Gains from Openess

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Outline

- Globalization
- A simple model to compute the gains from openess
- Migration
- A Simple Model of Migration

Globalization

Globalization

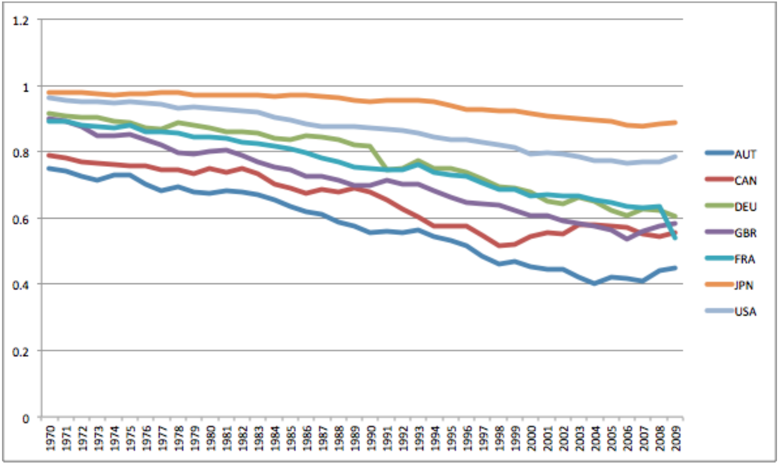

Figure: Home Shares for Manufacturing goods, 1970-2009 selected OECD economies

A Simple Model to Compute the Gains from Openess

Gains from Openess

What are the gains from Openess?

- Potential gains from opening to financial markets (e.g. insurance to aggregate shocks).
- Potential gains from trade (e.g. increased specialization).
- Potential gains from foreign investment (e.g. technology transfer).

A Simple Model to Count Gains from Openess

Assumptions

- 2 countries
  - Country 1 produces good 1 & country 2 produces good 2.
  - We denote with * the foreign country variables.
- Representative consumer in each country
- Perfect competition

Firms

Firms produce the good using labor.

Trade costs: τ and τ^* if good is exported.

- Thus, domestic price: $p_1 = w$ and $p_2^* = w^*$.
- Export price: $p_1^* = w\tau$ and $p_2 = w^*\tau^*$.

Consumer

Representative consumer: Constant Elasticity of Substitution (CES) utility function over two goods, home and foreign

$$U(c_1, c_2) = \left((c_1)^{\frac{\sigma-1}{\sigma}} + (c_2)^{\frac{\sigma-1}{\sigma}}\right)^{\sigma/(\sigma-1)}$$

- c_1 : consumption of the home good by the home consumer
- c_2 : consumption of the foreign good by the home consumer
- σ : the elasticity of substitution across the two varieties

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$$U\left(c_1, c_2\right) = \left(\left(c_1\right)^{\frac{\sigma-1}{\sigma}} + \left(c_2\right)^{\frac{\sigma-1}{\sigma}}\right)^{\sigma/(\sigma-1)}$$

- Budget constraint: $pc_1 + p_2 c_2 = wL$
  - p: price of domestic good, L: domestic consumer's labor endowment & w: her wage
  - Respectively, p^*, L^* , w^* for the foreign consumer

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Domestic consumer picks c_1, c_2 to maximize

$$\max_{c_1, c_2} \left(\left(c_1\right)^{\frac{\sigma-1}{\sigma}} + \left(c_2\right)^{\frac{\sigma-1}{\sigma}}\right)^{\sigma/(\sigma-1)}$$

$$\text{s.t. } p_1 c_1 + p_2 c_2 = wL$$

Consumer

Representative consumer: Consumer's optimization implies

$$\frac{c_1^{\frac{\sigma-1}{\sigma}-1}}{c_2^{\frac{\sigma-1}{\sigma}-1}} = \frac{p_1}{p_2} \Rightarrow$$

$$\left(\frac{c_1}{c_2}\right)^{-1/\sigma} = \frac{p_1}{p_2} \Rightarrow$$

$$\frac{c_1}{c_2} = \left(\frac{p_1}{p_2}\right)^{-\sigma}$$

- Relative consumption depends on relative price and elasticity of demand!
- Remember that $p_1 = w$ but $p_2 = w^*\tau^*$.

