

Themen

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1 Logistische Regression

1.1 Allgemeine Grundlagen

Odds, Log-Odds, und Odds-Ratio

```
. use http://www.stata-press.com/data/kkd/titanic, clear
```

- Zeilen (Spalten-) Prozente

```
. tab class survived, row col
```

- Odds (Chancen)

```
. display 203/122  
. display 118/167
```

- Wahrscheinlichkeitsverhältnisse

```
. display 62.46/37.54  
. display 41.40/58.60
```

- Log-Odds (Logit, logarithmierte Chance)

```
. display log(203/122)  
. display log(118/167)
```

- Odds-Ratio

```
. display (118/167)/(203/122)  
. display exp(log(118/167) - log(203/122))
```

Interpretation der logistischen Regression

```
. tab class, gen(class)  
. logit survived class2-class4
```

- Vorhergesagte Werte (linearer Prediktor):

```
. predict Lhat, xb
. tab class, sum(Lhat)
```

- Umrechnung in Wahrscheinlichkeiten

```
. gen Phat = 1/(1+exp(-Lhat))
. tab class, sum(Phat)
```

- Als Graphik:

```
. tw function y=1/(1+exp(-x)), range(-4 4)
```

1.2 Ein praktisches Beispiel

Ein praktisches Beispiel

```
. use http://www.stata-press.com/data/kkd/data1, clear
. gen owner = renttype == 1 if !mi(renttype)
. gen east = state >= 11 & state <= 16 if !mi(state)
. gen age = 1997 - ybirth
. logit owner age hhinc east
```

Ein praktisches Beispiel

- Odds-Ratio Interpretation

```
. logit owner age hhinc east, or
```

- Marginal-Effekte, Discrete Change Effekte

```
. mfx
. mfx, at(20 1000 0)
```

- Conditional effects Plot

```
. replace age = 20
. replace east = 0
. predict Phat0
. replace age = 50
. predict Phat1
. line Phat0 Phat1 hhinc, sort legend(order(1 "young" 2 "old"))
```

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