | **0.000** |
| **Supply Chain** | 0.914 | 0.914 | 0.015 | 59.681 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.931 | 0.932 | 0.914 | 0.949 |
| **Number of Chicks Production** | 0.926 | 0.926 | 0.896 | 0.949 |
| **Price of Chicken Cubs/Seeds** | 0.948 | 0.946 | 0.913 | 0.966 |
| **Supply Chain** | 0.914 | 0.914 | 0.879 | 0.942 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.931 | 0.932 | 0.001 | 0.914 | 0.949 |
| **Number of Chicks Production** | 0.926 | 0.926 | 0.001 | 0.886 | 0.948 |
| **Price of Chicken Cubs/Seeds** | 0.948 | 0.946 | -0.002 | 0.928 | 0.967 |

| | | | | | |
|---|---|---|---|---|---|
| **Supply Chain** | 0.914 | 0.914 | 0.000 | 0.893 | 0.944 |

rho_A

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.918 | 0.920 | 0.011 | 83.123 | **0.000** |
| **Number of Chicks Production** | 0.906 | 0.908 | 0.018 | 50.784 | **0.000** |
| **Price of Chicken Cubs/Seeds** | 0.935 | 0.933 | 0.015 | 62.628 | **0.000** |
| **Supply Chain** | 0.899 | 0.902 | 0.019 | 47.059 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.918 | 0.920 | 0.900 | 0.939 |
| **Number of Chicks Production** | 0.906 | 0.908 | 0.871 | 0.935 |
| **Price of Chicken Cubs/Seeds** | 0.935 | 0.933 | 0.889 | 0.958 |
| **Supply Chain** | 0.899 | 0.902 | 0.859 | 0.936 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.918 | 0.920 | 0.002 | 0.898 | 0.937 |
| **Number of Chicks Production** | 0.906 | 0.908 | 0.002 | 0.869 | 0.935 |
| **Price of Chicken Cubs/Seeds** | 0.935 | 0.933 | -0.002 | 0.903 | 0.960 |

| | | | | | |
|---|---|---|---|---|---|
| **Supply Chain** | 0.899 | 0.902 | 0.002 | 0.841 | 0.934 |

Cronbach's Alpha

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\| O/STDEV \|) | P Values |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.913 | 0.914 | 0.013 | 70.789 | **0.000** |
| **Number of Chicks Production** | 0.903 | 0.904 | 0.021 | 43.945 | **0.000** |
| **Price of Chicken Cubs/Seeds** | 0.934 | 0.930 | 0.016 | 59.785 | **0.000** |
| **Supply Chain** | 0.892 | 0.892 | 0.021 | 43.246 | **0.000** |

Keyakinan Interval

| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.913 | 0.914 | 0.889 | 0.937 |
| **Number of Chicks Production** | 0.903 | 0.904 | 0.860 | 0.935 |
| **Price of Chicken Cubs/Seeds** | 0.934 | 0.930 | 0.884 | 0.957 |
| **Supply Chain** | 0.892 | 0.892 | 0.846 | 0.928 |

Keyakinan Interval Bias-Dikoreksi

| | Sampel Asli (O) | Rata-rata Sampel (M) | Bias | 2.5% | 97.5% |
|---|---|---|---|---|---|
| **Broiler Chicken Business Efficiency** | 0.913 | 0.914 | 0.000 | 0.889 | 0.937 |
| **Number of Chicks Production** | 0.903 | 0.904 | 0.000 | 0.848 | 0.934 |
| **Price of Chicken Cubs/Seeds** | 0.934 | 0.930 | -0.003 | 0.906 | 0.959 |

| | | | | | |
|---|---|---|---|---|---|
| **Supply Chain** | 0.892 | 0.892 | 0.000 | 0.863 | 0.929 |

## Korelasi Variabel Laten

Mean, STDEV, T-Values, P-Values

| | Sampel Asli (O) | Rata-rata Sampel (M) | Standar Deviasi (STDEV) | T Statistik (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.883 | 0.890 | 0.039 | 22.375 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.942 | 0.943 | 0.010 | 98.674 | **0.000** |
| **Price of Chicken Cubs/Seeds -> Number of Chicks Production** | 0.734 | 0.751 | 0.062 | 11.885 | **0.000** |
| **Supply Chain -> Broiler Chicken Business Efficiency** | 0.823 | 0.828 | 0.030 | 27.447 | **0.000** |
| **Supply Chain -> Number of Chicks Production** | 0.815 | 0.825 | 0.031 | 26.135 | **0.000** |
| **Supply Chain -> Price of Chicken Cubs/Seeds** | 0.829 | 0.835 | 0.026 | 31.428 | **0.000** |

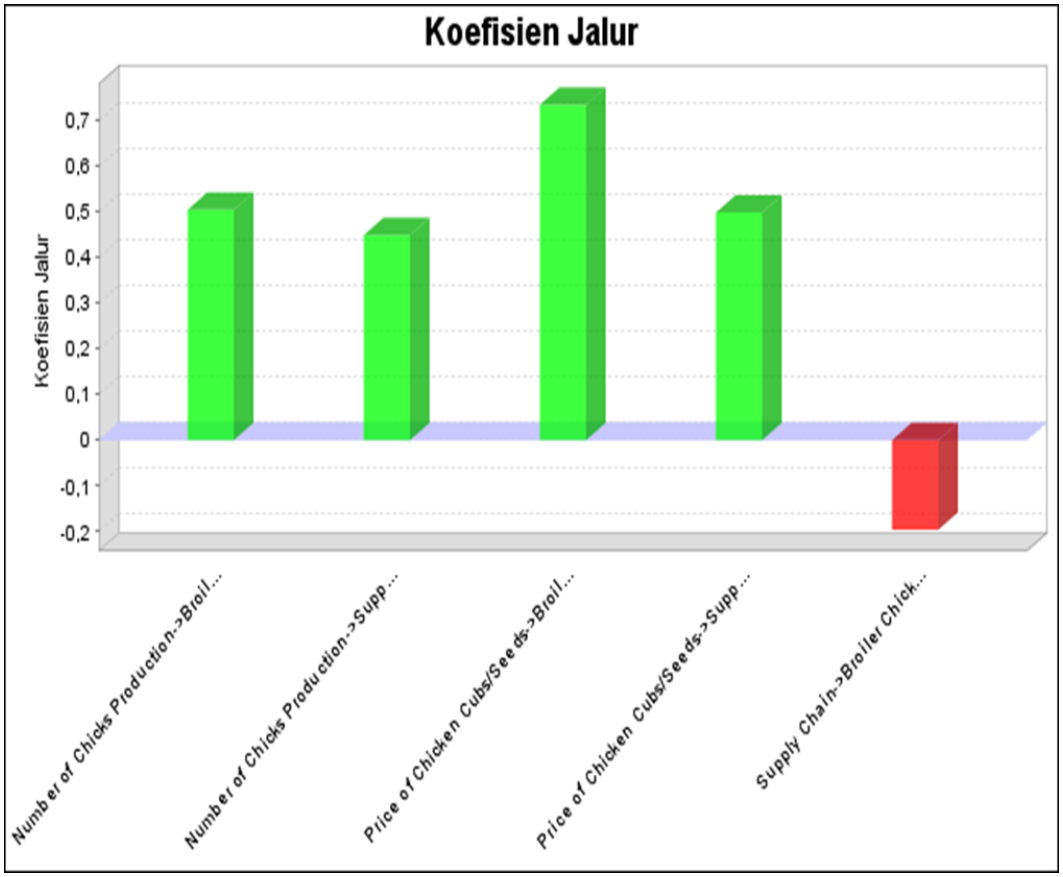
Keyakinan Interval

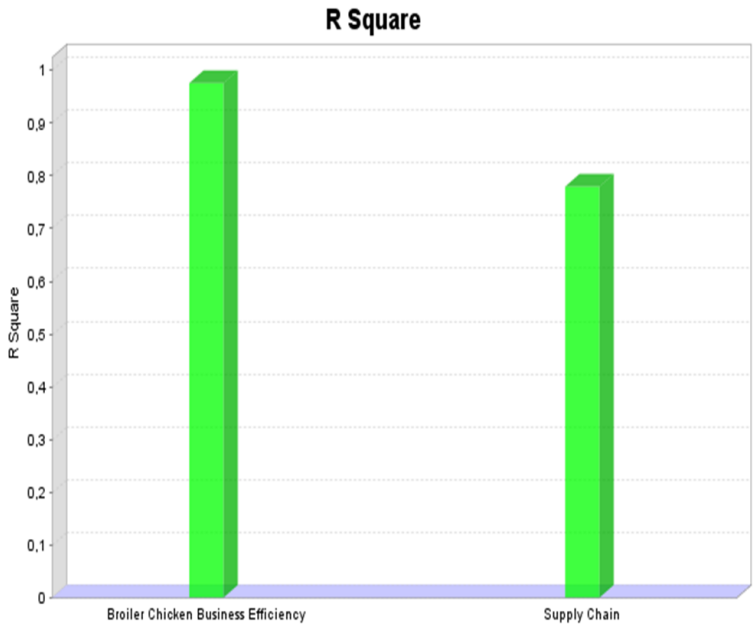
| | Sampel Asli (O) | Rata-rata Sampel (M) | 2.5% | 97.5% |
|---|---|---|---|---|

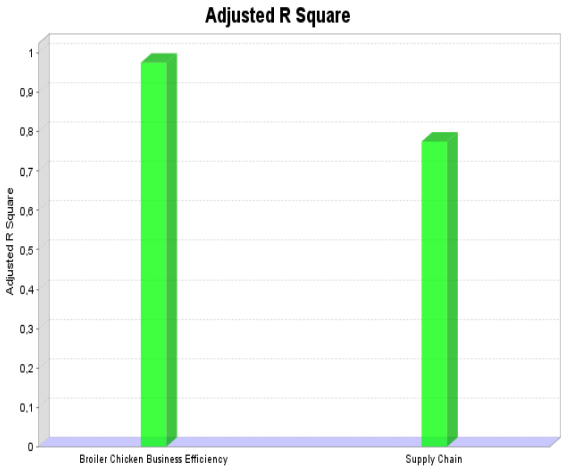
| | | | | |
|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.883 | 0.890 | 0.805 | 0.945 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.942 | 0.943 | 0.919 | 0.961 |
| **Price of Chicken Cubs/Seeds -> Number of Chicks Production** | 0.734 | 0.751 | 0.637 | 0.849 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | 0.823 | 0.828 | 0.776 | 0.883 |
| **Supply Chain -> Number of Chicks Production** | 0.815 | 0.825 | 0.760 | 0.885 |
| **Supply Chain -> Price of Chicken Cubs/Seeds** | 0.829 | 0.835 | 0.786 | 0.876 |

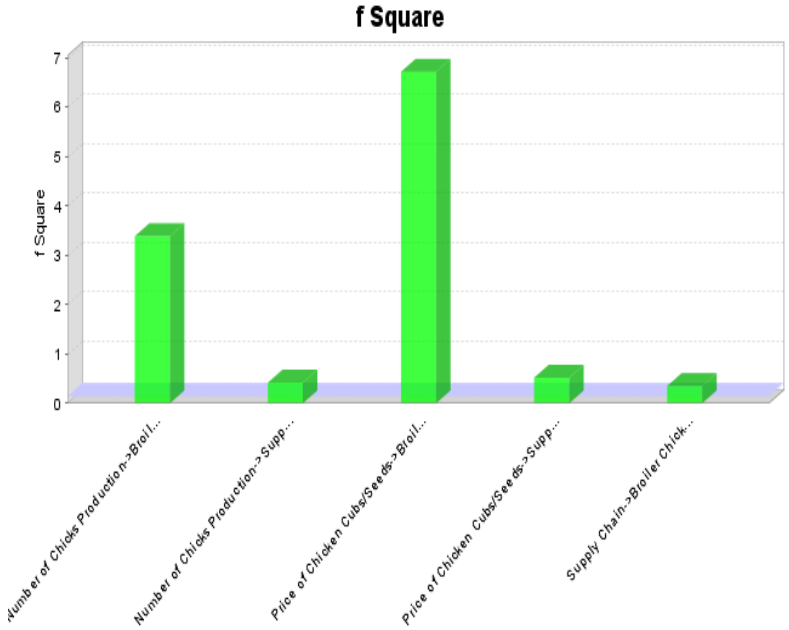
Keyakinan Interval Bias-Dikoreksi

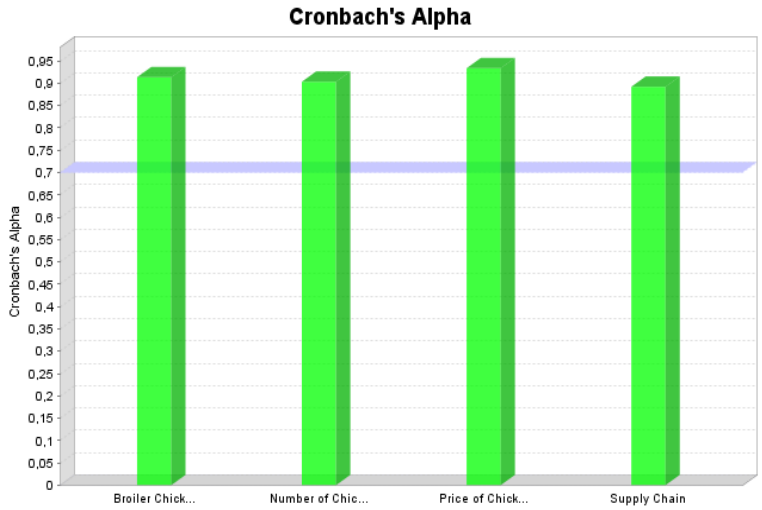
| | **Sampel Asli (O)** | **Rata-rata Sampel (M)** | **Bias** | **2.5%** | **97.5%** |
|---|---|---|---|---|---|
| **Number of Chicks Production -> Broiler Chicken Business Efficiency** | 0.883 | 0.890 | 0.007 | 0.795 | 0.941 |
| **Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency** | 0.942 | 0.943 | 0.001 | 0.919 | 0.958 |
| **Price of Chicken Cubs/Seeds -> Number of Chicks Production** | 0.734 | 0.751 | 0.016 | 0.609 | 0.842 |
| **Supply Chain -> Broiler Chicken Business Efficiency** | 0.823 | 0.828 | 0.004 | 0.773 | 0.878 |
| **Supply Chain -> Number of Chicks Production** | 0.815 | 0.825 | 0.010 | 0.750 | 0.856 |
| **Supply Chain -> Price of Chicken Cubs/Seeds** | 0.829 | 0.835 | 0.006 | 0.785 | 0.875 |

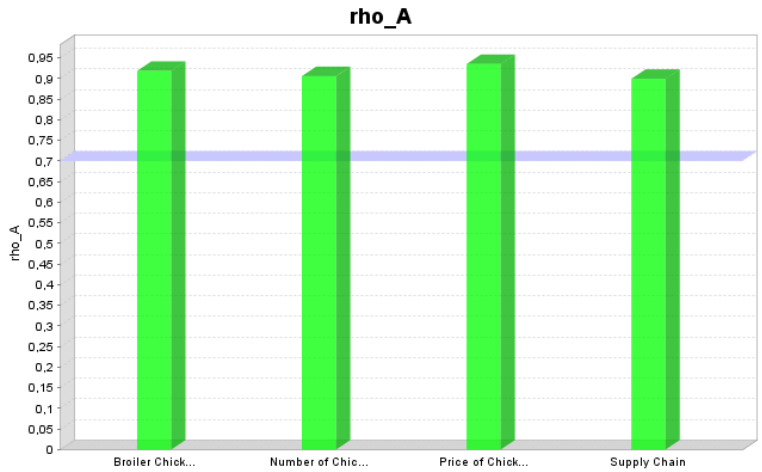

Koefisien Jalur
Koefisien Jalur
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
-0,1
-0,2
Number of Chicks Production->Broil...
Number of Chicks Production->Supp...
Price of Chicken Cubs/Seeds->Broil...
Price of Chicken Cubs/Seeds->Supp...
Supply Chain->Broiler Chick...

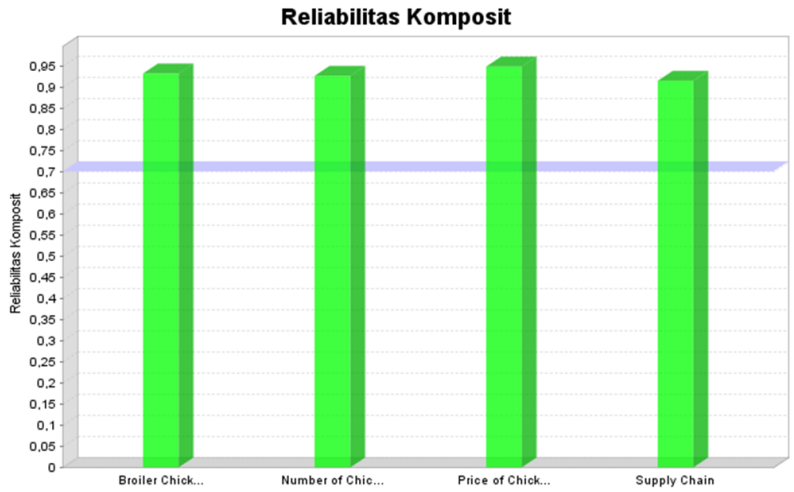

R Square
R Square
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
Broiler Chicken Business Efficiency
Supply Chain

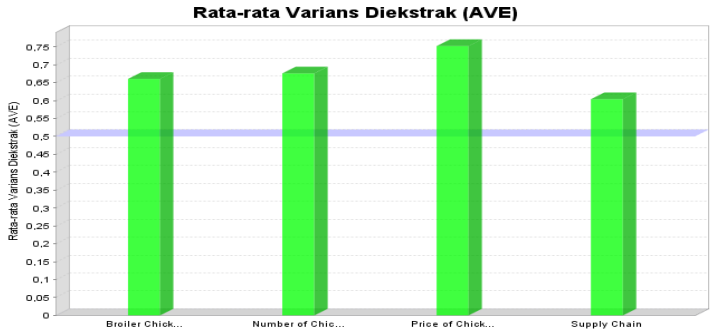

Adjusted R Square
Adjusted R Square
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
Broiler Chicken Business Efficiency
Supply Chain

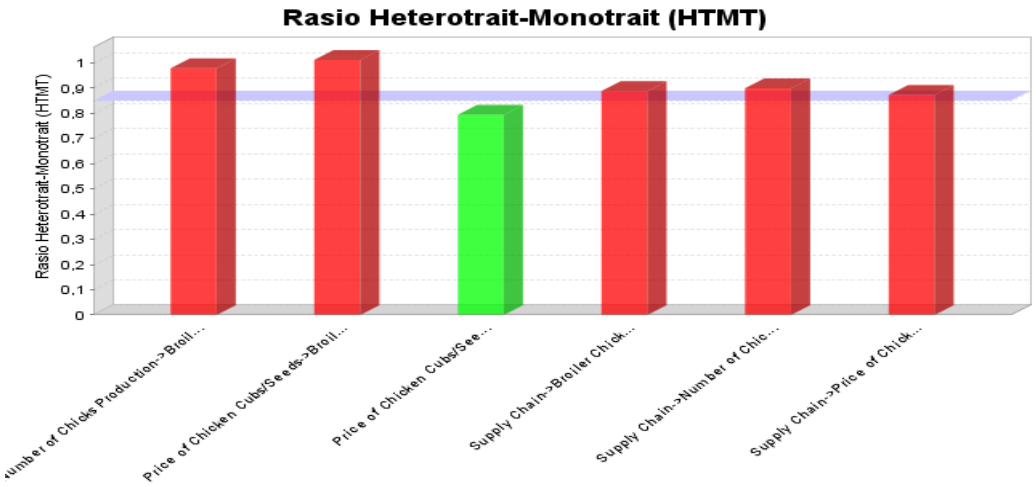

f Square
f Square
7
6
5
4
3
2
1
0
Number of Chicks Production->Broil...
Number of Chicks Production->Supp...
Price of Chicken Cubs/Seeds->Broil...
Price of Chicken Cubs/Seeds->Supp...
Supply Chain->Broiler Chick...

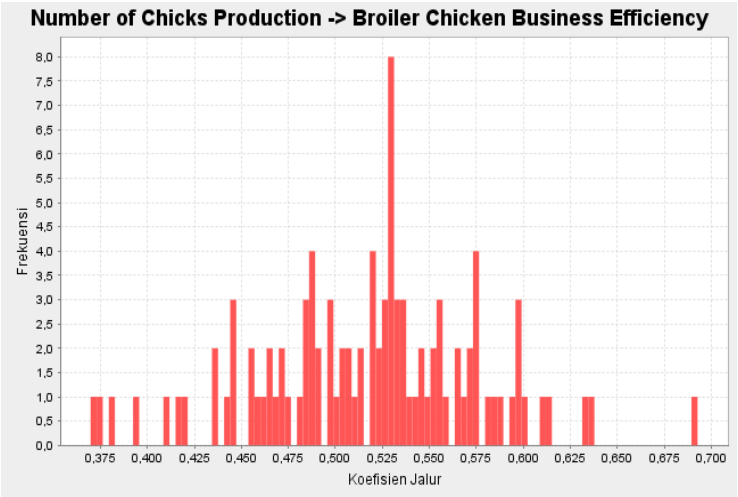

Cronbach's Alpha
Cronbach's Alpha
0,95
0,9
0,85
0,8
0,75
0,7
0,65
0,6
0,55
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
Broiler Chick...
Number of Chic...
Price of Chick...
Supply Chain

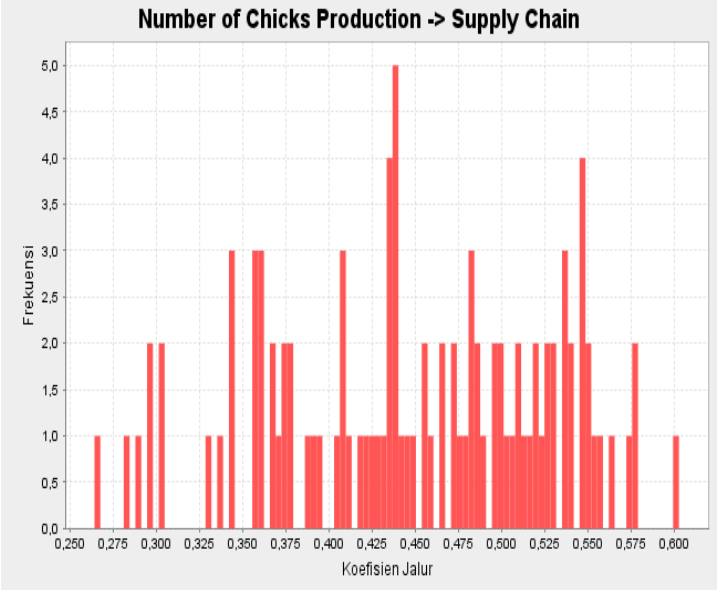

rho_A
rho_A
0,95
0,9
0,85
0,8
0,75
0,7
0,65
0,6
0,55
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
Broiler Chick...
Number of Chic...
Price of Chick...
Supply Chain

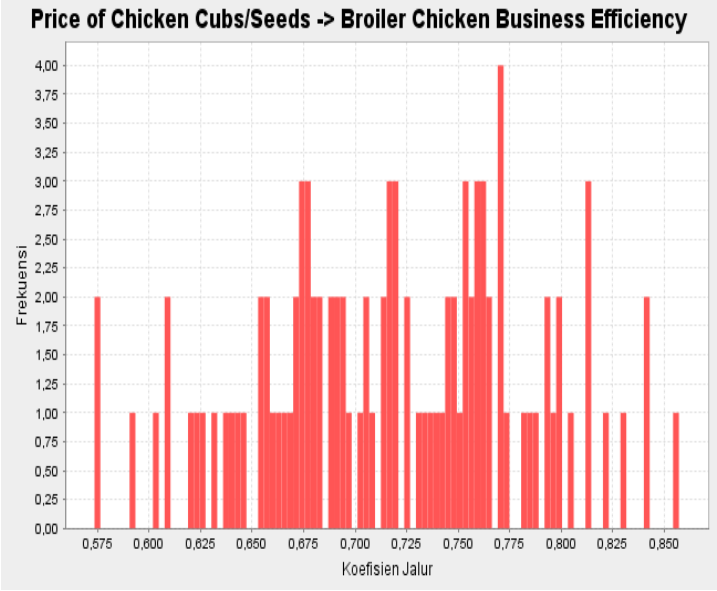

Reliabilitas Komposit
Reliabilitas Komposit
0,95
0,9
0,85
0,8
0,75
0,7
0,65
0,6
0,55
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
Broiler Chick...
Number of Chic...
Price of Chick...
Supply Chain

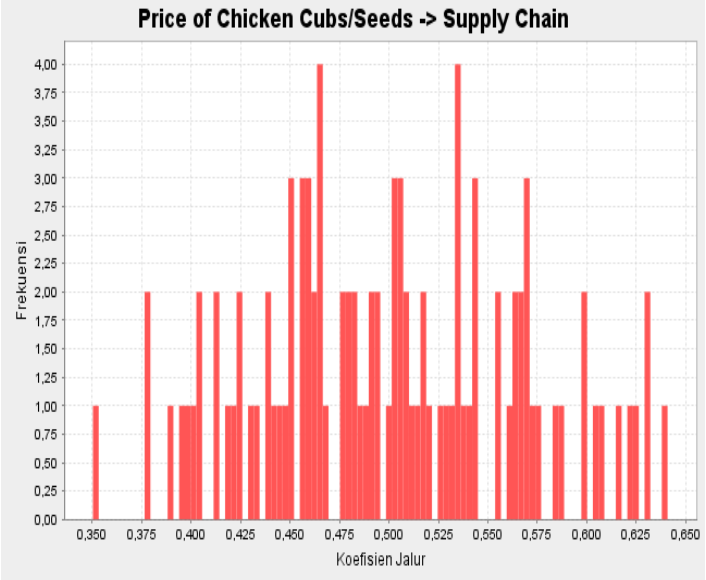

Rata-rata Varians Diekstrak (AVE)
Rata-rata Varians Diekstrak (AVE)
0,75
0,7
0,65
0,6
0,55
0,5
0,45
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
Broiler Chick...
Number of Chic...
Price of Chick...
Supply Chain

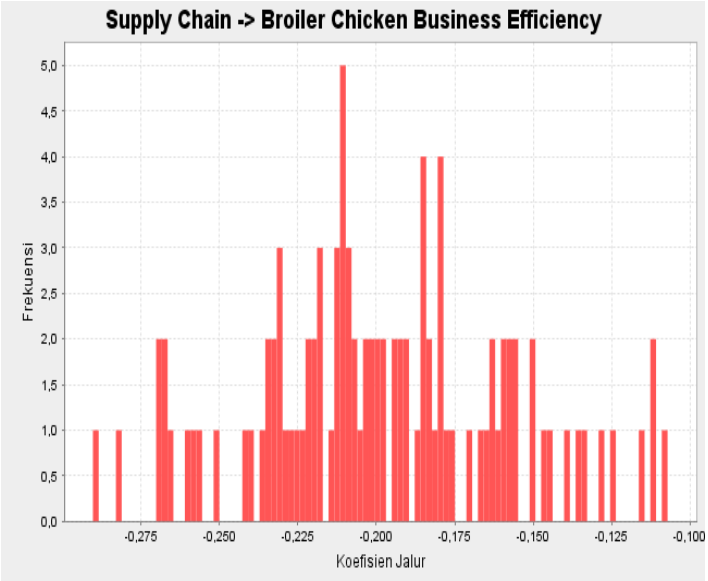

Rasio Heterotrait-Monotrait (HTMT)
Rasio Heterotrait-Monotrait (HTMT)
1
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
umber of Chicks Production->Broil...
Price of Chicken Cubs/Seeds->Broil...
Price of Chicken Cubs/See...
Supply Chain->Broiler Chick...
Supply Chain->Number of Chic...
Supply Chain->Price of Chick...

