Conclusions from analysis

1. Analysis: Data is probably heteroskedastic
   1. Meaning: The variation in the error term can be explained by variation in our independent variables.
   2. Conclusion: Analysis would be better if not for apparent omitted variable bias, but biases can be controlled with robust standard errors.
2. Analysis: Natural log function better approximates variation in the data (R2 of 0.73 vs 0.68)
   1. Meaning: The data for requirements and beneficiaries resembles a log-normal distribution.
   2. Conclusion: Relationship between requirements and beneficiaries is not always linear, and rather follows an equation that describes the elasticity (percent change over percent change) of the curve between the two. Many sectors display curves indicative of economies of scale, while others are linear or even diseconomies of scale.
3. Analysis: F-statistic for the joint significance of period dummies is low.
   1. Meaning: The effect on time of the relationship between requirements and beneficiaries is statistically zero.
   2. Conclusion: Exogenous variables that change with time that would affect all countries and all sectors equally (e.g. global economic health) do not strongly affect the relationship between requirements and beneficiaries. Rather, over the period of the data, the relationship stays constant.
4. Analysis: Country dummies are jointly significant.
   1. Meaning: The relationship between requirements and beneficiaries is significantly affected by the recipient country (exogenous variables that only affect the recipient and no other, e.g. GDP, conflict, etc.). This effect is manifested through a change in the intercept of the linear relationship between the natural log of requirement and the natural log of beneficiaries.
   2. Conclusion: Fixed costs are different between countries.
5. Analysis: Sector dummies are jointly significant
   1. Meaning: The relationship between requirements and beneficiaries is significantly affected by the sector (exogenous variables that only affect this sector and no other, e.g. fixed costs like transportation). This effect is manifested through a change in the intercept of the linear relationship between the natural log of requirement and the natural log of beneficiaries.
   2. Conclusion: Fixed costs are different between sectors
6. Analysis: Chow test shows positive for structural breaks between countries and sectors through interaction effects. Not only that, but this model increases the R2 from 0.73 to 0.86.
   1. Meaning: The relationship between requirements and beneficiaries is significantly affected by the sector and country. Not only is the effect manifested through a change in the intercept, but we can also infer that there are entirely different equations governing each country for each sector (3\*9 or 27 equations in total).
   2. Conclusion: Not only are fixed costs different, but variable costs vary between sectors and countries as well. Despite the fact that things vary so greatly as to yield statistical significance for only 4 years of data, each of these equations can be defined and predict 86% of the variation in requirements.
7. Analysis: Requirements lagged up to 3 years have a jointly significant positive relationship on current requirements.
8. Analysis: Beneficiary counts lagged up to 3 years have no jointly significant relationship on requirements.
9. Analysis: Beneficiary counts lagged up to 3 years have no jointly significant relationship on current beneficiaries.
10. Analysis: Requirements lagged up to 3 years have a jointly significant positive relationship on current beneficiaries.