BACS HW15 - 109006234

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Loading the data

```
security <- read.csv(
        "G:/My Drive/111_2_BACS/HW15/security_data_sem.csv")
```

Problem 1

(a) Create a PLS path model using SEMinR

(i) Measurement model

```
sec_mm <- constructs(
  composite("TRUST", multi_items("TRST", 1:4)),
  composite("SEC", multi_items("PSEC", 1:4)),
  composite("REP", multi_items("PREP", 1:4)),
  composite("INV", multi_items("PINV", 1:3)),
  composite("POL", multi_items("PPSS", 1:3)),
  composite("FAML", single_item("FAML1")),
  interaction_term(iv="REP",moderator="POL",method=orthogonal)
)
```

(ii) Measurement model

```
sec_sm <- relationships(
 paths(from = c("REP","INV","POL","FAML","REP*POL"), to = "SEC"),
 paths(from = "SEC", to = "TRUST")
)
```

(b) Show us the following results in table or figure formats

```
pls <- estimate_pls(
 data = security,
 measurement_model = sec_mm,
 structural_model = sec_sm
)
```

```
## Generating the seminr model
```

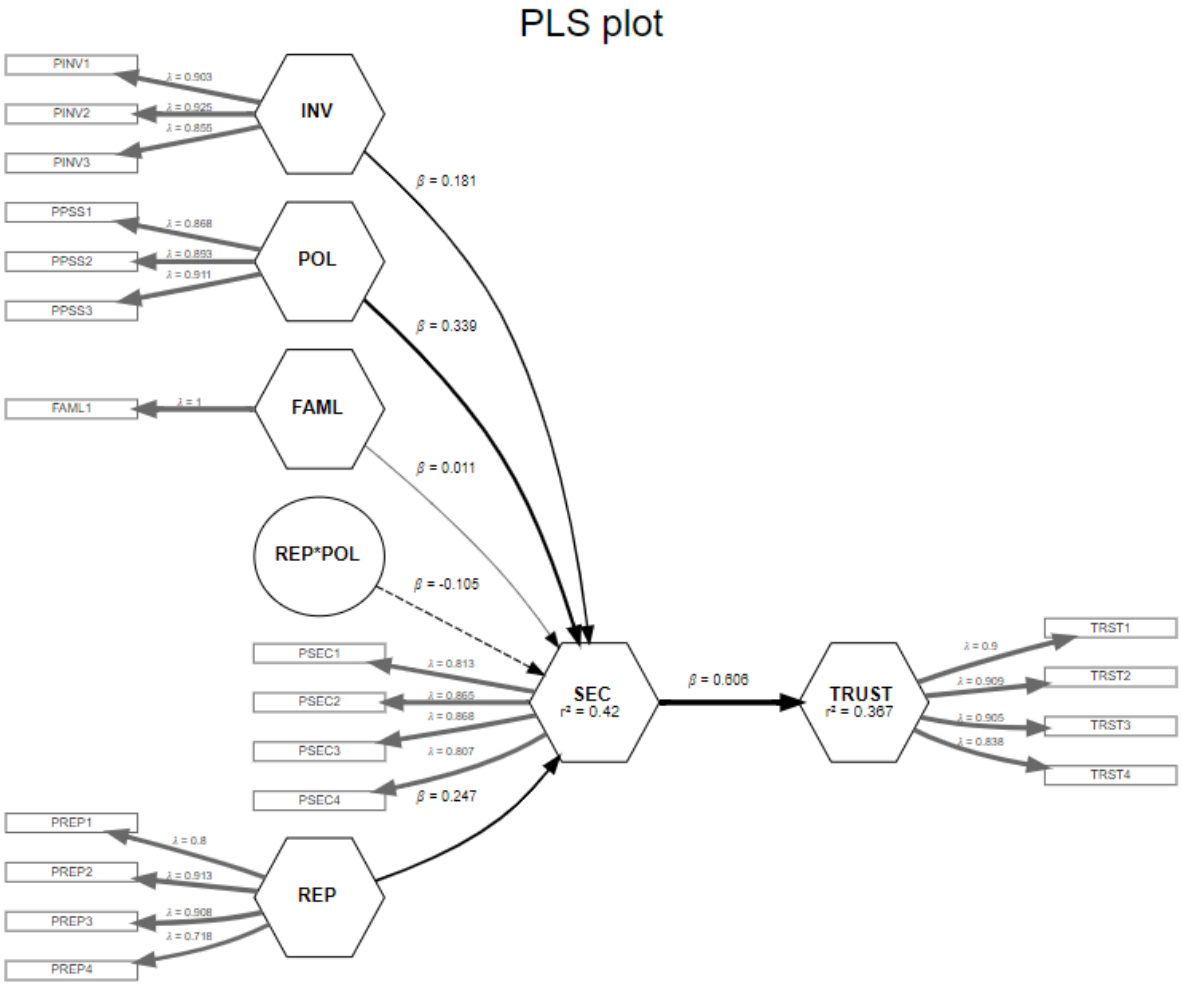
```
## All 405 observations are valid.
```

```
pls_report <- summary(pls)
pls_report
```

```
##
## Results from  package seminr (2.3.2)
##
## Path Coefficients:
##            SEC TRUST
## R^2      0.420 0.367
## AdjR^2   0.412 0.365
## REP      0.247     .
## INV      0.181     .
## POL      0.339     .
## FAML     0.011     .
## REP*POL -0.105     .
## SEC          . 0.606
##
## Reliability:
##         alpha  rhoC   AVE  rhoA
## REP     0.857 0.904 0.704 0.882
## INV     0.875 0.923 0.801 0.879
## POL     0.870 0.920 0.794 0.872
## FAML    1.000 1.000 1.000 1.000
## REP*POL 0.938 0.853 0.352 1.000
## SEC     0.859 0.905 0.704 0.862
## TRUST   0.911 0.937 0.789 0.911
##
## Alpha, rhoC, and rhoA should exceed 0.7 while AVE should exceed 0.5
```

