A ser's Gui e t t e POT Packa e (Versi n 1.0

Math eu R batet

with

$$H(y) = 1 - \left(1 + \xi y\right)^{-\frac{1}{\xi}}$$

Defi itio A biv ri te extreme v l e distrib ti h s the Pick ds' re rese t ti

$$G(y_1, y_2) = \exp - \left(\frac{1}{z_1} + \frac{1}{z_2} \right) A \left(\frac{z_2}{z_1 + z_2} \right) \quad (2.6)$$

ith

$$A : [0,1] - \rightarrow [0,1]$$

$$w - \rightarrow$$

```
     d 6  0    2  3   0
[1  2.9850 40 3.1486256 1.0 05649 0. 401 53 3.123151  2.3994109
  ##P  babi i    f      x   d
     d   9  15  20   1  2  0.25
[1  0.93 5000 0.9825149 0.992292
  ## ua  i   a    ia  d       babi i    f      x   d
     d   .25  .5  . 5   1  2  0
[1  1.5 5364 2.386294 3.  2589
  ##Eva ua    h  d   i   a    i  ...
  d  d   9  15  20   1  2  0.25
[1  0.015625000 0.0031 911  0.001141829
```

Sever l ti s c be ssed t three f these f r f cti s. I rtic l r

- f r▪ d", ser c s ecif if exceede ce r exceede ce r b bilit sh ld be c m ted ▬ith ti w . ai TR E r w . ai FALSE res ectivel
- f r▪ d", ser c s ecif if tile is rel ted t exceede ce r exceede ce r b bilit ▬ith ti w . ai TR E r w . ai FALSE res ectivel
- f r▪d d", ser c s ecif if the de sit r the l -de sit sh ld be c m ted ▬ith ti FALSE r TR E res ectivel .

3 2 Threshold Sele t on

The l c ti f r the GPD r e iv le tl the thresh ld is rtic l r r meter s m st fte it is t estim ted s the ther es. All meth ds t defi es it ble thresh ld se the s m t tic r xim ti defi ed b e ti 2.). I ther ▬ rds, ▬e select thresh ld f r ▬hich the s m t tic distrib ti **H** i e ti 2.4) is d r xim ti .

The **POT** ck e h s sever l t ls t defi ▪e s ble thresh ld. r this r se, the ser m st se xi d di f cti s.

The m i l f thresh ld selecti is t selects e h eve ts t red ce the v ri ce b t t

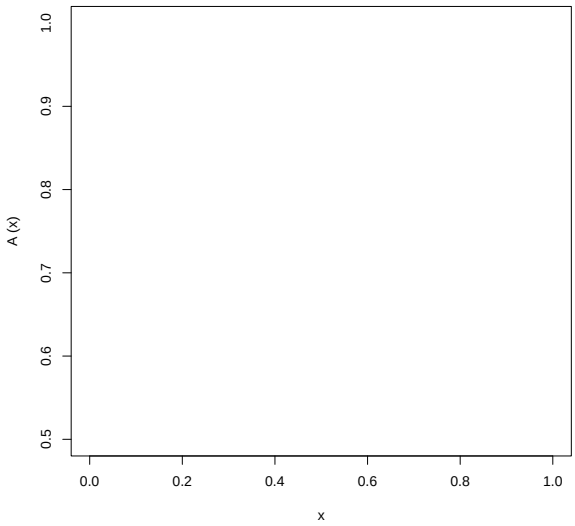
If ■, ■e ■ t t fit GPD ■ith v r i thresh ld, j st d

```
x  -    d 500  1 2  0.3  0.01
fi   d x  1 2     h d   "   "
```

N te th t the v r i thresh ld is re e ted c clic ll til it m tches the le th f bject `x`.

T e bivariate case

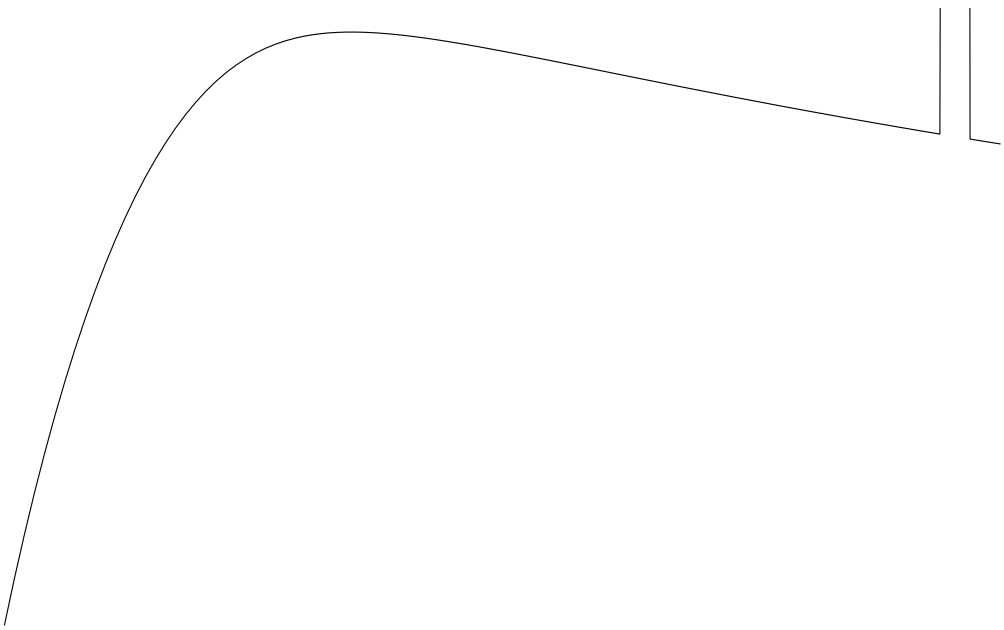
The e eric f cti t fit biv ri te POTs is **fitbv d**. There is c rre tl 6 m dels f r the biv ri tes GPD see A exe A. All f these m dels re fitted si m xim m likelih d estim t r. M re ver, the r ch ses *e e*


A (x)
1.0
0.9
0.8
0.7
0.6
0.5
0.0
0.2
0.4
0.6
0.8
1.0
x

```
O  i i a i   I f   a i
  C  v          u     fu
  Fu   i   Eva ua i      2
  G adi    Eva ua i     13
```

3 4 Con den e Intervals

O ce st tistic l m del is fitted, it is s l t .71995.1199eTdlsiv)Tj1 .8 Td es)Tj14.6 98 Td c fide ce)Tj5



4 AConcr t Statistical Anal sis of aks v r a hr shold

I this secti ,

A nd nc Mod ls for Bivariat xtr m Valıı

A 5 The M xed m odel

The mixed m del is defi ed b

$$V($$

C. Klü elber d A. M . Biv ri te extreme v l e distrib ti s b sed l mi l de e - de ce f cti s. *M th Meth A l* , 29 12) 1467 148 , 2 6. ISSN 17 4214 ISSN).

C. Kl elber d T. Mik sch. L r e devi ti s f he v -t iled r d m s ms ith lic ti s i i s r ce d fi ce. *J u l A l e P l t* , .ci29 rd 8j6.72I 2 teTd tisc 8e7116 54.47922.56 2Td L

St tistic l I stit te, 1981.

. III Pick ds. St tistic l i fere ce si extreme rder st tistics. *A l 3 3 t t t R3*

t e3 R Ae 3e 3 u e 3 E e t 3 t t t 3 l ut R3
.R- . .

3e