Potsdam Institute For Climate Impact Research
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Introductory phase report

Optimal adjustment of the global trade system to local network disruption

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4.1 statistics

- Idea: In case studies, we identify rules/indices that determine possible compensators due to network properties. So we can create a "law" / "equation" to determine the most probable compensators. This result can be checked with this statistics section

4.1.1 F(ir)

- Plot F(country(rs)) and F(sector(rs)) LPG and LPS
  What insights does it give? - first overview about results, identifies first estimates about important regions/sectors/regional sectors that shall be examined more detailled later on.
  Maybe aggregate results for regions and sectors and give a general result about "impact value"
  Identify differences from LPG and LPS, explain that behaviour. Show that F(LPG)¡F(LPS)
  Mention not feasible runs

4.1.2 comp_ir(ir)

- Plot strongest compensator rs_comp(rs) for LPG and LPS
  Decide: max(p) or max($p_i * r$) as criterion?
  USA and China as stabilisators of the world economy

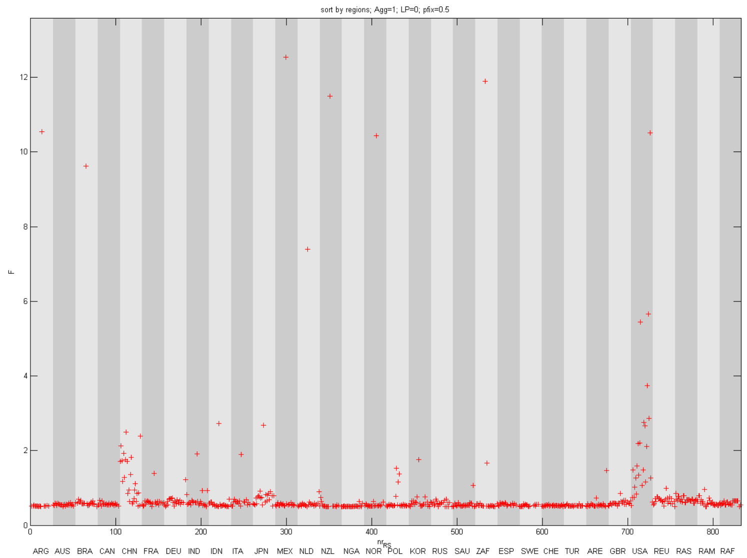

Figure 4.1: F for all ir, LPG, pfix=0.5, by regions

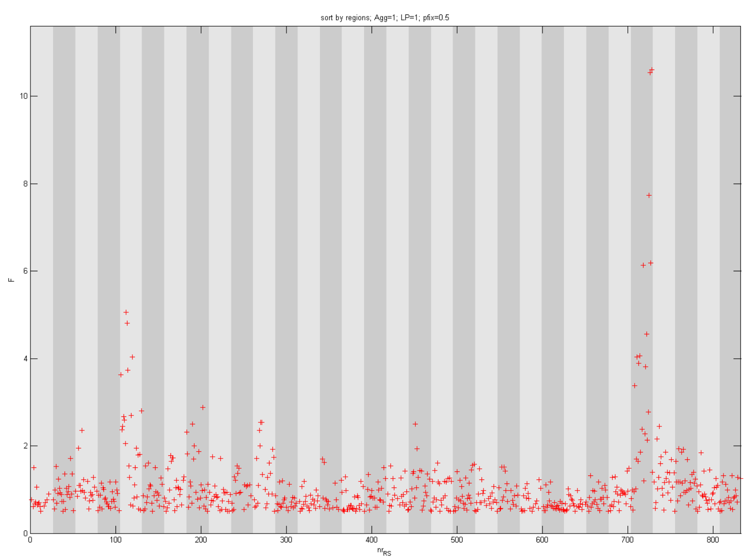

Figure 4.2: F for all ir, LPS, pfix=0.5, by regions

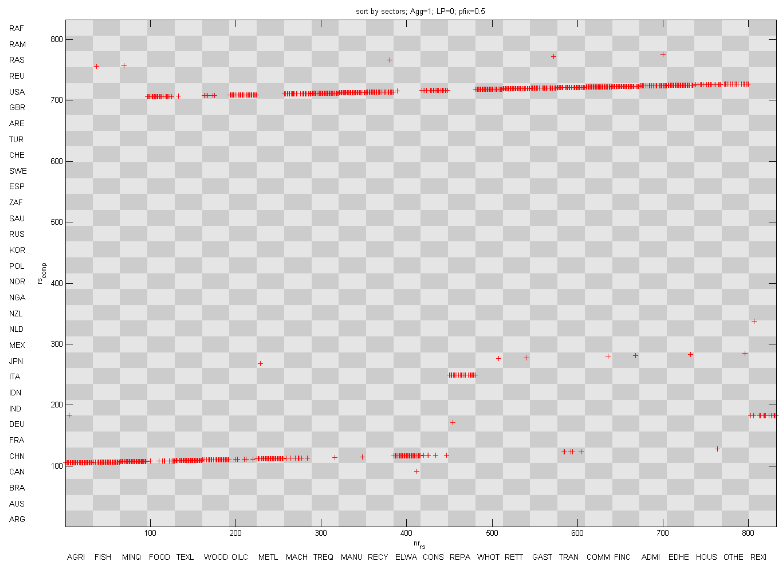

Figure 4.3: compensator rs, LPG, pfix=0.5, by sectors

maybe case-study the other compensators? Why are they important in that specific case?
Order (as done already) in regions, but alsorder in sectors.

4.2 comparison LPS/LPG

4.3 absorption potential

ad plots with degree(X), alpha(degree), alpha(X)

For Agg=1, do some kind of statistics. Is the upper right one usually the one with the highest change? Are these three good criterions?

ad2 Maybe apply other criteria? Some graph theory properties?

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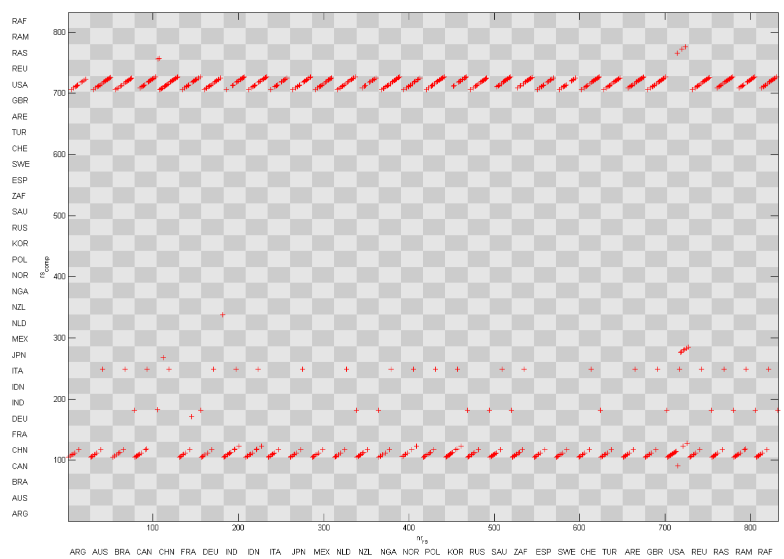