(i) Plot a figure of the estimated model

```
plot(pls, title="PLS plot")
```



(ii) Weights and loadings of composites

```
pls_report$weights
```

```
##              REP   INV   POL  FAML REP*POL   SEC TRUST
## TRST1      0.000 0.000 0.000 0.000   0.000 0.000 0.282
## TRST2      0.000 0.000 0.000 0.000   0.000 0.000 0.280
## TRST3      0.000 0.000 0.000 0.000   0.000 0.000 0.286
## TRST4      0.000 0.000 0.000 0.000   0.000 0.000 0.278
## PSEC1      0.000 0.000 0.000 0.000   0.000 0.277 0.000
## PSEC2      0.000 0.000 0.000 0.000   0.000 0.315 0.000
## PSEC3      0.000 0.000 0.000 0.000   0.000 0.307 0.000
## PSEC4      0.000 0.000 0.000 0.000   0.000 0.292 0.000
## PREP1      0.215 0.000 0.000 0.000   0.000 0.000 0.000
## PREP2      0.334 0.000 0.000 0.000   0.000 0.000 0.000
## PREP3      0.349 0.000 0.000 0.000   0.000 0.000 0.000
## PREP4      0.287 0.000 0.000 0.000   0.000 0.000 0.000
## PINV1      0.000 0.363 0.000 0.000   0.000 0.000 0.000
## PINV2      0.000 0.395 0.000 0.000   0.000 0.000 0.000
## PINV3      0.000 0.358 0.000 0.000   0.000 0.000 0.000
## PPSS1      0.000 0.000 0.360 0.000   0.000 0.000 0.000
## PPSS2      0.000 0.000 0.395 0.000   0.000 0.000 0.000
```

```
## PPSS3       0.000 0.000 0.367 0.000   0.000 0.000 0.000
## FAML1       0.000 0.000 0.000 1.000   0.000 0.000 0.000
## PREP1*PPSS1 0.000 0.000 0.000 0.000   0.239 0.000 0.000
## PREP1*PPSS2 0.000 0.000 0.000 0.000   0.031 0.000 0.000
## PREP1*PPSS3 0.000 0.000 0.000 0.000   0.021 0.000 0.000
## PREP2*PPSS1 0.000 0.000 0.000 0.000   0.046 0.000 0.000
## PREP2*PPSS2 0.000 0.000 0.000 0.000  -0.104 0.000 0.000
## PREP2*PPSS3 0.000 0.000 0.000 0.000  -0.228 0.000 0.000
## PREP3*PPSS1 0.000 0.000 0.000 0.000  -0.341 0.000 0.000
## PREP3*PPSS2 0.000 0.000 0.000 0.000   0.095 0.000 0.000
## PREP3*PPSS3 0.000 0.000 0.000 0.000   0.108 0.000 0.000
## PREP4*PPSS1 0.000 0.000 0.000 0.000   0.443 0.000 0.000
## PREP4*PPSS2 0.000 0.000 0.000 0.000   0.382 0.000 0.000
## PREP4*PPSS3 0.000 0.000 0.000 0.000   0.271 0.000 0.000
```

```
pls_report$loadings
```

```
##                REP    INV    POL   FAML REP*POL    SEC  TRUST
## TRST1        0.000  0.000  0.000  0.000  -0.000  0.000  0.900
## TRST2        0.000  0.000  0.000  0.000  -0.000  0.000  0.909
## TRST3        0.000  0.000  0.000  0.000  -0.000  0.000  0.905
## TRST4        0.000  0.000  0.000  0.000  -0.000  0.000  0.838
## PSEC1        0.000  0.000  0.000  0.000  -0.000  0.813  0.000
## PSEC2        0.000  0.000  0.000  0.000  -0.000  0.865  0.000
## PSEC3        0.000  0.000  0.000  0.000  -0.000  0.868  0.000
## PSEC4        0.000  0.000  0.000  0.000  -0.000  0.807  0.000
## PREP1        0.800  0.000  0.000  0.000   0.000  0.000  0.000
## PREP2        0.913  0.000  0.000  0.000   0.000  0.000  0.000
## PREP3        0.908  0.000  0.000  0.000   0.000  0.000  0.000
## PREP4        0.718  0.000  0.000  0.000   0.000  0.000  0.000
## PINV1        0.000  0.903  0.000  0.000  -0.000  0.000  0.000
## PINV2        0.000  0.925  0.000  0.000  -0.000  0.000  0.000
## PINV3        0.000  0.855  0.000  0.000  -0.000  0.000  0.000
## PPSS1        0.000  0.000  0.868  0.000   0.000  0.000  0.000
## PPSS2        0.000  0.000  0.893  0.000   0.000  0.000  0.000
## PPSS3        0.000  0.000  0.911  0.000   0.000  0.000  0.000
## FAML1        0.000  0.000  0.000  1.000  -0.000  0.000  0.000
## PREP1*PPSS1 -0.000 -0.000 -0.000 -0.000   0.581 -0.000 -0.000
## PREP1*PPSS2 -0.000 -0.000  0.000 -0.000   0.510 -0.000 -0.000
## PREP1*PPSS3 -0.000 -0.000 -0.000 -0.000   0.506 -0.000 -0.000
## PREP2*PPSS1 -0.000 -0.000 -0.000 -0.000   0.509 -0.000 -0.000
## PREP2*PPSS2 -0.000 -0.000  0.000 -0.000   0.421  0.000  0.000
## PREP2*PPSS3 -0.000 -0.000 -0.000  0.000   0.336  0.000  0.000
## PREP3*PPSS1 -0.000 -0.000 -0.000  0.000   0.236  0.000  0.000
## PREP3*PPSS2 -0.000 -0.000  0.000 -0.000   0.555 -0.000 -0.000
## PREP3*PPSS3 -0.000 -0.000 -0.000  0.000   0.466 -0.000 -0.000
## PREP4*PPSS1  0.000 -0.000  0.000  0.000   0.900 -0.000 -0.000
## PREP4*PPSS2 -0.000 -0.000 -0.000 -0.000   0.836 -0.000  0.000
## PREP4*PPSS3  0.000 -0.000  0.000  0.000   0.859 -0.000  0.000
```