Market Shares

We can compute the trade shares; i.e., the share of spending on goods from a given country. The domestic shares of spending is

$$\lambda = \frac{p_1 c_1}{p_1 c_1 + p_2 c_2}$$

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Recall that the solution of consumption is $c_1 = (p_1/p_2)^{-\sigma} c_2$. Thus,

$$\lambda = \frac{p_1 \left(\frac{p_1}{p_2}\right)^{-\sigma} (p_2)^{\sigma}}{p_1 \left(\frac{p_1}{p_2}\right)^{-\sigma} (p_2)^{\sigma} + p_2} = \frac{p_1^{1-\sigma}}{(p_1)^{1-\sigma} + (p_2)^{1-\sigma}} = \frac{p_1^{1-\sigma}}{P^{1-\sigma}}$$

where $P \equiv \left[(p_1)^{1-\sigma} + (p_2)^{1-\sigma}\right]^{1/(1-\sigma)}$ is the CES price index, a weighted mean over prices.

Welfare

We can compute welfare as real wage in this simple setup.

- Welfare is the real income; i.e., wage divided by the price index: $W = w/P$. Recall: $p_1 = w$.
- But remember that

$$\lambda = \frac{p_1^{1-\sigma}}{P^{1-\sigma}} \Rightarrow \lambda = \left(\frac{w}{P}\right)^{1-\sigma} \Longrightarrow$$
$$\frac{w}{P} = \lambda^{1/(1-\sigma)}$$

Thus, welfare is a function of the home share of spending, λ, and the elasticity of demand, σ!

This result has been derived by Arkolakis, Costinot, Rodriguez -Clare (2012).

Sufficient Stastics for Gains from Trade

This result has been derived by Arkolakis, Costinot, Rodriguez -Clare (2012).

- A generalization of a result of Eaton & Kortum (2002) for a wide class of models.

Our new result can give an order of magnitude for gains from trade.

- In changes (denoted with ˆ),

$$\widehat{W} = \widehat{\left(\frac{w}{P}\right)} = \left(\hat{\lambda}\right)^{1/(1-\sigma)}$$

- To compute gains from trade, we simply need to know $\hat{\lambda}$, and have an estimate for the trade elasticity $\varepsilon = 1 - \sigma$.

Sufficient Stastics for Gains from Trade

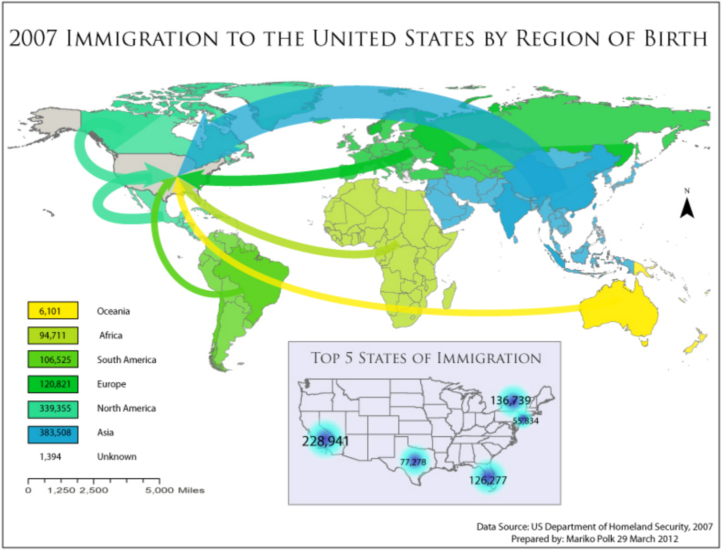
Let us compute the gains from trade:

- Import penetration ratio in the USA in 2000 is 7% $\Rightarrow \lambda = 0.93$
- Anderson & Van Wincoop (Journal of Economic Perspectives, 2004) report that the elasticity of trade is between -10 and -5.
- Apply the formula: gains from autarky $($where $\lambda = 1)$ to trade,

$$\widehat{W} = \frac{\left(\lambda_{trade}\right)^{1/(1-\sigma)}}{\left(\lambda_{autarky}\right)^{1/(1-\sigma)}} = \left(\frac{.93}{1}\right)^{1/(1-\sigma)} .$$

The number ranges from 0.7% to 1.4%.

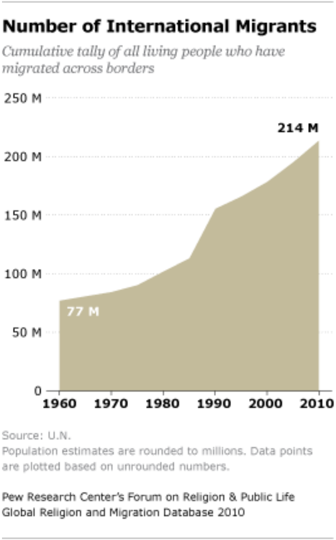
Migration

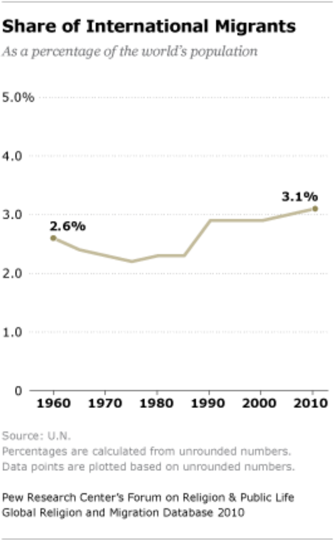

2007 Immigration to the United States by Region of Birth
6,101
Oceania
94,711
Africa
106,525
South America
120,821
Europe
339,355
North America
383,508
Asia
1,394
Unknown
0 1,250 2,500 5,000 Miles
N
Top 5 States of Immigration
228,941
77,278
126,277
136,739
55,834
Data Source: US Department of Homeland Security, 2007
Prepared by: Mariko Polk 29 March 2012

Migration in Human History

- Humans have been migrating since (at least) 70,000 years ago!
- Last century, migration is massive, global and relatively costless.
  - It is easy to move across the globe and common barriers hindering migration (language, racism, political differences) have been lifted.
- Recently, economic and political environment is markedly stable; weakens incentives for migration.

Global Migration Flows





A Simple Model of Migration

A Simple Model of Migration

We will consider the same model as before. But now, we will allow for people to move across locations as in Allen and Arkolakis (2013).

What is the main idea?

- In the long run, if income is different across countries, people can relocate.
- As long as real wage is different across countries, people will tend to move to the higher real wage location, up to the point that

$$\frac{w}{P} = \frac{w^*}{P*} = \bar{W}$$

  i.e., real wage equalizes.

A Simple Model of Migration

- Welfare equalization implies

$$\begin{aligned} \bar{W} &= \frac{w}{P} = \frac{w^*}{P^*} \Rightarrow \\ \frac{w^{1-\sigma}}{(w^*)^{1-\sigma}} &= \frac{P^{1-\sigma}}{(P^*)^{1-\sigma}} \end{aligned}$$

A Simple Model of Migration

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- Replace for the price index

$$P^{1-\sigma} \equiv (p_1)^{1-\sigma} + (p_2)^{1-\sigma} = (w)^{1-\sigma} + (w^*\tau^*)^{1-\sigma}$$

and

$$(P^*)^{1-\sigma} = (w\tau)^{1-\sigma} + (w^*)^{1-\sigma}.$$

A Simple Model of Migration

- Therefore, welfare equalization implies

$$\frac{w^{1-\sigma}}{\left(w^*\right)^{1-\sigma}} = \frac{P^{1-\sigma}}{\left(P^*\right)^{1-\sigma}} = \frac{\left(w\right)^{1-\sigma} + \left(w^*\tau^*\right)^{1-\sigma}}{\left(w\tau\right)^{1-\sigma} + \left(w^*\right)^{1-\sigma}}$$

