Insolvency data

March 5, 2012

```
> library(EffectStars)
> data(insolvency)
```

Effect Stars for the sequential logit model for insolvency data including p-values "p-global" and the additional circles refering to the global effects. To save computational time, only some preselected variables are used.

```
> star.sequential(Insolvency ~ Sector + Legal + Pecuniary_Reward + Seed_Capital
+ + Debt_Capital + Employees, insolvency, cex.cat = 1, cex.labels = 1.2, dist.y
+ = 1.1, lwd.circle = 2, test.glob = TRUE, globcircle = TRUE, dist.x = 1.2)

$odds
                  (Intercept) Sectorcommerce Sectorservice industry
odds(P[Y=1|Y>=1])  0.17561738       1.015447               1.041395
odds(P[Y=2|Y>=2])  0.07943945       1.955999               1.482950
odds(P[Y=3|Y>=3])  0.02300911       4.323460               4.290193
odds(P[Y=4|Y>=4])  0.03750044       2.700746               1.956079
odds(P[Y=5|Y>=5])  0.02061177       3.118456               3.356045
odds(P[Y=6|Y>=6])  0.04247058       1.783488               2.347249
                  Legalone man business    LegalGmBH LegalGbR, KG, OHG
odds(P[Y=1|Y>=1])             0.6858798 3.081381e-06         0.6758912
odds(P[Y=2|Y>=2])             0.5486068 3.269772e-01         0.6376350
odds(P[Y=3|Y>=3])             1.2333083 1.476791e-01         1.1227249
odds(P[Y=4|Y>=4])             0.5667274 1.421075e-01         0.7920397
odds(P[Y=5|Y>=5])             2.0601617 5.252218e-01         4.1345631
odds(P[Y=6|Y>=6])             0.2312470 1.851771e-01         0.6078331
                  Pecuniary_Rewardadditional Seed_Capital> 25000
odds(P[Y=1|Y>=1])                  0.4567339          0.09335455
odds(P[Y=2|Y>=2])                  1.2195652          0.42016714
odds(P[Y=3|Y>=3])                  1.0122849          1.11137649
odds(P[Y=4|Y>=4])                  2.0509194          0.63073375
odds(P[Y=5|Y>=5])                  0.6304500          0.38991900
odds(P[Y=6|Y>=6])                  3.3073341          1.86400642
                  Debt_Capitalyes Employees> 2
odds(P[Y=1|Y>=1])       2.2249313    0.6174437
odds(P[Y=2|Y>=2])       1.4734342    1.2884936
odds(P[Y=3|Y>=3])       0.8978703    0.6413286
odds(P[Y=4|Y>=4])       1.6049822    0.9782275
odds(P[Y=5|Y>=5])       1.0245101    0.6955203
odds(P[Y=6|Y>=6])       0.3905674    0.3997563
```

```
$coefficients