(iii) Regression coefficients of paths between factors

```
pls_report$paths
```

```
##            SEC TRUST
```

```
## R^2      0.420 0.367
## AdjR^2   0.412 0.365
## REP      0.247     .
## INV      0.181     .
## POL      0.339     .
## FAML     0.011     .
## REP*POL -0.105     .
## SEC          . 0.606
```

(iv) Bootstrapped path coefficients: t-values, 95% CI

```
boot_pls <- bootstrap_model(pls, nboot=1000)
```

```
## Bootstrapping model using seminr...
```

```
## SEMinR Model successfully bootstrapped
```

```
summary(boot_pls)
```

```
##
## Results from Bootstrap resamples:  1000
##
## Bootstrapped Structural Paths:
##                   Original Est. Bootstrap Mean Bootstrap SD T Stat. 2.5% CI
## REP  ->  SEC             0.247          0.242        0.056   4.373   0.125
## INV  ->  SEC             0.181          0.184        0.056   3.205   0.072
## POL  ->  SEC             0.339          0.343        0.055   6.195   0.237
## FAML  ->  SEC            0.011          0.012        0.057   0.186  -0.102
## REP*POL  ->  SEC        -0.105         -0.023        0.123  -0.848  -0.185
## SEC  ->  TRUST           0.606          0.608        0.035  17.207   0.540
##                   97.5% CI
## REP  ->  SEC         0.347
## INV  ->  SEC         0.297
## POL  ->  SEC         0.448
## FAML  ->  SEC        0.123
## REP*POL  ->  SEC     0.187
## SEC  ->  TRUST       0.676
##
## Bootstrapped Weights:
##                          Original Est. Bootstrap Mean Bootstrap SD T Stat.
## TRST1  ->  TRUST                 0.282          0.282        0.014  20.179
## TRST2  ->  TRUST                 0.280          0.280        0.015  18.242
## TRST3  ->  TRUST                 0.286          0.284        0.016  17.732
## TRST4  ->  TRUST                 0.278          0.278        0.020  13.677
## PSEC1  ->  SEC                   0.277          0.278        0.015  18.263
## PSEC2  ->  SEC                   0.315          0.314        0.017  18.194
## PSEC3  ->  SEC                   0.307          0.308        0.016  18.783
## PSEC4  ->  SEC                   0.292          0.291        0.018  16.015
## PREP1  ->  REP                   0.215          0.214        0.026   8.278
## PREP2  ->  REP                   0.334          0.334        0.019  17.771
## PREP3  ->  REP                   0.349          0.349        0.022  15.738
## PREP4  ->  REP                   0.287          0.286        0.026  11.109
## PINV1  ->  INV                   0.363          0.363        0.025  14.574
## PINV2  ->  INV                   0.395          0.395        0.025  15.667
## PINV3  ->  INV                   0.358          0.357        0.027  13.387
```

```
## PPSS1  ->  POL                  0.360          0.360        0.022  16.152
## PPSS2  ->  POL                  0.395          0.396        0.023  17.540
## PPSS3  ->  POL                  0.367          0.368        0.019  19.659
## FAML1  ->  FAML                 1.000          1.000        0.000       .
## PREP1*PPSS1  ->  REP*POL        0.239          0.093        0.155   1.540
## PREP1*PPSS2  ->  REP*POL        0.031          0.060        0.084   0.372
## PREP1*PPSS3  ->  REP*POL        0.021          0.061        0.116   0.182
## PREP2*PPSS1  ->  REP*POL        0.046          0.073        0.106   0.434
## PREP2*PPSS2  ->  REP*POL       -0.104          0.049        0.157  -0.666
## PREP2*PPSS3  ->  REP*POL       -0.228          0.037        0.233  -0.981
## PREP3*PPSS1  ->  REP*POL       -0.341         -0.001        0.311  -1.095
## PREP3*PPSS2  ->  REP*POL        0.095          0.091        0.136   0.697
## PREP3*PPSS3  ->  REP*POL        0.108          0.092        0.131   0.829
## PREP4*PPSS1  ->  REP*POL        0.443          0.136        0.278   1.591
## PREP4*PPSS2  ->  REP*POL        0.382          0.121        0.261   1.464
## PREP4*PPSS3  ->  REP*POL        0.271          0.114        0.179   1.518
##                         2.5% CI 97.5% CI
## TRST1  ->  TRUST          0.254    0.311
## TRST2  ->  TRUST          0.250    0.309
## TRST3  ->  TRUST          0.254    0.320
## TRST4  ->  TRUST          0.239    0.317
## PSEC1  ->  SEC            0.249    0.308
## PSEC2  ->  SEC            0.281    0.349
## PSEC3  ->  SEC            0.277    0.340
## PSEC4  ->  SEC            0.254    0.327
## PREP1  ->  REP            0.161    0.261
## PREP2  ->  REP            0.302    0.374
## PREP3  ->  REP            0.306    0.395
## PREP4  ->  REP            0.241    0.337
## PINV1  ->  INV            0.318    0.413
## PINV2  ->  INV            0.345    0.445
## PINV3  ->  INV            0.307    0.413
## PPSS1  ->  POL            0.314    0.401
## PPSS2  ->  POL            0.357    0.443
## PPSS3  ->  POL            0.331    0.406
## FAML1  ->  FAML           1.000    1.000
## PREP1*PPSS1  ->  REP*POL -0.239    0.375
## PREP1*PPSS2  ->  REP*POL -0.138    0.208
## PREP1*PPSS3  ->  REP*POL -0.221    0.278
## PREP2*PPSS1  ->  REP*POL -0.170    0.256
## PREP2*PPSS2  ->  REP*POL -0.285    0.349
## PREP2*PPSS3  ->  REP*POL -0.394    0.448
## PREP3*PPSS1  ->  REP*POL -0.620    0.677
## PREP3*PPSS2  ->  REP*POL -0.229    0.336
## PREP3*PPSS3  ->  REP*POL -0.227    0.319
## PREP4*PPSS1  ->  REP*POL -0.451    0.574
## PREP4*PPSS2  ->  REP*POL -0.453    0.569
## PREP4*PPSS3  ->  REP*POL -0.291    0.412
##
## Bootstrapped Loadings:
##                         Original Est. Bootstrap Mean Bootstrap SD T Stat.
## TRST1  ->  TRUST                0.900          0.900        0.015  58.088
## TRST2  ->  TRUST                0.909          0.909        0.019  47.066
## TRST3  ->  TRUST                0.905          0.904        0.022  41.660
## TRST4  ->  TRUST                0.838          0.838        0.030  27.609
## PSEC1  ->  SEC                  0.813          0.814        0.025  32.122
```

```
## PSEC2  ->  SEC                  0.865          0.865        0.027  32.525
## PSEC3  ->  SEC                  0.868          0.869        0.021  42.167
## PSEC4  ->  SEC                  0.807          0.806        0.025  32.239
## PREP1  ->  REP                  0.800          0.798        0.041  19.708
## PREP2  ->  REP                  0.913          0.913        0.016  56.331
## PREP3  ->  REP                  0.908          0.909        0.019  47.163
## PREP4  ->  REP                  0.718          0.719        0.033  21.644
## PINV1  ->  INV                  0.903          0.904        0.025  36.405
## PINV2  ->  INV                  0.925          0.925        0.021  43.387
## PINV3  ->  INV                  0.855          0.855        0.027  32.140
## PPSS1  ->  POL                  0.868          0.866        0.025  35.418
## PPSS2  ->  POL                  0.893          0.893        0.015  60.826
## PPSS3  ->  POL                  0.911          0.911        0.017  54.572
## FAML1  ->  FAML                 1.000          1.000        0.000      .
## PREP1*PPSS1  ->  REP*POL        0.581          0.579        0.267   2.174
## PREP1*PPSS2  ->  REP*POL        0.510          0.565        0.253   2.015
## PREP1*PPSS3  ->  REP*POL        0.506          0.576        0.272   1.862
## PREP2*PPSS1  ->  REP*POL        0.509          0.612        0.279   1.823
## PREP2*PPSS2  ->  REP*POL        0.421          0.582        0.290   1.453
## PREP2*PPSS3  ->  REP*POL        0.336          0.583        0.337   0.997
## PREP3*PPSS1  ->  REP*POL        0.236          0.490        0.345   0.682
## PREP3*PPSS2  ->  REP*POL        0.555          0.615        0.280   1.978
## PREP3*PPSS3  ->  REP*POL        0.466          0.594        0.296   1.574
## PREP4*PPSS1  ->  REP*POL        0.900          0.604        0.346   2.598
## PREP4*PPSS2  ->  REP*POL        0.836          0.530        0.341   2.449
## PREP4*PPSS3  ->  REP*POL        0.859          0.584        0.322   2.671
##                           2.5% CI 97.5% CI
## TRST1  ->  TRUST            0.868    0.927
## TRST2  ->  TRUST            0.866    0.941
## TRST3  ->  TRUST            0.855    0.938
## TRST4  ->  TRUST            0.767    0.889
## PSEC1  ->  SEC              0.760    0.861