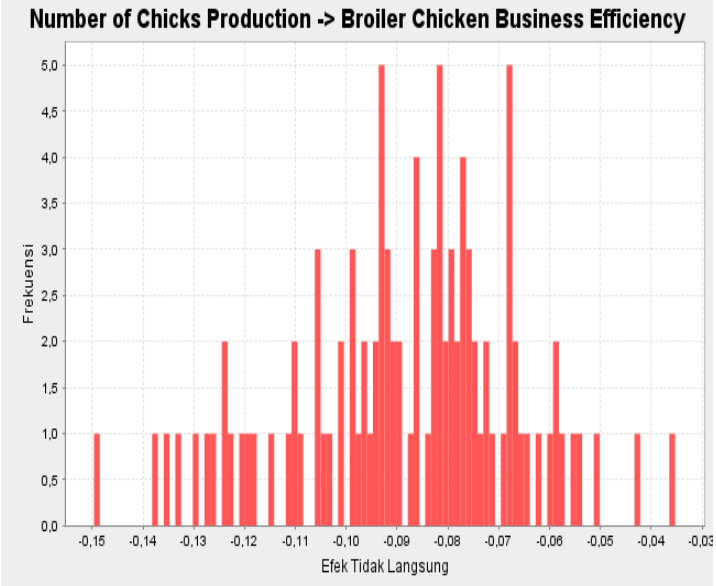

Number of Chicks Production -> Broiler Chicken Business Efficiency
Frekuensi
8,0
7,5
7,0
6,5
6,0
5,5
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
0,375
0,400
0,425
0,450
0,475
0,500
0,525
0,550
0,575
0,600
0,625
0,650
0,675
0,700
Koefisien Jalur

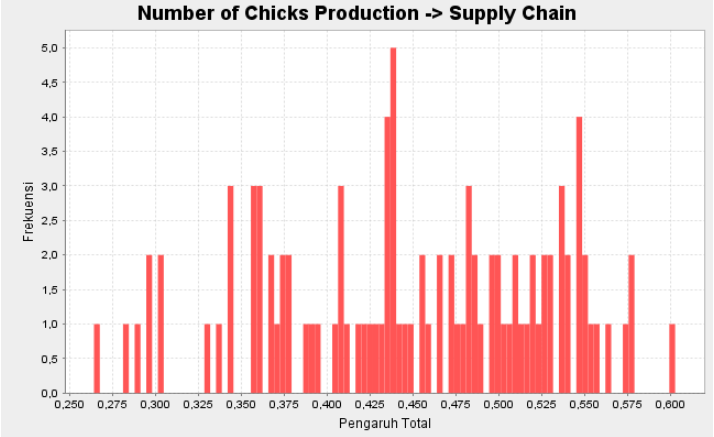

Number of Chicks Production -> Supply Chain
Frekuensi
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
0,250 0,275 0,300 0,325 0,350 0,375 0,400 0,425 0,450 0,475 0,500 0,525 0,550 0,575 0,600
Koefisien Jalur

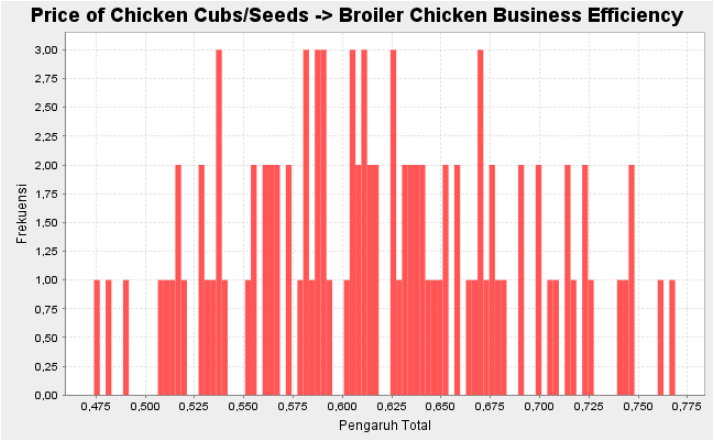

Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency
Frekuensi
4,00
3,75
3,50
3,25
3,00
2,75
2,50
2,25
2,00
1,75
1,50
1,25
1,00
0,75
0,50
0,25
0,00
0,575 0,600 0,625 0,650 0,675 0,700 0,725 0,750 0,775 0,800 0,825 0,850
Koefisien Jalur


Price of Chicken Cubs/Seeds -> Supply Chain
Frekuensi
4,00
3,75
3,50
3,25
3,00
2,75
2,50
2,25
2,00
1,75
1,50
1,25
1,00
0,75
0,50
0,25
0,00
0,350 0,375 0,400 0,425 0,450 0,475 0,500 0,525 0,550 0,575 0,600 0,625 0,650
Koefisien Jalur


Supply Chain -> Broiler Chicken Business Efficiency
Frekuensi
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
-0,275 -0,250 -0,225 -0,200 -0,175 -0,150 -0,125 -0,100
Koefisien Jalur


Number of Chicks Production -> Broiler Chicken Business Efficiency
Frekuensi
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
-0,15 -0,14 -0,13 -0,12 -0,11 -0,10 -0,09 -0,08 -0,07 -0,06 -0,05 -0,04 -0,03
Efek Tidak Langsung


Number of Chicks Production -> Supply Chain
Frekuensi
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
0,250 0,275 0,300 0,325 0,350 0,375 0,400 0,425 0,450 0,475 0,500 0,525 0,550 0,575 0,600
Pengaruh Total


Price of Chicken Cubs/Seeds -> Broiler Chicken Business Efficiency
Frekuensi
3,00
2,75
2,50
2,25
2,00
1,75
1,50
1,25
1,00
0,75
0,50
0,25
0,00
0,475 0,500 0,525 0,550 0,575 0,600 0,625 0,650 0,675 0,700 0,725 0,750 0,775
Pengaruh Total

**Lampiran. 3 Analisa Model Rantai Pasok dengan Simulation Equation Model**

DATA RANTAI PASOK01;

| INPUT CARD; | Thn | GPSFFI | GPSFPFI | PSFFI | PSFPI | PSFNGPS | CFFI | CFPI |
|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 8 | 5 | 93 | 40 | 26 | 17 | 10 |
| 2021(2) | | 8 | 5 | 93 | 42 | 26 | 17 | 10 |
| 2021(3) | | 8 | 5 | 93 | 42 | 28 | 17 | 10 |
| 2021(4) | | 9 | 5 | 93 | 40 | 27 | 17 | 10 |
| 2021(5) | | 9 | 5 | 93 | 43 | 28 | 17 | 10 |
| 2021(6) | | 9 | 5 | 93 | 43 | 28 | 17 | 10 |
| 2021(7) | | 10 | 5 | 93 | 43 | 27 | 17 | 10 |
| 2021(8) | | 10 | 6 | 93 | 40 | 28 | 17 | 10 |
| 2021(9) | | 10 | 6 | 93 | 40 | 28 | 17 | 10 |
| 2021(10) | | 10 | 7 | 93 | 43 | 28 | 17 | 10 |
| 2021(11) | | 10 | 8 | 93 | 45 | 27 | 17 | 10 |
| 2021(12) | | 10 | 9 | 93 | 45 | 28 | 17 | 10 |
| 2022(1) | | 9 | 9 | 109 | 45 | 28 | 17 | 10 |
| 2022(2) | | 9 | 8 | 109 | 45 | 27 | 17 | 10 |
| 2022(3) | | 10 | 9 | 109 | 45 | 28 | 17 | 10 |
| 2022(4) | | 10 | 7 | 109 | 48 | 26 | 17 | 10 |
| 2022(5) | | 10 | 9 | 109 | 48 | 26 | 17 | 10 |
| 2022(6) | | 9 | 9 | 109 | 48 | 28 | 17 | 10 |
| 2022(7) | | 9 | 8 | 109 | 50 | 28 | 17 | 10 |
| 2022(8) | | 10 | 9 | 109 | 50 | 28 | 17 | 10 |
| 2022(9) | | 10 | 9 | 109 | 50 | 27 | 17 | 10 |
| 2022(10) | | 10 | 9 | 109 | 50 | 28 | 17 | 10 |
| 2022(11) | | 10 | 9 | 109 | 48 | 28 | 17 | 10 |
| 2022(12) | | 10 | 9 | 109 | 51 | 27 | 17 | 10 |
| 2023(1) | | 10 | 9 | 120 | 48 | 26 | 17 | 10 |
| 2023(2) | | 9 | 9 | 120 | 48 | 26 | 17 | 10 |
| 2023(3) | | 9 | 9 | 120 | 48 | 26 | 17 | 10 |
| 2023(4) | | 10 | 9 | 120 | 50 | 27 | 17 | 10 |
| 2023(5) | | 10 | 9 | 120 | 50 | 26 | 17 | 10 |
| 2023(6) | | 9 | 10 | 120 | 50 | 25 | 17 | 10 |
| 2023(7) | | 10 | 10 | 120 | 50 | 25 | 17 | 10 |
| 2023(8) | | 10 | 10 | 120 | 51 | 27 | 17 | 10 |
| 2023(9) | | 9 | 10 | 120 | 51 | 26 | 17 | 10 |
| 2023(10) | | 10 | 11 | 120 | 52 | 27 | 17 | 10 |
| 2023(11) | | 10 | 12 | 120 | 52 | 26 | 17 | 10 |
| 2023(12) | | 10 | 12 | 120 | 52 | 27 | 17 | 10 |

RUN;

DATA RANTAI PASOK02;

| INPUT CARD; | Thn | CFPFI | CFPPI | CFI | CFPI | CIF | SHI | SH | B | CD |
|---|---|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 15386 | 400 | 500 | 5000 | 763 | 59 | 289 | 316 | 470 |
| 2021(2) | | 15386 | 400 | 500 | 5000 | 760 | 59 | 289 | 316 | 470 |
| 2021(3) | | 15386 | 400 | 500 | 5000 | 757 | 59 | 289 | 316 | 470 |
| 2021(4) | | 15386 | 400 | 500 | 5000 | 754 | 59 | 289 | 316 | 470 |
| 2021(5) | | 15386 | 400 | 500 | 5000 | 751 | 59 | 289 | 316 | 470 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2021(6) | 15386 | 400 | 500 | 5000 | 748 | 59 | 289 | 316 | 470 |
| 2021(7) | 15386 | 400 | 500 | 5000 | 745 | 59 | 289 | 316 | 470 |
| 2021(8) | 15386 | 400 | 500 | 5000 | 742 | 59 | 289 | 316 | 470 |
| 2021(9) | 15386 | 400 | 500 | 5000 | 739 | 59 | 289 | 316 | 470 |
| 2021(10) | 15386 | 400 | 500 | 5000 | 736 | 59 | 289 | 316 | 470 |
| 2021(11) | 15386 | 400 | 500 | 5000 | 733 | 59 | 289 | 316 | 470 |
| 2021(12) | 15386 | 400 | 500 | 5000 | 730 | 59 | 289 | 316 | 470 |
| 2022(1) | 19782 | 400 | 500 | 5000 | 739 | 62 | 295 | 390 | 490 |
| 2022(2) | 19782 | 400 | 500 | 5000 | 731 | 62 | 295 | 390 | 490 |
| 2022(3) | 19782 | 400 | 500 | 5000 | 724 | 62 | 295 | 390 | 490 |
| 2022(4) | 19782 | 400 | 500 | 5000 | 717 | 62 | 295 | 390 | 490 |
| 2022(5) | 19782 | 400 | 500 | 5000 | 710 | 62 | 295 | 390 | 490 |
| 2022(6) | 19782 | 400 | 500 | 5000 | 703 | 62 | 295 | 390 | 490 |
| 2022(7) | 19782 | 400 | 500 | 5000 | 696 | 62 | 295 | 390 | 490 |
| 2022(8) | 19782 | 400 | 500 | 5000 | 682 | 62 | 295 | 390 | 490 |
| 2022(9) | 19782 | 400 | 500 | 5000 | 669 | 62 | 295 | 390 | 490 |
| 2022(10) | 19782 | 400 | 500 | 5000 | 649 | 62 | 295 | 390 | 490 |
| 2022(11) | 19782 | 400 | 500 | 5000 | 630 | 62 | 295 | 390 | 490 |
| 2022(12) | 19782 | 400 | 500 | 5000 | 612 | 62 | 295 | 390 | 490 |
| 2023(1) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(2) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(3) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(4) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(5) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(6) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(7) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(8) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(9) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(10) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(11) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |
| 2023(12) | 21980 | 400 | 500 | 5000 | 600 | 68 | 315 | 407 | 502 |

;
RUN;

DATA RANTAI PASOK03;

| INPUT CARD; | Thn | DOC GPS1 | DOC GPS2 | DOC PS1 | DOC PS2 | DOC PS3 | DOC PS4 |
|---|---|---|---|---|---|---|---|
| 2021(1) | 13,563 | 6,093 | 1,686,259 | 428,256 | 374,724 | 187,362 | |
| 2021(2) | 24,528 | 11,020 | 1,753,621 | 445,364 | 389,694 | 194,847 | |
| 2021(3) | 51,173 | 22,991 | 1,721,927 | 437,315 | 382,650 | 191,325 | |
| 2021(4) | 36,243 | 16,283 | 1,941,375 | 493,048 | 431,417 | 215,708 | |
| 2021(5) | 54,676 | 24,564 | 2,011,494 | 510,856 | 446,999 | 223,499 | |
| 2021(6) | 55,871 | 25,101 | 2,002,413 | 508,549 | 444,981 | 222,490 | |
| 2021(7) | 15,671 | 7,041 | 2,540,410 | 645,184 | 564,536 | 282,268 | |
| 2021(8) | 52,693 | 23,673 | 1,991,404 | 505,753 | 442,534 | 221,267 | |
| 2021(9) | 39,991 | 17,967 | 1,777,844 | 451,516 | 395,076 | 197,538 | |
| 2021(10) | 26,628 | 11,963 | 1,676,826 | 425,860 | 372,628 | 186,314 | |
| 2021(11) | 47,911 | 21,525 | 2,124,782 | 539,627 | 472,174 | 236,087 | |
| 2021(12) | 30,073 | 13,511 | 2,561,196 | 650,463 | 569,155 | 284,577 | |
| 2022(1) | - | - | 2,069,360 | 525,552 | 459,858 | 229,929 | |
| 2022(2) | 33,458 | 15,032 | 1,737,644 | 441,306 | 386,143 | 193,072 | |
| 2022(3) | 41,384 | 18,593 | 1,771,554 | 449,919 | 393,679 | 196,839 | |
| 2022(4) | 35,483 | 15,941 | 1,986,926 | 504,616 | 441,539 | 220,770 | |
| 2022(5) | 27,557 | 12,380 | 2,002,747 | 508,634 | 445,055 | 222,527 | |
| 2022(6) | 58,738 | 26,389 | 2,033,347 | 516,406 | 451,855 | 225,927 | |
| 2022(7) | 57,458 | 25,814 | 2,540,665 | 645,248 | 564,592 | 282,296 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2022(8) | 39,471 | 17,733 | 1,949,961 | 495,228 | 433,325 | 216,662 |
| 2022(9) | 46,219 | 20,765 | 1,727,206 | 438,656 | 383,824 | 191,912 |
| 2022(10) | 30,602 | 13,749 | 1,680,948 | 426,908 | 373,544 | 186,772 |
| 2022(11) | 67,817 | 30,468 | 2,135,010 | 542,225 | 474,447 | 237,223 |
| 2022(12) | 9,403 | 4,225 | 2,154,185 | 547,095 | 478,708 | 239,354 |
| 2023(1) | - | - | 2,078,046 | 527,758 | 461,788 | 230,894 |
| 2023(2) | 24,564 | 11,036 | 1,965,929 | 499,284 | 436,873 | 218,437 |
| 2023(3) | 25,822 | 11,601 | 2,006,575 | 509,606 | 445,906 | 222,953 |
| 2023(4) | 40,375 | 18,139 | 2,056,042 | 522,169 | 456,898 | 228,449 |
| 2023(5) | 51,591 | 23,179 | 2,103,507 | 534,224 | 467,446 | 233,723 |
| 2023(6) | 31,596 | 14,195 | 2,180,608 | 553,805 | 484,580 | 242,290 |
| 2023(7) | 41,673 | 18,722 | 2,683,363 | 681,489 | 596,303 | 298,151 |
| 2023(8) | 54,162 | 24,333 | 1,892,543 | 480,646 | 420,565 | 210,283 |
| 2023(9) | - | - | 1,583,470 | 402,151 | 351,882 | 175,941 |
| 2023(10) | 50,341 | 22,617 | 1,401,718 | 355,992 | 311,493 | 155,746 |
| 2023(11) | 100,682 | 45,234 | 1,637,730 | 415,932 | 363,940 | 181,970 |
| 2023(12) | 52,811 | 23,727 | 1,758,220 | 446,532 | 390,716 | 195,358 |

;
RUN;

DATA RANTAI PASOK04;

| INPUT CARD; | Thn | DOC FS1 | DOC FS2 | DOC FS3 | DOC FS4 | DOC FS5 | DOC FS6 | DOC FS7 |
|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 27,143,551 | 60,212,807 | 19,115,177 | 14,336,383 | 46,664,926 | 36,318,836 | 19,593,056 |
| 2021(2) | | 19,908,045 | 43,880,316 | 13,930,259 | 10,447,694 | 34,007,245 | 26,340,416 | 14,278,516 |
| 2021(3) | | 20,314,306 | 44,305,619 | 14,164,953 | 10,559,198 | 34,142,229 | 26,616,992 | 14,430,903 |
| 2021(4) | | 21,309,706 | 45,328,272 | 14,808,440 | 10,835,444 | 34,312,238 | 27,449,790 | 14,808,440 |
| 2021(5) | | 24,168,269 | 49,152,344 | 16,724,034 | 12,237,098 | 39,260,690 | 31,612,504 | 17,539,841 |
| 2021(6) | | 20,888,763 | 45,330,922 | 14,947,416 | 11,040,209 | 35,505,191 | 28,520,539 | 15,683,430 |
| 2021(7) | | 27,700,579 | 61,336,997 | 20,033,455 | 14,839,596 | 47,758,767 | 38,335,623 | 21,022,761 |
| 2021(8) | | 20,912,517 | 46,306,288 | 15,124,231 | 11,203,134 | 36,055,420 | 28,941,430 | 15,871,107 |
| 2021(9) | | 18,351,209 | 40,634,821 | 13,271,857 | 9,831,005 | 31,639,451 | 25,396,763 | 13,927,257 |
| 2021(10) | | 19,000,063 | 42,071,568 | 13,741,117 | 10,178,605 | 32,758,144 | 26,294,730 | 14,419,691 |
| 2021(11) | | 24,756,899 | 54,818,849 | 17,904,543 | 13,262,625 | 42,683,547 | 34,261,780 | 18,788,718 |
| 2021(12) | | 31,310,060 | 69,020,610 | 22,543,022 | 16,698,535 | 53,741,451 | 42,998,420 | 23,656,258 |
| 2022(1) | | 26,776,087 | 54,021,931 | 18,790,237 | 14,092,678 | 51,673,151 | 35,231,694 | 18,790,237 |
| 2022(2) | | 21,509,119 | 43,395,591 | 15,094,118 | 11,320,589 | 41,508,826 | 28,301,472 | 15,094,118 |
| 2022(3) | | 21,687,665 | 43,755,816 | 15,219,414 | 11,414,561 | 41,853,389 | 28,536,402 | 15,219,414 |
| 2022(4) | | 21,932,368 | 44,249,515 | 15,391,136 | 11,543,352 | 42,325,623 | 28,858,379 | 15,391,136 |
| 2022(5) | | 27,682,240 | 55,850,133 | 19,426,133 | 14,569,600 | 53,421,867 | 36,424,000 | 19,426,133 |
| 2022(6) | | 26,997,284 | 54,468,204 | 18,945,462 | 14,209,097 | 52,100,021 | 35,522,742 | 18,945,462 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2022(7) | 35,545,640 | 71,714,888 | 24,944,309 | 18,708,232 | 68,596,849 | 46,770,579 | 24,944,309 |
| 2022(8) | 28,753,011 | 58,010,462 | 20,177,552 | 15,133,164 | 55,488,268 | 37,832,910 | 20,177,552 |
| 2022(9) | 29,630,689 | 59,781,215 | 20,793,466 | 15,595,100 | 57,182,032 | 38,987,749 | 20,793,466 |
| 2022(10) | 29,923,642 | 60,372,260 | 20,999,047 | 15,749,285 | 57,747,379 | 39,373,213 | 20,999,047 |
| 2022(11) | 35,302,714 | 71,224,775 | 24,773,835 | 18,580,376 | 68,128,045 | 46,450,940 | 24,773,835 |
| 2022(12) | 38,199,875 | 77,069,924 | 26,806,930 | 20,105,197 | 73,719,057 | 50,262,994 | 26,806,930 |
| 2023(1) | 40,155,736 | 74,861,765 | 23,232,962 | 14,914,988 | 56,504,857 | 34,419,202 | 24,380,268 |
| 2023(2) | 32,894,156 | 61,324,105 | 19,031,619 | 12,217,829 | 46,286,776 | 28,194,991 | 19,971,452 |
| 2023(3) | 35,202,986 | 65,628,424 | 20,367,442 | 13,075,395 | 49,535,630 | 30,173,988 | 21,373,241 |
| 2023(4) | 33,099,255 | 61,706,468 | 19,150,283 | 12,294,009 | 46,575,380 | 28,370,790 | 20,095,976 |
| 2023(5) | 29,976,037 | 55,883,897 | 17,343,278 | 11,133,956 | 42,180,566 | 25,693,746 | 18,199,737 |
| 2023(6) | 30,584,528 | 57,018,299 | 17,695,334 | 11,359,968 | 43,036,800 | 26,215,310 | 18,569,178 |
| 2023(7) | 39,302,197 | 73,270,524 | 22,739,128 | 14,597,959 | 55,303,805 | 33,687,597 | 23,862,048 |
| 2023(8) | 32,721,282 | 61,001,819 | 18,931,599 | 12,153,619 | 46,043,519 | 28,046,813 | 19,866,493 |
| 2023(9) | 31,859,608 | 59,395,413 | 18,433,059 | 11,833,569 | 44,831,020 | 27,308,236 | 19,343,334 |
| 2023(10) | 33,107,097 | 61,721,088 | 19,154,821 | 12,296,922 | 46,586,415 | 28,377,512 | 20,100,738 |
| 2023(11) | 42,251,531 | 78,768,926 | 24,445,529 | 15,693,426 | 59,453,940 | 36,215,598 | 25,652,715 |
| 2023(12) | 49,478,144 | 92,241,396 | 28,626,640 | 18,377,596 | 69,622,816 | 42,409,837 | 30,040,301 |

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RUN;