                   (Intercept) Sectorcommerce Sectorservice industry
logit(P[Y=1|Y>=1])   -1.739448      0.0153293             0.04056132
logit(P[Y=2|Y>=2])   -2.532760      0.6709010             0.39403306
logit(P[Y=3|Y>=3])   -3.771865      1.4640559             1.45633167
logit(P[Y=4|Y>=4])   -3.283403      0.9935282             0.67094173
logit(P[Y=5|Y>=5])   -3.881893      1.1373381             1.21076315
logit(P[Y=6|Y>=6])   -3.158944      0.5785709             0.85324400
                   Legalone man business   LegalGmBH LegalGbR, KG, OHG
logit(P[Y=1|Y>=1])            -0.3770528 -12.6901326        -0.3917232
logit(P[Y=2|Y>=2])            -0.6003733  -1.1178648        -0.4499892
logit(P[Y=3|Y>=3])             0.2097002  -1.9127136         0.1157586
logit(P[Y=4|Y>=4])            -0.5678769  -1.9511713        -0.2331438
logit(P[Y=5|Y>=5])             0.7227845  -0.6439345         1.4193817
logit(P[Y=6|Y>=6])            -1.4642688  -1.6864426        -0.4978549
                   Pecuniary_Rewardadditional Seed_Capital> 25000
logit(P[Y=1|Y>=1])                -0.78365443          -2.3713506
logit(P[Y=2|Y>=2])                 0.19849439          -0.8671027
logit(P[Y=3|Y>=3])                 0.01221002           0.1055993
logit(P[Y=4|Y>=4])                 0.71828819          -0.4608715
logit(P[Y=5|Y>=5])                -0.46132136          -0.9418163
logit(P[Y=6|Y>=6])                 1.19614246           0.6227282
                   Debt_Capitalyes Employees> 2
logit(P[Y=1|Y>=1])      0.79972604  -0.48216735
logit(P[Y=2|Y>=2])      0.38759583   0.25347376
logit(P[Y=3|Y>=3])     -0.10772968  -0.44421325
logit(P[Y=4|Y>=4])      0.47311267  -0.02201299
logit(P[Y=5|Y>=5])      0.02421459  -0.36309510
logit(P[Y=6|Y>=6])     -0.94015485  -0.91690024

$se
                   (Intercept) Sectorcommerce Sectorservice industry
logit(P[Y=1|Y>=1])   0.5881318      0.5823058             0.5754190
logit(P[Y=2|Y>=2])   0.5074392      0.4556767             0.4635765
logit(P[Y=3|Y>=3])   0.7876534      0.7404356             0.7413618
logit(P[Y=4|Y>=4])   0.6662614      0.6096970             0.6215566
logit(P[Y=5|Y>=5])   0.8671284      0.7719187             0.7665086
logit(P[Y=6|Y>=6])   0.6821515      0.6217999             0.6125099
                   Legalone man business   LegalGmBH LegalGbR, KG, OHG