## PSEC2  ->  SEC              0.803    0.907
## PSEC3  ->  SEC              0.827    0.908
## PSEC4  ->  SEC              0.751    0.850
## PREP1  ->  REP              0.709    0.866
## PREP2  ->  REP              0.878    0.940
## PREP3  ->  REP              0.866    0.940
## PREP4  ->  REP              0.650    0.779
## PINV1  ->  INV              0.849    0.944
## PINV2  ->  INV              0.874    0.958
## PINV3  ->  INV              0.796    0.899
## PPSS1  ->  POL              0.811    0.905
## PPSS2  ->  POL              0.862    0.920
## PPSS3  ->  POL              0.874    0.937
## FAML1  ->  FAML             1.000    1.000
## PREP1*PPSS1  ->  REP*POL   -0.100    0.917
## PREP1*PPSS2  ->  REP*POL   -0.102    0.887
## PREP1*PPSS3  ->  REP*POL   -0.150    0.900
## PREP2*PPSS1  ->  REP*POL   -0.115    0.942
## PREP2*PPSS2  ->  REP*POL   -0.153    0.920
## PREP2*PPSS3  ->  REP*POL   -0.310    0.985
## PREP3*PPSS1  ->  REP*POL   -0.335    0.931
## PREP3*PPSS2  ->  REP*POL   -0.109    0.941
## PREP3*PPSS3  ->  REP*POL   -0.196    0.947
## PREP4*PPSS1  ->  REP*POL   -0.244    0.981
```

```
## PREP4*PPSS2  ->  REP*POL  -0.326    0.921
## PREP4*PPSS3  ->  REP*POL  -0.229    0.947
##
## Bootstrapped HTMT:
##                     Original Est. Bootstrap Mean Bootstrap SD 2.5% CI 97.5% CI
## REP  ->  INV                0.705          0.707        0.049   0.600    0.796
## REP  ->  POL                0.543          0.543        0.056   0.436    0.650
## REP  ->  FAML               0.599          0.600        0.054   0.495    0.696
## REP  ->  REP*POL            0.000          0.000        0.000   0.000    0.000
## REP  ->  SEC                0.595          0.593        0.044   0.502    0.675
## REP  ->  TRUST              0.682          0.681        0.045   0.597    0.767
## INV  ->  POL                0.498          0.499        0.057   0.381    0.602
## INV  ->  FAML               0.494          0.494        0.053   0.389    0.595
## INV  ->  REP*POL            0.085          0.104        0.034   0.055    0.183
## INV  ->  SEC                0.568          0.568        0.047   0.477    0.656
## INV  ->  TRUST              0.563          0.564        0.049   0.469    0.650
## POL  ->  FAML               0.596          0.594        0.049   0.490    0.685
## POL  ->  REP*POL            0.000          0.000        0.000   0.000    0.000
## POL  ->  SEC                0.622          0.624        0.051   0.522    0.724
## POL  ->  TRUST              0.458          0.457        0.058   0.337    0.581
## FAML  ->  REP*POL           0.046          0.065        0.024   0.031    0.123
## FAML  ->  SEC               0.455          0.455        0.050   0.351    0.550
## FAML  ->  TRUST             0.471          0.470        0.052   0.366    0.573
## REP*POL  ->  SEC            0.059          0.083        0.019   0.053    0.128
## REP*POL  ->  TRUST          0.044          0.071        0.017   0.045    0.112
## SEC  ->  TRUST              0.685          0.685        0.036   0.612    0.754
##
## Bootstrapped Total Paths:
##                     Original Est. Bootstrap Mean Bootstrap SD 2.5% CI 97.5% CI
## REP  ->  SEC                0.247          0.242        0.056   0.125    0.347
## REP  ->  TRUST              0.150          0.147        0.037   0.077    0.220
## INV  ->  SEC                0.181          0.184        0.056   0.072    0.297
## INV  ->  TRUST              0.109          0.112        0.036   0.044    0.181
## POL  ->  SEC                0.339          0.343        0.055   0.237    0.448
## POL  ->  TRUST              0.205          0.209        0.035   0.140    0.278
## FAML  ->  SEC               0.011          0.012        0.057  -0.102    0.123
## FAML  ->  TRUST             0.006          0.007        0.035  -0.062    0.076
## REP*POL  ->  SEC           -0.105         -0.023        0.123  -0.185    0.187
## REP*POL  ->  TRUST         -0.063         -0.014        0.075  -0.113    0.114
## SEC  ->  TRUST              0.606          0.608        0.035   0.540    0.676
```

