Robust diagnostics for count regression models

by Tsung-Chi Cheng Discussant: Philipp Pfeiffer

CRC 649 - Motzen 2014

◆□▶ ◆□▶ ◆三▶ ◆三▶ 三三 のへぐ

Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)

- Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)
- Typical problems: excess number of zero and overdispersion

- Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)
- Typical problems: excess number of zero and overdispersion

< □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > <

 However, often analyzed incorrectly when structurally estimating a distribution

- Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)
- Typical problems: excess number of zero and overdispersion
- However, often analyzed incorrectly when structurally estimating a distribution
- We need robust estimators that can correctly identify outliers

- Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)
- Typical problems: excess number of zero and overdispersion
- However, often analyzed incorrectly when structurally estimating a distribution
- We need robust estimators that can correctly identify outliers
- George proposes a new minimum trimmed distance estimator

- Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)
- Typical problems: excess number of zero and overdispersion
- However, often analyzed incorrectly when structurally estimating a distribution
- We need robust estimators that can correctly identify outliers
- George proposes a new minimum trimmed distance estimator

Focus on likelihood function instead of data trimming

- Count data common in many fields (e.g., # of world cup goals by player, # of hospital visits, # of banks going bust)
- Typical problems: excess number of zero and overdispersion
- However, often analyzed incorrectly when structurally estimating a distribution
- We need robust estimators that can correctly identify outliers
- George proposes a new minimum trimmed distance estimator
 - Focus on likelihood function instead of data trimming
- Superiority of this approach is illustrated by examples and simulation studies

 Striking results! The proposed methodology can be used for robustly fitting mixture models

◆□▶ ◆□▶ ◆臣▶ ◆臣▶ 臣 の�?

 Striking results! The proposed methodology can be used for robustly fitting mixture models

◆□▶ ◆□▶ ◆臣▶ ◆臣▶ 臣 の�?

What role does the algorithm choice play?

 Striking results! The proposed methodology can be used for robustly fitting mixture models

< □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > < □ > <

- What role does the algorithm choice play?
 - Can subset sampling be improved?
 - Other algorithms applicable?

 Striking results! The proposed methodology can be used for robustly fitting mixture models

- What role does the algorithm choice play?
 - Can subset sampling be improved?
 - Other algorithms applicable?
- What drives the results?
 - Closer look into the theory could be helpful

- Striking results! The proposed methodology can be used for robustly fitting mixture models
- What role does the algorithm choice play?
 - Can subset sampling be improved?
 - Other algorithms applicable?
- What drives the results?
 - Closer look into the theory could be helpful
- Slightly confusing use of R functions
 - To outsiders a little unclear what algorithms and estimators are used and how they are connected

- Striking results! The proposed methodology can be used for robustly fitting mixture models
- What role does the algorithm choice play?
 - Can subset sampling be improved?
 - Other algorithms applicable?
- What drives the results?
 - Closer look into the theory could be helpful
- Slightly confusing use of R functions
 - To outsiders a little unclear what algorithms and estimators are used and how they are connected

What is the relation between MTLE and MTDE?

- Striking results! The proposed methodology can be used for robustly fitting mixture models
- What role does the algorithm choice play?
 - Can subset sampling be improved?
 - Other algorithms applicable?
- What drives the results?
 - Closer look into the theory could be helpful
- Slightly confusing use of R functions
 - To outsiders a little unclear what algorithms and estimators are used and how they are connected

- What is the relation between MTLE and MTDE?
- Clearly highlight the contribution

- Striking results! The proposed methodology can be used for robustly fitting mixture models
- What role does the algorithm choice play?
 - Can subset sampling be improved?
 - Other algorithms applicable?
- What drives the results?
 - Closer look into the theory could be helpful
- Slightly confusing use of R functions
 - To outsiders a little unclear what algorithms and estimators are used and how they are connected

- What is the relation between MTLE and MTDE?
- Clearly highlight the contribution
- Offer a little road map