Quantifying the effects of NTMs

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Approaches to quantifying NTMs

- Chen and Novy (2012) described two approaches to quantifying NTMs.
  - Direct approach: collecting observable data on the incidence of NTMs (inventory-based frequency measures), for example, frequency or coverage ratios.
  - Indirect approach: estimating the existence of NTMs from market anomalies (e.g. unexplained price gaps or smaller than expected trade flows).
  - Indirect approach usually requires to calculate an ad valorem equivalent of an NTM.

Price gap method

- Assuming NTMs are adding cost to imports, the price gap method is to compare the domestic price of a good with its international price to obtain an estimate of the price gap.

$$TE = \frac{P_d}{P_w} - (1 + t + c)$$

- This method requires huge amount of data.

Gravity method

- Considering NTMs as factors in the trade cost, the gravity method estimates:
  - The impact of a specific measure on trade flow (e.g. positive, negative, or neutral) or price.
  - The ad valorem equivalent of NTMs, then further to construct a restrictiveness index.

- Gravity method is based on partial equilibrium modelling.

- Computable general equilibrium modelling can also be used, however, treatments of NTMs in CGE must be careful.

Gravity…

Newton

$$F_{ij} = G\frac{M_i M_j}{D_{ij}^2}$$

- Where *F* is the attraction force, *G* is the gravitational constant, *M* is mass, *D* is distance, *i* and *j* index point masses

Gravity

$$X_{ij} = G\frac{Y_i^{\alpha} Y_j^{\beta}}{T_{ij}^{\theta}}$$

- Where X_{ij}= exports from country *i* to *j* or total trade; *Y*=economic size (GDP, POP) and *T*= Trade costs

Naïve gravity

- Naïve estimation of the gravity regression is

$$\ln(Trade_{ij}) = \alpha + \beta_1 \ln(GPD_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(dist_{ij}) + \varepsilon_{ij}$$

- This regression fits the data very well

- However this naïve version can lead to very biased results
  - Serious omitted variable bias: any *i*- or *j*- characteristic that correlates both with trade and GDP ends up in the error term. The basic OLS assumption of orthogonality between the error term and the explanatory variables is violated

Derive the gravity equation

Step 1: the (Dixit-Stiglitz) demand function

$$x_{ij} = Y_j \frac{p_{ij}^{-\sigma}}{P_j^{1-\sigma}} \qquad (1)$$

where *i* indexes exporter, *j* indexes importer

- LHS = nominal demand by *j*'s consumers for *i*'s goods
- Y_j is *j*'s nominal income
- p_{ij} is imports price

$$P_j \equiv \left[\sum_i \left(p_{ij} \right)^{1-\sigma} \right]^{\frac{1}{1-\sigma}} \qquad (2)$$

is the ideal CES price index in *j*, $\sigma > 1$ is the elasticity of substitution across varieties

- (1) can be rewritten in terms of value:

$$p_{ij}x_{ij} \equiv T_{ij} = Y_j\left(\frac{p_{ij}}{P_j}\right)^{1-\sigma} \quad (3)$$

- Equation (3) could be estimated directly, but researchers often lack good data on trade prices

b. Step 2: adding the pass-through equation

$$p_{ij} = p_i t_{ij} \quad (4)$$

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_1828