Problem 2

(a) Create a common factor model using SEMinR

(i) Either respecify all the constructs as being reflective(), or use the as.reflective() function to convert your earlier measurement model to being entirely reflective.

```
cfm_mm <- constructs(
 reflective('TRUST', multi_items('TRST', 1:4)),
 reflective('SEC', multi_items('PSEC', 1:4)),
 reflective('REP', multi_items('PREP', 1:4)),
 reflective('INV', multi_items('PINV', 1:3)),
 reflective('POL', multi_items('PPSS', 1:3)),
 reflective('FAML', single_item('FAML1')),
```

```
 interaction_term(iv='REP', moderator='POL', method=orthogonal)
)
```

(ii) Use the same structural model as before

```
cfm_sm <- relationships(
 paths(from = c("REP","INV","POL","FAML","REP*POL"), to = "SEC"),
 paths(from = "SEC", to = "TRUST")
)
```

(b) Show us the following results in table or figure formats

```
cfm_pls <- estimate_cbsem(
 data = security,
 measurement_model = cfm_mm,
 structural_model = cfm_sm
)
```

```
## Generating the seminr model for CBSEM
```

```
cfm_pls_report <- summary(cfm_pls)
cfm_pls_report
```

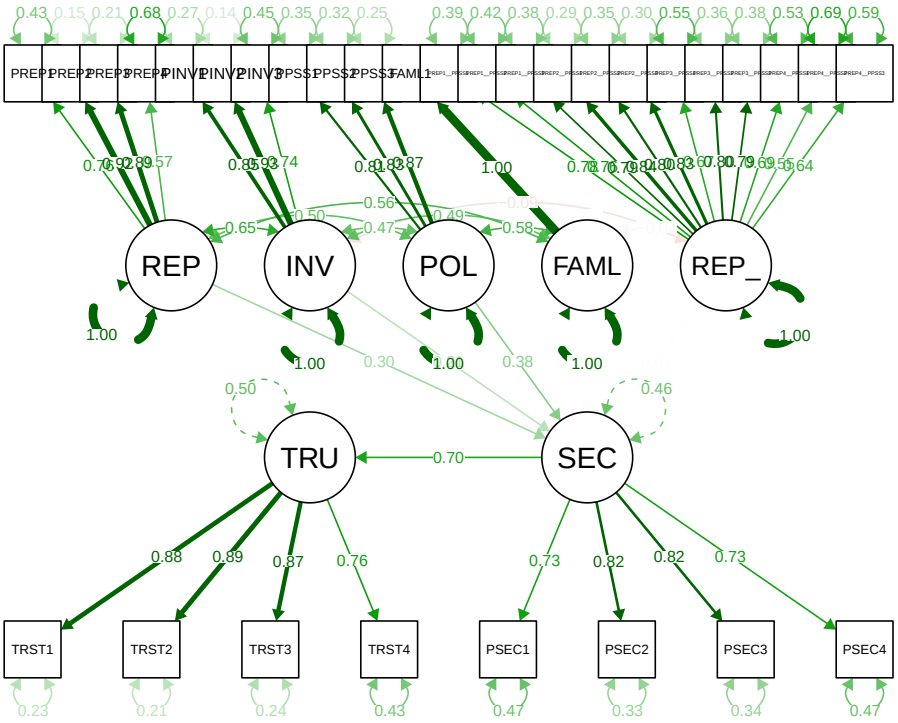
```
##
## Results from  package seminr (2.3.2)
## Estimation used  package seminr (2.3.2)
##
## Fit metrics:
##       npar       fmin       logl        aic        bic     ntotal       bic2
##     77.000      3.529 -17296.241  34746.482  35054.781    405.000  34810.451
##        rmr       srmr       crmr        gfi       agfi       pgfi        mfi
##      0.116      0.063      0.065      0.742      0.694      0.627      0.049
##       ecvi
##      7.439
##
##                           metric   scaled robust
## cfi                        0.764    0.772  0.799
## tli                        0.738    0.747  0.777
## nnfi                       0.738    0.747  0.777
## rni                        0.764    0.772  0.799
## rmsea                      0.120    0.072  0.107
## rmsea.ci.lower             0.116    0.069  0.100
## rmsea.ci.upper             0.124    0.075  0.114
## rmsea.pvalue               0.000    0.000  0.000
## rmsea.notclose.pvalue      1.000    0.000  1.000
## chisq                   2858.871 1303.538      .
## df                       419.000  419.000      .
## pvalue                     0.000    0.000      .
## baseline.chisq         10812.133 4340.588      .
## baseline.df              465.000  465.000      .
## baseline.pvalue            0.000    0.000      .
## rfi                        0.707    0.667      .
```

```
## nfi                       0.736    0.700       .
## pnfi                      0.663    0.630       .
## ifi                       0.765    0.774       .
##
## Reliability:
##       rhoC  AVE
## TRUST 0.91 0.72
## SEC   0.86 0.60
## REP   0.87 0.63
## INV   0.88 0.71
## POL   0.87 0.70
## FAML  1.00 1.00
##
## Path Coefficients:
##             SEC TRUST
## R^2        0.54  0.50
## REP        0.30     .
## INV        0.21     .
## POL        0.38     .
## FAML      -0.01     .
## REP_x_POL  0.01     .
## SEC           .  0.70
```