DATA RANTAI PASOK05;

| INPUT CARD; | Thn | DOC FS8 | DOC FS9 | DOC FS10 | Feed DOC GPS 1 | Feed DOC GPS 2 | Feed DOC PS1 | Feed DOC PS2 | Feed DOC PS3 | Feed DOC PS4 |
|---|---|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 14.336.383 | 716.819 | 501.773 | 225.168 | 726.348 | 65.204.501 | 16.559.873 | 14.489.889 | 7.244.945 |
| 2021(2) | | 10.447.694 | 522.385 | 365.669 | 377.882 | 1.218.975 | 60.044.379 | 15.249.366 | 13.343.195 | 6.671.598 |
| 2021(3) | | 10.559.198 | 527.960 | 365.271 | 684.038 | 2.206.575 | 51.359.070 | 13.043.573 | 11.413.127 | 5.706.563 |
| 2021(4) | | 10.835.444 | 541.772 | 361.181 | 409.349 | 1.320.479 | 49.339.301 | 12.530.616 | 10.964.289 | 5.482.145 |
| 2021(5) | | 12.237.098 | 611.855 | 407.903 | 501.482 | 1.617.682 | 42.246.742 | 10.729.331 | 9.388.165 | 4.694.082 |
| 2021(6) | | 11.040.209 | 608.358 | 438.442 | 400.973 | 1.293.461 | 33.075.903 | 8.400.229 | 7.350.201 | 3.675.100 |
| 2021(7) | | 14.839.596 | 840.910 | 618.317 | 76.919 | 248.125 | 29.870.434 | 7.586.142 | 6.637.874 | 3.318.937 |
| 2021(8) | | 11.203.134 | 634.844 | 466.797 | 198.786 | 641.246 | 16.392.813 | 4.163.254 | 3.642.847 | 1.821.424 |
| 2021(9) | | 9.831.005 | 557.090 | 409.625 | 109.504 | 353.240 | 10.496.131 | 2.665.684 | 2.332.474 | 1.166.237 |
| 2021(10) | | 10.178.605 | 576.788 | 424.109 | 48.141 | 155.292 | 6.628.336 | 1.683.387 | 1.472.963 | 736.482 |
| 2021(11) | | 13.262.625 | 751.549 | 552.609 | 45.232 | 145.910 | 4.757.464 | 1.208.245 | 1.057.214 | 528.607 |
| 2021(12) | | 16.698.535 | 946.250 | 695.772 | 13.682 | 44.135 | 1.808.687 | 459.349 | 401.931 | 200.965 |
| 2022(1) | | 14.092.678 | 822.073 | 587.195 | - | - | 80.852.976 | 20.534.089 | 17.967.328 | 8.983.664 |
| 2022(2) | | 11.320.589 | 660.368 | 471.691 | 1.090.701 | 490.025 | 59.540.233 | 15.121.329 | 13.231.163 | 6.615.581 |
| 2022(3) | | 11.414.561 | 665.849 | 475.607 | 1.258.071 | 565.220 | 52.806.490 | 13.411.172 | 11.734.776 | 5.867.388 |
| 2022(4) | | 11.543.352 | 673.362 | 480.973 | 854.306 | 383.819 | 50.536.123 | 12.834.571 | 11.230.250 | 5.615.125 |
| 2022(5) | | 14.569.600 | 849.893 | 607.067 | 552.045 | 248.020 | 42.070.983 | 10.684.694 | 9.349.107 | 4.674.554 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2022(6) | 14.209.097 | 828.864 | 592.046 | 972.224 | 436.796 | 33.616.345 | 8.537.484 | 7.470.299 | 3.735.149 |
| 2022(7) | 18.708.232 | 1.091.314 | 779.510 | 727.861 | 327.010 | 29.889.503 | 7.590.985 | 6.642.112 | 3.321.056 |
| 2022(8) | 15.133.164 | 882.768 | 630.548 | 336.769 | 151.302 | 16.065.555 | 4.080.141 | 3.570.123 | 1.785.062 |
| 2022(9) | 15.595.100 | 909.714 | 649.796 | 282.317 | 126.838 | 10.180.063 | 2.585.413 | 2.262.236 | 1.131.118 |
| 2022(10) | 15.749.285 | 918.708 | 656.220 | 125.321 | 56.304 | 6.640.760 | 1.686.542 | 1.475.725 | 737.862 |
| 2022(11) | 18.580.376 | 1.083.855 | 774.182 | 143.021 | 64.256 | 4.778.920 | 1.213.694 | 1.061.982 | 530.991 |
| 2022(12) | 20.105.197 | 1.172.803 | 837.717 | 11.108 | 4.991 | 1.742.888 | 442.638 | 387.308 | 193.654 |
| 2023(1) | 17.209.601 | 717.067 | 430.240 | - | - | 81.112.468 | 20.599.992 | 18.024.993 | 9.012.496 |
| 2023(2) | 14.097.495 | 587.396 | 352.437 | 818.001 | 367.508 | 67.260.978 | 17.082.153 | 14.946.884 | 7.473.442 |
| 2023(3) | 15.086.994 | 628.625 | 377.175 | 728.435 | 327.268 | 59.930.241 | 15.220.379 | 13.317.831 | 6.658.916 |
| 2023(4) | 14.185.395 | 591.058 | 354.635 | 1.017.308 | 457.051 | 52.301.850 | 13.283.010 | 11.622.633 | 5.811.317 |
| 2023(5) | 12.846.873 | 535.286 | 321.172 | 1.031.371 | 463.370 | 44.164.414 | 11.216.359 | 9.814.314 | 4.907.157 |
| 2023(6) | 13.107.655 | 546.152 | 327.691 | 534.217 | 240.011 | 35.993.584 | 9.141.228 | 7.998.574 | 3.999.287 |
| 2023(7) | 16.843.799 | 701.825 | 421.095 | 457.530 | 205.557 | 31.672.314 | 8.043.762 | 7.038.292 | 3.519.146 |
| 2023(8) | 14.023.407 | 584.309 | 350.585 | 401.325 | 180.305 | 15.615.420 | 3.965.821 | 3.470.093 | 1.735.047 |
| 2023(9) | 13.654.118 | 568.922 | 341.353 | - | - | 9.345.673 | 2.373.504 | 2.076.816 | 1.038.408 |
| 2023(10) | 14.188.756 | 591.198 | 354.719 | 232.223 | 104.332 | 5.571.527 | 1.414.991 | 1.238.117 | 619.059 |
| 2023(11) | 18.107.799 | 754.492 | 452.695 | 227.642 | 102.274 | 3.659.973 | 929.517 | 813.327 | 406.664 |
| 2023(12) | 21.204.919 | 883.538 | 530.123 | 18.484 | 8.304 | 1.387.700 | 352.432 | 308.378 | 154.189 |

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RUN;

DATA RANTAI PASOK06;

| INPUT CARD; | Thn | Feed1 | Feed2 | Feed3 | Feed4 | Feed5 | Feed6 |
|---|---|---|---|---|---|---|---|
| 2021(1) | | 80.780.192 | 166.849.890 | 63.904.950 | 39.074.345 | 150.979.793 | 104.870.639 |
| 2021(2) | | 61.374.393 | 124.533.674 | 47.589.750 | 29.098.502 | 112.434.023 | 77.796.729 |
| 2021(3) | | 63.257.632 | 127.046.999 | 48.893.892 | 29.714.552 | 114.053.706 | 79.510.685 |
| 2021(4) | | 64.427.578 | 126.198.542 | 49.628.557 | 29.604.996 | 111.286.752 | 79.613.430 |
| 2021(5) | | 73.298.593 | 137.273.008 | 56.223.663 | 33.539.182 | 127.734.464 | 91.973.335 |
| 2021(6) | | 64.526.856 | 128.963.145 | 51.185.792 | 30.822.231 | 117.667.538 | 84.522.732 |
| 2021(7) | | 85.224.586 | 173.775.831 | 68.321.893 | 41.259.321 | 157.626.493 | 113.143.998 |
| 2021(8) | | 63.729.010 | 129.945.620 | 51.089.559 | 30.852.783 | 117.869.512 | 84.606.513 |
| 2021(9) | | 56.404.854 | 115.011.418 | 45.218.013 | 27.306.980 | 104.323.176 | 74.882.977 |
| 2021(10) | | 58.606.572 | 118.760.365 | 46.691.953 | 28.197.086 | 107.723.727 | 77.323.886 |
| 2021(11) | | 77.025.424 | 149.986.077 | 58.634.487 | 35.409.135 | 135.308.240 | 97.123.999 |
| 2021(12) | | 95.768.357 | 183.043.291 | 71.302.885 | 43.059.530 | 164.602.768 | 117.771.297 |
| 2022(1) | | 79.719.353 | 149.674.272 | 62.806.870 | 38.402.929 | 167.152.127 | 101.712.476 |
| 2022(2) | | 66.320.736 | 123.184.759 | 51.577.027 | 31.536.502 | 137.265.398 | 83.609.900 |
| 2022(3) | | 67.524.570 | 125.451.435 | 52.526.076 | 32.116.794 | 139.791.165 | 85.231.706 |
| 2022(4) | | 66.294.847 | 123.166.775 | 51.569.497 | 31.531.898 | 137.245.357 | 83.679.509 |
| 2022(5) | | 83.906.805 | 155.887.388 | 65.269.503 | 39.908.695 | 173.706.102 | 105.909.894 |
| 2022(6) | | 83.402.178 | 154.949.863 | 64.876.965 | 39.668.679 | 172.661.412 | 105.272.939 |
| 2022(7) | | 109.290.219 | 203.046.308 | 85.014.778 | 51.981.839 | 226.255.523 | 137.949.664 |
| 2022(8) | | 87.637.019 | 162.817.618 | 68.171.167 | 41.682.901 | 181.428.492 | 110.618.292 |
| 2022(9) | | 91.080.546 | 169.215.223 | 70.849.822 | 43.320.751 | 188.557.375 | 114.964.825 |
| 2022(10) | | 92.296.795 | 170.447.962 | 71.365.965 | 43.636.343 | 189.931.022 | 115.802.348 |
| 2022(11) | | 109.820.745 | 195.039.805 | 81.229.482 | 49.667.339 | 216.229.534 | 131.836.745 |
| 2022(12) | | 116.796.794 | 204.306.456 | 84.754.777 | 51.822.863 | 225.699.014 | 137.610.357 |
| 2023(1) | | 120.806.331 | 209.743.389 | 78.800.635 | 41.316.933 | 184.644.743 | 100.438.903 |
| 2023(2) | | 102.601.437 | 176.206.321 | 66.065.767 | 34.639.757 | 154.804.548 | 84.293.246 |
| 2023(3) | | 110.861.112 | 190.436.190 | 71.401.032 | 37.437.155 | 167.306.078 | 91.187.615 |
| 2023(4) | | 101.180.139 | 173.806.304 | 65.165.920 | 34.167.946 | 152.696.034 | 83.224.636 |
| 2023(5) | | 91.894.135 | 157.854.893 | 59.185.191 | 31.032.116 | 138.682.060 | 75.586.532 |
| 2023(6) | | 95.509.228 | 164.064.868 | 61.513.522 | 32.252.913 | 144.137.779 | 78.560.089 |
| 2023(7) | | 122.163.621 | 209.851.536 | 78.680.508 | 41.253.946 | 184.363.262 | 100.484.373 |
| 2023(8) | | 100.858.451 | 173.253.713 | 64.958.735 | 34.059.314 | 152.210.561 | 82.960.034 |
| 2023(9) | | 99.032.160 | 170.116.527 | 63.782.497 | 33.442.586 | 149.454.412 | 81.457.840 |
| 2023(10) | | 103.273.584 | 176.330.430 | 66.112.300 | 34.664.153 | 154.913.584 | 84.433.277 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2023(11) | 132.930.747 | 218.200.807 | 81.368.807 | 42.663.482 | 190.706.373 | 103.941.589 |
| 2023(12) | 152.988.600 | 247.438.170 | 91.918.825 | 48.195.092 | 215.512.470 | 117.461.770 |

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RUN;

DATA RANTAI PASOK07;

| INPUT CARD; | Thn | Feed7 | Feed8 | Feed9 | Feed10 | DOCFS1P1 | DOCFS2P2 | DOCFS3P3 | DOCFS4P4 |
|---|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 53.382.957 | 39.074.345 | 2.264.117 | 1.643.732 | 6.195 | 8.831 | 5.667 | 5.865 |
| 2021(2) | | 39.810.052 | 29.127.587 | 1.686.537 | 1.224.413 | 6.228 | 8.878 | 5.698 | 5.896 |
| 2021(3) | | 40.682.037 | 29.773.394 | 1.723.477 | 1.236.685 | 6.213 | 8.857 | 5.685 | 5.883 |
| 2021(4) | | 40.532.043 | 29.663.620 | 1.717.124 | 1.187.256 | 6.354 | 9.058 | 5.814 | 6.016 |
| 2021(5) | | 48.158.237 | 33.605.598 | 1.945.311 | 1.345.029 | 6.134 | 8.744 | 5.612 | 5.807 |
| 2021(6) | | 43.862.315 | 30.883.265 | 1.970.546 | 1.473.084 | 5.706 | 8.134 | 5.220 | 5.402 |
| 2021(7) | | 58.554.548 | 41.341.023 | 2.712.166 | 2.068.290 | 4.183 | 5.963 | 3.827 | 3.961 |
| 2021(8) | | 43.785.763 | 30.913.877 | 2.028.097 | 1.546.620 | 5.076 | 7.236 | 4.644 | 4.806 |
| 2021(9) | | 38.753.614 | 27.361.052 | 1.795.014 | 1.368.871 | 5.640 | 8.040 | 5.160 | 5.340 |
| 2021(10) | | 40.016.839 | 28.252.921 | 1.853.524 | 1.413.492 | 6.110 | 8.710 | 5.590 | 5.785 |
| 2021(11) | | 50.255.683 | 35.481.809 | 2.327.775 | 1.775.153 | 6.298 | 8.978 | 5.762 | 5.963 |
| 2021(12) | | 61.133.781 | 43.162.028 | 2.831.632 | 2.159.393 | 6.580 | 9.380 | 6.020 | 6.230 |
| 2022(1) | | 51.187.287 | 38.402.929 | 2.596.083 | 1.923.201 | 6.580 | 9.380 | 6.020 | 6.230 |
| 2022(2) | | 42.092.467 | 31.568.055 | 2.132.446 | 1.579.735 | 6.580 | 9.380 | 6.020 | 6.230 |
| 2022(3) | | 42.898.470 | 32.180.390 | 2.173.279 | 1.609.983 | 6.580 | 9.380 | 6.020 | 6.230 |
| 2022(4) | | 42.117.225 | 31.594.337 | 2.133.700 | 1.580.664 | 3.102 | 4.422 | 2.838 | 2.937 |
| 2022(5) | | 53.306.129 | 39.987.722 | 2.700.542 | 2.000.584 | 2.820 | 4.020 | 2.580 | 2.670 |
| 2022(6) | | 52.985.541 | 39.747.231 | 2.684.300 | 1.988.553 | 4.418 | 6.298 | 4.042 | 4.183 |
| 2022(7) | | 69.432.253 | 52.084.773 | 3.517.507 | 2.605.799 | 5.875 | 8.375 | 5.375 | 5.563 |
| 2022(8) | | 55.675.941 | 41.765.442 | 2.820.599 | 2.089.524 | 5.953 | 8.486 | 5.446 | 5.636 |
| 2022(9) | | 57.863.620 | 43.406.535 | 2.931.427 | 2.171.626 | 3.937 | 5.612 | 3.602 | 3.727 |
| 2022(10) | | 58.285.158 | 43.722.752 | 2.952.784 | 2.187.448 | 3.133 | 4.466 | 2.866 | 2.966 |
| 2022(11) | | 66.345.069 | 49.768.913 | 3.361.106 | 2.489.937 | 5.953 | 8.486 | 5.446 | 5.636 |
| 2022(12) | | 69.247.554 | 51.946.220 | 3.508.150 | 2.598.867 | 2.507 | 3.574 | 2.294 | 2.374 |
| 2023(1) | | 67.526.208 | 47.425.728 | 2.312.320 | 1.422.238 | 1.645 | 2.345 | 1.505 | 1.558 |
| 2023(2) | | 56.686.646 | 39.801.995 | 1.939.148 | 1.192.712 | 2.233 | 3.183 | 2.043 | 2.114 |
| 2023(3) | | 61.308.649 | 43.057.413 | 2.097.260 | 1.289.961 | 2.444 | 3.484 | 2.236 | 2.314 |
| 2023(4) | | 55.954.857 | 39.297.413 | 1.914.115 | 1.177.315 | 3.196 | 4.556 | 2.924 | 3.026 |
| 2023(5) | | 50.819.492 | 35.690.817 | 1.738.444 | 1.069.265 | 5.993 | 8.543 | 5.483 | 5.674 |
| 2023(6) | | 52.818.718 | 37.094.885 | 1.806.833 | 1.111.330 | 7.050 | 10.050 | 6.450 | 6.675 |
| 2023(7) | | 67.559.188 | 47.447.200 | 2.311.078 | 1.421.475 | 7.050 | 10.050 | 6.450 | 6.675 |
| 2023(8) | | 55.776.958 | 39.172.473 | 1.908.028 | 1.173.572 | 7.050 | 10.050 | 6.450 | 6.675 |
| 2023(9) | | 54.766.978 | 38.463.159 | 1.873.480 | 1.152.322 | 3.408 | 4.858 | 3.118 | 3.226 |
| 2023(10) | | 56.767.470 | 39.868.115 | 1.941.912 | 1.194.413 | 3.447 | 4.914 | 3.154 | 3.264 |
| 2023(11) | | 69.872.482 | 49.071.840 | 2.390.212 | 1.470.148 | 4.387 | 6.254 | 4.014 | 4.154 |
| 2023(12) | | 78.957.817 | 55.452.522 | 2.701.005 | 1.661.308 | 1.723 | 2.456 | 1.576 | 1.631 |

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RUN;

DATA RANTAI PASOK08;

| INPUT CARD; | Thn | DOCFS5P5 | DOCFS6P6 | DOCFS7P7 | DOCFS8P8 | DOCFS9P9 | DOCFS10P10 | Feed1P1 | Feed2P2 |
|---|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 5.911 | 6.722 | 6.610 | 5.733 | 5.667 | 8.699 | 8.510 | 12.131 |
| 2021(2) | | 5.943 | 6.758 | 6.645 | 5.764 | 5.698 | 8.745 | 8.314 | 11.852 |
| 2021(3) | | 5.929 | 6.742 | 6.630 | 5.751 | 5.685 | 8.725 | 8.811 | 12.560 |
| 2021(4) | | 6.064 | 6.895 | 6.780 | 5.881 | 5.814 | 8.923 | 9.047 | 12.897 |
| 2021(5) | | 5.853 | 6.656 | 6.545 | 5.677 | 5.612 | 8.613 | 9.073 | 12.935 |
| 2021(6) | | 5.445 | 6.191 | 6.088 | 5.281 | 5.220 | 8.012 | 9.140 | 13.030 |
| 2021(7) | | 3.992 | 4.539 | 4.463 | 3.872 | 3.827 | 7.565 | 9.207 | 13.125 |
| 2021(8) | | 4.844 | 5.508 | 5.416 | 4.698 | 4.644 | 7.722 | 9.130 | 13.014 |
| 2021(9) | | 5.382 | 6.120 | 6.018 | 5.220 | 5.160 | 7.920 | 8.923 | 12.720 |
| 2021(10) | | 5.831 | 6.630 | 6.520 | 5.655 | 5.590 | 8.580 | 8.930 | 12.730 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2021(11) | 6.010 | 6.834 | 6.720 | 5.829 | 5.762 | 8.844 | 8.937 | 12.740 |
| 2021(12) | 6.279 | 7.140 | 7.021 | 6.090 | 6.020 | 9.240 | 9.003 | 12.834 |
| 2022(1) | 6.279 | 7.140 | 7.021 | 6.090 | 6.020 | 9.240 | 9.118 | 12.998 |
| 2022(2) | 6.279 | 7.140 | 7.021 | 6.090 | 6.020 | 9.240 | 9.275 | 13.222 |
| 2022(3) | 6.279 | 7.140 | 7.021 | 6.090 | 6.020 | 9.240 | 9.257 | 13.196 |
| 2022(4) | 2.960 | 3.366 | 3.310 | 2.871 | 2.838 | 4.356 | 9.675 | 13.792 |
| 2022(5) | 2.691 | 3.060 | 3.009 | 2.610 | 2.580 | 3.960 | 10.183 | 14.516 |
| 2022(6) | 4.216 | 4.794 | 4.714 | 4.089 | 4.042 | 6.204 | 10.243 | 14.602 |
| 2022(7) | 5.606 | 6.375 | 6.269 | 5.438 | 5.375 | 10.625 | 9.972 | 14.215 |
| 2022(8) | 5.681 | 6.460 | 6.352 | 5.510 | 5.446 | 9.056 | 10.124 | 14.432 |
| 2022(9) | 3.757 | 4.272 | 4.201 | 3.644 | 3.602 | 5.528 | 9.573 | 13.647 |
| 2022(10) | 2.990 | 3.400 | 3.343 | 2.900 | 2.866 | 4.400 | 10.153 | 14.474 |
| 2022(11) | 5.681 | 6.460 | 6.352 | 5.510 | 5.446 | 8.360 | 10.021 | 14.285 |
| 2022(12) | 2.392 | 2.720 | 2.675 | 2.320 | 2.294 | 3.520 | 10.170 | 14.497 |
| 2023(1) | 1.570 | 1.785 | 1.755 | 1.523 | 1.505 | 2.310 | 10.143 | 14.459 |
| 2023(2) | 2.130 | 2.423 | 2.382 | 2.066 | 2.043 | 3.135 | 10.015 | 14.277 |
| 2023(3) | 2.332 | 2.652 | 2.608 | 2.262 | 2.236 | 3.432 | 10.016 | 14.278 |
| 2023(4) | 3.050 | 3.468 | 3.410 | 2.958 | 2.924 | 4.488 | 10.425 | 14.861 |
| 2023(5) | 5.718 | 6.503 | 6.394 | 5.546 | 5.483 | 8.415 | 10.302 | 14.686 |
| 2023(6) | 6.728 | 7.650 | 7.523 | 6.525 | 6.450 | 9.900 | 10.456 | 14.906 |
| 2023(7) | 6.728 | 7.650 | 7.523 | 6.525 | 6.450 | 12.750 | 10.228 | 14.580 |
| 2023(8) | 6.728 | 7.650 | 7.523 | 6.525 | 6.450 | 10.725 | 10.215 | 14.561 |
| 2023(9) | 3.252 | 3.698 | 3.636 | 3.154 | 3.118 | 4.785 | 10.133 | 14.446 |
| 2023(10) | 3.289 | 3.740 | 3.678 | 3.190 | 3.154 | 4.840 | 10.194 | 14.532 |
| 2023(11) | 4.186 | 4.760 | 4.681 | 4.060 | 4.014 | 6.160 | 10.274 | 14.646 |
| 2023(12) | 1.644 | 1.870 | 1.838 | 1.595 | 1.576 | 2.420 | 10.285 | 14.662 |

;
RUN;

DATA RANTAI PASOK09;

| INPUT CARD; | Thn | Feed3P3 | Feed4P4 | Feed5P5 | Feed6P6 | Feed7P7 | Feed8P8 |
|---|---|---|---|---|---|---|---|
| 2021(1) | | 7.786 | 8.057 | 8.121 | 9.234 | 9.080 | 7.876 |
| 2021(2) | | 7.606 | 7.872 | 7.934 | 9.021 | 8.871 | 7.695 |
| 2021(3) | | 8.061 | 8.342 | 8.408 | 9.561 | 9.401 | 8.155 |
| 2021(4) | | 8.277 | 8.566 | 8.633 | 9.817 | 9.653 | 8.373 |
| 2021(5) | | 8.301 | 8.591 | 8.658 | 9.846 | 9.682 | 8.398 |
| 2021(6) | | 8.362 | 8.654 | 8.722 | 9.918 | 9.753 | 8.460 |
| 2021(7) | | 8.423 | 8.717 | 8.786 | 9.990 | 9.824 | 8.521 |
| 2021(8) | | 8.353 | 8.644 | 8.712 | 9.907 | 9.741 | 8.450 |
| 2021(9) | | 8.163 | 8.448 | 8.515 | 9.682 | 9.521 | 8.258 |
| 2021(10) | | 8.170 | 8.455 | 8.522 | 9.690 | 9.529 | 8.265 |
| 2021(11) | | 8.177 | 8.462 | 8.528 | 9.698 | 9.536 | 8.272 |
| 2021(12) | | 8.237 | 8.524 | 8.591 | 9.769 | 9.607 | 8.333 |
| 2022(1) | | 8.342 | 8.633 | 8.701 | 9.894 | 9.729 | 8.439 |
| 2022(2) | | 8.486 | 8.782 | 8.851 | 10.065 | 9.897 | 8.585 |
| 2022(3) | | 8.469 | 8.764 | 8.833 | 10.044 | 9.877 | 8.567 |
| 2022(4) | | 8.852 | 9.161 | 9.233 | 10.499 | 10.324 | 8.955 |
| 2022(5) | | 9.316 | 9.641 | 9.717 | 11.049 | 10.865 | 9.424 |
| 2022(6) | | 9.371 | 9.698 | 9.775 | 11.115 | 10.930 | 9.480 |
| 2022(7) | | 9.123 | 9.442 | 9.516 | 10.821 | 10.640 | 9.229 |
| 2022(8) | | 9.262 | 9.585 | 9.661 | 10.985 | 10.802 | 9.370 |
| 2022(9) | | 8.759 | 9.064 | 9.135 | 10.388 | 10.215 | 8.860 |
| 2022(10) | | 9.289 | 9.613 | 9.689 | 11.017 | 10.834 | 9.397 |
| 2022(11) | | 9.168 | 9.488 | 9.563 | 10.874 | 10.693 | 9.275 |
| 2022(12) | | 9.304 | 9.629 | 9.704 | 11.035 | 10.851 | 9.412 |
| 2023(1) | | 9.280 | 9.603 | 9.679 | 11.006 | 10.823 | 9.388 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2023(2) | 9.163 | 9.482 | 9.557 | 10.868 | 10.686 | 9.269 |
| 2023(3) | 9.163 | 9.483 | 9.558 | 10.868 | 10.687 | 9.270 |
| 2023(4) | 9.537 | 9.870 | 9.948 | 11.312 | 11.123 | 9.648 |
| 2023(5) | 9.425 | 9.754 | 9.831 | 11.179 | 10.992 | 9.535 |
| 2023(6) | 9.567 | 9.900 | 9.978 | 11.346 | 11.157 | 9.678 |
| 2023(7) | 9.357 | 9.683 | 9.760 | 11.098 | 10.913 | 9.466 |
| 2023(8) | 9.345 | 9.671 | 9.747 | 11.084 | 10.899 | 9.454 |
| 2023(9) | 9.271 | 9.594 | 9.670 | 10.996 | 10.813 | 9.379 |
| 2023(10) | 9.326 | 9.652 | 9.728 | 11.062 | 10.877 | 9.435 |
| 2023(11) | 9.400 | 9.728 | 9.804 | 11.149 | 10.963 | 9.509 |
| 2023(12) | 9.410 | 9.738 | 9.815 | 11.161 | 10.975 | 9.519 |

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RUN;

