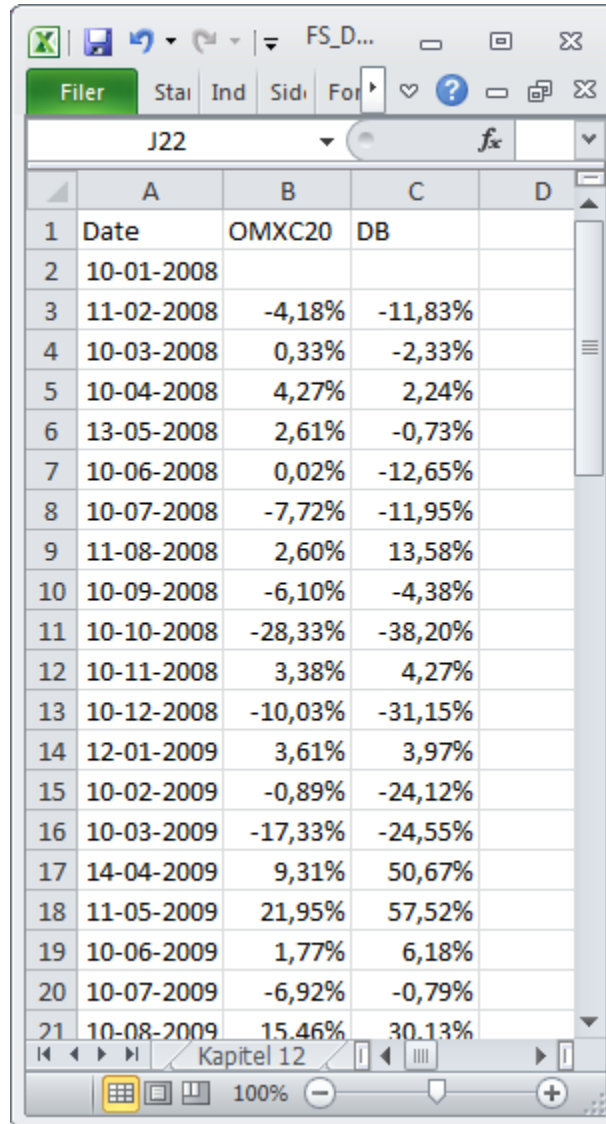


Anvendt Statistik og KeHaTools Kapitel 14: Simpel lineær regression

Oversigt

- Kapitel 14.2 lineær regression
- Kapitel 14.3 tests i lineær regression
- Kapitel 14.4 forudsigelsesinterval
- Kapitel 14.5 forudsætninger for lineær regression

Lineær regression - I



| | A | B | C | D |
|----|------------|---------|---------|---|
| 1 | Date | OMXC20 | DB | |
| 2 | 10-01-2008 | | | |
| 3 | 11-02-2008 | -4,18% | -11,83% | |
| 4 | 10-03-2008 | 0,33% | -2,33% | |
| 5 | 10-04-2008 | 4,27% | 2,24% | |
| 6 | 13-05-2008 | 2,61% | -0,73% | |
| 7 | 10-06-2008 | 0,02% | -12,65% | |
| 8 | 10-07-2008 | -7,72% | -11,95% | |
| 9 | 11-08-2008 | 2,60% | 13,58% | |
| 10 | 10-09-2008 | -6,10% | -4,38% | |
| 11 | 10-10-2008 | -28,33% | -38,20% | |
| 12 | 10-11-2008 | 3,38% | 4,27% | |
| 13 | 10-12-2008 | -10,03% | -31,15% | |
| 14 | 12-01-2009 | 3,61% | 3,97% | |
| 15 | 10-02-2009 | -0,89% | -24,12% | |
| 16 | 10-03-2009 | -17,33% | -24,55% | |
| 17 | 14-04-2009 | 9,31% | 50,67% | |
| 18 | 11-05-2009 | 21,95% | 57,52% | |
| 19 | 10-06-2009 | 1,77% | 6,18% | |
| 20 | 10-07-2009 | -6,92% | -0,79% | |
| 21 | 10-08-2009 | 15,46% | 30,13% | |

Lineær regression - II

The screenshot shows Microsoft Excel with the 'Data' tab selected in the ribbon. The 'Dataanalyse' (Data Analysis) toolpak is installed and visible in the ribbon. The 'Dataanalyse' button is circled in red. A dialog box titled 'Dataanalyse' is open, showing a list of analysis tools. The 'Regression' option is selected and circled in red.