logit(P[Y=1|Y>=1])             0.3491397 104.8401495         0.4460096
logit(P[Y=2|Y>=2])             0.3137769   0.4115745         0.3615460
logit(P[Y=3|Y>=3])             0.3447993   0.6049861         0.4083810
logit(P[Y=4|Y>=4])             0.3658928   0.6029518         0.4068952
logit(P[Y=5|Y>=5])             0.5063849   0.7129934         0.5171544
logit(P[Y=6|Y>=6])             0.5254381   0.5706510         0.4805166
                   Pecuniary_Rewardadditional Seed_Capital> 25000
logit(P[Y=1|Y>=1])                  0.3497730           0.5249035
logit(P[Y=2|Y>=2])                  0.2852715           0.3202548
logit(P[Y=3|Y>=3])                  0.3231631           0.3416503
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logit(P[Y=4|Y>=4])                  0.3358002           0.3788952
logit(P[Y=5|Y>=5])                  0.4062108           0.4206556
logit(P[Y=6|Y>=6])                  0.3959170           0.4450993
                    Debt_Capitalyes Employees> 2
logit(P[Y=1|Y>=1])       0.3489160    0.3663869
logit(P[Y=2|Y>=2])       0.2808159    0.2830114
logit(P[Y=3|Y>=3])       0.3302155    0.3180963
logit(P[Y=4|Y>=4])       0.3442941    0.3404903
logit(P[Y=5|Y>=5])       0.4102248    0.3791932
logit(P[Y=6|Y>=6])       0.4981974    0.4234093

$p_rel
     Sectorcommerce Sectorservice industry Legalone man business    LegalGmBH
[1,]     0.02019306             0.04156506           0.003709243 2.694435e-10
     LegalGbR, KG, OHG Pecuniary_Rewardadditional Seed_Capital> 25000
[1,]        0.05743264                0.002143241         5.05263e-08
     Debt_Capitalyes Employees> 2
[1,]      0.04626058    0.1160858

$p_global
     Sectorcommerce Sectorservice industry Legalone man business LegalGmBH
[1,]      0.6969632              0.6386987            0.01651334 0.1865577
     LegalGbR, KG, OHG Pecuniary_Rewardadditional Seed_Capital> 25000
[1,]        0.03477966                0.001364875         4.33702e-05
     Debt_Capitalyes Employees> 2
[1,]      0.05118903    0.2280346

$xlim
[1] 16.94796 78.51403

$ylim
[1] 14.29768 91.77840
```

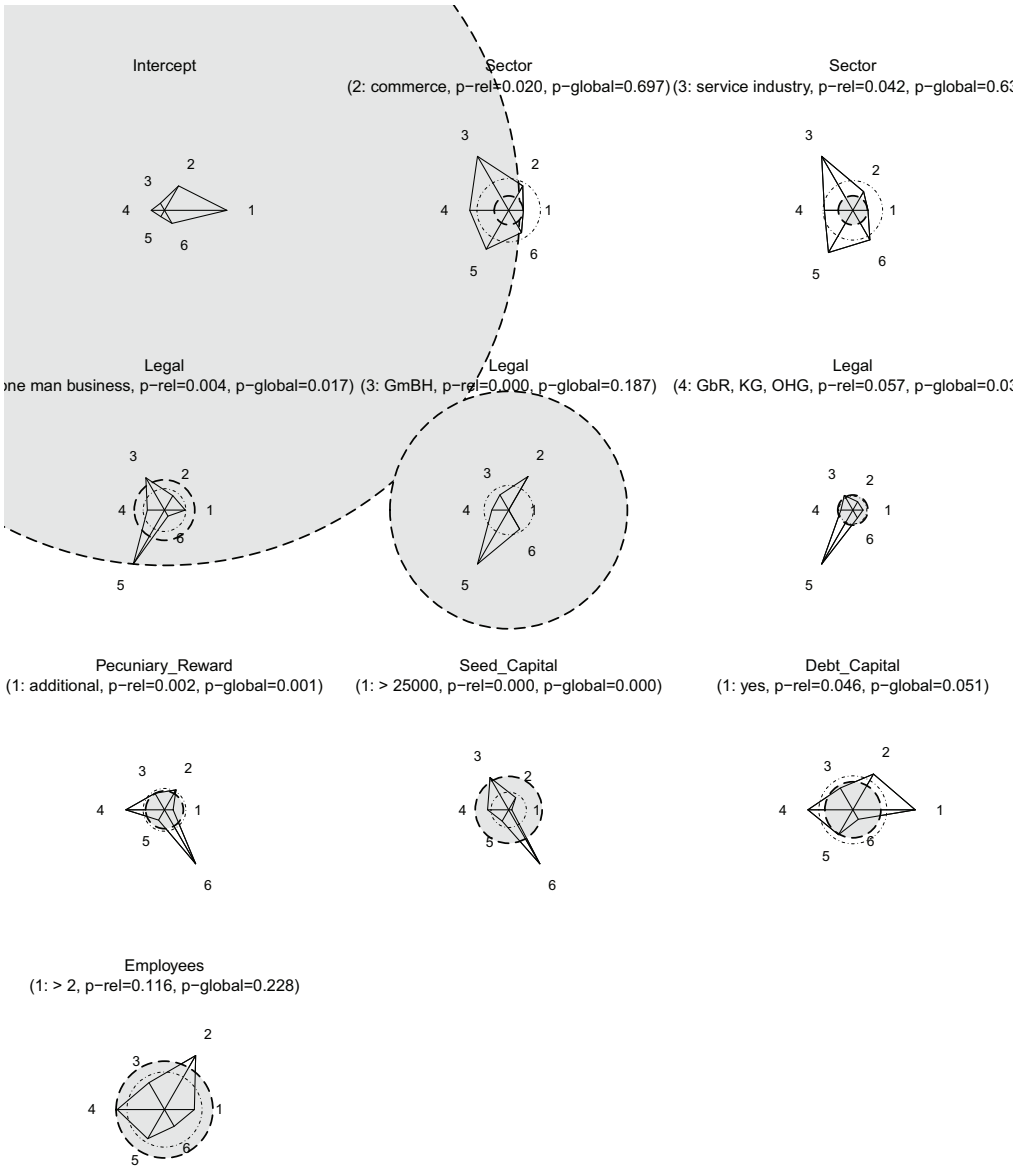

Now we can look at the p-global values and decide which covariates will be modelled globally the next time. These covariates are defined by the argument "global". The intercept is not plotted anymore because 1 is not element of "select".