DATA RANTAI PASOK10;

| INPUT CARD; | Thn | Feed9P9 | Feed10P10 | LB1 | LB2 | LB3 | LB4 |
|---|---|---|---|---|---|---|---|
| 2021(1) | | 7.786 | 11.950 | 26.558.149 | 22.699.273 | 45.625.538 | 18.159.418 |
| 2021(2) | | 7.606 | 11.675 | 19.354.354 | 16.542.183 | 33.249.787 | 13.233.746 |
| 2021(3) | | 8.061 | 12.373 | 19.560.914 | 16.718.730 | 33.604.646 | 13.374.984 |
| 2021(4) | | 8.277 | 12.704 | 20.072.659 | 17.156.119 | 34.483.799 | 13.724.895 |
| 2021(5) | | 8.301 | 12.741 | 22.669.224 | 19.375.405 | 38.944.565 | 15.500.324 |
| 2021(6) | | 8.362 | 12.835 | 20.451.986 | 17.480.330 | 35.135.464 | 13.984.264 |
| 2021(7) | | 8.423 | 16.651 | 27.490.352 | 23.496.027 | 47.227.015 | 18.796.822 |
| 2021(8) | | 8.353 | 13.889 | 20.753.806 | 17.738.296 | 35.653.975 | 14.190.637 |
| 2021(9) | | 8.163 | 12.530 | 18.211.937 | 15.565.758 | 31.287.174 | 12.452.606 |
| 2021(10) | | 8.170 | 12.540 | 18.855.866 | 16.116.125 | 32.393.411 | 12.892.900 |
| 2021(11) | | 8.177 | 12.550 | 24.569.012 | 20.999.156 | 42.208.303 | 16.799.325 |
| 2021(12) | | 8.237 | 12.643 | 30.934.036 | 26.439.347 | 53.143.087 | 21.151.477 |
| 2022(1) | | 8.342 | 12.804 | 25.091.336 | 23.429.077 | 42.618.606 | 17.850.725 |
| 2022(2) | | 8.486 | 13.025 | 20.298.275 | 18.594.833 | 34.235.347 | 14.339.413 |
| 2022(3) | | 8.469 | 12.999 | 20.061.091 | 18.073.055 | 34.519.534 | 14.458.444 |
| 2022(4) | | 8.852 | 13.587 | 20.337.726 | 18.528.398 | 34.909.020 | 14.621.579 |
| 2022(5) | | 9.316 | 14.299 | 25.836.757 | 24.221.960 | 44.060.899 | 18.454.827 |
| 2022(6) | | 9.371 | 14.384 | 25.197.465 | 23.622.623 | 42.970.677 | 17.998.189 |
| 2022(7) | | 9.123 | 18.035 | 33.175.931 | 31.102.435 | 56.576.810 | 23.697.093 |
| 2022(8) | | 9.262 | 15.401 | 26.836.144 | 25.158.885 | 45.765.210 | 19.168.674 |
| 2022(9) | | 8.759 | 13.443 | 27.655.310 | 25.926.853 | 47.162.180 | 19.753.793 |
| 2022(10) | | 9.289 | 14.258 | 27.928.732 | 26.183.186 | 47.628.463 | 19.949.094 |
| 2022(11) | | 9.168 | 14.072 | 32.949.200 | 30.889.875 | 56.190.154 | 23.535.143 |
| 2022(12) | | 9.304 | 14.281 | 35.653.217 | 33.424.891 | 60.801.468 | 25.466.583 |
| 2023(1) | | 9.280 | 14.243 | 32.698.242 | 29.973.389 | 54.497.071 | 21.798.828 |
| 2023(2) | | 9.163 | 14.064 | 26.785.241 | 24.553.138 | 44.642.069 | 17.856.827 |
| 2023(3) | | 9.163 | 14.065 | 28.665.288 | 26.276.514 | 47.775.481 | 19.110.192 |
| 2023(4) | | 9.537 | 14.639 | 26.952.250 | 24.706.230 | 44.920.417 | 17.968.167 |
| 2023(5) | | 9.425 | 14.466 | 24.409.058 | 22.374.970 | 40.681.764 | 16.272.706 |
| 2023(6) | | 9.567 | 14.684 | 24.904.544 | 22.829.166 | 41.507.574 | 16.603.030 |
| 2023(7) | | 9.357 | 18.497 | 32.003.217 | 29.336.282 | 53.338.695 | 21.335.478 |
| 2023(8) | | 9.345 | 15.539 | 26.644.473 | 24.424.100 | 44.407.454 | 17.762.982 |
| 2023(9) | | 9.271 | 14.230 | 25.942.824 | 23.780.922 | 43.238.040 | 17.295.216 |
| 2023(10) | | 9.326 | 14.315 | 26.958.636 | 24.712.083 | 44.931.060 | 17.972.424 |
| 2023(11) | | 9.400 | 15.573 | 34.404.818 | 31.537.750 | 57.341.364 | 22.936.546 |
| 2023(12) | | 9.410 | 15.700 | 40.289.345 | 36.931.900 | 67.148.909 | 26.859.564 |

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RUN;

DATA RANTAI PASOK11;

| INPUT CARD; | Thn | LB5 | LB6 | LB7 | LB8 | LB9 | LB10 | LB11 |
|---|---|---|---|---|---|---|---|---|
| 2021(1) | | 54.932.240 | 11.349.636 | 9.079.709 | 6.809.782 | 13.619.564 | 15.889.491 | 2.269.927 |
| 2021(2) | | 40.032.082 | 8.271.091 | 6.616.873 | 4.962.655 | 9.925.310 | 11.579.528 | 1.654.218 |
| 2021(3) | | 40.459.326 | 8.359.365 | 6.687.492 | 5.015.619 | 10.031.238 | 11.703.111 | 1.671.873 |
| 2021(4) | | 41.517.808 | 8.578.059 | 6.862.448 | 5.146.836 | 10.293.671 | 12.009.283 | 1.715.612 |
| 2021(5) | | 46.888.481 | 9.687.703 | 7.750.162 | 5.812.622 | 11.625.243 | 13.562.784 | 1.937.541 |
| 2021(6) | | 42.302.399 | 8.740.165 | 6.992.132 | 5.244.099 | 10.488.198 | 12.236.231 | 1.748.033 |
| 2021(7) | | 56.860.386 | 11.748.014 | 9.398.411 | 7.048.808 | 14.097.616 | 16.447.219 | 2.349.603 |
| 2021(8) | | 42.926.676 | 8.869.148 | 7.095.318 | 5.321.489 | 10.642.977 | 12.416.807 | 1.773.830 |
| 2021(9) | | 37.669.134 | 7.782.879 | 6.226.303 | 4.669.727 | 9.339.455 | 10.896.031 | 1.556.576 |
| 2021(10) | | 39.001.022 | 8.058.062 | 6.446.450 | 4.834.837 | 9.669.675 | 11.281.287 | 1.611.612 |
| 2021(11) | | 50.817.957 | 10.499.578 | 8.399.662 | 6.299.747 | 12.599.493 | 14.699.409 | 2.099.916 |
| 2021(12) | | 63.983.219 | 13.219.673 | 10.575.739 | 7.931.804 | 15.863.608 | 18.507.543 | 2.643.935 |
| 2022(1) | | 56.129.462 | 11.156.703 | 8.925.362 | 6.694.022 | 13.388.044 | 15.619.384 | 2.231.341 |
| 2022(2) | | 45.171.699 | 8.962.133 | 7.169.706 | 5.377.280 | 10.754.559 | 12.546.986 | 1.792.427 |
| 2022(3) | | 46.628.481 | 9.036.527 | 7.229.222 | 5.421.916 | 10.843.833 | 12.651.138 | 1.807.305 |
| 2022(4) | | 46.852.882 | 9.138.487 | 7.310.789 | 5.483.092 | 10.966.184 | 12.793.882 | 1.827.697 |
| 2022(5) | | 58.132.704 | 11.534.267 | 9.227.413 | 6.920.560 | 13.841.120 | 16.147.973 | 2.306.853 |
| 2022(6) | | 56.694.296 | 11.248.868 | 8.999.095 | 6.749.321 | 13.498.642 | 15.748.416 | 2.249.774 |
| 2022(7) | | 74.645.844 | 14.810.683 | 11.848.547 | 8.886.410 | 17.772.820 | 20.734.957 | 2.962.137 |
| 2022(8) | | 60.381.324 | 11.980.421 | 9.584.337 | 7.188.253 | 14.376.506 | 16.772.590 | 2.396.084 |
| 2022(9) | | 62.224.447 | 12.346.120 | 9.876.896 | 7.407.672 | 14.815.345 | 17.284.569 | 2.469.224 |
| 2022(10) | | 62.839.648 | 12.468.184 | 9.974.547 | 7.480.910 | 14.961.821 | 17.455.458 | 2.493.637 |
| 2022(11) | | 74.135.700 | 14.709.464 | 11.767.571 | 8.825.679 | 17.651.357 | 20.593.250 | 2.941.893 |
| 2022(12) | | 80.219.738 | 15.916.615 | 12.733.292 | 9.549.969 | 19.099.938 | 22.283.261 | 3.183.323 |
| 2023(1) | | 62.671.631 | 13.624.268 | 10.899.414 | 8.174.561 | 16.349.121 | 19.073.975 | 2.724.854 |
| 2023(2) | | 51.338.379 | 11.160.517 | 8.928.414 | 6.696.310 | 13.392.621 | 15.624.724 | 2.232.103 |
| 2023(3) | | 54.941.803 | 11.943.870 | 9.555.096 | 7.166.322 | 14.332.644 | 16.721.418 | 2.388.774 |
| 2023(4) | | 51.658.480 | 11.230.104 | 8.984.083 | 6.738.063 | 13.476.125 | 15.722.146 | 2.246.021 |
| 2023(5) | | 46.784.029 | 10.170.441 | 8.136.353 | 6.102.265 | 12.204.529 | 14.238.617 | 2.034.088 |
| 2023(6) | | 47.733.710 | 10.376.894 | 8.301.515 | 6.226.136 | 12.452.272 | 14.527.651 | 2.075.379 |
| 2023(7) | | 61.339.500 | 13.334.674 | 10.667.739 | 8.000.804 | 16.001.609 | 18.668.543 | 2.666.935 |
| 2023(8) | | 51.068.573 | 11.101.864 | 8.881.491 | 6.661.118 | 13.322.236 | 15.542.609 | 2.220.373 |
| 2023(9) | | 49.723.746 | 10.809.510 | 8.647.608 | 6.485.706 | 12.971.412 | 15.133.314 | 2.161.902 |
| 2023(10) | | 51.670.720 | 11.232.765 | 8.986.212 | 6.739.659 | 13.479.318 | 15.725.871 | 2.246.553 |
| 2023(11) | | 65.942.568 | 14.335.341 | 11.468.273 | 8.601.205 | 17.202.409 | 20.069.477 | 2.867.068 |
| 2023(12) | | 77.221.245 | 16.787.227 | 13.429.782 | 10.072.336 | 20.144.673 | 23.502.118 | 3.357.445 |

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RUN;

DATA RANTAI PASOK12;

| INPUT CARD; | Thn | LB1P1 | LB2P2 | LB3P3 | LB4P4 | LB5P5 | LB6P6 |
|---|---|---|---|---|---|---|---|
| 2021(1) | | 16.161 | 14.260 | 20.344 | 17.492 | 19.774 | 20.192 |
| 2021(2) | | 15.868 | 14.001 | 19.975 | 17.175 | 19.415 | 19.825 |
| 2021(3) | | 17.278 | 15.245 | 21.750 | 18.701 | 21.140 | 21.587 |
| 2021(4) | | 16.601 | 14.648 | 20.898 | 17.969 | 20.312 | 20.742 |
| 2021(5) | | 16.846 | 14.864 | 21.206 | 18.233 | 20.612 | 21.048 |
| 2021(6) | | 12.219 | 10.781 | 15.381 | 13.225 | 14.950 | 15.266 |
| 2021(7) | | 13.274 | 11.713 | 16.710 | 14.368 | 16.242 | 16.585 |
| 2021(8) | | 14.124 | 12.463 | 17.780 | 15.288 | 17.282 | 17.647 |
| 2021(9) | | 15.198 | 13.410 | 19.132 | 16.450 | 18.595 | 18.989 |
| 2021(10) | | 16.405 | 14.475 | 20.651 | 17.756 | 20.072 | 20.497 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2021(11) | 16.830 | 14.850 | 21.186 | 18.216 | 20.592 | 21.028 |
| 2021(12) | 17.935 | 15.825 | 22.577 | 19.412 | 21.944 | 22.408 |
| 2022(1) | 19.550 | 17.250 | 24.610 | 21.160 | 23.920 | 24.426 |
| 2022(2) | 14.875 | 13.125 | 18.725 | 16.100 | 18.200 | 18.585 |
| 2022(3) | 18.700 | 16.500 | 23.540 | 20.240 | 22.880 | 23.364 |
| 2022(4) | 16.915 | 14.925 | 21.293 | 18.308 | 20.696 | 21.134 |
| 2022(5) | 14.450 | 12.750 | 18.190 | 15.640 | 17.680 | 18.054 |
| 2022(6) | 17.680 | 15.600 | 22.256 | 19.136 | 21.632 | 22.090 |
| 2022(7) | 19.125 | 16.875 | 24.075 | 20.700 | 23.400 | 23.895 |
| 2022(8) | 18.983 | 16.750 | 23.897 | 20.547 | 23.227 | 23.718 |
| 2022(9) | 14.025 | 12.375 | 17.655 | 15.180 | 17.160 | 17.523 |
| 2022(10) | 12.750 | 11.250 | 16.050 | 13.800 | 15.600 | 15.930 |
| 2022(11) | 14.592 | 12.875 | 18.368 | 15.793 | 17.853 | 18.231 |
| 2022(12) | 15.017 | 13.250 | 18.903 | 16.253 | 18.373 | 18.762 |
| 2023(1) | 19.550 | 17.250 | 24.610 | 21.160 | 23.920 | 24.426 |
| 2023(2) | 14.875 | 13.125 | 18.725 | 16.100 | 18.200 | 18.585 |
| 2023(3) | 18.700 | 16.500 | 23.540 | 20.240 | 22.880 | 23.364 |
| 2023(4) | 16.915 | 14.925 | 21.293 | 18.308 | 20.696 | 21.134 |
| 2023(5) | 14.450 | 12.750 | 18.190 | 15.640 | 17.680 | 18.054 |
| 2023(6) | 17.680 | 15.600 | 22.256 | 19.136 | 21.632 | 22.090 |
| 2023(7) | 19.125 | 16.875 | 24.075 | 20.700 | 23.400 | 23.895 |
| 2023(8) | 18.983 | 16.750 | 23.897 | 20.547 | 23.227 | 23.718 |
| 2023(9) | 14.025 | 12.375 | 17.655 | 15.180 | 17.160 | 17.523 |
| 2023(10) | 12.750 | 11.250 | 16.050 | 13.800 | 15.600 | 15.930 |
| 2023(11) | 14.592 | 12.875 | 18.368 | 15.793 | 17.853 | 18.231 |
| 2023(12) | 15.017 | 13.250 | 18.903 | 16.253 | 18.373 | 18.762 |

RUN;

DATA RANTAI PASOK12;

| INPUT CARD; | Thn | LB7P7 | LB8P8 | LB9P9 | LB10P10 | LB11P11 |
|---|---|---|---|---|---|---|
| 2021(1) | | 15.591 | 19.488 | 17.112 | 24.013 | 24.717 |
| 2021(2) | | 15.308 | 19.135 | 16.801 | 23.578 | 24.268 |
| 2021(3) | | 16.668 | 20.835 | 18.294 | 25.673 | 26.425 |
| 2021(4) | | 16.015 | 20.019 | 17.578 | 24.668 | 25.390 |
| 2021(5) | | 16.252 | 20.314 | 17.837 | 25.031 | 25.765 |
| 2021(6) | | 11.788 | 14.734 | 12.938 | 18.156 | 18.688 |
| 2021(7) | | 12.806 | 16.007 | 14.055 | 19.724 | 20.302 |
| 2021(8) | | 13.626 | 17.032 | 14.955 | 20.987 | 21.602 |
| 2021(9) | | 14.662 | 18.327 | 16.092 | 22.582 | 23.244 |
| 2021(10) | | 15.826 | 19.783 | 17.370 | 24.376 | 25.090 |
| 2021(11) | | 16.236 | 20.295 | 17.820 | 25.007 | 25.740 |
| 2021(12) | | 17.302 | 21.628 | 18.990 | 26.649 | 27.430 |
| 2022(1) | | 18.860 | 23.575 | 20.700 | 29.049 | 29.900 |
| 2022(2) | | 14.350 | 17.938 | 15.750 | 22.103 | 22.750 |
| 2022(3) | | 18.040 | 22.550 | 19.800 | 27.786 | 28.600 |
| 2022(4) | | 16.318 | 20.398 | 17.910 | 25.134 | 25.870 |
| 2022(5) | | 13.940 | 17.425 | 15.300 | 21.471 | 22.100 |
| 2022(6) | | 17.056 | 21.320 | 18.720 | 26.270 | 27.040 |
| 2022(7) | | 18.450 | 23.063 | 20.250 | 28.418 | 29.250 |
| 2022(8) | | 18.313 | 22.892 | 20.100 | 28.207 | 29.033 |
| 2022(9) | | 13.530 | 16.913 | 14.850 | 20.840 | 21.450 |
| 2022(10) | | 12.300 | 15.375 | 13.500 | 18.945 | 19.500 |
| 2022(11) | | 14.077 | 17.596 | 15.450 | 21.682 | 22.317 |
| 2022(12) | | 14.487 | 18.108 | 15.900 | 22.313 | 22.967 |
| 2023(1) | | 18.860 | 23.575 | 20.700 | 29.049 | 29.900 |

| | | | | | |
|---|---|---|---|---|---|
| 2023(2) | 14.350 | 17.938 | 15.750 | 22.103 | 22.750 |
| 2023(3) | 18.040 | 22.550 | 19.800 | 27.786 | 28.600 |
| 2023(4) | 16.318 | 20.398 | 17.910 | 25.134 | 25.870 |
| 2023(5) | 13.940 | 17.425 | 15.300 | 21.471 | 22.100 |
| 2023(6) | 17.056 | 21.320 | 18.720 | 26.270 | 27.040 |
| 2023(7) | 18.450 | 23.063 | 20.250 | 28.418 | 29.250 |
| 2023(8) | 18.313 | 22.892 | 20.100 | 28.207 | 29.033 |
| 2023(9) | 13.530 | 16.913 | 14.850 | 20.840 | 21.450 |
| 2023(10) | 12.300 | 15.375 | 13.500 | 18.945 | 19.500 |
| 2023(11) | 14.077 | 17.596 | 15.450 | 21.682 | 22.317 |
| 2023(12) | 14.487 | 18.108 | 15.900 | 22.313 | 22.967 |

```
PROC SORT DATA=RANTAI PASOK01;BY THN;
PROC SORT DATA=RANTAI PASOK02;BY THN;
PROC SORT DATA=RANTAI PASOK03;BY THN;
PROC SORT DATA=RANTAI PASOK04;BY THN;
PROC SORT DATA=RANTAI PASOK05;BY THN;
PROC SORT DATA=RANTAI PASOK06;BY THN;
PROC SORT DATA=RANTAI PASOK07;BY THN;
PROC SORT DATA=RANTAI PASOK08;BY THN;
PROC SORT DATA=RANTAI PASOK09;BY THN;
PROC SORT DATA=RANTAI PASOK10;BY THN;
PROC SORT DATA=RANTAI PASOK11;BY THN;
PROC SORT DATA=RANTAI PASOK12;BY THN;
DATA RANTAI PASOK00;
MERGE RANTAI PASOK01 RANTAI PASOK02 RANTAI PASOK03 RANTAI PASOK04 RANTAI
PASOK05 RANTAI PASOK06 RANTAI PASOK07 RANTAI PASOK08 RANTAI PASOK09
RANTAI PASOK10 RANTAI PASOK11 RANTAI PASOK12;
BY THN;
RUN;

PROC SYSLIN DATA= RANTAI PASOK00 2SLS;
ENDOGENOUS GPSFFI PSFFIDOCFS PSFFIFeed CFFILB GPSFPI PSFPIDOCFS PSFPIFeed
CFPPILB PSFNGPSDOCFS
        PSFNGPSFeed CFILB CIFLB BLB CDLB;
INSTRUMENTS
                    PSF     PSFNG     CF     CF     CFP     CFP     CF     CF                    S          C
GPSFPFI     PSFFI     PI       PS       FI       PI       FI       PI       I       PI       CIF     SHI     H     B     D
  DOCGP     DOCG     DOCP     DOC     DOC     DOCP
     S1          PS2          S1          PS2          PS3          S4
  DOC       DOC       DOCFS     DOC       DOC       DOC
  FS1       FS2       3         FS4       FS5       FS6       DOCFS7
  DOC       DOC       DOCFS     FeedDOC     FeedDOCG     FeedDOC     FeedDOC     FeedDOC     FeedDOC
  FS8       FS9       10        GPS1        PS2          PS1         PS2         PS3         PS4
  Fee       Fee       Fee       Fee       Feed
  d1        d2        d3        d4        5         Feed6
  Fee       Fee       Fee       Feed1     DOCFS     DOCFS2P     DOCFS     DOCFS4P4
  d7        d8        d9        0         1P1       2           3P3
  DOCFS     DOCFS     DOCFS     DOCFS8P     DOCFS     DOCFS10     Feed1     Feed2P2
  5P5       6P6       7P7       8           9P9       P10         P1
  Feed3P    Feed4     Feed5     Feed6     Feed7     Feed8P8
  3         P4        P5        P6        P7

  Feed9P9       Feed10P10       LB1       LB2       LB3       LB4
  LB5     LB6     LB7     LB8     LB9     LB10     LB11
  LB1P1     LB2P2     LB3P3     LB4P4     LB5P5     LB6P6
  LB7P7     LB8P8     LB9P9     LB10P10     LB11P11;
```

```
MODEL GPSFFI = DOCGPS1 PSFFI DOCPS1 PSFNGPS DOCPS2
MODEL PSFFIDOCFS = DOCFS1 DOCFS2 DOCFS3 DOCFS4 DOCFS1P1 DOCFS2P2 DOCFS3P3
DOCFS4P4
IDENTITY PSFFIDOCFS = DOCFS1 DOCFS2 DOCFS3 DOCFS4
MODEL PSFFIFeed = Feed1 Feed2 Feed3 Feed4 Feed1P1 Feed2P2 Feed3P3 Feed4P4
IDENTITY PSFFI Feed = Feed1 Feed2 Feed3 Feed4
MODEL CFFILB = LB1 LB2 LB3 LB1P1 LB2P2 LB3P3 SHI SH B
IDENTITY CFFILB = LB1 LB2 LB3
MODEL GPSFPI = PSFNGPS PSFPI DOCPS3 DOCPS4 DOCGPS2
MODEL PSFPIDOCFS = DOCFS7 DOCFS8 DOCFS9 DOCFS10 DOCFS1P7 DOCFS2P8 DOCFS3P9
DOCFS4P10
IDENTITY PSFPIDOCFS = DOCFS7 DOCFS8 DOCFS9 DOCFS10
MODEL PSFPIFeed = Feed7 Feed8 Feed9 Feed10 Feed7P7 Feed8P8 Feed9P9 Feed10P10
IDENTITY PSFPIFeed = Feed7 Feed8 Feed9 Feed10
MODEL CFPPILB = LB8 LB9 LB8P8 LB9P9
IDENTITY CFPPILB = LB8 LB9
MODEL PSFNGPSDOCFS = DOCFS5 DOCFS6 DOCFS5P5 DOCFS6P6
IDENTITY PSFNGPSDOCFS = DOCFS5 DOCFS6
MODEL PSFNGPSFeed = Feed5 Feed6 Feed5P5 Feed6P6
IDENTITY PSFNGPSFeed = Feed5 + Feed6
MODEL CFILB= LB4 LB5 LB4P4 LB5P5
IDENTITY CFILB= LB4 LB5
MODEL CIFLB = LB6 LB7 LB6P6 LB7P7
MODEL BLB= LB10 LB10P10
MODEL CDLB = LB11 LB11P11
run;
```

## Hasil Olahan Rantai Pasok

The SAS System 1
2:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: GPSFFI
Dependent variable: GPSFFI

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 14 | 92673131.887 | 11584141.486 | 664.080 | 0.0001 |
| Error | 22 | 366321.72578 | 17443.89170 | | |
| C Total | 36 | 93029755.367 | | | |

| | | | |
|---|---|---|---|
| Root MSE | 2.07533 | R-Square | 0.8871 |
| Dep Mean | 9251.43333 | Adj R-SQ | 0.8896 |
| C.V. | 1.42762 | | |

The SAS System 2
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 37418 | 601.332072 | 6.541 | 0.0020 |
| DOCGPS1 | 1 | 2.41096 | 0.849116 | 1.285 | 0.0022 |
| PSFFI | 1 | 32.09467 | 2.311851 | 0.206 | 0.1323 |
| DOCPS1 | 1 | 1982.4632 | 1.334748 | 1.675 | 0.0912 |
| PSFNGPS | 1 | 27.4166 | 0.029178 | 3.825 | 0.5682 |
| DOCPS2 | 1 | 503.48301 | 0.338130 | 3.141 | 0.1414 |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Durbin-Watson 1.224
(For Number of Obs.) 36
1st Order Autocorrelation 0.325



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFFIDOCFS
Dependent variable: PSFFIDOCFS

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 12 | 4.14431 | 0.46048 | 364.585 | 0.0001 |
| Error | 24 | 0.02526 | 0.00126 | | |
| C Total | 36 | 4.16274 | | | |

| | | | |
|---|---|---|---|
| Root MSE | 0.03554 | R-Square | 0.7765 |
| Dep Mean | 3.91233 | Adj R-SQ | 0.7712 |
| C.V. | 0.90838 | | |

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 652391.456 | 0.257732 | 2.786 | 0.00023 |
| DOCFS1 | 1 | 1.89727 | 0.000254 | 4.666 | 0.03445 |
| DOCFS2 | 1 | 3.33483 | 0.000485 | 4.759 | 0.19961 |
| DOCFS3 | 1 | 0.94542 | 0.002114 | 2.875 | 0.13544 |
| DOCFS4 | 1 | 0.20012 | 0.003024 | 0.165 | 0.13120 |
| DOCFS1P1 | 1 | -1.11134 | 0.027441 | -0.93 | 0.02966 |
| DOCFS2P2 | 1 | 0.09436 | 0.000124 | 1.742 | 0.04577 |
| DOCFS3P3 | 1 | -0.87776 | 0.001979 | -2.36 | 0.82265 |
| DOCFS4P4 | 1 | 0.17432 | 0.026143 | 0.982 | 0.01110 |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Durbin-Watson 1.221
(For Number of Obs.) 36
1st Order Autocorrelation 0.014