| | A | B | C | D | E | F | G | H | I | J | K | L |
|----|------------|---------|---------|---|---|---|---|---|---|---|---|---|
| 1 | Date | OMXC20 | DB | | | | | | | | | |
| 2 | 10-01-2008 | | | | | | | | | | | |
| 3 | 11-02-2008 | -4,18% | -11,83% | | | | | | | | | |
| 4 | 10-03-2008 | 0,33% | -2,33% | | | | | | | | | |
| 5 | 10-04-2008 | 4,27% | 2,24% | | | | | | | | | |
| 6 | 13-05-2008 | 2,61% | -0,73% | | | | | | | | | |
| 7 | 10-06-2008 | 0,02% | -12,65% | | | | | | | | | |
| 8 | 10-07-2008 | -7,72% | -11,95% | | | | | | | | | |
| 9 | 11-08-2008 | 2,60% | 13,58% | | | | | | | | | |
| 10 | 10-09-2008 | -6,10% | -4,38% | | | | | | | | | |
| 11 | 10-10-2008 | -28,33% | -38,20% | | | | | | | | | |
| 12 | 10-11-2008 | 3,38% | 4,27% | | | | | | | | | |
| 13 | 10-12-2008 | -10,03% | -31,15% | | | | | | | | | |
| 14 | 12-01-2009 | 3,61% | 3,97% | | | | | | | | | |
| 15 | 10-02-2009 | -0,89% | -24,12% | | | | | | | | | |
| 16 | 10-03-2009 | -17,33% | -24,55% | | | | | | | | | |
| 17 | 14-04-2009 | 9,31% | 50,67% | | | | | | | | | |
| 18 | 11-05-2009 | 21,95% | 57,52% | | | | | | | | | |
| 19 | 10-06-2009 | 1,77% | 6,18% | | | | | | | | | |
| 20 | 10-07-2009 | -6,92% | -0,79% | | | | | | | | | |
| 21 | 10-08-2009 | 15,46% | 30,13% | | | | | | | | | |

Lineær regression - III

| | A | B | C | D |
|----|------------|---------|---------|---|
| 1 | Date | OMXC20 | DB | |
| 2 | 10-01-2008 | | | |
| 3 | 11-02-2008 | -4,18% | -11,83% | |
| 4 | 10-03-2008 | 0,33% | -2,33% | |
| 5 | 10-04-2008 | 4,27% | 2,24% | |
| 6 | 13-05-2008 | 2,61% | -0,73% | |
| 7 | 10-06-2008 | 0,02% | 12,65% | |
| 8 | 10-07-2008 | -7,72% | -11,95% | |
| 9 | 11-08-2008 | 2,60% | 13,58% | |
| 10 | 10-09-2008 | -6,10% | -4,38% | |
| 11 | 10-10-2008 | -28,33% | -38,20% | |
| 12 | 10-11-2008 | 3,38% | 4,27% | |
| 13 | 10-12-2008 | -10,03% | -31,15% | |
| 14 | 12-01-2009 | 3,61% | 3,97% | |
| 15 | 10-02-2009 | -0,89% | -24,12% | |
| 16 | 10-03-2009 | -17,33% | 24,55% | |
| 17 | 14-04-2009 | 9,31% | 50,67% | |
| 18 | 11-05-2009 | 21,95% | 57,52% | |
| 19 | 10-06-2009 | 1,77% | 6,18% | |
| 20 | 10-07-2009 | -6,92% | -0,79% | |
| 21 | 10-08-2009 | 15,46% | 30,13% | |

Regression

Input

Input for Y-område:

Input for X-område:

Etiketter Konstant er nul

Konfidensniveau %

Outputindstillinger

Outputområde:

Ny regnearksfane:

Ny projektmappe

Residualer

Residualer Residualplot

Standardiserede residualer Linjetilpasningsplot

Normal sandsynlighed

Plot af normal sandsynlighed

OK
Annuller
Hjælp

Lineær regression - IV

FS_Data.xlsx - Microsoft Excel

Filer Startside Indsæt Sidelayout Formler Data Gennemse Vis Udvikler Tilføjelsesprogr

Hent eksterne data Opdater alle Sorter Filter Dataværktøjer Disposition Problemløser Dataanalyse KeHaTools