```
> star.sequential(Insolvency ~ Sector + Legal + Pecuniary_Reward + Seed_Capital
+ + Debt_Capital + Employees, insolvency, cex.cat = 1, cex.labels = 1.2, dist.y
+ = 1.1, lwd.circle = 2, test.glob = TRUE, globcircle = TRUE, dist.x = 1.2
+ , global = c(2,3,5,10), select = c(4,6:9), lwd.global = 1.8)

$odds
```

```
                  (Intercept) Sectorcommerce Sectorservice industry
odds(P[Y=1|Y>=1])  0.07704397       2.214263                2.054398
odds(P[Y=2|Y>=2])  0.08511118       2.214263                2.054398
odds(P[Y=3|Y>=3])  0.03947246       2.214263                2.054398
odds(P[Y=4|Y>=4])  0.03991490       2.214263                2.054398
odds(P[Y=5|Y>=5])  0.03911502       2.214263                2.054398
odds(P[Y=6|Y>=6])  0.03343760       2.214263                2.054398
                  Legalone man business LegalGmBH LegalGbR, KG, OHG
odds(P[Y=1|Y>=1])             0.7457167 0.2122583         0.7021536
odds(P[Y=2|Y>=2])             0.4993672 0.2122583         0.6130590
odds(P[Y=3|Y>=3])             1.3369729 0.2122583         1.1914106
odds(P[Y=4|Y>=4])             0.6256610 0.2122583         0.8898744
odds(P[Y=5|Y>=5])             1.5494934 0.2122583         3.0465073
odds(P[Y=6|Y>=6])             0.2365681 0.2122583         0.6009052
                  Pecuniary_Rewardadditional Seed_Capital> 25000
odds(P[Y=1|Y>=1])                  0.4946951          0.07343149
odds(P[Y=2|Y>=2])                  1.0704665          0.56491000
odds(P[Y=3|Y>=3])                  1.0721721          0.97011246
odds(P[Y=4|Y>=4])                  2.0661950          0.63576844
odds(P[Y=5|Y>=5])                  0.6028070          0.42391034
odds(P[Y=6|Y>=6])                  3.6943414          1.44289021
                  Debt_Capitalyes Employees> 2
odds(P[Y=1|Y>=1])       2.1840268     0.775933
odds(P[Y=2|Y>=2])       1.4366827     0.775933
odds(P[Y=3|Y>=3])       0.9247805     0.775933
odds(P[Y=4|Y>=4])       1.6644481     0.775933
odds(P[Y=5|Y>=5])       0.9531648     0.775933
odds(P[Y=6|Y>=6])       0.4005213     0.775933

$coefficients
                   (Intercept) Sectorcommerce Sectorservice industry
logit(P[Y=1|Y>=1])   -2.563379      0.7949194                0.7199827