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFFIFeed
Dependent variable: PSFFIFeed

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 11 | 11660123.790 | 1457515.4738 | 37.309 | 0.0001 |
| Error | 24 | 820388.63568 | 39066.12551 | | |
| C Total | 36 | 13530185.867 | | | |

Root MSE 1.65153 R-Square 0.9118
Dep Mean 40.06667 Adj R-SQ 0.9092
C.V. 493.30664

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 70368.671 | 297.067255 | 0.022 | 0.00001 |
| Feed1 | 1 | 3.1674 | 3.044262 | 1.258 | 0.14200 |
| Feed2 | 1 | 9.4412 | 2.184290 | 4.732 | 0.19961 |
| Feed3 | 1 | 2.9992 | 1.888185 | 1.717 | 0.12350 |
| Feed4 | 1 | 1.92775 | 0.019684 | 0.269 | 0.10120 |
| Feed1P1 | 1 | 0.05921 | 0.080995 | 12.615 | 0.12966 |
| Feed2P2 | 1 | 0.12143 | 0.081639 | 11.838 | 0.71577 |
| Feed3P3 | 1 | 0.47834 | 0.104656 | 9.779 | 0.08130 |
| Feed4P4 | 1 | 0.5649 | 0.060256 | 4.887 | 0.00411 |

SYSLIN Procedure
Two-Stage Least Squares Estimation

Durbin-Watson 2.143
(For Number of Obs.) 36
1st Order Autocorrelation -0.079



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: CFFILB
Dependent variable: CFFILB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 13 | 33442762.309 | 4777537.4727 | 10.320 | 0.0001 |
| Error | 22 | 10184386.077 | 462926.63987 | | |
| C Total | 36 | 42984142.167 | | | |

Root MSE 0.38713 R-Square 0.7881
Dep Mean 0.83333 Adj R-SQ 0.6923
C.V. 62.95024



SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 4046640.632 | 42967.067255 | 0.022 | 0.0022 |
| LB1 | 1 | 2.3754 | 11.425870 | 1.258 | 0.01226 |
| LB2 | 1 | 0.4623 | 2.435507 | 4.732 | 0.36212 |
| LB3 | 1 | 7.9734 | 8.348319 | 1.717 | 0.00630 |
| LB1P1 | 1 | 0.623 | 0.077437 | 0.269 | 0.76100 |
| LB2P2 | 1 | 2.3111 | 0.211523 | 12.615 | 0.91820 |
| LB3P3 | 1 | -1.0791 | 0.636006 | -0.838 | 0.05700 |

SYSLIN Procedure
Two-Stage Least Squares Estimation

Durbin-Watson 1.734
(For Number of Obs.) 36
1st Order Autocorrelation 0.130



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: GPSFPI
Dependent variable: GPSFPI

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 10 | 1248408754.8 | 208068125.81 | 3482.765 | 0.0001 |
| Error | 26 | 1374070.9578 | 59742.21556 | | |
| C Total | 36 | 1249761082.7 | | | |

Root MSE 244.42221 R-Square 0.8309
Dep Mean 24318.10000 Adj R-SQ 0.8186
C.V. 1.00510

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 37418 | 967.708655 | 7.229 | 0.0000 |
| PSFNGPS | 1 | 0.26 | 0.234285 | 5.574 | 0.1022 |
| PSFPI | 1 | 2.0021 | 0.743610 | 1.384 | 0.0145 |
| DOCPS3 | 1 | 67429.122 | 0.278466 | 1.816 | 0.9902 |
| DOCPS4 | 1 | 33714.811 | 0.077437 | 0.111 | 0.8265 |
| DOCGPS2 | 1 | 6850.673 | 0.211523 | 2.415 | 0.5641 |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Durbin-Watson 1.903
(For Number of Obs.) 36
1st Order Autocorrelation 0.133



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFPIDOCFS
Dependent variable: PSFPIDOCFS

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 9 | 513603299.31 | 85600549.885 | 163.387 | 0.0001 |
| Error | 26 | 12049994.601 | 523912.80874 | | |
| C Total | 36 | 525593056.97 | | | |

Root MSE 3.81822 R-Square 0.7999
Dep Mean 70.03333 Adj R-SQ 0.7918
C.V. 2.99469

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 31423.85 | 297.067255 | 0.022 | 0.00000 |
| DOCFS7 | 1 | 1.273 | 3.044262 | 1.153 | 0.03445 |
| DOCFS8 | 1 | 1.4421 | 2.184290 | 1.732 | 0.19961 |
| DOCFS9 | 1 | 2.581 | 1.888185 | 2.713 | 0.13544 |
| DOCFS10 | 1 | 1.6121 | 0.019684 | 1.269 | 0.20010 |
| DOCFS7P7 | 1 | -1.2214 | 0.080995 | -1.615 | 0.16300 |
| DOCFS8P8 | 1 | 0.143 | 0.081639 | 0.238 | 0.01100 |
| DOCFS9P9 | 1 | -0.9743 | 0.104656 | -0.979 | 0.88810 |
| DOCFS10P10 | 1 | -0.553 | 0.060256 | -0.887 | 0.73450 |



Durbin-Watson 1.275
(For Number of Obs.) 36
1st Order Autocorrelation 0.145



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFPIFeed
Dependent variable: PSFPIFeed

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 6 | 2631264.9335 | 438544.15559 | 320.781 | 0.0001 |
| Error | 29 | 31443.58123 | 1367.11223 | | |
| C Total | 36 | 2660125.4667 | | | |

Root MSE 6.86427 R-Square 0.9118
Dep Mean 152.13333 Adj R-SQ 0.9051
C.V. 15.60672



SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

Parameter Standard T for H0:

| Variable | DF | Estimate | Error | Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 218442.1285 | 2282.0026 | 0.022 | 0.00200 |
| Feed7 | 1 | 2.2255 | 2.221123 | 2.458 | 0.12300 |
| Feed8 | 1 | 4.4511 | 4.315232 | 2.965 | 0.09010 |
| Feed9 | 1 | 2.9992 | 2.888877 | 1.497 | 0.14100 |
| Feed10 | 1 | 2.523 | 2.019156 | 1.950 | 0.10120 |
| Feed7P7 | 1 | 0.05921 | 0.060966 | 0.276 | 0.12966 |
| Feed8P8 | 1 | 0.12143 | 0.139123 | 0.089 | 0.05770 |
| Feed9P9 | 1 | 0.47834 | 0.354623 | 0.430 | 0.18130 |
| Feed10P10 | 1 | 0.5649 | 0.533256 | 0.224 | 0.14110 |



Durbin-Watson 1.345
(For Number of Obs.) 30
1st Order Autocorrelation 0.281



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: CFPPILB
Dependent variable: CFPPILB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 6 | 1631234.9333 | 8544.13229 | 320.781 | 0.0001 |
| Error | 29 | 31443.5812 | 367.13222 | | |
| C Total | 36 | 1662678.5145 | | | |

Root MSE 2.221511 R-Square 0.8287
Dep Mean 255.13761 Adj R-SQ 0.8251
C.V. 23.43242

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 1037600.349 | 10087.6678 | 0.002 | 0.0155 |
| LB8 | 1 | 3.467 | 1.115323 | 3.212 | 0.1760 |
| LB9 | 1 | 6.2301 | 2.386532 | 6.911 | 0.0632 |
| LB8P8 | 1 | -2.9601 | 1.777661 | -2.422 | 0.0147 |
| LB9P9 | 1 | -1.9131 | 1.002671 | -1.922 | 0.6620 |



Durbin-Watson 1.554
(For Number of Obs.) 36
1st Order Autocorrelation 0.354



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFNGPSDOCFS
Dependent variable: PSFNGPSDOCFS

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 7 | 31264.9335 | 438.159 | 320.781 | 0.0001 |
| Error | 28 | 1313.5812 | 67.112 | | |
| C Total | 36 | 32578.5147 | | | |

Root MSE 1.12097 R-Square 0.9122
Dep Mean 222.19387 Adj R-SQ 0.9108
C.V. 16.44512



SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

Parameter Standard T for H0:

| Variable | DF | Estimate | Error | Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 7076940.341 | 65458.8856 | 0.002 | 0.0010 |
| DOCFS5 | 1 | 1.112 | 0.993433 | 1.021 | 0.4450 |
| DOCFS6 | 1 | 8.2961 | 5.44O322 | 8.112 | 0.0112 |
| DOCFS5P5 | 1 | -0.1114 | 0.445561 | -0.082 | 0.1630 |
| DOCFS6P6 | 1 | -0.6123 | 0.112236 | -0.613 | 0.0110 |



Durbin-Watson 1.644
(For Number of Obs.) 36
1st Order Autocorrelation 0.815

SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFNGPSFeed
Dependent variable: PSFNGPSFeed

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 5 | 2264.9335 | 138655.15559 | 320.781 | 0.0001 |
| Error | 31 | 314.5812 | 1399.20021 | | |
| C Total | 36 | 2579.4147 | | | |

| | | | |
|---|---|---|---|
| Root MSE | 5.38071 | R-Square | 0.8761 |
| Dep Mean | 123.23323 | Adj R-SQ | 0.8722 |
| C.V. | 17.87112 | | |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 2062440.111 | 21865.6743 | 0.002 | 0.0130 |
| Feed5 | 1 | 3.3301 | 3.7223I | 3.234 | 0.0535 |
| Feed6 | 1 | 9.1161 | 2.83762 | 9.115 | 0.0298 |
| Feed5P5 | 1 | 1.0040 | 0.98672 | 0.919 | 0.1630 |
| Feed6P6 | 1 | 1.7113 | 0.33270 | 0.525 | 0.1110 |



| | |
|---|---|
| Durbin-Watson | 1.232 |
| (For Number of Obs.) | 36 |
| 1st Order Autocorrelation | 0.532 |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: PSFNGPSFeed
Dependent variable: PSFNGPSFeed

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 5 | 31264.9335 | 38541.15889 | 320.781 | 0.0001 |
| Error | 31 | 443.5813 | 1317.19923 | | |
| C Total | 36 | 32708.5148 | | | |

| | | | |
|---|---|---|---|
| Root MSE | 5.66552 | R-Square | 0.9237 |
| Dep Mean | 163.98711 | Adj R-SQ | 0.9215 |
| C.V. | 23.77119 | | |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 2766934.753 | 26288.6322 | 0.000 | 0.000 |
| LB4 | 1 | 1.2291 | 1.11121 | 1.971 | 0.0111 |
| LB5 | 1 | 2.9912 | 2.66213 | 2.778 | 0.0801 |
| LB4P4 | 1 | -0.8799 | 0.76733 | -0.129 | 0.2333 |
| LB5P5 | 1 | -3.4234 | 3.38123 | -3.956 | 0.0232 |



| | |
|---|---|
| Durbin-Watson | 1.434 |
| (For Number of Obs.) | 36 |
| 1st Order Autocorrelation | 0.633 |



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: CFILB
Dependent variable: CFILB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 4 | 631555.1445 | 544.15559 | 320.781 | 0.0001 |
| Error | 32 | 314.5812 | 13.11223 | | |
| C Total | 36 | 631579.7257 | | | |

Root MSE 2.773244 R-Square 0.9237
Dep Mean 244.44212 Adj R-SQ 0.9215
C.V. 11.62092

The SAS System 35
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 2766934.753 | 26288.6322 | 0.000 | 0.0000 |
| LB4 | 1 | 1.2291 | 1.11121 | 1.971 | 0.0111 |
| LB5 | 1 | 2.9912 | 2.66213 | 2.778 | 0.0801 |
| LB4P4 | 1 | -0.8799 | 0.76733 | -0.129 | 0.2333 |
| LB5P5 | 1 | -3.4234 | 3.38123 | -3.956 | 0.0232 |

The SAS System 36
02:30 pm Monday, February 5, 2024

Durbin-Watson 1.289
(For Number of Obs.) 36
1st Order Autocorrelation 0.266

The SAS System 37
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: CFILB
Dependent variable: CFILB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 5 | 21264.9335 | 43288.12002 | 320.781 | 0.0001 |
| Error | 31 | 343.5812 | 1112.49222 | | |
| C Total | 36 | 21607.5147 | | | |

Root MSE 6.32366 R-Square 0.9237
Dep Mean 73.99833 Adj R-SQ 0.9215
C.V. 12.98212

The SAS System 38
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 2766934.753 | 26288.6322 | 0.000 | 0.0000 |
| LB4 | 1 | 1.2291 | 1.11121 | 1.971 | 0.0111 |
| LB5 | 1 | 2.9912 | 2.66213 | 2.778 | 0.0801 |
| LB4P4 | 1 | -0.8799 | 0.76733 | -0.129 | 0.2333 |
| LB5P5 | 1 | -3.4234 | 3.38123 | -3.956 | 0.0232 |



Durbin-Watson 1.622
(For Number of Obs.) 36
1st Order Autocorrelation 0.723



SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: CIFLB
Dependent variable: CIFLB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 7 | 1264.2212 | 8544.15111 | 320.781 | 0.0001 |
| Error | 29 | 43.5833 | 2364.34334 | | |
| C Total | 36 | 1307.8045 | | | |

Root MSE 3.98732 R-Square 0.8881
Dep Mean 113.11761 Adj R-SQ 0.8852
C.V. 11.76211

The SAS System 41
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 1729334.563 | 10245.344 | 0.000 | 0.0100 |
| LB6 | 1 | 1.2310 | 1.40041 | 1.212 | 0.1122 |
| LB7 | 1 | 0.9815 | 0.8223 | 0.889 | 0.1510 |
| LB6P6 | 1 | -0.779 | 0.76755 | -0.223 | 0.1454 |
| LB7P7 | 1 | -1.024 | 0.0332 | -1.002 | 0.4233 |

The SAS System 42
02:30 pm Monday, February 5, 2024

Durbin-Watson 1.444
(For Number of Obs.) 36
1st Order Autocorrelation 0.421

The SAS System 40
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: BLB
Dependent variable: BLB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 8 | 2831632.9665 | 47753.13123 | 320.781 | 0.0001 |
| Error | 28 | 312.5812 | 2227.33341 | | |
| C Total | 36 | 2831945.5477 | | | |

Root MSE 2.27322 R-Square 0.7788
Dep Mean 283.76174 Adj R-SQ 0.7717
C.V. 14.31340

The SAS System 41
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

Parameter Standard T for H0:

| Variable | DF | Estimate | Error | Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 2421067.002 | 3422.888 | 0.000 | 0.0010 |
| LB10 | 1 | 0.443 | 0.4291 | 0.353 | 0.1541 |
| LB10P10 | 1 | -0.779 | 0.2309 | -0.439 | 0.3550 |



Durbin-Watson 1.424
(For Number of Obs.) 36
1st Order Autocorrelation 0.533

The SAS System 40
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Model: CDLB
Dependent variable: CDLB

Analysis of Variance

| Source | DF | Sum of Squares | Mean Square | F Value | Prob>F |
|---|---|---|---|---|---|
| Model | 10 | 1631261.9445 | 444.10009 | 320.781 | 0.0001 |
| Error | 26 | 3123.5222 | 67.15343 | | |
| C Total | 36 | 1634385.4667 | | | |

| | | | |
|---|---|---|---|
| Root MSE | 1.24442 | R-Square | 0.8776 |
| Dep Mean | 93.76111 | Adj R-SQ | 0.8731 |
| C.V. | 12.32113 | | |

The SAS System 41
02:30 pm Monday, February 5, 2024

SYSLIN Procedure
Two-Stage Least Squares Estimation

Parameter Estimates

| Variable | DF | Parameter Estimate | Standard Error | T for H0: Parameter=0 | Prob > \|T\| |
|---|---|---|---|---|---|
| INTERCEP | 1 | 2421067.002 | 422.822 | 0.000 | 0.0010 |
| LB11 | 1 | 0.311 | 0.4291 | 0.231 | 0.5411 |
| LB11P11 | 1 | -0.6641 | 0.2309 | -0.533 | 0.5511 |

The SAS System 42
02:30 pm Monday, February 5, 2024

| | |
|---|---|
| Durbin-Watson | 1.782 |
| (For Number of Obs.) | 36 |
| 1st Order Autocorrelation | 0.892 |

**Validasi Model dan Simulasi Kebijakan**

SIMULASI DOCGPS THN=2021(1)-2023(12) 1
04:30 pm Monday, February 5, 2024

SIMNLIN Procedure

Model Summary

| | |
|---|---|
| Model Variables | 14 |
| Endogenous | 14 |

Parameters 75
RANGE Variable THN
Equations 14

Number of Statements 22

Program Lag Length 1

SIMULASI DOCGPS THN=2021(1)-2023(12) 2
04:30 pm Monday, February 5, 2024

SIMNLIN Procedure
Dynamic Simultaneous Simulation

Solution Summary

Dataset Option Dataset
DATA= RANTAI PASOK00

Variables Solved 14

Simulation Lag Length 1

Solution RANGE THN
First 2021(1)
Last 2023(12)

Solution Method NEWTON
CONVERGE= 1E-8

SIMULASI DOCGPS THN=2021(1)-2023(12) 3
04:30 pm Monday, February 5, 2024

SIMNLIN Procedure
Dynamic Simultaneous Simulation

Maximum CC 1.0135E-14
Maximum Iterations 1
Total Iterations 16
Average Iterations 1

Observations Processed
Read 22
Lagged 0
Solved 21
First 21
Last 31

Variables Solved For: GPSFFI PSFFIDOCFS PSFFIFeed CFFILB GPSFPI PSFPIDOCFS PSFPIFeed
CFPPILB PSFNGPSDOCFS PSFNGPSFeed CFILB CIFLB
BLB CDLB

SIMULASI DOCGPS THN=2021(1)-2023(12) 4
04:30 pm Monday, February 5, 2024

SIMNLIN Procedure

Dynamic Simultaneous Simulation

Solution Range THN=2021(1)-2023(12)

Theil Forecast Error Statistics

| | | | | Coef | MSE Decomposition Proportions Inequality | | | |
|---|---|---|---|---|---|---|---|---|
| Peubah Endogen | N | RMSE | RMPSE | Corr (R) | Bias (UM) | Reg (UR) | Dist (UD) | U |
| GPSFFI | 36 | 5.2971 | 1.3288 | 0.9472 | 0.003 | 0.251 | 0.746 | 0.0068 |
| PSFFIDOCFS | 36 | 0.0547 | 1.2627 | 0.8926 | 0.019 | 0.063 | 0.918 | 0.0065 |
| PSFFIFeed | 36 | 2.0882 | 1.552 | 0.7607 | 0.000 | 0.225 | 0.774 | 0.4169 |
| CFFILB | 36 | 1.005 | 0.000 | 0.8741 | 0.006 | 0.295 | 0.699 | 0.2590 |
| GPSFPI | 36 | 6.3533 | 1.7942 | 0.9361 | 0.000 | 0.544 | 0.456 | 0.0090 |
| PSFPIDOCFS | 36 | 7.2753 | 2.9736 | 0.9269 | 0.001 | 0.019 | 0.980 | 0.0156 |
| PSFPIFeed | 36 | 2.1888 | 2.9736 | 0.9923 | 0.015 | 0.069 | 0.916 | 0.0276 |
| CFPPILB | 36 | 3.514 | 0.000 | 0.867 | 0.718 | 0.226 | 0.002 | 0.0619 |
| PSFNGPSDOCFS | 36 | 3.674 | 1.4419 | 0.8813 | 0.753 | 0.001 | 0.247 | 0.0631 |
| PSFNGPSFeed | 36 | 3.614 | 1.35208 | 0.8444 | 0.718 | 0.045 | 0.237 | 0.0619 |
| CFILB | 36 | 1.223 | 0.2219 | 0.7211 | 0.000 | 0.002 | 0.201 | 0.0301 |
| CIFLB | 36 | 3.531 | 1.2019 | 0.8442 | 0.000 | 0.004 | 0.000 | 0.0021 |
| BLB | 36 | 2.203 | 1.6722 | 0.9333 | 0.001 | 0.055 | 0.002 | 0.0044 |
| CDLB | 36 | 3.111 | 1.3321 | 0.9322 | 0.003 | 0.000 | 0.022 | 0.0459 |

Descriptive Statistics

| | | Actual | | Predicted | |
|---|---|---|---|---|---|
| Variables | N | MEAN | Std | MEAN | Std |
| GPSFFI | 36 | 9.52778 | 0,65405 | 9.42 | 0,55419 |
| PSFFIDOCFS | 36 | 3,127,286 | 2,673,489 | 3,289,567 | 2,975,422 |
| PSFFIFeed | 36 | 354,846,825 | 22,966,148 | 385,923,575 | 32,627,852 |
| CFFILB | 36 | 94,080,714 | 5,330,038 | 98,950,021 | 8,803,771 |
| GPSFPI | 36 | 8.19444 | 2,026 | 7.9123 | 1,249 |
| PSFPIDOCFS | 36 | 35,048,184 | 2,285,383 | 36,701,453 | 3,656,613 |
| PSFPIFeed | 36 | 3,960,444,792 | 17,949,420 | 4,309,640,021 | 33,725,202 |
| CFPPILB | 36 | 20,380,161 | 3,656,613 | 20,681,998 | 3,145,112 |
| PSFNGPSDOCFS | 36 | 81,471,940 | 6,716,953 | 82,926,118 | 8,973,546 |
| PSFNGPSFeed | 36 | 9,206,329,247 | 47,454,437 | 9,935,810,082 | 56,655,812 |
| CFILB | 36 | 72,246,340 | 1,828,306 | 75,759,662 | 2,285,383 |
| CIFLB | 36 | 20,228,966 | 1,371,230 | 19,783,682 | 878,734 |
| BLB | 36 | 15,733,640 | 2,742,460 | 16,014,621 | 3,199,536 |
| CDLB | 36 | 2,247,663 | 458,915 | 2,119,863 | 578,865 |

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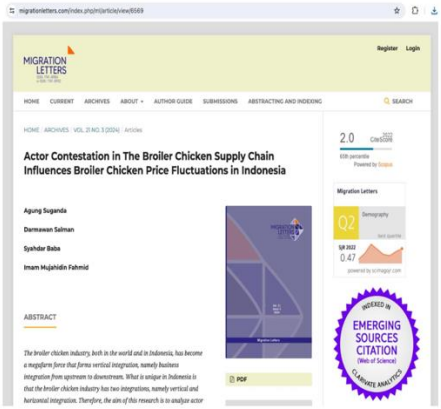

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**Actor Contestation in The Broiler Chicken Supply Chain Influences Broiler Chicken Price Fluctuations in Indonesia**

Agung Suganda
Darmawan Salman
Syahdar Baba
Imam Mujahidin Fahmid

ABSTRACT

*The broiler chicken industry, both in the world and in Indonesia, has become a megaform force that forms vertical integration, namely business integration from upstream to downstream. What is unique in Indonesia is that the broiler chicken industry has two integrations, namely vertical and horizontal integration. Therefore, the aim of this research is to analyze actor*

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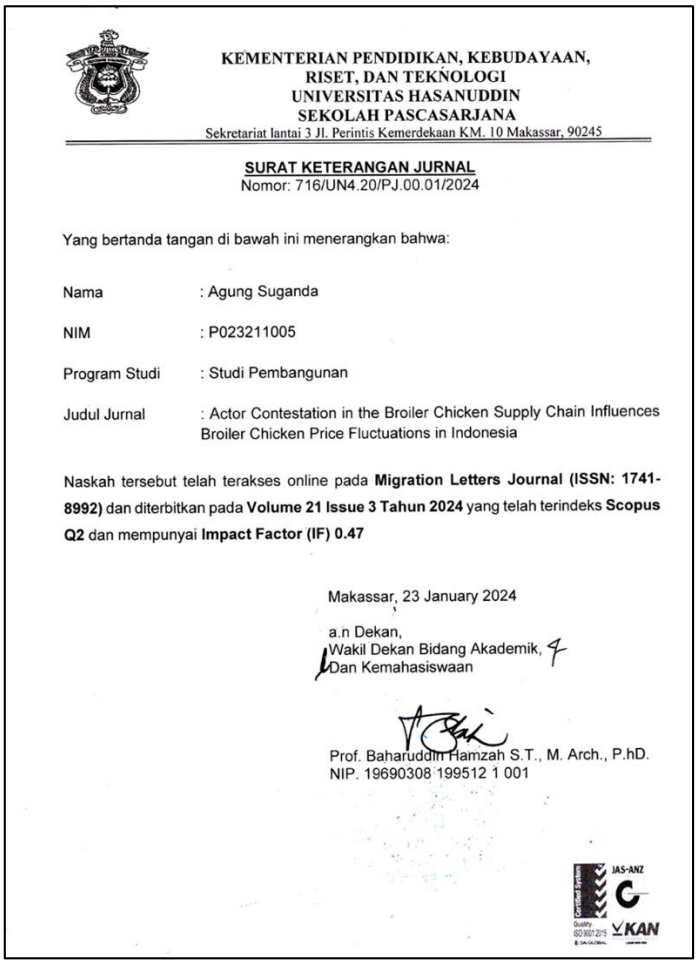

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Yang bertanda tangan di bawah ini menerangkan bahwa:

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NIM : P023211005

Program Studi : Studi Pembangunan

Judul Jurnal : Actor Contestation in the Broiler Chicken Supply Chain Influences Broiler Chicken Price Fluctuations in Indonesia

Naskah tersebut telah terakses online pada **Migration Letters Journal (ISSN: 1741-8992)** dan diterbitkan pada **Volume 21 Issue 3 Tahun 2024** yang telah terindeks **Scopus Q2** dan mempunyai **Impact Factor (IF) 0.47**

Makassar, 23 January 2024

a.n Dekan,
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Dan Kemahasiswaan

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**Migration Letters**

Volume: 21, No: 3, pp. 210-225

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)
www.migrationletters.com

# Actor Contestation in The Broiler Chicken Supply Chain Influences Broiler Chicken Price Fluctuations in Indonesia

Agung Suganda[1], Darmawan Salman[2*], Syahdar Baba[3], Imam Mujahidin Fahmid[4]

**Abstract**

*The broiler chicken industry, both in the world and in Indonesia, has become a megafarm force that forms vertical integration, namely business integration from upstream to downstream. What is unique in Indonesia is that the broiler chicken industry has two integrations, namely vertical and horizontal integration. Therefore, the aim of this research is to analyze actor contestation in the broiler chicken supply chain arena, and actor contestation in the broiler chicken market arena. This research uses a qualitative descriptive method to detect the social practices of each actor contesting in these two arenas. This research was carried out nationally and in several provinces, namely West Java, Central Java, East Java, South Sulawesi and North Sumatra. The research informants consisted of 1-2 top management people at the GPS company, 1-2 leaders of commercial farms in the province, 1-2 representatives of breeder associations (Gopan or Pinsar) in the province, one independent breeder in the province, and one farmer. The research results show that actor contestation in the broiler chicken supply chain arena is controlled by full and partial integrator companies due to ownership of DOC FS, Feed input sources, and control of downstreaming and forms an oligopolistic market structure, while actor contestation in the broiler chicken market arena is determined based on the competitive market structure. because there are many supply actors and consumers for each. The prices are formed based on the strength of each actor depending on the use of economic capital by supply chain actors and the use of social capital in the form of information networks and networks of market chain actors.*

***Keywords:*** *Actor Contestation, Social Practices, Price Determination, Live Bird, Supply Chain.*

## 1. INTRODUCTION

The poultry industry is an industry that produces chicken meat which has become a popular commodity. The world trend of chicken meat consumption continues to increase from 2010 – 2018 (OECD-FAO, 2022). It was also reported that the trend in chicken meat consumption is dominated by lower-middle income consumers. This means that middle to lower income consumers prefer chicken meat compared to other meat consumption. Due to the increasing demand for chicken meat, the poultry industry continues to develop production technology in response to high demand.