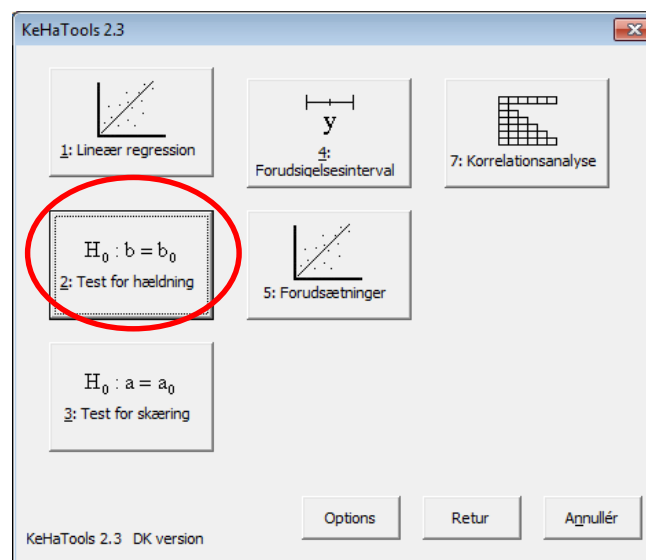
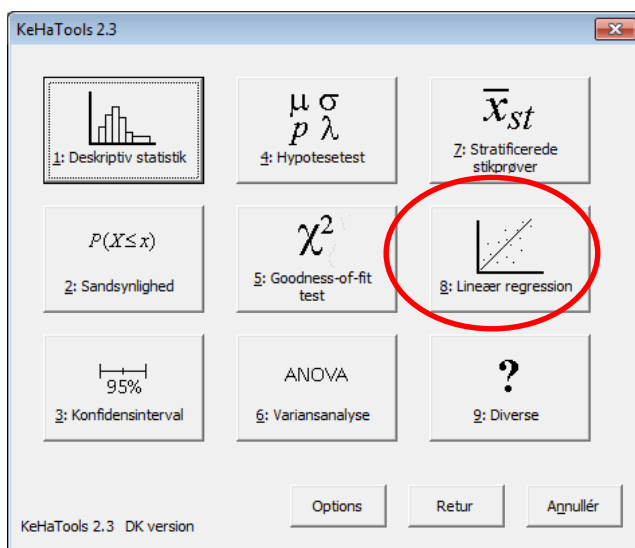
RESUMEOUTPUT

| | F | G | H | I | J | K | L | M | N | O |
|----|-----------------------------|------------------------------|---------------|----------------|------------------|---------------------|--------------------|-------------------|----------|---|
| 1 | RESUMEOUTPUT | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | Regressionsstatistik | | | | | | | | | |
| 4 | Multipel F | 0,795514 | | | | | | | | |
| 5 | R-kvadrer | 0,632843 | | | | | | | | |
| 6 | Justeret R | 0,626402 | | | | | | | | |
| 7 | Standardf | 0,098282 | | | | | | | | |
| 8 | Observati | 59 | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | ANAVA | | | | | | | | | |
| 11 | | <i>fg</i> | <i>SK</i> | <i>MK</i> | <i>F</i> | <i>ignifikans F</i> | | | | |
| 12 | Regressio | 1 | 0,949 | 0,949 | 98,24697 | 5,19E-14 | | | | |
| 13 | Residual | 57 | 0,550582 | 0,009659 | | | | | | |
| 14 | I alt | 58 | 1,499582 | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | <i>Koefficientetandardfe</i> | <i>t-stat</i> | <i>P-værdi</i> | <i>Nedre 95%</i> | <i>Øvre 95%</i> | <i>ledre 95,0%</i> | <i>Øvre 95,0%</i> | | |
| 17 | Skæring | -0,00947 | 0,012844 | -0,73696 | 0,464169 | -0,03519 | 0,016254 | -0,03519 | 0,016254 | |
| 18 | X-variabel | 1,744894 | 0,176039 | 9,911961 | 5,19E-14 | 1,392382 | 2,097407 | 1,392382 | 2,097407 | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |

Kapitel 12 Kapitel 13 **Kapitel 14** Kapitel 15

Klar 100%

Test for hældning - I



Test for hældning - II

| | A | B | C | D |
|----|------------|---------|---------|---|
| 1 | Date | OMXC20 | DB | |
| 2 | 10-01-2008 | | | |
| 3 | 11-02-2008 | -4,18% | -11,83% | |
| 4 | 10-03-2008 | 0,33% | -2,33% | |
| 5 | 10-04-2008 | 4,27% | 2,24% | |
| 6 | 13-05-2008 | 2,61% | -0,73% | |
| 7 | 10-06-2008 | 0,02% | -12,65% | |
| 8 | 10-07-2008 | -7,72% | -11,95% | |
| 9 | 11-08-2008 | 2,60% | 13,58% | |
| 10 | 10-09-2008 | -6,10% | -4,38% | |
| 11 | 10-10-2008 | -28,33% | -38,20% | |
| 12 | 10-11-2008 | 3,38% | 4,27% | |
| 13 | 10-12-2008 | -10,03% | -31,15% | |
| 14 | 12-01-2009 | 3,61% | 3,97% | |
| 15 | 10-02-2009 | -0,89% | -24,12% | |
| 16 | 10-03-2009 | -17,33% | 24,55% | |
| 17 | 14-04-2009 | 9,31% | 50,67% | |
| 18 | 11-05-2009 | 21,95% | 57,52% | |
| 19 | 10-06-2009 | 1,77% | 6,18% | |
| 20 | 10-07-2009 | -6,92% | -0,79% | |
| 21 | 10-08-2009 | 15,46% | 30,13% | |

Lineær regression: Test for hældning

Resumé-data Observationer

x-værdier: 14!\$B\$3:\$B\$61

y-værdier: 14!\$C\$3:\$C\$61

Etiketter i første række

Antal observationer:

Hældning:

Standardfejl (hældning):

Nul-værdi: 1,190

Tosidet test $H_0 : b = b_0$ $H_A : b \neq b_0$

Venstresidet test $H_0 : b \geq b_0$ $H_A : b < b_0$

Højresidet test $H_0 : b \leq b_0$ $H_A : b > b_0$

OK

Annullér

Test for hældning - III

FS_Data.xlsx - Microsoft Excel

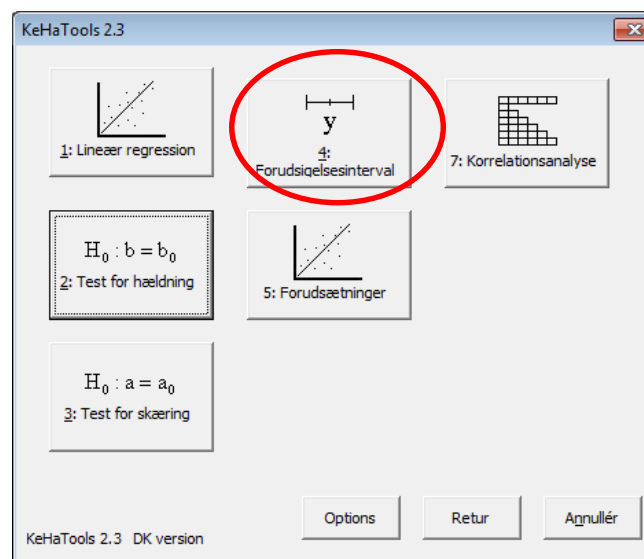
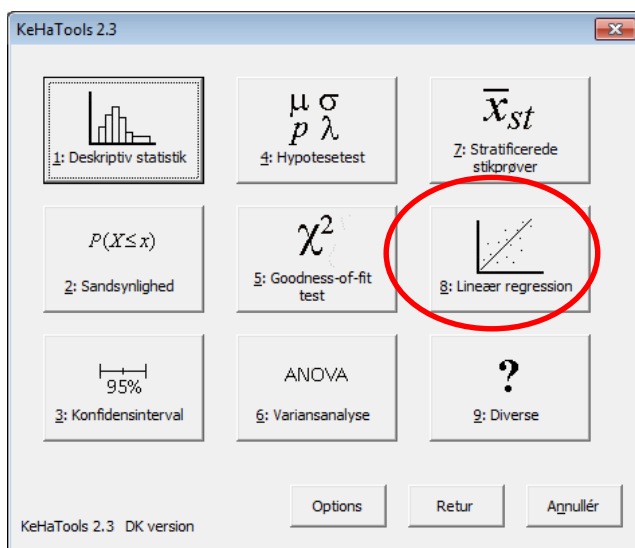
fx =TFORDELING(ABS(C14);C8-2;2)