Figure 4.4: compensator rs, LPG, pfix=0.5, by regions

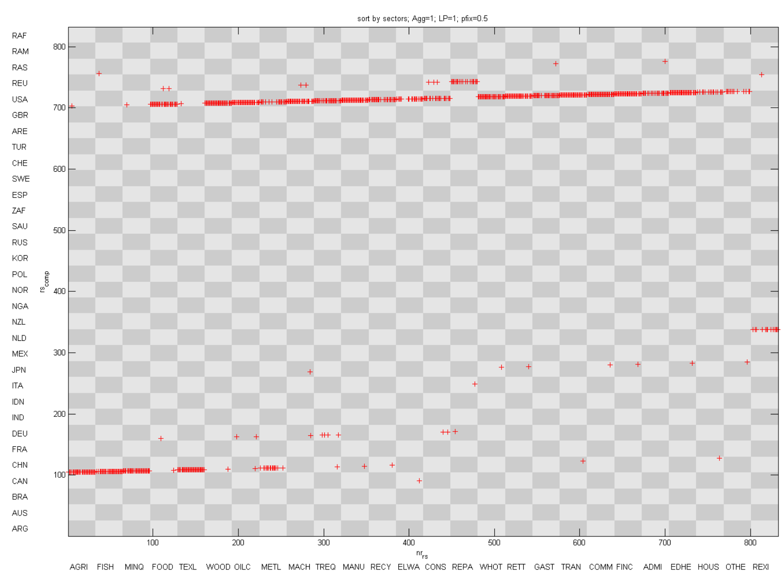

Figure 4.5: compensator rs, LPS, pfix=0.5, by sectors

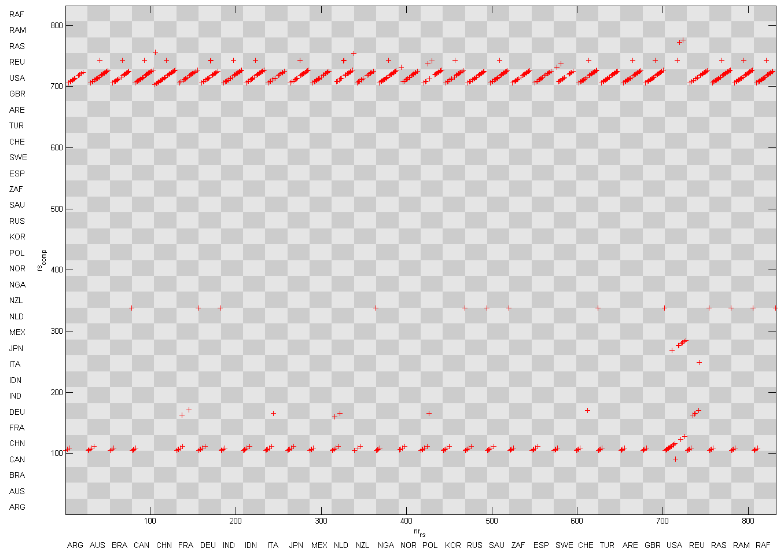

Figure 4.6: compensator rs, LPS, pfix=0.5, by regions

4.4 linear response

- Idea: In theory develop a rule / equation / law that hints at a linear response of the system. Maybe the "expansion" of the polyhedron, until it touches a hyperplane? In this chapter, show that this is the truth.
- Measure the slope F(pfix) / p(pfix) and connect it to some network properties - estimate the behaviour without actually doing the simulation.
- shows phase transition
- shows F(LPS)¿F(LPG)

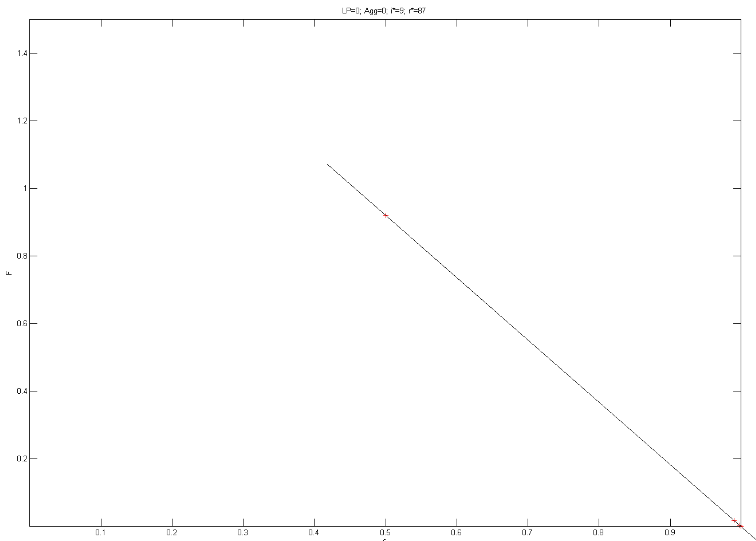

Figure 4.7: Agg=0, LPG, i*r*=2245, linear part

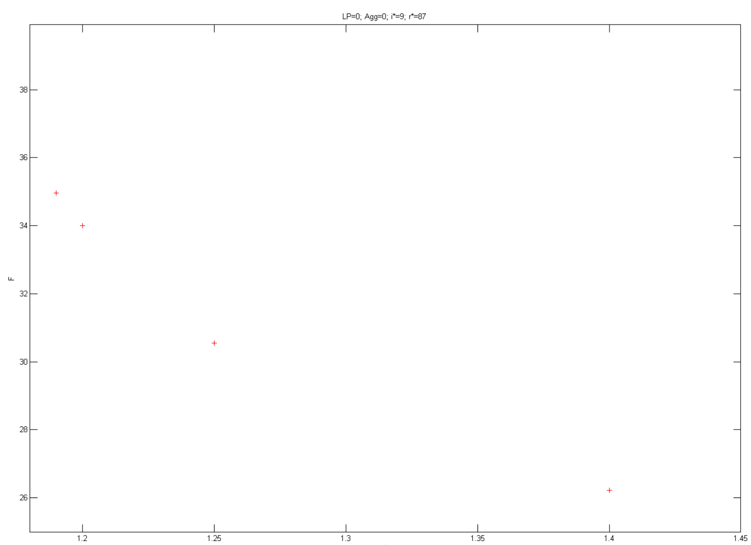

Figure 4.8: Agg=0, LPG, i*r*=2245, nonlinear part, slope: m=-1.841=m(Agg1,LP0)

4.5 phase transition

4.6 case studies incl. forward/backward effects

4.6.1 Japan machinery drops out

4.6.2 other forward effect example

4.6.3 identify supply chains

4.7 ??? time evolution ???

Chapter 5

Final

5.1 discussion

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5.3 Appendix

Bibliography