**Explanatory File for ‘Network\_Interdependencies\_Thurner\_et\_al\_2018.RData’**

This document describes the R-Code in ‘Network\_Interdependencies\_Thurner\_et\_al\_2018.RData’ and how to replicate the results in ‘Network Interdependecies and the Evolution of the Arms Trade Network’, Thurner et al. 2018, JCR.

**Lines 1-18:** Necessary R-packages

**Lines 19-723:** preparing a matrix called ‘laenderliste’ (“country list” in german), which is necessary to merge all different data sets for the analysis.

**Lines 724-949:** create a matrix EX where columns represent years from 1950-2013 and rows the actors in the network. EX[i,j]=1 means that country i did exist in year j, EX[i,j]=0 means that country i did not exist in year j. Smallest countries (listed in 1.2 in the Appendix) that were not considered in analysis have been muted out.

**Lines 950-1056:** Reading in the SIPRI data

**Lines 1057-1090:** create a list of 64 adjacency matrices (one for each year from 1950-2013) and read in the trade flow from country I to country j in year t into the right column and row of the right matrix.

**Lines 1091-1605:** Read in data for the covariates of the Model, e.g. Alliance, Geographic Distance, etc.

**Lines 1606-1707:** A help function that is necessary for the simulation. For a given time period ‘from – year’ it removes all countries from the adjacency matrix that did not exist at year i, and returns the matrix from year “from+plus”, e.g. amperiod2(from=1960,year=1965,plus=1,mode=1,tiv=2) creates an adjacency matrix for year 1960+1 based on countries that existed in year 1965. A tie is defined if the trade was 2Mio TIV or more. The TERGM requires networks on the same set of vertices. Mode=1 returns MCW adjacency matrix. By changing the mode parameter the covariates can be cut into the right form as well.

mod=1, MCW

mod=2, Defense Alliance

mod=6, polity IV

mod=25, path dependency

mod=8, military capability, CINC

mod=10, intrastate conflicts

mod=22 GDP

mod=23 capital distance

The tiv parameter (default is tiv=1) allows to control the binarization of the network, e.g. if tiv=1, all ties with more or equal 1 (in million tiv) are taken as ties in the network, while all trades with less than 1 are neglected.

**Lines 1708-1732:** Help function necessary for some figures. For a given year I it cuts out all countries that did not exist from the adjacency matrix. It also binarizes according to the ‘tiv’ parameter.

**Lines 1733-1954:** Estimation of the model parameters for the entire time period. Results are stored in the result matrix ReMa. The function amperiod2() is being used to preprocess the data

**Lines 1955-2123:** Plotting the results to get Figure 5

**Lines 2124-2177:** Code for Figure 6

**Lines 2178-2467:** Code for out-of-sample AUC

**Lines 2468-2513:** Code for Figure 7

**Lines 2514-2689:** Code for the remaining figures in the paper (Figures 1-4)

**Lines 2690-2756:** Power-Law calculation as discussed on page 13

**Lines 2757-2793:** Code for Table1

**Lines 2794–3166:** Codes for Figures in the Appendix