A Simple Model of Migration

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$$\frac{w^{1-\sigma}}{(w^*)^{1-\sigma}} = \frac{P^{1-\sigma}}{(P^*)^{1-\sigma}} = \frac{(w)^{1-\sigma} + (w^*\tau^*)^{1-\sigma}}{(w\tau)^{1-\sigma} + (w^*)^{1-\sigma}}$$

- Rearrange this

$$\begin{aligned}
\frac{w^{1-\sigma}}{(w^*)^{1-\sigma}} &= \frac{\left(\frac{w}{w^*}\right)^{1-\sigma} + (\tau^*)^{1-\sigma}}{\left(\frac{w}{w^*}\tau\right)^{1-\sigma} + 1} \Rightarrow \\
\left(\frac{w^{1-\sigma}}{(w^*)^{1-\sigma}}\right)^2 \tau^{1-\sigma} + \left(\frac{w}{w^*}\right)^{1-\sigma} &= \left(\frac{w}{w^*}\right)^{1-\sigma} + (\tau^*)^{1-\sigma} \Rightarrow \\
\frac{w^{(1-\sigma)2}}{(w^*)^{(1-\sigma)2}} &= \frac{(\tau^*)^{1-\sigma}}{\tau^{1-\sigma}}
\end{aligned}$$

Wage and Trade Costs

- Rearrange this

$$\frac{w}{w^*} = \sqrt{\frac{\tau^*}{\tau}}$$

  i.e., if exporting costs,τ , are relatively low, relative wage is high.

- Using the labor market clearing condition, $c_1 + c_1^* = L$, you can also show that

$$\frac{L}{L^*} = \sqrt{\frac{\tau}{\tau^*}}$$

  i.e., people locate in places with better access - relatively lower importing costs.

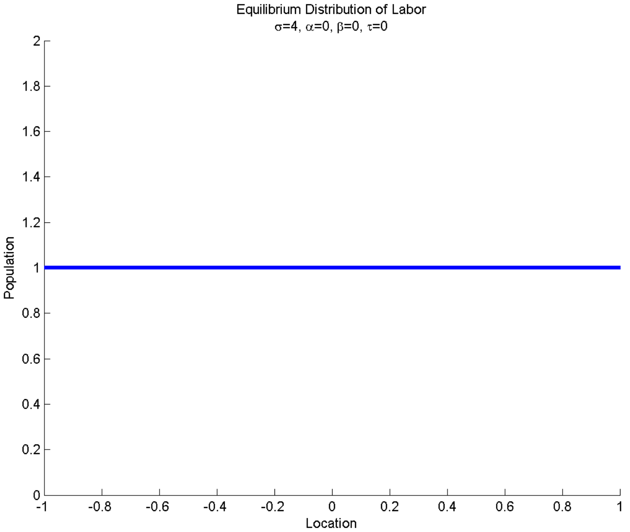
Computing the Population

- In general, with many locations, population can be determined by a differential equation (in space).

- In natural sciences, we solve for the energy of each point in the system.
  - Energy is determined by whether a point is well placed to other high-energy points.

- Here, locations that are well placed will attract more people.
  - The economic link is trade!