The poultry industry, especially broiler chickens, is an industry with quite large capitalization and is integrated from upstream to downstream, and has implemented

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supply chain management which has great potential to streamline production and increase market competitiveness (Salim et al., 2020; Alfaima et al. ., 2023). According to (Daryanto 2022; Elsedig et al., 2015), the competitive performance of the poultry industry depends on a global supply chain with a high level of global connectivity and must be able to increase its comparative advantage. In the global value chain, the value chain activities of the poultry industry are integrated from breeding (Great Grand Parent Stocks/GGPS, Grand Parent Stocks/GPS, Parent Stocks/PS), feed/medicine, cultivation (on-farm), distributor, processing and final consumers (Bukhori et al, 2015; Saptana et al, 2016; Prayugo et al, 2012; Syam, et.al, 2019).

The poultry industry is classified as an oligopolitical market (Mua'zu et al, 2013). Several studies show that the market structure in the poultry industry in various countries is an oligolithic market structure, especially in control of production inputs and outputs, such as Indonesia, Malaysia, Thailand, the Philippines and Japan (Mua'zu et al, 2013; Saptana et al, 2020; Chokesomritpol et al, 2018; Chung, 2007; Tajima, 2023). Control of day old chick (DOC) input by several large companies in a country is because these companies have access to pure line broiler companies. There are only 3 companies in the world. This company dominates the world market for pure lines, namely Aviagen Broiler Breeders, Cobb-Vantress, and Hubbard (Hiemstra and Napel, 2013). The Aviagen Broiler Breeders company is part of the Aviagen Group and which is a family company called EW Group located in Germany. Hubbard is owned by Groupe Grimaud which is located in France and is also a family company. Cobb-Vantress is a subsidiary of Tyson Foods Inc. The company is represented by Cobb-Europe in Europe located in Colchester, England. However, the Hubbard company was acquired by Aviagen in 2016 so there are only two broiler chicken genetic companies, namely Aviagen and Cobb-Vantress. Thus, the dependence on DOC GPS seeds from abroad is very high, making the supply of DOC seeds oligopolistic in nature. In addition, imported feed raw material components encourage the price of livestock production inputs (sapronak) to continue to increase from time to time, while output prices experience relatively high fluctuations (Saptana et al., 2016).

Generally, the broiler chicken business is intensive farming and it is often associated that individual breeders often get small profits (Brevik et al, 2020;Caffyn, 2020). Over several decades, the industry developed or evolved from a fragmented local business into one of the most efficient and vertically integrated parts of agricultural production (Asche et al, 2018;Brevik et al, 2020). Vertical integration of the broiler chicken supply chain implies coordination and collaboration between several actors (Brevik et al, 2020). Along with the development of increasingly complex supply chains, model optimization is needed to improve efficiency and competitive market performance (Pla et al, 2014; Rodríguez et al, 2012). Broiler chicken supply chain players, both in Indonesia and abroad, have the same system, namely the supply chain is formed from vertical integration (Brevik et al, 2020; Mua'zu et al, 2013). Supply chain actors become a unified network from upstream to downstream and are all linked in the supply chain system (Caffyn, 2021a; Juniyanti et al., 2021). The integrator's strength in controlling production inputs, such as DOC and feed, also has cultivation companies, transportation and processing companies so that with this system efficiency can be created (Syam, et.al, 2019).

The complexity of the broiler chicken supply chain has many challenges that can result in failure to manage the supply chain. Considering that the supply chain consists of activities carried out by several business actors, managing it is not easy. This complex system is a combination of a number of elements that influence each other dynamically, when the number is small it does not have much influence but when the number becomes larger it will greatly influence the running system (Cilliers, 2002). The complexity of the broiler chicken supply chain is built by a number of actors who have their own habitus and use their capital (economic, cultural, social and symbolic) in the broiler chicken supply chain as an arena by carrying out a number of social practices and contestations in

playing with prices so that the prices formed are not completely because of the balance of demand and supply but because of the actors who play a role.

Contestation is an activity that critically involves certain objects at a certain level which aims to change or maintain the status quo (Weiner, 2018). The identification and measurement of actor contestation is measured based on information about the influence of the knowledge and power elements possessed by each actor (Juniyanti et al., 2021). Actor contestation in the broiler chicken supply chain is the activity of actors involved in the supply chain who attempt to maintain their position of power (Zürn, 2018) in the supply chain. In social theory, there is a dualism of power, namely subjective power (actor level) and objective power (structural level) (Juniyanti et al, 2018). The level of power structure refers to power that does not only come from the actor himself but also depends on the actors around him (Arts and Van Tatenhove, 2004). Power is defined as an actor's ability to mobilize resources to achieve specific outcome goals in a network, which can take the form of changing political decisions, rules of the game, and actor dependency in reproducing domination (Morriss, 2006). Thus, the ability of actors to use their power reflects social practices in the supply chain system.

Social practiceis a meeting place between structures and agents that are repeated and patterned across time and space where the duality of structure and action is mutually dependent or related (Priyono, 2003). In other words, social practice is an activity that is carried out continuously and continuously and requires special treatment from the agent who carries out the action.According toBourdieu (1990 cited by Krisdinanto, 2014; Wahyudi, 2020) said that social practice is the result of a combination of habitus, capital and arena (Caffyn, 2021b; Juniyanti et al., 2021; Koka, 2024).

Habitus appears as a product of behavior based on human life experience. Habitus is a lifestyle, values, dispositions and expectations that have been internalized within a person or group which continue to change into choices that are institutionalized and embedded within a person or group. (Bourdieu, 1980 cited by Fausayana, 2017; Fausayana, 2017). Bourdieu also defines habitus as a property of social agents (whether individuals, groups or institutions) which consists of structured elements and elements that structure "structured and structuring structure" (Bourdieu, 1994 cited by Wiranata, 2020). Thus, habitus is a "structure" in which there is a systematic arrangement rather than being arranged randomly and without a pattern.

Capital tends to be connoted with economics or finance. However, Bourdieu expands the "sense" of capital, namely economic, social, cultural and symbolic capital which acts as a tool to achieve systemic power (Fashri, 2014;Krisdinanto, 2014). Economic capital consists of all assets or connotes money owned by agents/actors; cultural capital consists of education, knowledge, skills and language skills aimed at achieving a higher social status; social capital consists of trust, networks and interrelationships so that it can grow a strong network to maintain a position in the arena; and symbolic capital consists of prestige, self-esteem and symbols of identity or power that make it possible to obtain equivalent to what is obtained through physical and economic power (Fashri, 2014; Krisdinanto, 2014)..

Bourdieu argues that in order to understand interactions between humans, or to explain an event or social phenomenon, it is not enough just to see the event but also to observe space as a place where events, interactions and transactions occur (Wiranata, 2020). A social space or arena means not only localizing the object of observation in a specific historical context or local/regional/national or international place context, but also exploring further the ways in which previous knowledge about an object emerged. who gave rise to that knowledge, and their interests in giving rise to knowledge which resulted in certain practices (Bourdieu, 1990 cited by Wiranata, 2020).The arena is a realm of contestation for internal actorsimplement strategies to maximize their position using the

capital they have, wellin the form of economic, cultural, social and symbolic (Sjaf, 2014; Wiranata, 2020).

Based on the concept of social practice, it is linked to the concept of the supply chain, namely the behavior of the actors which is identified with habitus, the capital owned by the actors in order to maintain their position in the supply chain, and the supply chain itself as an arena for contestation. Who are the supply chain actors in Indonesia? Abroiler chicken supply chain factors according to Minister of Agriculture Regulation no. 32 of 2017 which means: (1) integration business actors areBusiness actors breeding Great Grand Parent Stock (GGPS), Grand Parent Stock (GPS), and/or Parent Stock (PS) as well as cultivating Final Stock (FS); (2) independent business actors are purebred chicken cultivation business actors who have PS and/or do not yet have PS but are able to carry out FS cultivation business independently; (3) FS chicken breeders, hereinafter referred to as Breeders, are business actors cultivating purebred chickens who do not have GGPS, GPS and PS; (4) GPS breeders are business actors who produce PS shoot eggs and/or Day Old Chick (DOC) for the needs of PS breeders and independent business actors; (5) PS breeders are business actors who produce DOC FS for the needs of breeders, cooperatives and independent business actors and whether or not they carry out FS cultivation as a producer of broiler chickens (live birds) and eggs for consumption. Other actors are collectors in chicken distribution who take live chickens to breeders' cages that have been appointed by the core company, then sell live chickens or carcasses to wholesalers, retailers, meat shops and hotels, restaurants and catering (HORECA) ( Saptana et al., 2016). Partnership pattern breeders are breeders who run a livestock business with a cooperation pattern between the core company and breeders as plasma where in the contract the output and input prices have been agreed upon which have been determined by the core company (Fahmid, Jamil, et al., 2022; Fahmid, Wahyudi, et al., 2022). Non-partner (independent) breeders are breeders who are able to run a livestock business with their own capital and are free to sell their output to the market. All losses and profits are borne by yourself.

Actors compete in the supply chain so that they can maintain their position in the chain. The oligopolistic market structure in the broiler chicken industry indicates that actors with large capital can compete in determining live bird prices. This is one of the allegations regarding the practice of determining prices in the broiler chicken supply chain in Indonesia. This condition needs to be proven by research into these allegations so that pricing practices in this industry can be known (Baba et al., 2021). No one has ever researched research like this before, so the results of this research can be used as novelty or the latest in science and knowledge. Therefore, the aim of this research isto analyze contestation between actors in the supply chain in relation to fluctuations in live bird prices in Indonesia.

## 2. LITERATURE REVIEW

This section explores related literature on supply chains influencing price fluctuations. The point of reviewing these works is to provide a more basic understanding of this research

### 2.1 Supply Chain

According to (Daryanto 2022; Elsedig et al., 2015), the competitive performance of the poultry industry depends on a global supply chain with a high level of global connectivity and must be able to increase its comparative advantage. In the global value chain, the value chain activities of the poultry industry are integrated from breeding (Great Grand Parent Stocks/GGPS, Grand Parent Stocks/GPS, Parent Stocks/PS), feed/medicine, cultivation (on-farm), distributor, processing and final consumers (Bukhori et al, 2015; Saptana et al, 2016; Prayugo et al, 2012; Syam, et.al, 2019).

Vertical integration of the broiler chicken supply chain implies coordination and collaboration between several actors (Brevik et al, 2020). Along with the development of increasingly complex supply chains, model optimization is needed to improve efficiency and competitive market performance (Pla et al, 2014; Rodríguez et al, 2012). Broiler chicken supply chain players, both in Indonesia and abroad, have the same system, namely the supply chain is formed from vertical integration (Brevik et al, 2020; Mua'zu et al, 2013). Supply chain actors become a unified network from upstream to downstream and are all linked in the supply chain system. The integrator's strength in controlling production inputs, such as DOC and feed, also has cultivation companies, transportation and processing companies so that with this system efficiency can be created.

The complexity of the broiler chicken supply chain has many challenges that can result in failure to manage the supply chain. Considering that the supply chain consists of activities carried out by several business actors, managing it is not easy. This complex system is a combination of a number of elements that influence each other dynamically, when the number is small it does not have much influence but when the number becomes larger it will greatly influence the running system (Cilliers, 2002). The complexity of the broiler chicken supply chain is built by a number of actors who have their own habitus and use their capital (economic, cultural, social and symbolic) in the broiler chicken supply chain as an arena by carrying out a number of social practices and contestations in playing with prices so that the prices formed are not completely because of the balance of demand and supply but because of the actors who play a role.

### 2.2 Price Fluctuations

According to Yohanes Surya, price fluctuations are changes in the rise and fall of a variable that occur as a result of market mechanisms (Ismail, 2022). Fluctuation theory is formed from the law of supply and demand that occurs in the market . According to the law of demand, the higher income, the more consumers spend that money. Vice versa, as income decreases, the less money is spent. From the law of supply and demand, it can be concluded that if prices experience uncertainty, income will decrease or vice versa. Dornbusch describes the "four elements" of the recovery cycle (upward movement) - peak (peak point) - recession (downward movement) - trough (lowest point) (Edward, 2019; Puspitasi, et.al, 2019).

### 2.3 Research question

The following research questions guided the primary objectives of this study.

1. What is the Supply Chain Model for the Poultry Industry in Indonesia?
2. How are Actors Contested in the Broiler Chicken Supply Chain Arena?
3. How are Actors Contested in the Live Bird Market Arena?

## 3. RESEARCH METHODS

### 3.1 Research design

This research describes and explains the phenomena that are the object of study, namely the characteristics and contestation capacity of broiler chicken supply chain actors in relation to price fluctuations of broiler chickens (live birds) (Fausayana, 2017; Miles and Huberman, 1992). The case unit in this research is the broiler chicken supply chain system with a focus on contestation between actors in relation to fluctuations in live bird prices, both nationally and at provincial level. The social practice theory approach is applied in this research as a design model in determining habitus, capital and arena in broiler chicken chains.

3.2 Determination of Research Locations and Informants

The locations chosen for this research were the national and provincial levels, namely West Java,Central Java, East Java, North Sumatra and South Sulawesi. The province chosen is a center for broiler chicken production. The research informants consisted of 1-2 top management people at the GPS company at head office, 1-2 leaders of commercial farms in the province, 1-2 representatives of breeder associations (Gopan or Pinsar) in the province, one integrator partnership breeder in the province, and one independent farmer.

3.3 Data collection technique

This research uses primary and secondary data. Primary data collected through in-depth interviews is used to reveal data about actor identity, actor interests, actor power, roles played by actors in the running of the broiler chicken supply chain system and formation of live bird prices. Interviews were conducted with integrator companies, commercial farms integrators, integrator partnership breeders, independent actors, plasma breeders, brokers and live bird collectors. Secondary data was collected through various documents from the Directorate General of Animal Husbandry and Animal Health, Central Statistics Agency, as well as reports related to research (Mappa, et.al, 2018).

3.4 Analysis Method

The data analysis technique in this research follows the data analysis flow according to Creswell and Poth (2018). The data analysis steps are as follows.

a. Data coding for context analysis. The context in this research is the supply chain system and the formation of live bird prices as an arena for ongoing actor contestation. Supply chain analysis was carried out descriptively by following the flow of broiler chicken and live bird products from breeders to consumers at production centers.

b. Inter-case analysis. The analysis between cases in this research includes a comparison of the supply chain system in the West Java case; Central Java; East Java, North Sumatra and South Sulawesi. The comparison between cases is mainly focused on actor identification, the number of actors and the variety of actors involved in the supply chain system.

c. Theme analysis. The themes analyzed in this research are the interests of actors, the influence of actors, and the role of actors in forming live bird prices in the supply chain system in each broiler chicken producing center area. In each case, actors will be mapped based on the type and level of influence, type and level of importance so that actors can be identified in classifications: high influence-high interest, high influence-low interest, low influence-high interest, and low influence-low interest. After that, each category of actor is analyzed for the ways they use to fight for their interests based on the strength of their influence to play a role in the supply chain system and the formation of live bird prices.

d. Analysis between themes. Inter-theme analysis is intended as an analysis of the relationship between themes in each case and a comparative analysis between cases related to these themes so that similarities and differences in theme characteristics between cases are found which allows theoretical construction regarding actor contestation in the formation of live bird prices.

In this research, an analysis of the average price of live birds at the breeder level and the price of live birds at the wholesale level in each province was also carried out. The analysis used is price trend analysis from January to the first week of December 2023.

## 4. RESULTS AND DISCUSSION

4.1 Poultry Industry Supply Chain Model in Indonesia

In general, the broiler chicken supply chain model at the national level can be seen in Figure 1. This illustration reflects the actors involved in the supply chain network, namely DOC GPS suppliers, DOC PS suppliers, DOC FS suppliers, FS cultivators, and live bird market players (LB).

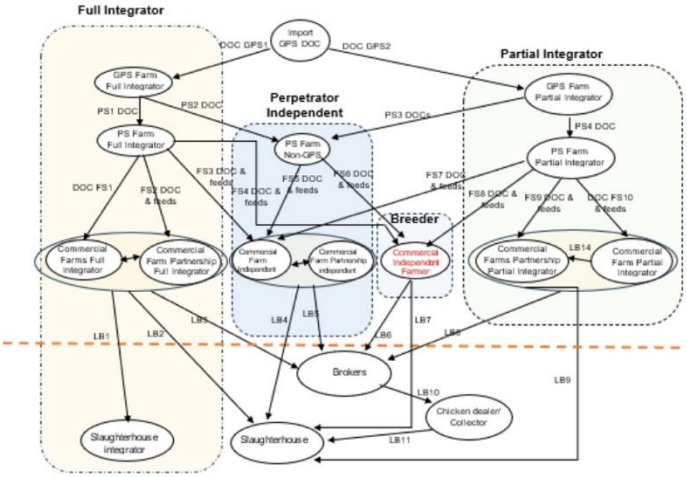


Figure 1. Supply Chain Models from DOC GPS to Live Bird

Figure 1 shows an overview of the national broiler chicken business system. In this picture, it is divided into two actors, namely LB supply actors and LB market players. LB supply actors are divided into 4 actors, namely full integrators, partial integrators, independent actors and breeders. Full integrators are actors who are vertically integrated starting from GPS farms to RPHU, Partial Integrators are actors who are vertically integrated starting from GPS farms only to cultivation companies, independent actors arepurebred chicken cultivation business actors who have PS and/or do not yet have PS are vertically integrated with FS cultivation business actors independently, and breeders are purebred chicken cultivation business actors who are not integrated with full integrators or partial integrators or independent actors .

There are two business integrations involved, namely vertical and horizontal integration. Vertical integration is full integrator and partial integrator. Vertically integrated companies control all stages from livestock breeding and hatchery to growth, processing, and marketing (Vukina and Zheng, 2015). Horizontal integration is for independent actors and breeders because the procurement of DOC PS and feed is supplied by full integrators/partial integrators using a buying and selling system only. Based on these two integrations, this could indicate that actors who are vertically integrated will gain privileges in obtaining the availability of feed production inputs and DOC as well as prices compared to actors who do not have integration with full integrators and partial integrators.

GAn illustration of the number of business actors can be seen in Figure 2. In this figure the number of GPS breeding companies is less than that of PS and FS companies. The number of GPS breeding companies is smaller because they have to meet standards set by the government. The government opens opportunities for all companies, cooperatives or

other actors to manage DOC GPS. Therefore, these companies have the opportunity to gain access to overseas chicken genetic companies producing DOC GPS.

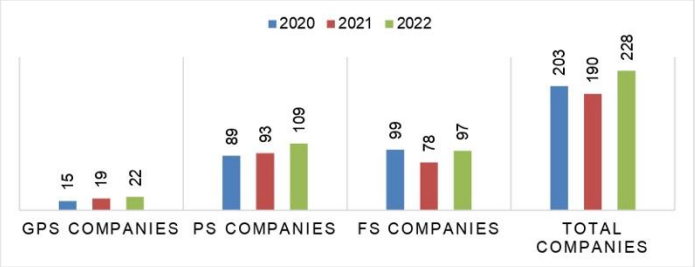


Figure 2. Number of Broiler Chicken Companies

(Source: Ministry of Agriculture, 2023)

4.2 Actor Contestation in the Broiler Chicken Supply Chain Arena

Mapping actor contestation in the broiler chicken supply chain system reflects the ability of actors to contest in the broiler chicken supply chain. Control of production inputs (DOC and feed) and integration/affiliation of actors are important factors in contesting. Broiler chicken supply chain actors are full integrators, partial integrators, independent actors and breeders.Munro (1993) emphasized that the position of integrators as actors in the poultry supply chain arena is determined by the volume and composition of capital they have, and the struggle in the arena occurs to accumulate several forms of capital. Integrators have an important role in the broiler chicken supply chain because these integrators have resources that independent actors or breeders do not have.

In Indonesia, integrators are divided into 2, namely full integrators and partial integrators. Full integrators have integrated actors from upstream to downstream, namely feed factories, PS farms, FS farms, commercial farms, partnerships and RPHU. A partial integrator is an actor who only has some of the factors or is not as complete as a full integrator. Table 1 shows the full and partial integrators in the broiler chicken supply chain. All actors are companies, both domestic companies and Multinational Corporations (MNCs). The number of integrator companies is 22 companies.

Table 1. List of Full and Partial Integrator Companies in Indonesia

| No | GPS Company | Mastery of Production Input and Actor Integration | | | | | |
|---|---|---|---|---|---|---|---|
| | | Feed Factory | PS Farm | FS Farm | Commercial Farm | Partnership | RPHU |
| A | **Full integrator** | | | | | | |
| 1 | PT. Charoend Phokphand | √ | √ | √ | √ | √ | √ |
| 2 | PT. Japfa Indonesia | √ | √ | √ | √ | √ | √ |
| 3 | PT. Indonesian Seeds | √ | √ | √ | √ | √ | √ |
| 4 | PT. Januputera Sejahtera | √ | √ | √ | √ | √ | √ |
| 5 | PT. Cibadak ISF | √ | √ | √ | √ | √ | √ |
| 6 | PT. Explore Nasuba | √ | √ | √ | √ | √ | √ |
| 7 | PT. Sido Sari Multifarm | √ | √ | √ | √ | √ | √ |
| 8 | PT. Widodo Makmur Poultry | √ | √ | √ | √ | √ | √ |
| 9 | PT. Super Poultry Jaya | √ | √ | √ | √ | √ | √ |
| 10 | PT. Sreeya Sewu Indonesia | √ | √ | √ | √ | √ | √ |

| No | GPS Company | Mastery of Production Input and Actor Integration | | | | | |
|---|---|---|---|---|---|---|---|
| | | Feed Factory | PS Farm | FS Farm | Commercial Farm | Partnership | RPHU |
| | | | | | | | |
| **B** | **Partial integrator** | | | | | | |
| 1 | PT. Be independent | | √ | √ | | | √ |
| 2 | PT. Obedient Beautiful Shining | | √ | √ | √ | √ | √ |
| 3 | PT. Wonokoyo JC | √ | √ | √ | √ | | √ |
| 4 | PT. Mother Nature's Beautiful Work | | √ | √ | √ | √ | √ |
| 5 | PT. Hybro Indonesia | | √ | √ | √ | √ | √ |
| 6 | PT. CJ-PIA | √ | √ | | | | |
| 7 | PT. Borneo Jaya Animals | | √ | √ | | | √ |
| 8 | PT. Reza Mighty | | √ | | | | √ |
| 9 | CV. Missouri | √ | √ | √ | | | √ |
| 10 | PT. Intan Jaya Abadi | | √ | √ | √ | √ | √ |
| 11 | PT. Create Superior Light | √ | √ | √ | √ | √ | |
| 12 | PT. Dynamics of Megatama Citra | √ | √ | √ | √ | √ | √ |

The integrator company has the ability to import DOC GPS and manage or raise DOC GPS as a prospective parent to produce DOC PS. The average maintenance from DOC GPS to culling is an average of 65 weeks with the average productivity of one GPS parent producing 60 DOC PS. Likewise, DOC PS maintenance is up to 65 weeks of culling and the average productivity of one PS parent can produce 150 DOC FS. The GPS company contributes to providing DOC FS whose output is live bird (LB) which will be consumed by consumers. By mastering the production input in the form of DOC, this becomes a separate point for determining the DOC FS price.

Table 1 shows that several GPS companies have poultry feed factories or are affiliated with feed companies, either for the production of grower, layer or finisher feed for both GPS, PS and FS maintenance. Generally, every purchase of DOC PS or DOC FS from a GPS company will be included with the purchase of feed from that company. The main feed ingredient for chickens is corn which reaches 40-50%. The need for corn for feed factories is 12.5 million tons per year. If domestic corn production drops, companies will import corn from China and/or the United States. Apart from corn, other feed ingredients are soybean meal, rice bran and others. All these feed ingredients depend on the season, so if there is a decrease in production it will cause the price of these feed ingredients to increase. This is the next point that large companies can determine feed prices.

Based on these two things, the actor who has strong contestation in determining LB prices is the integrator actor who has 2 input resources, namely feed and DOC. These two production inputs are important factors in cultivating DOC FS. Feed is an important factor in broiler chicken cultivation because feed costs dominate the operational costs of broiler chicken cultivation, amounting to 60-70% (Thirumalaisamy et al., 2016).The results of an interview from one of the top management of a broiler chicken company in Indonesia stated that:

“DOC and feed prices are determined by the head office in Jakarta. "The price of DOC and feed is different in each province."