(i) Plot a figure of the estimated model

```
plot(cfm_pls, title="Common-Factor Models using CB-SEM")
```

```
## Plotting of lavaan models using semPlot.
```



```
## NULL
```

(ii) Loadings of composites

```
cfm_pls_report$loadings
```

```
## $coefficients
##           TRUST       SEC       REP       INV       POL FAML
## TRST1 0.8800240        NA        NA        NA        NA   NA
## TRST2 0.8886342        NA        NA        NA        NA   NA
## TRST3 0.8690644        NA        NA        NA        NA   NA
## TRST4 0.7575988        NA        NA        NA        NA   NA
## PSEC1        NA 0.7308766        NA        NA        NA   NA
## PSEC2        NA 0.8173481        NA        NA        NA   NA
## PSEC3        NA 0.8151708        NA        NA        NA   NA
## PSEC4        NA 0.7260444        NA        NA        NA   NA
## PREP1        NA        NA 0.7551328        NA        NA   NA
## PREP2        NA        NA 0.9199208        NA        NA   NA
## PREP3        NA        NA 0.8871362        NA        NA   NA
## PREP4        NA        NA 0.5650059        NA        NA   NA
## PINV1        NA        NA        NA 0.8520004        NA   NA
## PINV2        NA        NA        NA 0.9257476        NA   NA
## PINV3        NA        NA        NA 0.7388750        NA   NA
## PPSS1        NA        NA        NA        NA 0.8051533   NA
## PPSS2        NA        NA        NA        NA 0.8272576   NA
## PPSS3        NA        NA        NA        NA 0.8674335   NA
## FAML1        NA        NA        NA        NA        NA    1
##
## $significance
##                              Std Estimate         SE      t-Value   2.5% CI
## TRUST -> TRST1                  0.8800240 0.02272091 0.000000e+00 0.8354919
## TRUST -> TRST2                  0.8886342 0.03330783 0.000000e+00 0.8233521
## TRUST -> TRST3                  0.8690644 0.03749444 0.000000e+00 0.7955767
## TRUST -> TRST4                  0.7575988 0.04846748 0.000000e+00 0.6626042
## SEC -> PSEC1                    0.7308766 0.03679205 0.000000e+00 0.6587655
## SEC -> PSEC2                    0.8173481 0.04480183 0.000000e+00 0.7295381
## SEC -> PSEC3                    0.8151708 0.03728082 0.000000e+00 0.7421017
## SEC -> PSEC4                    0.7260444 0.03811841 0.000000e+00 0.6513337
## REP -> PREP1                    0.7551328 0.04464916 0.000000e+00 0.6676220
## REP -> PREP2                    0.9199208 0.02635333 0.000000e+00 0.8682692
## REP -> PREP3                    0.8871362 0.04015103 0.000000e+00 0.8084416
## REP -> PREP4                    0.5650059 0.04585583 0.000000e+00 0.4751302
## INV -> PINV1                    0.8520004 0.04489927 0.000000e+00 0.7639994
## INV -> PINV2                    0.9257476 0.04556425 0.000000e+00 0.8364433
## INV -> PINV3                    0.7388750 0.04511601 0.000000e+00 0.6504492
## POL -> PPSS1                    0.8051533 0.04355300 0.000000e+00 0.7197910
## POL -> PPSS2                    0.8272576 0.02807169 0.000000e+00 0.7722381
## POL -> PPSS3                    0.8674335 0.03273664 0.000000e+00 0.8032708
## FAML -> FAML1                   1.0000000 0.00000000           NA 1.0000000
## REP_x_POL -> PREP1_x_PPSS1      0.7781584 0.05799871 0.000000e+00 0.6644831
## REP_x_POL -> PREP1_x_PPSS2      0.7597768 0.05931838 0.000000e+00 0.6435149
## REP_x_POL -> PREP1_x_PPSS3      0.7879106 0.05013554 0.000000e+00 0.6896467
## REP_x_POL -> PREP2_x_PPSS1      0.8447368 0.03649041 0.000000e+00 0.7732169
## REP_x_POL -> PREP2_x_PPSS2      0.8034561 0.03639411 0.000000e+00 0.7321250
## REP_x_POL -> PREP2_x_PPSS3      0.8342444 0.03536430 0.000000e+00 0.7649317
## REP_x_POL -> PREP3_x_PPSS1      0.6736451 0.12948899 1.967998e-07 0.4198514
```