Population on a Line



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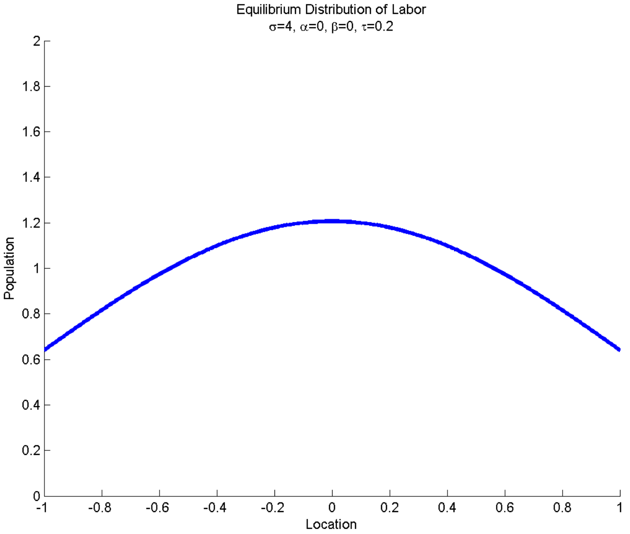

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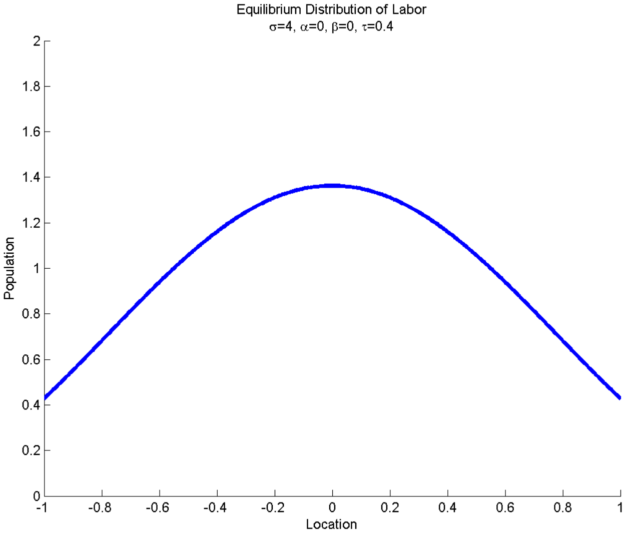

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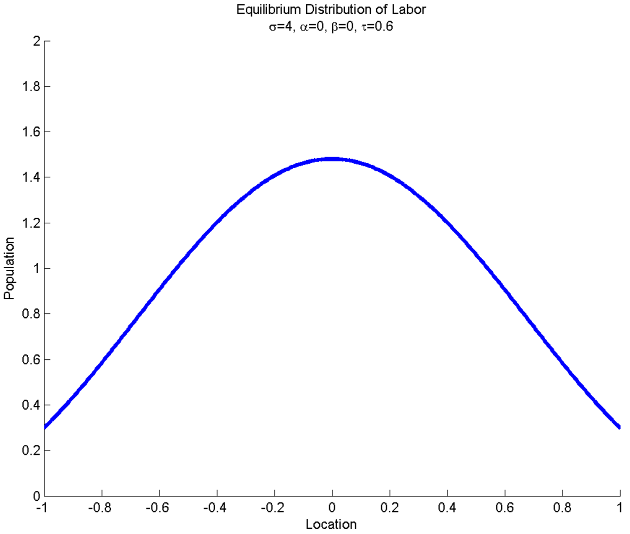
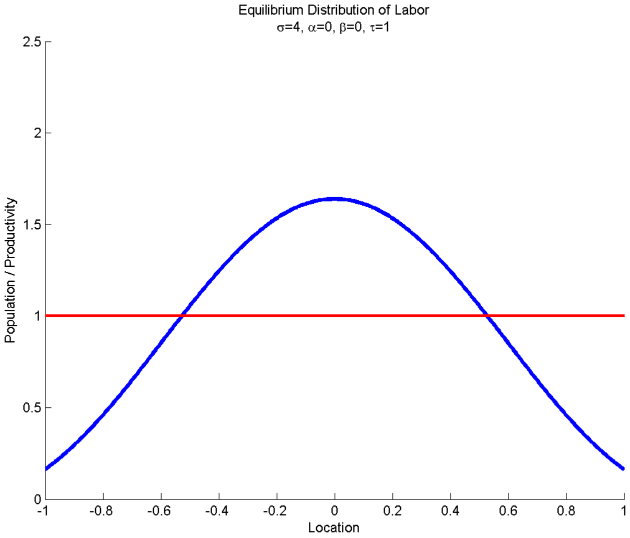