Regarding the DOC and feed pricing system by integrator companies, each province has different feed ingredient production potential. If the area is a rice producer, bran

production will automatically be abundant, as will other feed ingredients such as corn. On the other hand, there are several areas where labor and transportation costs are cheaper compared to other provinces, so that the resulting LB output will be cheaper than other provinces. These two production input factors greatly determine LB price fluctuations on the market. In integrator companies, there are several companies that are pioneers in the poultry industry in Indonesia so that these companies have quite a long experience in this industry, including mastery of technology, cultivation and markets. This experience becomes important capital in contesting these actors in the broiler chicken supply chain in Indonesia. The capabilities of the integrator company will be transmitted to its branch companies or those affiliated with the integrator in each province (Junaidi, Masdar, et al., 2024; Miar et al., 2024).

The results of supply chain surveys in producing regions, such as West Java, Central Java, East Java, North Sumatra and South Sulawesi show that the broiler chicken supply chain system has the same supply chain model, as seen in Figure 4. Representative companies (Commercial farms) in The province is tasked with maintaining DOC FS directly, and distributing DOC FS and feed to partnership breeders affiliated with the company, as well as to breeders or cultivation companies outside the integration.

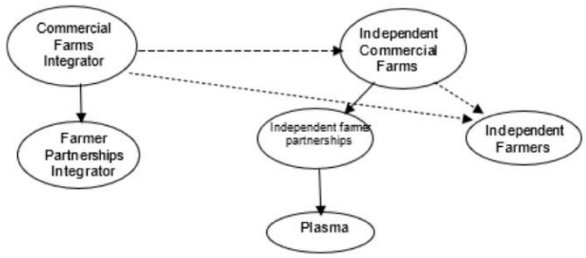


Figure 4 Broiler Chicken Supply Chain Model in the Study Area

(Dotted line outside integration)

The role of each actor or supply chain actor in the province in determining the prices of DOC FS, feed and live bird (LB) can be seen in Table 2. In this table it is shown that the price determiner for DOC FS, feed and LB or the price setter is the integrator company or parent company. All supply chain actors under it, including commercial farm integrators, are only price takers. The results of interviews with independent palaku or associations stated that:

"The price of DOC FS and feed for partnership breeders is set by the DOC and feed supplier company, independent actors and breeders only accept the price set by the company. "Integrated business actors will be given cheaper prices compared to cultivation actors outside of affiliation or integration."

Table 2. Determination of DOC FS and Feed Prices in Sample Provinces

| **Supply Chain Actors*** | **Determination of DOC FS prices** | **Determination of feed prices** | **Determining live bird prices** |
|---|---|---|---|
| a. Full and Partial Integrator | Price setter**) | Price setter | Price setter |
| b. Commercial farms integrator | Price taker***) | Price takers | Price takers |
| c. Farmer partnership integrator | Price takers | Price takers | Price takers |
| d. Independent Commercial Farms | Price takers | Price takers | Price takers |

| | | | |
|---|---|---|---|
| e. Independent farmer partnership | Price takers | Price takers | Price takers |
| f. Plasma | Price takers | Price takers | Price takers |
| g. Independent farmer | Price takers | Price takers | Price takers |

Notes:

*) Actors in the provinces of West Java, Central Java, East Java, North Sumatra and South Sulawesi

**) Price setting is the most important and complicated process considering the company environment and competition so that the price set becomes the reference price (Cataluña et al, 2019)

***) Price taker is the price accepted by business actors as is (Anufriev and Kopányi, 2018)

4.3 Actor Contest in the Live Bird Market Arena

The description above relies on mastery of production inputs in the broiler chicken supply chain system, such as DOC FS and Feed. These two production inputs are the main production inputs for DOC FS cultivation. Control of production inputs has control over the prices of DOC FS and feed. Large capital determines control of production inputs. In accordance with Bourdieu's theory that in an arena there are sources of input as capital that facilitate the conquest of certain control (Vogt, Silva and Valle, 2021). It was further stated that capital is a resource that enables the conquest of power and determines a larger and more influential position in the field.

The broiler chicken supply chain arena is not limited to the supply flow of DOC, feed and live birds between supply actors in the supply chain, but also to actors marketing live birds as the output of broiler chicken cultivation. The DOC FS maintenance output is live bird, this output becomes a commodity that will be consumed by consumers after being processed first. Before processing, this output must be sold to live bird marketers. In this market arena, supply players face off against broiler chicken marketing players (Hadi et al., 2019; Hamdan & Basrowi, 2024; Mulyani & Basrowi, 2024). As in Figure 1, there are three actors marketing broiler chickens, namely brokers, chicken traders or baskets, and poultry slaughterhouses (RPHU). There are quite a lot of supply actors or market players, so the market structure that occurs when these two actors meet can be called a competitive market. A competitive market is a market structure where price formation occurs as a result of bargaining between supply players and the market, especially the live bird market (Alexandro & Basrowi, 2024b; Junaidi, Basrowi, et al., 2024; Yusuf et al., 2024).

This competitive market becomes an arena for contestation between supply actors and market players in determining prices. The two actors will pit themselves against each other in determining the live bird price. Supply players determine the selling price of live birds in cages based on how much they cost, while market players have the power in terms of market information and marketing networks. Market players have access to other supply chain actors to find prices so they can compare prices from one actor to another. The market player's decision is to make a deal with a supply player who provides a price below that of other market players. Apart from that, supply actors have the power to withhold supply to the market so that live bird products will be scarce on the market, causing prices to increase. On the other hand, supply actors can also reduce prices by over-supplying live birds (Alexandro & Basrowi, 2024a; Kittie & Basrowi, 2024; Purwaningsih et al., 2024).

Based on information on live bird prices at the producer level and prices at the wholesale level, it can be seen in Figure 5. Figure 5 depicts the average development of live bird prices in the provinces of West Java, Central Java, East Java, South Sulawesi and North Sumatra. In the picture you can see that both prices fluctuate from the first week of January 2023 to the first week of December 2023. However, in March - April 2023 there

will be an increase in prices, especially the price of live bird chickens at the wholesale level. The price increase is in line with the approaching month of Ramadan and Eid al-Fitr, which for Muslims are big holidays. In these months the prices of all basic commodities increase drastically. Usually, after the big holiday, the price of live birds will return to normal, but in May it decreases slightly and then rises again until the middle of the second week of July 2023. This increase can be caused by various factors, one of which is the increase in feed and DOC prices. Then, in the last week of November and early December 2023, there will be a decrease in live bird prices at the breeder level. In fact, the lowest price at the breeder level is IDR 14,000/kg live bird, even though the cost of goods sold at the breeder level is IDR 17,000/kg live bird. The results of a survey with breeder associations stated that:

"The price of DOC FS has decreased drastically from IDR 8000/DOC FS to IDR 4000/DOC FS. The decline in the price of DOC FS is due to the large company that owns the GPS having an oversupply of DOC FS so this is damaging the market price of live birds at the breeder level."

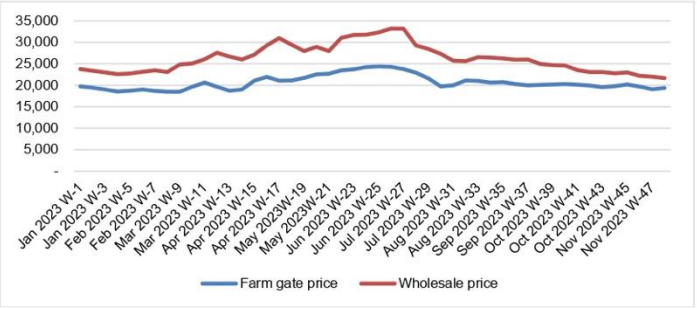


Figure 5 Development of Live Bird Prices at the Breeder Level with Live Bird Selling Prices at the Wholesale Level

The contestation between actors in the live bird market arena is quite interesting to discuss because there will be a shift in the demand supply curve until an agreement price is formed. Each actor has capital strength, be it economic capital or social capital. Broiler chicken supply chain actors have the power of economic capital in controlling production input resources. Meanwhile, live bird market players have social capital in the form of information networks and networks of market players and supply players. In the live bird market arena, market players are slightly more dominant in determining live bird prices because they have information networks and links to supply players, so that market players can detect profitable live bird price ranges. Meanwhile, broiler chicken supply chain actors do not have information about live bird prices among other supply chain actors or live bird prices between them cover each other because they compete with each other (Purwaningsih et al., 2019; Purwaningsih & Rahmanto, 2013).

This opportunity is used by market players to get the best prices. Supply players (integrators with a market >50%) are closed, so their supply strength is unable to influence market prices. The suggestion is that there should be openness between integrator companies as supply actors. The input components between integrators and independent farmers are different (efficiency) while competing in the same market, so there is a need to separate the market between integrators (which should sell to RPHU) and independent breeders. The LB supply chain is a competitive market because it involves many supply and demand actors so that the price mechanism is built on the basis of bargaining between supply and demand actors (competition market theory). The

government's role in competitive markets must be reduced in order to create a perfectly competitive market. However, with the existence of independent breeders/breeders, the presence of the government is needed to protect and empower independent breeders/breeders so that they are able to survive in market competition.

## 5. CONCLUSION

Based on the description above, it can be concluded that actor contestation in the broiler chicken supply chain arena is controlled by integrator companies due to ownership of DOC FS and Feed input sources, while actor contestation in the broiler chicken market arena is determined by the strength of each actor depending on the use of economic capital by supply chain actors and the use of social capital in the form of information networks and chain actor networks.

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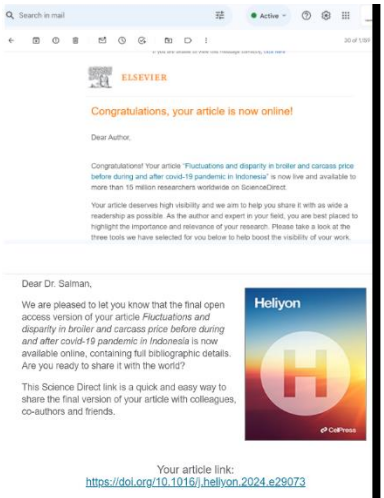
|---|---|---|---|---|---|---|---|---|
| Action Links | HELIYON-D-23-45669 | Fluctuations and Disparity in Broiler and Carcass Price Before During and After COVID-19 Pandemic in Indonesia | Other Author | Sep 27, 2023 | Mar 29, 2024 | Completed - Accept | Mar 29, 2024 | Accept |



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KEMENTRIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI
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SEKOLAH PASCASARJANA
Sekretariat lantai 3 Jl. Perintis Kemerdekaan KM. 10 Makassar, 90245

**SURAT KETERANGAN JURNAL**
Nomor: 3003/UN4.20/PJ.00.01/2024

Yang bertanda tangan di bawah ini menerangkan bahwa:

Nama : Agung Suganda

NIM : P023211005

Program Studi : Studi Pembangunan

Judul Jurnal : Fluctuations and Disparity in Broiler and Carcass Price before During and After Covid-19 Pandemic in Indonesia

Naskah tersebut telah diterima/*accept* pada **Heliyon Journal (ISSN: 2405-8440)** dan diterbitkan pada **Upcoming Issue Tahun 2024** yang telah terindeks **Scopus Q1** dan mempunyai **Impact Factor (IF) 0.62**

Makassar, 22 April 2024

a.n Dekan,
Wakil Dekan Bidang Akademik,
Dan Kemahasiswaan

Prof. Baharuddin Hamzah S.T., M. Arch., P.hD.
NIP. 19690308 199512 1 001

Heliyon 10 (2024) e29073

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

# Fluctuations and disparity in broiler and carcass price before during and after covid-19 pandemic in Indonesia

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ARTICLE INFO

*Keywords:*
Fluctuations
Disparity
Broiler
Carcass
Price

ABSTRACT

This study aims to analyze fluctuations and disparity in broiler and carcass prices before, during, and after COVID-19 pandemic in five broiler-producing regions in Indonesia, including North Sumatra, West Java, Central Java, East Java, and South Sulawesi. Weekly data series were used to analyze fluctuations and disparity before (2017–February 2020), during (March 2020–2022), and after (January–June 2023) COVID-19 pandemic. Furthermore, Coefficient of variation (CV) and convergence models were also used during the analysis. The results showed that broiler price fluctuations in the five study areas were categorized as "medium" before and during pandemic. After pandemic, the majority of the areas were in the "low" category, except for South Sulawesi province, where CV was 10.02%. Carcass price fluctuations were categorized as "low" and "moderate" before and during COVID-19 pandemic. After the viral outbreak, all the provinces investigated in this study were classified as "low". This indicated that the variability in carcass price decreased across all provinces after pandemic. The coefficient value of $\beta 1$ was less than 1 indicating that broiler and carcass price did not show significant disparity between regions at all periods. The primary drivers of fluctuations and disparity were related to production and availability factors, and the government played a role in maintaining stability in producing areas.

## 1. Introduction

Coronavirus disease 2019 (COVID-19) is a highly contagious disease that poses a severe threat to global public health, having been declared pandemic crisis worldwide [1]. COVID-19 has plunged the world into deepest recession with unprecedented levels of poverty, deprivation, and unemployment making them more volatile and has left an indelible mark on countries across the globe, including Indonesia [2,3]. Furthermore, its adverse effects have extended into the poultry industry, creating significant challenges across various segments of the supply chain. From the perspective of producers, the decrease in consumption demand has led to a corresponding decline in poultry production [4].

The poultry industry, especially broiler industry, is an industry with quite large capitalization and is integrated from upstream to downstream, including breeding (Great Grand Parent Stocks/GGPS, Grand Parent Stocks/GPS, Parent Stocks/PS), feed/medicine, cultivation (on-farm), distributors, processing and final consumers has faced formidable obstacles due to this pandemic, despite its

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https://doi.org/10.1016/j.heliyon.2024.e29073
Received 27 September 2023; Received in revised form 25 March 2024; Accepted 29 March 2024
Available online 6 April 2024

relatively resilient economic cycle [5]. One of the most significant challenges in the poultry supply chain has been the catastrophic impact of COVID-19 [6]. This pandemic has led to disruptions in production levels, shifts in customer demand and product access, as well as economic challenges for broiler breeders and traders [7–11]. The reduced demand for broiler chickens will certainly disrupt the production process starting from DOC, production and marketing processes, where the broiler industry is a living thing industry that has perishable properties. The impact on poultry demand and production has been continuously observed in Bengkulu Province. Recent data showed that there was a decrease in chicken demand from 2019 to 2020 (509385–498367 chickens), as evidenced by the reduced number of chickens sold in 2020 [12]. This decreased demand is consistent with the broader trends observed during pandemic, where various factors such as lockdowns, reduced consumer spending, and supply chain disruptions have reshaped consumption patterns [10].

The impact of COVID-19 on the global poultry industry has been significant and widespread, extending well beyond the borders of Indonesia and affecting several countries around the world. This sector also grapples with an array of challenges caused by pandemic, including disruptions within supply chains, shifts in consumer demand, and labor shortages. Several global studies examining the association between COVID-19 and the poultry sector have emerged from countries, such as India [7,13], Canada [14,15], China [14], Nigeria [16], Iran [8], Kuwait [17], United Kingdom, Italy, Brazil, Germany, Saudi Arabia, Egypt [18], Myanmar [19], USA [18,20], and Poland [21]. The global chicken meat trade has experienced a 4% decline due to the impact of COVID-19 on the poultry supply chain, aligning with broader trends and challenges faced by the poultry industry, as observed in Canada and the USA [15,22]. Poultry supply chains are severely constrained by restrictions on human movement and logistics [14,17,23]. In Bangladesh, the sector suffered damage due to COVID-19 pandemic, with the implementation of a lockdown and rumors suggesting that poultry and their products can transmit diseases [23]. The combination of production and transportation disruptions, decreased consumer demand and market uncertainties created significant challenges, causing the permanent closure of several farms [23,24]. Furthermore, a significant loss of up to 1.35 billion US$ was recorded in just two weeks from 20 March to April 4, 2020 [25]. As of August 2020, Brazil reported approximately 50,000 cases among poultry workers, while India experienced $3 million in losses [7]. This situation raised concerns about the potential occurrence of a food crisis due to the collapse of the livestock sector during pandemic. In the USA, the impact of COVID-19 was also felt by workers in the meat and poultry processing industry [22]. DOC production in the US decreased significantly in April and May 2020 compared to the previous year [4]. Consequently, the global COVID-19 pandemic had a significant impact on broiler farms, especially the commodity price.

COVID-19 pandemic has caused significant challenges, including rising production costs and selling price, exerting immense pressure on poultry meat consumers [15]. The shortage in broiler supply can lead to an increase in price of broiler chickens, both live and carcass. This condition can be attributed to the fundamental economic principle of supply and demand, as well as the concept that price serves as an indicator of the relationship between both factors [26,27]. Price is a dynamic and multifaceted element within the marketing mix and it extends beyond being a simple number on a label. Furthermore, it is responsive to changes in supply and demand, competitive forces, economic conditions, and consumer preferences. Businesses often adjust their price to remain competitive, capture market share, or respond to shifts in the market environment. According to previous studies, it can take on several forms and serves develop their marketing strategy around three keydimensions: (1) standardization-adaptation, (2) configurationcoordination, and (3) strategic integration [28]. This element also plays a crucial role in shaping the perceived value of a product or service. Therefore, price can be narrowly defined as the amount of a customer pays for a product or the sum of the values that consumers exchange for the benefits of using a product [29].

The scarcity of supply of broiler chickens serves as an indicator of potential increases in chicken carcass price in the market. Chicken carcass are derived from broiler after various processing steps, including the removal of feathers, viscera, organs, heads, and feet [30,31]. Disruptions in the goods distribution system due to health protocols often lead to a lack of supply of these commodities. As COVID-19 cases decrease and restrictions are lifted, various industries, including broiler and chicken carcass industries, have the opportunity to fully resume their operations. Several studies have shown that when supply is ample and meets or exceeds the demand from consumers and other buyers, it can lead to a decrease in price. This is because suppliers find themselves with more products available than buyers are willing to purchase at the current price levels. Consequently, suppliers can reduce the value of their products to stimulate demand and encourage more purchases. A decline in chicken carcass price has a positive impact on the inflation rate, and it is generally considered beneficial for the government and the overall economy. Designating chicken meat as a strategic food commodity subject to monitoring for price fluctuations and disparity is a common practice by governments to ensure food security, stabilize price, and protect consumers. This designation reflects the importance of chicken meat as a staple protein source and recognizes its significant role in the overall food supply chain.

Strategic food commodities play a crucial role in shaping inflation figures, particularly within categories of goods, such as foodstuffs or volatile items [32,33]. A stable and sufficient supply of these commodities helps to prevent sudden spikes and fluctuations, thereby promoting price stability in the market. Maintaining a steady supply helps to avoid supply-demand imbalances that can contribute to inflation. The government contributes to controlling inflation rates by managing the availability of essential food items such as broiler [34].

According to previous studies, the government actively plays a role in maintaining stable price for broiler chickens to control fluctuations and disparity. Stability is important to ensure that consumers have access to affordable food, and producers continue to operate profitably without facing extreme fluctuations. Price variations in commodity markets, including broiler chickens. are often caused by the interplay between supply and demand dynamics [35]. Fluctuations in the value of food commodities are a common challenge in several countries, including Indonesia. This condition can be attributed to various factors, such as changes in supply and demand, weather conditions, market speculation, and the economy. The list of commodities, such as rice, corn, chicken meat, broiler eggs, shallots, sugar, garlic, cayenne pepper, meat, red chili, and cooking oil represents a range of essential food items, each with its

unique set of influencing factors [36]. Weather events, diseases, supply disruptions, and other factors have been reported to have cascading effects on crop yields and availability, leading to shortages and price increases. This is especially critical for essential items, including chicken meat, which is a staple protein source for many people. Governments often prioritize the stability of strategic food commodities to ensure that the population has access to affordable and reliable sources of nutrition. Results have shown that studies on the impact of COVID-19 on broiler industry have primarily focused on the aspects of production and supply chain. These include studies conducted by Ref. [4] in Mississippi [19], in Myanmar [37], in the European region, and [38] in Indonesia. Research results in Indonesia show that there is negative price transmission at the farmer and consumer levels as a result of market power by the poultry industry [39].

Price disparity refers to significant differences in price of goods or commodities based on a range of factors, such as time, location, consumer segment, demographic factors, infrastructure support, and supply-demand variations [40]. Disparity is measured by the difference between the highest price and the average national price [41]. Furthermore, it can be interpreted as a positive or negative difference between domestic market and international price [42]. It also refers to the variation or difference in price of a commodity compared to a standard or reference price, which can be at different geographical levels, including local, regional, national, or international. This variation often occurs due to a range of factors, including production cost, public policy, scarcity of goods, local market conditions, supply and demand dynamics, infrastructure support, length of supply chains, geographical barriers, transportation costs, taxes, tariffs, and other economic and regulatory factors [43].

Investigating price fluctuations and disparity in this context is crucial in identifying price gaps between regions to maintain stability. This is important for the government as a staple food value stabilizer in maintaining a balance between supply and demand for broiler chickens and their carcass. Based on previous reports, price fluctuations and disparity are terms used to describe pricing phenomena in real market conditions, especially the value of broiler and carcass chickens. These phenomena are influenced by a complex interplay of various factors, and understanding the dynamics is essential for businesses, policymakers, and consumers. Therefore, this study aims to analyze fluctuations and disparity in broiler price at the farmer level and broiler carcass at the consumer level before, during, and after COVID-19 pandemic in Indonesia. The results are expected to provide valuable insights into the impact of pandemic on the poultry industry and the broader economy.

## 2. Material and methods

### 2.1. Study locations and data collection

Location determination was based on the consideration of the largest population of broiler chickens in Indonesia, namely the provinces of West Java, Central Java, East Java, South Sulawesi, and North Sumatra (Fig. 1). Furthermore, these provinces were also the regions with the highest number of consumers in the country.

This study collected both primary and secondary data, where the primary data referred to information that was directly collected from original sources. Meanwhile, the secondary data consisted of information that had been collected and published by an individual or institution. In this study, primary data were gathered through interviews with informants, specifically broiler farmers and traders. The interview results with these informants served as a crucial component in supporting the data analysis and overall results. Secondary data was a time series dataset collected from the Directorate General of Livestock and Animal Health, Ministry of Agriculture, and Central Bureau of Statistics to provide historical trends and patterns in poultry farming and trading. The data collected were the average price of broiler and carcass series per week before (2017–February 2020), during (March 2020–2022), and after COVID-19 pandemic (January–June 2023).

### 2.2. Analysis method

Analysis of coefficient of variation (CV), and convergence models was used to detect price fluctuations and disparity. CV calculated as the ratio of the standard deviation (SD) to the mean price ($\bar{X}$), provided a quantitative measure of relative variability by following the formula:

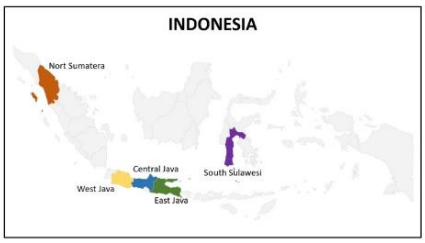


**Fig. 1.** Location study (using various colors).

$$CV = \frac{SD}{\overline{X}} \quad (1)$$

The smaller CV, the lower the level of price fluctuations and vice versa [44]. CV value of >25 percent indicated that there was fluctuations, while CV < 25 percent showed smaller variation. According to Ref. [45], price variations were grouped based on CV, namely: CV = 0: not critical fluctuations; CV < 10 percent: low; 10 percent ≤ CV < 20 percent: moderate; 20 percent ≤ CV < 30 percent: high; and over 30 percent: very high. This CV value was used to detect price fluctuations at the study locations before, during, and after COVID-19.

Disparity in live bird price at the farmer level and broiler carcass price at the consumer level was determined using the convergence model with the following formula [41]:

$$\boldsymbol{P}_{it} = \boldsymbol{\beta}_1 \boldsymbol{P}_{t-1} + \boldsymbol{\beta}_2 \boldsymbol{P}\boldsymbol{X}_{it} + \boldsymbol{\varepsilon}_{it} \quad (2)$$

where: $P_{it}$ is price of broiler or carcass at the regional level (rupiah); $P_{it-1}$ is price at the regional level in the previous period (rupiah); $PX_{it}$ is price of broiler (live bird) or carcass at the national level; $\beta_1$ is the convergence coefficient; $\beta_2$ is the coefficient of the national broiler or carcass price variable. When the coefficient $\beta_1 < 1$, there was no convergence or price disparity. This formula was a multiple regression used to measure price disparity in each region where $P_{it-1}$ reflected commodity value in the area and $PX_{it}$ was commodity price at the national level. Therefore, price conditions in the regions reflected disparity compared to national commodity price, as seen from the coefficient value $\beta_1$.

## 3. Results and discussion

### 3.1. Broiler chicken population in Indonesia

The development of broiler population in Indonesia could be seen as a response to the rapid demand for broiler chickens. Furthermore, these animals served as a primary source of meat for consumption in several countries, including Indonesia. As the population grew and consumer preferences shifted, there was a need to increase poultry production to meet the rising demand for protein-rich meat. The growth of broiler industry in Indonesia, as well as in other countries, could be facilitated by an integrated farming industry and investments, including those from foreign investors [38,46,47]. An integrated method comprised various stages of broiler production, from breeding and hatching to raising and processing, being managed by a single entity or under a coordinated system. This could lead to improved efficiency, quality control, and supply chain management, contributing to the rapid development of the sector.

Fig. 2 showed the history of the poultry population in Indonesia, including local, layer, as well as broiler chickens, which were dominant. This is to illustrate the poultry industry map in Indonesia. Broiler chickens had been specifically bred and developed to efficiently and economically produce high-quality meat protein for human consumption. This industrial method was driven by the need to provide a cost-effective and accessible source of animal protein to meet the nutritional demands of a growing global population. The development of local chickens in several regions, including Indonesia, tended to be relatively stable compared to the growth seen in commercial laying hens and broiler populations. However, local species often had a smaller population size compared to these commercial breeds. Based on Fig. 2 Layer chickens continued to grow despite COVID-19 pandemic, compared to broiler, which experienced a decline. The decline could be attributed, at least in part, to the impacts of pandemic on the poultry industry.

