The Gravity Model
Lecture 10
Economics 181
International Trade

I. Motivation

Figure 2.1 from textbook (attached):

- Biggest trading partners in 2003
- Biggest is Canada, followed by Mexico.
- This suggests that proximity (lack of distance) really matters
- Other factors that matter: SIZE. We trade more with bigger countries.

See this better in Figure 2.2 from textbook (attached)

- We trade more with big economies
- We trade more with economies that are closer

II. Framework

The gravity model takes the insights from the two figures discussed above and fitrs them into the following equation:

$$(1) \quad T_{ij} = A x Y_i x Y_j / D_{ij}$$

Yi = country i's GDP
Yj = country j's GDP
D = distance between country i and j
Tij = volume of trade between country i and j

T rises as product of two country's GDPs rises
T falls as distance between two countries rises

More general form:

$$(2) \quad T_{ij} = A x (Y^a_i) x (Y^b_j) / D^c_{ij}$$

If we take logs of (2) we get the following:

$$(3) \ \log(T_{ij}) = \log A + a\log(Y_i) + b\log(Y_j) - c\log(D_{ij})$$

We can rewrite (3) as the following, which is how it is typically estimated:

$$(4) \ \log(T_{ij}) = \log A + a\log(Y_i Y_j) - c\log(D_{ij})$$

III. Applications: Andrew Rose and the impact of a common currency on trade