logit(P[Y=2|Y>=2])   -2.463797      0.7949194                0.7199827
logit(P[Y=3|Y>=3])   -3.232152      0.7949194                0.7199827
logit(P[Y=4|Y>=4])   -3.221006      0.7949194                0.7199827
logit(P[Y=5|Y>=5])   -3.241249      0.7949194                0.7199827
logit(P[Y=6|Y>=6])   -3.398074      0.7949194                0.7199827
                   Legalone man business LegalGmBH LegalGbR, KG, OHG
logit(P[Y=1|Y>=1])            -0.2934095 -1.549951        -0.3536030
logit(P[Y=2|Y>=2])            -0.6944136 -1.549951        -0.4892942
logit(P[Y=3|Y>=3])             0.2904080 -1.549951         0.1751380
logit(P[Y=4|Y>=4])            -0.4689466 -1.549951        -0.1166750
logit(P[Y=5|Y>=5])             0.4379280 -1.549951         1.1139958
logit(P[Y=6|Y>=6])            -1.4415190 -1.549951        -0.5093182
                   Pecuniary_Rewardadditional Seed_Capital> 25000
logit(P[Y=1|Y>=1])                -0.70381364         -2.61140237
logit(P[Y=2|Y>=2])                 0.06809453         -0.57108886
logit(P[Y=3|Y>=3])                 0.06968659         -0.03034328
logit(P[Y=4|Y>=4])                 0.72570877         -0.45292086
logit(P[Y=5|Y>=5])                -0.50615821         -0.85823330
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logit(P[Y=6|Y>=6])                1.30680229          0.36664819
                  Debt_Capitalyes Employees> 2
logit(P[Y=1|Y>=1])      0.78117033   -0.2536891
logit(P[Y=2|Y>=2])      0.36233681   -0.2536891
logit(P[Y=3|Y>=3])     -0.07819887   -0.2536891
logit(P[Y=4|Y>=4])      0.50949358   -0.2536891
logit(P[Y=5|Y>=5])     -0.04796742   -0.2536891
logit(P[Y=6|Y>=6])     -0.91498844   -0.2536891

$se
                  (Intercept) Sectorcommerce Sectorservice industry
logit(P[Y=1|Y>=1])   0.3656835      0.2418765              0.2427355
logit(P[Y=2|Y>=2])   0.3432714      0.2418765              0.2427355
logit(P[Y=3|Y>=3])   0.3995180      0.2418765              0.2427355
logit(P[Y=4|Y>=4])   0.4068283      0.2418765              0.2427355
logit(P[Y=5|Y>=5])   0.4554504      0.2418765              0.2427355
logit(P[Y=6|Y>=6])   0.4633427      0.2418765              0.2427355
                  Legalone man business LegalGmBH LegalGbR, KG, OHG