### 3.2. Broiler and carcass chickens price before, during, and after COVID-19 in study locations

The development of broiler price in five locations in the period before (2017 to February 2020), during (March 2020–December 2022), and after COVID-19 pandemic (January–June 2023) is presented in Fig. 3. Fig. 3 shows the variation of broiler prices across five provinces as source areas for broiler production in Indonesia. Price of broiler chickens increased along with staple food items, and this could have implications for inflation in Indonesia. When price of a critical food item increased substantially, it could contribute to overall inflation, affecting the cost of living for consumers. Therefore, the Indonesian government was expected to make various efforts

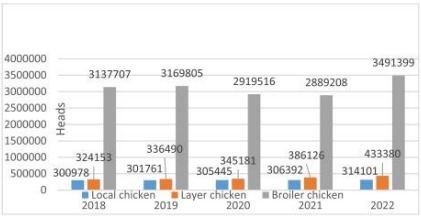


**Fig. 2.** Local chicken. Layer chicken. and broiler chicken population in Indonesia (Central Bureau of Statistics of Indonesia. 2023).


**Fig. 3.** The lowest and highest price of broiler chickens in study locations before. During. And after COVID-19 pandemic.

when price of broiler chickens continued to increase, such as regulating imports and exports, implementing price ceilings, providing subsidies, and conducting market operations.

Fig. 3 showed that the lowest price for broiler chickens before COVID-19 pandemic was IDR 9216/kg in Central Java Province. Furthermore, the province consistently had lower price compared to other provinces during and after pandemic. The highest value before, during, and after the viral infection was obtained in South Sulawesi. Competitive production input factor value could cause price in Central Java to be cheaper compared to other regions. The factors that caused inflation in South Sulawesi during these 3 periods included the cost of input production and transportation. Higher input costs could directly impact the overall cost of production, while increased transportation expenses increased the final price of broiler chickens.

The history of broiler and carcass price before COVID-19 pandemic in five location study is presented in Fig. 4. The five study locations are source areas for broiler production, so price fluctuations in these five areas can provide an overview of price fluctuations in other areas. Price during this period fluctuated greatly throughout 2017–February 2020 in all provinces. The seasonal increase in broiler (chicken) value, particularly during the Eid Al-Fitr celebrations, occurred in June from 2017 to 2019. Eid Al-Fitr was a significant religious holiday for Muslims that marked the end of Ramadan, a month of fasting and prayer. A consistent pattern of increases starting around two months before the Eid Al-Fitr holidays in both 2017 and 2018 was observed. This pattern suggested that the anticipation of increased demand during the holiday season caused increased price leading up to Eid Al-Fitr. In 2018, there was a notable and significant increase, particularly in the South Sulawesi Province. This upward trend actually began in October 2017 and culminated in a peak in July 2018. This phenomenon could be attributed to several factors, including high demand and supply constraints.

The historical data for carcass price, as depicted in Fig. 4, showed anomalies in the months of May and June 2019 across the provinces of West Java, Central Java, and East Java. During this period, although broiler price decreased, the value of carcass continuously increased. The participation of broiler collectors and brokers in managing the supply of these animals to carcass cutters and traders could contribute to the observed pricing dynamics. The relationship between broiler and carcass price, as influenced by the actions of these intermediaries, underscored the complexities of poultry market dynamics. These results suggested that when the

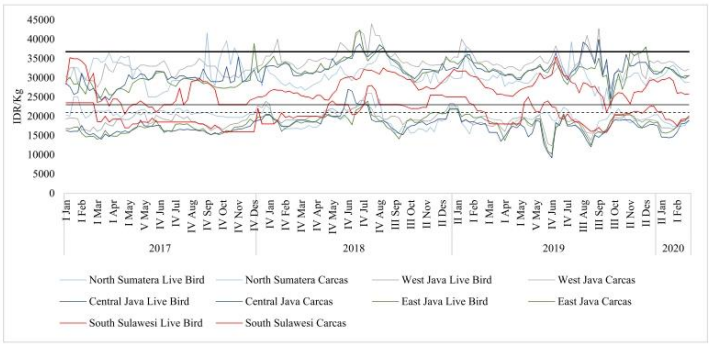


**Fig. 4.** Broiler and carcass price trends before COVID-19 pandemic at study locations.

supply of live broiler chickens became excessive, it led to decreased value, while that of carcass remained relatively stable or even increased in response to the growing demand before Eid Al-Fitr.

Price conditions before and during COVID-19 pandemic were significantly different due to the various measures taken to control the spread of the virus. The development of weekly price during pandemic is presented in Fig. 5. Fig. 5 illustrates the condition of broiler prices in the five production source regions. The increase in the value of these animals in the months leading up to Eid Al-Fitr in April 2020, 2021, and 2022 was likely a reflection of the seasonal demand surge associated with the holiday celebrations. Based on annual price fluctuations, the government of Indonesia managed fluctuations for broiler and carcass price by setting ceiling and floor values through the regulation. The issuance of Regulation Number 5 of 2022 by the National Food Agency of the Republic of Indonesia indicated a proactive effort to stabilize and control variations in the poultry market. The regulation was set in October 2022, where the floor and ceiling price were IDR 21000/kg and IDR 23000/kg, respectively. Meanwhile. The chicken carcass price was set at IDR 36750/kg. In Fig. 5, the observed broiler financial value had generally remained below the government's highest average price threshold of IDR 23000 per kilogram. The average price had also typically fallen within the range of the lowest price set by the government, which was IDR 21000 per kilogram.

At the end of 2022, the Government of Indonesia lifted activity restrictions because pandemic case was considered to be under control and continued to decline. This led to the revival of economic activity, including the poultry industry. Monitoring of broiler price movements after COVID-19 pandemic, which began in January–June 2023, seemed to be under control, as shown in Fig. 6. The figure provides an overview of broiler prices after the government announced Indonesia was free from the Covid-19 Pandemic. Therefore, Figs. 4–6 can explain the position of broiler prices before, during, and after the Covid-19 pandemic. Price control measures were set by the government for the poultry industry and the observation showed that the values generally stayed within the reference range. The figure also showed that price of broiler chicken carcass often followed the trends of live broiler chickens. The success of controlling the financial value of live broiler chickens and carcass, namely by regulating DOC broiler production in breeding companies can be carried out by maintaining a balance between availability and demand. This can be achieved through the early rejection mechanism of parent stock (PS) chickens above 52 weeks and cutting fertile eggs/hatching eggs (HE). The Indonesian government had taken a proactive method to maintain control over DOC (day-old chick) broiler production to achieve more lasting effects and benefits. By focusing on the early rejection mechanism for PS that was above 52 weeks old, the government aimed to further stabilize the poultry market.

### 3.3. Fluctuations in broiler and chicken carcass price before, during, and after COVID-19 pandemic

Fluctuations in commodity price referred to the variations in price of goods over time due to the influence of market mechanisms, supply and demand dynamics, and various external factors. Price of goods, including live broiler chickens and their carcass, were primarily influenced by the fundamental economic principles of supply and demand. These principles were the cornerstone of market economics and played a crucial role in determining the equilibrium price, where supply matched demand.

The results of the data series analysis fluctuation in broiler price for the three periods are presented in Tables 1 and 2. Table 1 provides an overview of the variation in broiler price fluctuations in the five study areas, while Table 2 provides an overview of the level of broiler price fluctuations in the five study areas. Before pandemic, the average price of broiler chicken at the producer level in Central Java and East Java was comparatively lower compared to other provinces. This price difference could be influenced by a variety of factors related to regional supply and demand dynamics, production costs, transportation, and market preferences. The range of CV values between provinces for the average price of broiler chicken ranged between 10.23% and 13.69%. This indicated that price fluctuations were categorized as moderate [45]. Central Java Province had a higher CV value compared to the other four

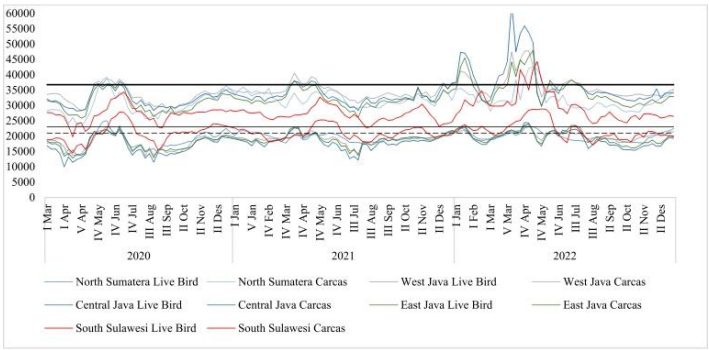


**Fig. 5.** Broiler price trends during COVID-19 pandemic in study locations.

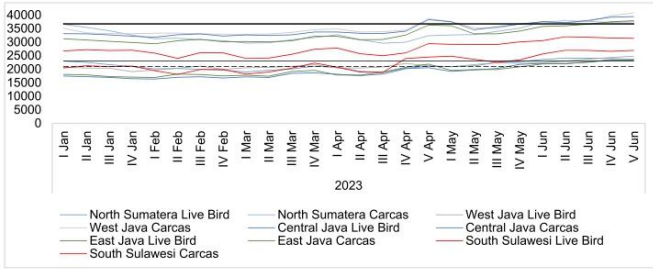


**Fig. 6.** Broiler price trends after COVID-19 in study locations.

**Table 1**
Average value, SD, and CV in broiler price variation in the period before, during, and after COVID-19 pandemic at study locations.

| Provinces | Before COVID-19 | | | During COVID-19 | | | After COVID-19 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | stand dev | coeff of var | mean | stand dev | coeff of var | Mean | stand dev | coeff of var |
| North Sumatera | 19696 | 2139 | 10.86 | 19392 | 2017 | 10.40 | 20543 | 1115 | 5.43 |
| West Java | 18989 | 1943 | 10.23 | 19100 | 2179 | 11.41 | 20714 | 715 | 3.45 |
| Central Java | 17463 | 2415 | 13.83 | 18080 | 2827 | 15.64 | 17922 | 1251 | 6.98 |
| East Java | 17873 | 2203 | 12.32 | 18775 | 2347 | 12.50 | 18507 | 1321 | 7.14 |
| South Sulawesi | 20371 | 2789 | 13.69 | 21268 | 2812 | 13.22 | 20867 | 2091 | 10.02 |

**Table 2**
Comparison of fluctuations rate of broiler chicken price before, during, and after COVID-19 pandemic at study locations.

| Provinces | Before COVID-19 | | During COVID-19 | | After COVID-19 | |
|---|---|---|---|---|---|---|
| | coeff of var | categorizing price fluctuations | coeff of var | categorizing price fluctuations | coeff of var | categorizing price fluctuations |
| North Sumatera | 10.86 | moderate | 10.40 | Moderate | 5.43 | Low |
| West Java | 10.23 | moderate | 11.41 | Moderate | 3.45 | Low |
| Central Java | 13.83 | moderate | 15.64 | Moderate | 6.98 | Low |
| East Java | 12.32 | moderate | 12.50 | Moderate | 7.14 | Low |
| South Sulawesi | 13.69 | Moderate | 13.22 | Moderate | 10.02 | moderate |

provinces before COVID-19 pandemic. This showed that the average price of broiler chicken in Central Java exhibited greater variability relative to its mean price compared to the other provinces.

Price fluctuations for broiler chickens before and during pandemic, along with the specific CV values showed that CV range was 10.23%–15.64%, as shown in Table 2. This indicated that during these periods, price fluctuations were categorized as moderate. Central Java Province had the highest CV value in both periods. After pandemic, most provinces experienced low fluctuations, except for South Sulawesi Province. Based on these results, price variability was generally mild and stable in most provinces.

Analyzing price data at the consumer level, specifically for broiler chicken carcass, offered valuable insights into how these price fluctuations impact the end consumers. This level of analysis helped to better understand the real-world implications of price variability and how it affected purchasing decisions and consumer behavior.

Tables 3 and 4 showed CV and categorization of price fluctuations in broiler carcass price in the five study provinces. Table 3

**Table 3**
Average value, SD, and CV of broiler chicken carcass price in the period before, during, and after COVID-19 pandemic at study locations.

| Provinces | Before COVID-19 | | | During COVID-19 | | | After COVID-19 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | stand dev | coeff of var | mean | stand dev | coeff of var | Mean | stand dev | coeff of var |
| North Sumatera | 30757 | 3055 | 9.93 | 31516 | 3413 | 10.83 | 31988 | 1920 | 6.00 |
| West Java | 33874 | 2860 | 8.44 | 34791 | 3377 | 9.71 | 34370 | 1680 | 4.89 |
| Central Java | 31697 | 2909 | 9.18 | 34364 | 5332 | 15.52 | 33645 | 1717 | 5.10 |
| East Java | 31451 | 3189 | 10.14 | 32725 | 4044 | 12.36 | 31586 | 1907 | 6.04 |
| South Sulawesi | 27186 | 3354 | 12.34 | 28070 | 3687 | 13.13 | 26592 | 1673 | 6.29 |

provides an overview of the variation in broiler carcass price fluctuations in the five study areas, while Table 4 provides an overview of the level of broiler carcass price fluctuations in the five study areas. The average broiler carcass price was lower in South Sulawesi compared to other provinces despite production not meeting demand. This indicated a complex interplay of factors influencing the poultry market. Furthermore, traders were capitalizing on the demand gap for broiler chicken meat in the area by supplying chicken carcass to the region. The use of the subsidized sea toll route from East Java to South Sulawesi was a significant factor that contributed to the lower price in the province. This arrangement leveraged the geographical advantage of South Sulawesi as a sea transportation hub for Eastern Indonesia, allowing efficient and cost-effective distribution of poultry products. The results showed that the area had a cheaper average weekly price for chicken carcass compared to other regions despite having CV values of 12.21% before COVID-19 pandemic and 13.13% during pandemic. Although the average price was lower, CV values indicated a certain level of variability around the average level. West Java had a consistently high average chicken carcass value compared to other provinces before, during, and after COVID-19 pandemic. Furthermore, this suggested a unique market dynamic for poultry products in the region. The situation could be influenced by a combination of factors that contributed to higher price.

### 3.4. Disparity in broiler chicken and broiler carcass price before, during, and after the recovery of COVID-19 pandemic

Price disparity referred to the difference between price of commodities in different regions compared to the national average price [40,41]. Price disparity of broiler chickens was analyzed using the Barro model with a multiple regression method. The model was statistically tested by using the F and R-sq test. The results of statistical tests on broiler and carcass price model showed that it had good fitness, with significance at $\alpha < 0.01$ and R-sq > 71%.

Disparity in broiler price before, during, and after COVID-19 pandemic is presented in Table 5. The table showed the R-sq values in the range between 71.50% and 95.20%. These values were considered statistically significant at a significance level ($\alpha$) of less than 0.01. Furthermore, they reflected the relationship between strong and very strong broiler price in a specific region compared to the national level [48]. The coefficient value ($\beta_1$) was below one ($\beta_1 < 1$) for the time periods before, during, and after COVID-19 pandemic. This showed that there was no significant disparity in the value at the regional level. Therefore, the government's implementation of various policies had effectively controlled price of broiler chickens by ensuring a balance between supply and demand in the study area. This was a positive outcome, as price stability could benefit both consumers and producers, leading to a more predictable and sustainable market environment.

Table 5 showed that there were two provinces with different price disparity values before and after COVID-19, namely North Sumatra and South Sulawesi. According to a previous report, South Sumatra and South Sulawesi had disparity close to one before the viral outbreak. A value of one or more indicated the occurrence of price disparity. The provinces of North Sumatra and South Sulawesi were both producers of broiler chickens, but their production levels were lower compared to other areas, such as Java (West Java, Central Java, and East Java). The post-COVID-19 price disparity values showed the occurrence of changes, with 0.74 for North Sumatra and 0.18 for South Sulawesi. The lower disparity could be attributed to the supply of chicken carcass from outside the province of South Sulawesi. This external supply seemed to have a controlling effect.

Disparity in broiler carcass price in the study areas before, during, and after COVID-19 pandemic is presented in Table 6. The R-squared (R-sq) values in the table were within the range of 73.40%–91.70%. These values were considered statistically significant at a significance level ($\alpha$) of less than 0.01. Price factor included in the model could determine whether there was disparity. Based on Table 6, there was no significant disparity in broiler carcass price across several provinces before, during, and after COVID-19 pandemic, as indicated by the coefficient value $\beta_1$ being less than 1. West Java exhibited a lower disparity value compared to other provinces. This lower value was characterized by $\beta_1$ being close to zero. This indicated that the region had been successful in controlling disparity. The incidence disparity in the provinces of North Sumatra and South Sulawesi were similar to those of live broiler. Furthermore, broiler carcass supply from East Java was the key to controlling the variations in South Sulawesi.

The results of this study were in line with [49], that the income of broiler meat sellers after pandemic at Mesir market was still under control. The profitability of selling broiler chicken meat indicated that the business was currently in a profitable position. These results were inconsistent with [12] in Bengkulu and [50] in Bangladesh, that price of chicken meat during COVID-19 pandemic was more volatile compared to the pre-pandemic period. Studies on fluctuations and price disparity for broiler chickens and meat in Indonesia were still rarely carried out. Furthermore, the existing papers were limited to certain regions or provinces and were based on assumptions, rather than real price data in the field.

## 4. Conclusion and implications

In conclusion, fluctuations in broiler price before and during COVID-19 pandemic in the provinces of North Sumatra, West Java, Central Java, East Java, and South Sulawesi were categorized as moderate. Meanwhile, fluctuations were generally low across most provinces during the post-pandemic period, except for South Sulawesi, with CV of 10.02%. The patterns of variation in broiler carcass price in different provinces before, during, and after COVID-19 pandemic were categorized between the low and medium categories. After COVID-19 pandemic, all provinces were in the low fluctuations category.

Disparity in broiler price before, during, and after the viral outbreak between the regions was characterized by a coefficient value of $\beta 1<1$, indicating the absence of significance. The coefficient value $\beta 1$, which related to the impact of a variable on broiler price and price disparity, was close to one in the province of South Sulawesi. Meanwhile, North Sumatra had a coefficient value $\beta 1$ close to one after the incidence. Similar results were obtained for broiler carcass price, where there was no disparity for this commodity in North Sumatra and South Sulawesi.

**Table 4**
Comparison of fluctuations rate of broiler carcass price before, during, and after COVID-19 pandemic.

| Provinces | Before COVID-19 | | During COVID-19 | | After COVID-19 | |
|---|---|---|---|---|---|---|
| | coeff of var | categorizing price fluctuations | coeff of var | coeff of var | categorizing price fluctuations | coeff of var |
| North Sumatera | 9.93 | low | 10.83 | Moderate | 6.00 | low |
| West Java | 8.44 | low | 9.71 | Low | 4.89 | low |
| Central Java | 9.18 | Low | 15.52 | Moderate | 5.10 | Low |
| East Java | 10.14 | Low | 12.36 | Moderate | 6.04 | Low |
| South Sulawesi | 12.34 | Low | 13.13 | Moderate | 6.29 | Low |

**Table 5**
Disparity in broiler chicken price before, during, and after the recovery from COVID-19 pandemic.

| Provinces | Before COVID-19 | | | During COVID-19 | | | After COVID-19 | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta_1$ LB | Sig | Rsq | $\beta_1$ LB | Sig | Rsq | $\beta_1$ LB | Sig | Rsq |
| North Sumatera | 0.66750 | 0.000 | 78.00% | 0.53872 | 0.000 | 86.30% | 0.7308 | 0.000 | 84.50% |
| West Java | 0.35234 | 0.000 | 80.50% | 0.21399 | 0.000 | 89.30% | 0.0362 | 0.000 | 71.50% |
| Central Java | 0.29074 | 0.000 | 80.00% | 0.08076 | 0.000 | 90.40% | 0.2320 | 0.000 | 86.90% |
| East Java | 0.43233 | 0.000 | 79.90% | 0.21541 | 0.000 | 90.00% | 0.0086 | 0.000 | 82.40% |
| South Sulawesi | 0.74436 | 0.000 | 82.40% | 0.68830 | 0.000 | 84.90% | 0.1788 | 0.000 | 95.20% |

Note: LB = Live bird.

**Table 6**
Disparity in broiler chicken carcass price before, during, and after COVID-19 pandemic.

| Provinces | Before COVID-19 | | | During COVID-19 | | | After COVID-19 | | |
|---|---|---|---|---|---|---|---|---|---|
| | $\beta_1$ LB | Sig | Rsq | $\beta_1$ LB | Sig | Rsq | $\beta_1$ LB | Sig | Rsq |
| North Sumatera | 0.55542 | 0.000 | 74.00% | 0.60265 | 0.000 | 76.70% | 0.6980 | 0.000 | 89.20% |
| West Java | 0.25347 | 0.000 | 73.80% | 0.06471 | 0.000 | 91.70% | 0.0055 | 0.000 | 91.30% |
| Central Java | 0.35958 | 0.000 | 73.40% | 0.13373 | 0.000 | 84.50% | 0.0694 | 0.000 | 82.60% |
| East Java | 0.45585 | 0.000 | 77.80% | 0.05922 | 0.000 | 90.60% | 0.0844 | 0.000 | 83.50% |
| South Sulawesi | 0.72954 | 0.000 | 81.20% | 0.65234 | 0.000 | 82.70% | 0.1455 | 0.000 | 85.40% |

This research makes a significant contribution to the existing literature; This has provided an illustration that Covid 19 does not have a significant influence on fluctuations and disparities in chicken and broiler carcass prices in Indonesia. Further studies are advised to analyze supply chain management complexity models and the contestation of actors that influence price mechanism of broiler chickens and carcass in Indonesia.

## Ethics approval and consent to participate

The authors declared that ethics approval and consent to participate are Not applicable.

## Consent for publication

Consent for publication are not applicable.

## Availability of data and materials

The dataset supporting the conclusions of this article are available in https://drive.google.com/drive/folders/1cOa6cwW9X6w_piR1q5xAcxqkMtDaXfro?usp=drive_link or https://s.id/data_materials.

## CRediT authorship contribution statement

**Agung Suganda:** Writing – original draft, Methodology, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Imam Mujahidin Fahmid:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Syahdar Baba:** Writing – review & editing, Validation, Supervision, Methodology, Conceptualization. **Darmawan Salman:** Writing – review & editing, Validation, Supervision, Methodology, Formal analysis, Conceptualization.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgements

The authors are grateful acknowledge to the Ministry of Agriculture and Hasanuddin University, which provided data related to this study.

## Abbreviation

| | |
|---|---|
| CV | coefficient of variation |
| DOC | Day old chick |
| HE | Hatching eggs |
| IDR | Indonesian Rupiah |
| LB | live bird |
| PS | parent stock |
| Rsq | R squared |
| SD | Standard deviation |

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## Lampiran. 6 Curriculum Vitae

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1. Jenis Pekerjaan : Pegawai Negeri Sipil
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5. Riwayat Pekerjaan :
   - Kepala Pusat Veteriner Farma Surabaya (2018-2021)
   - Plt. Balai Besar Veteriner Denpasar (2021)
   - Plt. Kepala Balai Inseminasi Buatan Singosari (2020)
   - Kepala Subdit Sanitary dan Standardisasi (2016-2018)
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   - Kepala Seksi Pengawasan Sanitary PH (2010-2012)
   - Kepala Seksi Higiene Sanitasi (2008-2010)
   - Medik Veteriner Muda (2007-2008)
   - Medik Veteriner Pertama (2005-2006)

   pada Dirketorat Jenderal Peternakan dan Kesehatan Hewan, Kementerian Pertanian Republik Indonesia

**D. Karya ilmiah yang telah dipublikasikan**

1. Cattle corporation village program as small-scale farmer group empowerment to support national beef self sufficiency pada IOP Conf. series: Earth and Environmental Science 1114 (2022) doi: 10.1088/1765-1315/1114/1/012041 yang diterbitkan oleh IOP Published.

2. Actor contestation in the broiler chicken supply chain influences broiler chicken price fluctuations in Indonesia pada Migration Letters Journal (ISSN: 1741-8992) yang diterbitkan pada volume 21 issue 3 tahun 2024 yang telah terindeks scopus Q2 dan mempunyai Impact Factor (IF) 0,47

3. Fluctuations and disparity in broiler and carcass price before during and after covid-19 pandemic in Indonesia pada Heliyon Journal tahun 2024 (https://doi.org/10.1016/j.heliyon.2024.e29073) yang telah terindeks scopus Q1 dan mempunyai Impact Factor (IF) 0,62

**E. Makalah pada Seminar/Konferensi Ilmiah Nasional dan Internasional**

1. Developing Strategy for Animal Production and Green Agroindustry Through CES pada 3rd International Conference on Animal Production for Food Sustainability di Universitas Udayana pada tahun 2023

2. CCVP as Small-Scale Farmer Group Empowerement to Support National Beef Self Sufficiency pada 9th International Conference on Sustainable Agriculture and Environment di Universitas Sebelas Maret pada tahun 2022.

3. Strategi Peningakatan Populasi dan Produksi Ternak Menghadapi Krisis Pangan Global pada Studium Generale “Outlook Peternakan 2023” yang diselenggarakan oleh Fakultas Peternakan Universitas Gadjah Mada Yogyakarta tahun 2022.

4. Penguatan dan Strategi Pasokan Hewan Kurban Pasca Wabah PMK pada Seminar Ekonomi Kurban Pasca Pandemi yang diselenggarakan oleh Pusat Ekonomi dan Bisnis Syariah (PEBS) FEB Universitas Indonesia tahun 2022.

**F. Delegasi**

1. Head of Indonesian Delegation for Global Agenda Forum for Sustainable Livestock (FAO), Itali - November 2023;
2. Member of Indonesian Delegation for The 6th Joint Agriculutural Working Group Meeting Between Indonesia and Denmark, Denmark - Agustus 2023;
3. Member of Indonesian Delegation for Market Access and Bilateral Meeting with Saudi Food and Drug Authority (SFDA), Saudi - April 2023.