Population on a Line and Productivity



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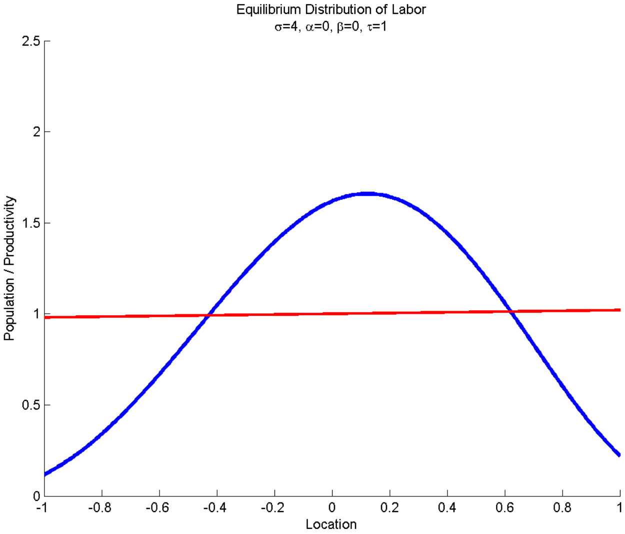

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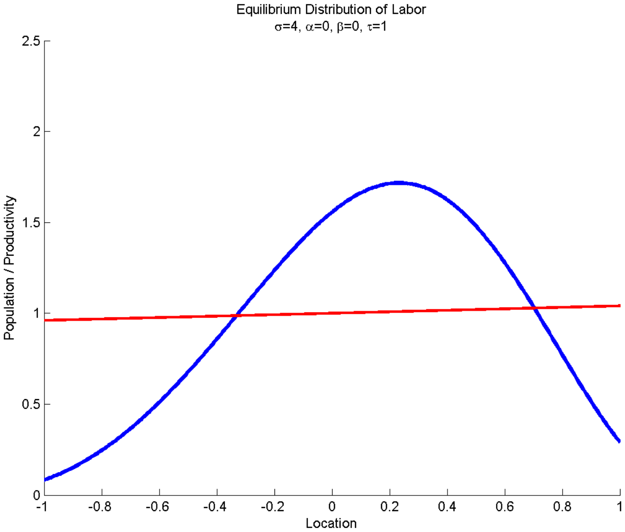

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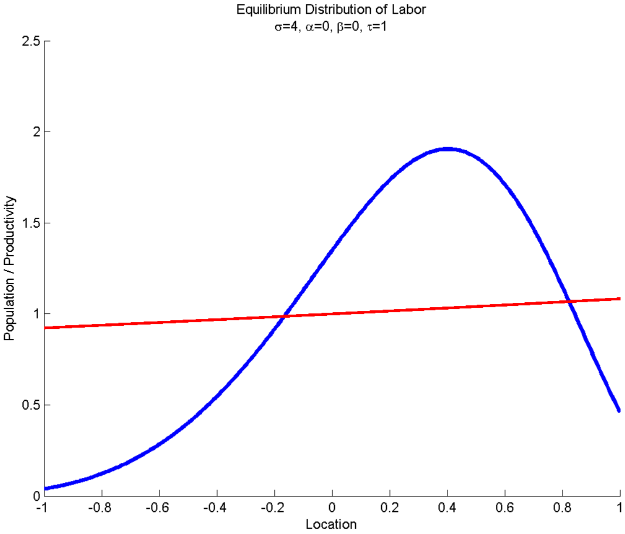

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