logit(P[Y=1|Y>=1])             0.3464605 0.2375718         0.4357008
logit(P[Y=2|Y>=2])             0.2953137 0.2375718         0.3407132
logit(P[Y=3|Y>=3])             0.3256827 0.2375718         0.3865082
logit(P[Y=4|Y>=4])             0.3529541 0.2375718         0.3888449
logit(P[Y=5|Y>=5])             0.4313220 0.2375718         0.4336284
logit(P[Y=6|Y>=6])             0.5077752 0.2375718         0.4535456
                  Pecuniary_Rewardadditional Seed_Capital> 25000
logit(P[Y=1|Y>=1])                  0.3377323           0.5095141
logit(P[Y=2|Y>=2])                  0.2754836           0.2957371
logit(P[Y=3|Y>=3])                  0.3164285           0.3251825
logit(P[Y=4|Y>=4])                  0.3246048           0.3554026
logit(P[Y=5|Y>=5])                  0.3939447           0.3928564
logit(P[Y=6|Y>=6])                  0.3871134           0.4022872
                  Debt_Capitalyes Employees> 2
logit(P[Y=1|Y>=1])       0.3402915     0.138308
logit(P[Y=2|Y>=2])       0.2805316     0.138308
logit(P[Y=3|Y>=3])       0.3251493     0.138308
logit(P[Y=4|Y>=4])       0.3395848     0.138308
logit(P[Y=5|Y>=5])       0.4073462     0.138308
logit(P[Y=6|Y>=6])       0.4845924     0.138308

$p_rel
     Sectorcommerce Sectorservice industry Legalone man business    LegalGmBH
[1,]   0.0004630788            0.001700325           0.002630372 5.538014e-12
     LegalGbR, KG, OHG Pecuniary_Rewardadditional Seed_Capital> 25000
[1,]        0.07651028               0.0007306213        6.823243e-09
     Debt_Capitalyes Employees> 2
[1,]      0.04320919    0.0682878

$p_global
     Legalone man business LegalGbR, KG, OHG Pecuniary_Rewardadditional
[1,]            0.01144885        0.04793595               0.0004478503
```
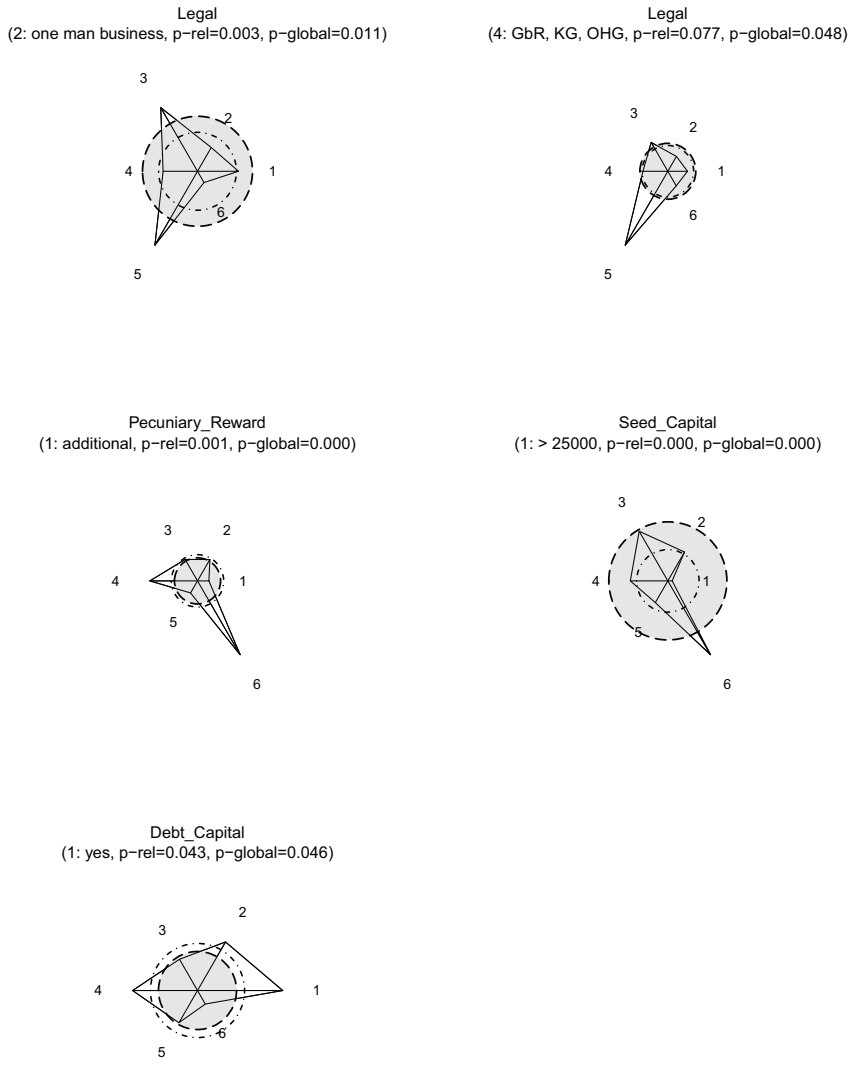

```
     Seed_Capital> 25000 Debt_Capitalyes
[1,]         6.23062e-06      0.04627003

$xlim
[1] 14.48182 46.69647

$ylim
[1] 12.21719 60.66478
```



Effect Stars for the cumulative logit model for some covariates of the insol-

vency data.

```
> m2 <- star.cumulative(Insolvency ~ Sector + Clientele + Employees, insolvency,
+ globcircle = TRUE, test.glob = TRUE, cex.cat = 1, cex.labels = 1.2,
+ lwd.circle = 2, lwd.global = 1.8)
```