```
## REP_x_POL -> PREP3_x_PPSS2    0.8011944 0.03780427 0.000000e+00 0.7270994
## REP_x_POL -> PREP3_x_PPSS3    0.7902063 0.06416741 0.000000e+00 0.6644405
## REP_x_POL -> PREP4_x_PPSS1    0.6854770 0.06906812 0.000000e+00 0.5501059
## REP_x_POL -> PREP4_x_PPSS2    0.5531922 0.06212434 0.000000e+00 0.4314307
## REP_x_POL -> PREP4_x_PPSS3    0.6405843 0.05794028 0.000000e+00 0.5270235
##                               97.5% CI
## TRUST -> TRST1               0.9245562
## TRUST -> TRST2               0.9539164
## TRUST -> TRST3               0.9425522
## TRUST -> TRST4               0.8525933
## SEC -> PSEC1                 0.8029877
## SEC -> PSEC2                 0.9051581
## SEC -> PSEC3                 0.8882399
## SEC -> PSEC4                 0.8007551
## REP -> PREP1                 0.8426435
## REP -> PREP2                 0.9715724
## REP -> PREP3                 0.9658307
## REP -> PREP4                 0.6548817
## INV -> PINV1                 0.9400013
## INV -> PINV2                 1.0150518
## INV -> PINV3                 0.8273007
## POL -> PPSS1                 0.8905156
## POL -> PPSS2                 0.8822771
## POL -> PPSS3                 0.9315961
## FAML -> FAML1                1.0000000
## REP_x_POL -> PREP1_x_PPSS1 0.8918338
## REP_x_POL -> PREP1_x_PPSS2 0.8760387
## REP_x_POL -> PREP1_x_PPSS3 0.8861744
## REP_x_POL -> PREP2_x_PPSS1 0.9162567
## REP_x_POL -> PREP2_x_PPSS2 0.8747873
## REP_x_POL -> PREP2_x_PPSS3 0.9035572
## REP_x_POL -> PREP3_x_PPSS1 0.9274389
## REP_x_POL -> PREP3_x_PPSS2 0.8752894
## REP_x_POL -> PREP3_x_PPSS3 0.9159721
## REP_x_POL -> PREP4_x_PPSS1 0.8208480
## REP_x_POL -> PREP4_x_PPSS2 0.6749536
## REP_x_POL -> PREP4_x_PPSS3 0.7541452
```

(iii) Regression coefficients of paths between factors, and their p-values

```
cfm_pls_report$paths
```

```
## $coefficients
##                     SEC     TRUST
## R^2        0.540381651 0.4951084
## REP        0.299536782        NA
## INV        0.214253245        NA
## POL        0.376401499        NA
## FAML      -0.008837653        NA
## REP_x_POL  0.008355287        NA
## SEC                 NA 0.7036394
##
## $pvalues
##                     SEC TRUST
## REP       3.817182e-05    NA
## INV       3.534482e-03    NA
```

```
## POL       4.380975e-09    NA
## FAML      8.996836e-01    NA
## REP_x_POL 8.516847e-01    NA
## SEC                NA     0
##
## $significance
##                  Std Estimate         SE      t-Value     2.5% CI   97.5% CI
## SEC -> REP        0.299536782 0.07273355 3.817182e-05  0.15698165 0.44209191
## SEC -> INV        0.214253245 0.07345058 3.534482e-03  0.07029275 0.35821374
## SEC -> POL        0.376401499 0.06413246 4.380975e-09  0.25070419 0.50209881
## SEC -> FAML      -0.008837653 0.07010617 8.996836e-01 -0.14624321 0.12856791
## SEC -> REP_x_POL  0.008355287 0.04468802 8.516847e-01 -0.07923162 0.09594219
## TRUST -> SEC      0.703639369 0.03721629 0.000000e+00  0.63069677 0.77658197
```