| | A | B | C | D | E | F | G | H | I |
|----|--------------------------|--------------------|----------------|---|---|---|---|---|---|
| 1 | Test for hældning | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Hypoteser | | (tosidet test) | | | | | | |
| 4 | | $H_0 : b = b_0$ | | | | | | | |
| 5 | | $H_A : b \neq b_0$ | | | | | | | |
| 6 | | | | | | | | | |
| 7 | Input | | | | | | | | |
| 8 | | Stikprøvestørrelse | 59 | | | | | | |
| 9 | | Hældning | 1,744894 | | | | | | |
| 10 | | Standardfejl | 0,176039 | | | | | | |
| 11 | | Nul-værdi | 1,19 | | | | | | |
| 12 | | | | | | | | | |
| 13 | Resultat | | | | | | | | |
| 14 | | Teststørrelse | 3,152105 | | | | | | |
| 15 | | p-værdi | 0,002584 | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |

Kapitel 12 Kapitel 13 **Ark3** Kapitel 14 Kapj

Klar 100%

Forudsigelsesinterval - I



Forudsigelsesinterval - II

| | A | B | C | D |
|----|------------|---------|---------|---|
| 1 | Date | OMXC20 | DB | |
| 2 | 10-01-2008 | | | |
| 3 | 11-02-2008 | -4,18% | -11,83% | |
| 4 | 10-03-2008 | 0,33% | -2,33% | |
| 5 | 10-04-2008 | 4,27% | 2,24% | |
| 6 | 13-05-2008 | 2,61% | -0,73% | |
| 7 | 10-06-2008 | 0,02% | 12,65% | |
| 8 | 10-07-2008 | -7,72% | -11,95% | |
| 9 | 11-08-2008 | 2,60% | 13,58% | |
| 10 | 10-09-2008 | -6,10% | -4,38% | |
| 11 | 10-10-2008 | -28,33% | -38,20% | |
| 12 | 10-11-2008 | 3,38% | 4,27% | |
| 13 | 10-12-2008 | -10,03% | -31,15% | |
| 14 | 12-01-2009 | 3,61% | 3,97% | |
| 15 | 10-02-2009 | -0,89% | -24,12% | |
| 16 | 10-03-2009 | -17,33% | 24,55% | |
| 17 | 14-04-2009 | 9,31% | 50,67% | |
| 18 | 11-05-2009 | 21,95% | 57,52% | |
| 19 | 10-06-2009 | 1,77% | 6,18% | |
| 20 | 10-07-2009 | -6,92% | -0,79% | |
| 21 | 10-08-2009 | 15,46% | 30,13% | |

Lineær regression: Forudsigelsesinterval

Resumé-data Observationer

x-værdier: 14!\$B\$3:\$B\$61

y-værdier: 14!\$C\$3:\$C\$61

Etiketter i første række

Antal observationer: Standardfejl:

Skæring: Standardfejl (skæring):

Hældning: Standardfejl (hældning):

Konfidensniveau: Forudsigelse af enkelt y-værdi

Ny x-værdi: Forudsigelse af gennemsnitlig y-værdi

OK

Annullér

Forudsigelsesinterval - III

FS_Data.xlsx - Microsoft Excel

File Startside Indsæt Sidelayou Formler Data Gennemse Vis Udvikler Tilføjesprogr

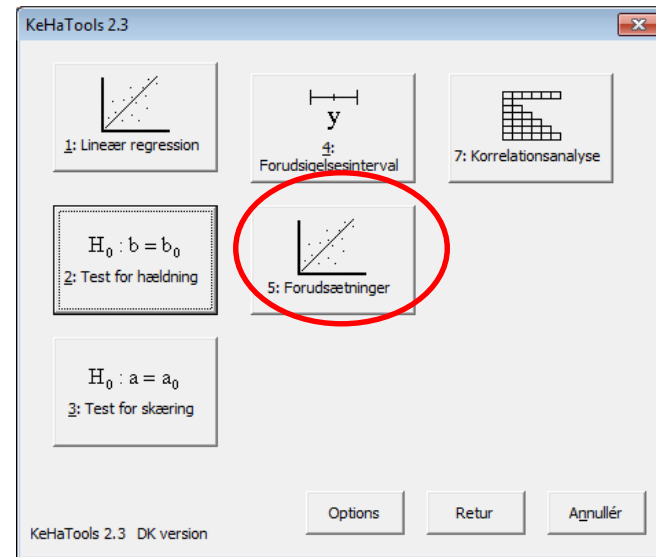
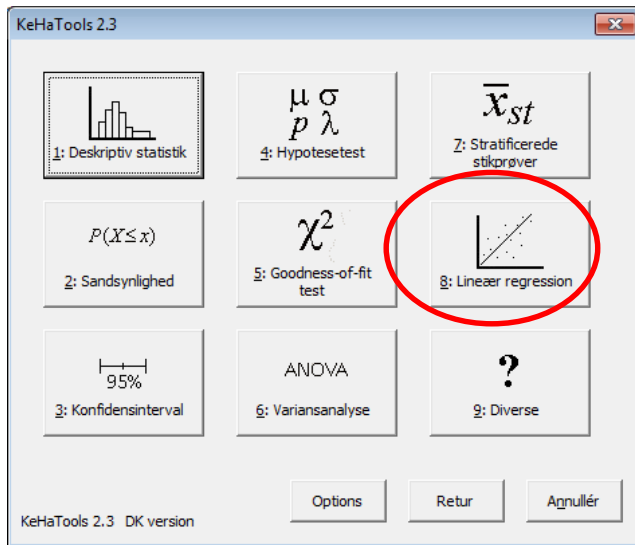
C14 fx =C12+TINV(1-C8;C5-2)*F5*KVROD(1+1/C5+(C9-KVROD(F6^2/

| | A | B | C | D | E | F | G | H | I |
|----|---|---|----------|-------------------------|---|----------|---|---|---|
| 1 | Forudsigelsesinterval for enkelt y-værdi | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Input | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | Stikprøvestørrelse | | 59 | Standardfejl | | 0,098282 | | | |
| 6 | Skæring | | -0,00947 | Standardfejl (skæring) | | 0,012844 | | | |
| 7 | Hældning | | 1,744894 | Standardfejl (hældning) | | 0,176039 | | | |
| 8 | Konfidensniveau | | 95% | | | | | | |
| 9 | Ny x-værdi | | 0,01 | | | | | | |
| 10 | | | | | | | | | |
| 11 | Resultat | | | | | | | | |
| 12 | Forudsagt y-værdi | | 0,007983 | | | | | | |
| 13 | Nedre grænse | | -0,19049 | | | | | | |
| 14 | Øvre grænse | | 0,206455 | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |

Kapitel 12 Kapitel 13 **Ark5** Kapitel 14 Kapj|

Klar 100%

Forudsætninger - I



Forudsætninger - II

| | A | B | C | D |
|----|------------|---------|---------|---|
| 1 | Date | OMXC20 | DB | |
| 2 | 10-01-2008 | | | |
| 3 | 11-02-2008 | -4,18% | -11,83% | |
| 4 | 10-03-2008 | 0,33% | -2,33% | |
| 5 | 10-04-2008 | 4,27% | 2,24% | |
| 6 | 13-05-2008 | 2,61% | -0,73% | |
| 7 | 10-06-2008 | 0,02% | -12,65% | |
| 8 | 10-07-2008 | -7,72% | -11,95% | |
| 9 | 11-08-2008 | 2,60% | 13,58% | |
| 10 | 10-09-2008 | -6,10% | -4,38% | |
| 11 | 10-10-2008 | -28,33% | -38,20% | |
| 12 | 10-11-2008 | 3,38% | 4,27% | |
| 13 | 10-12-2008 | -10,03% | -31,15% | |
| 14 | 12-01-2009 | 3,61% | 3,97% | |
| 15 | 10-02-2009 | -0,89% | -24,12% | |
| 16 | 10-03-2009 | -17,33% | -24,55% | |
| 17 | 14-04-2009 | 9,31% | 50,67% | |
| 18 | 11-05-2009 | 21,95% | 57,52% | |
| 19 | 10-06-2009 | 1,77% | 6,18% | |
| 20 | 10-07-2009 | -6,92% | -0,79% | |
| 21 | 10-08-2009 | 15,46% | 30,13% | |

Lineær regression: Forudsætninger

x-værdier: 14!\$B\$3:\$B\$61

y-værdier: 14!\$C\$3:\$C\$61

Etiketter i første række

OK

Annullér

Forudsætninger - III

