TRADE LIBERALIZATION, INCOME RISK, AND MOBILITY

William F. Maloney

Development Economics Research Group

World Bank

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TRADE AND WAGE *LEVELS (FIRST MOMENTS)*

- Traditional Trade Theory - Trade raises (lowers) returns to abundant (scarce) factors -(Stolper Samuelson logic)
  - Lawrence and Slaughter (1993), Feenstra and Hanson (1999), Goldberg and Pavcnik (2005)
  - Surveys by Feenstra and Hanson (2002), Goldberg and Pavcnik (2007)
  - Lots of Latin American literature suggesting perverse effects.

- Firm Heterogeneity, Worker Heterogeneity, Labor Market Frictions
  - Helpman, Itskhoki and Redding (2008a, 2008b), Helpman and Itskhoki (2007), Amiti and Davis (2008), Davis and Harrigan (2007), Mitra and Rajan (2009), Egger and Kreickemeier (2009)

BUT WHAT ABOUT INCOME VOLATILITY (SECOND MOMENTS)?

- Risk- Negatively affects welfare
  - We assume agents are risk averse
  - Development process arguably as much about reducing risk as raising income- social protection mechanisms

- Also may have additional impacts on welfare through growth
  - Krebs (2003): labor market risk has important impacts on human capital accumulation
  - Social protection becomes a growth issue, as well!

- If Mexico had US levels of risk
  - Direct welfare effect = .5% growth per year
  - Effect through higher HC=.5% growth per year

Note: Income Risk $\neq$ Income Inequality

Consider two identical earnings distributions:
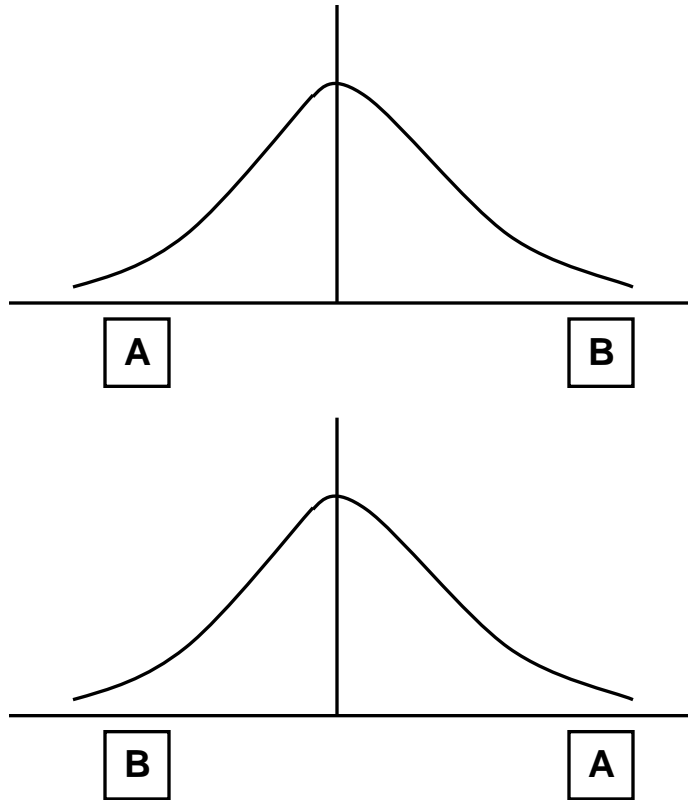
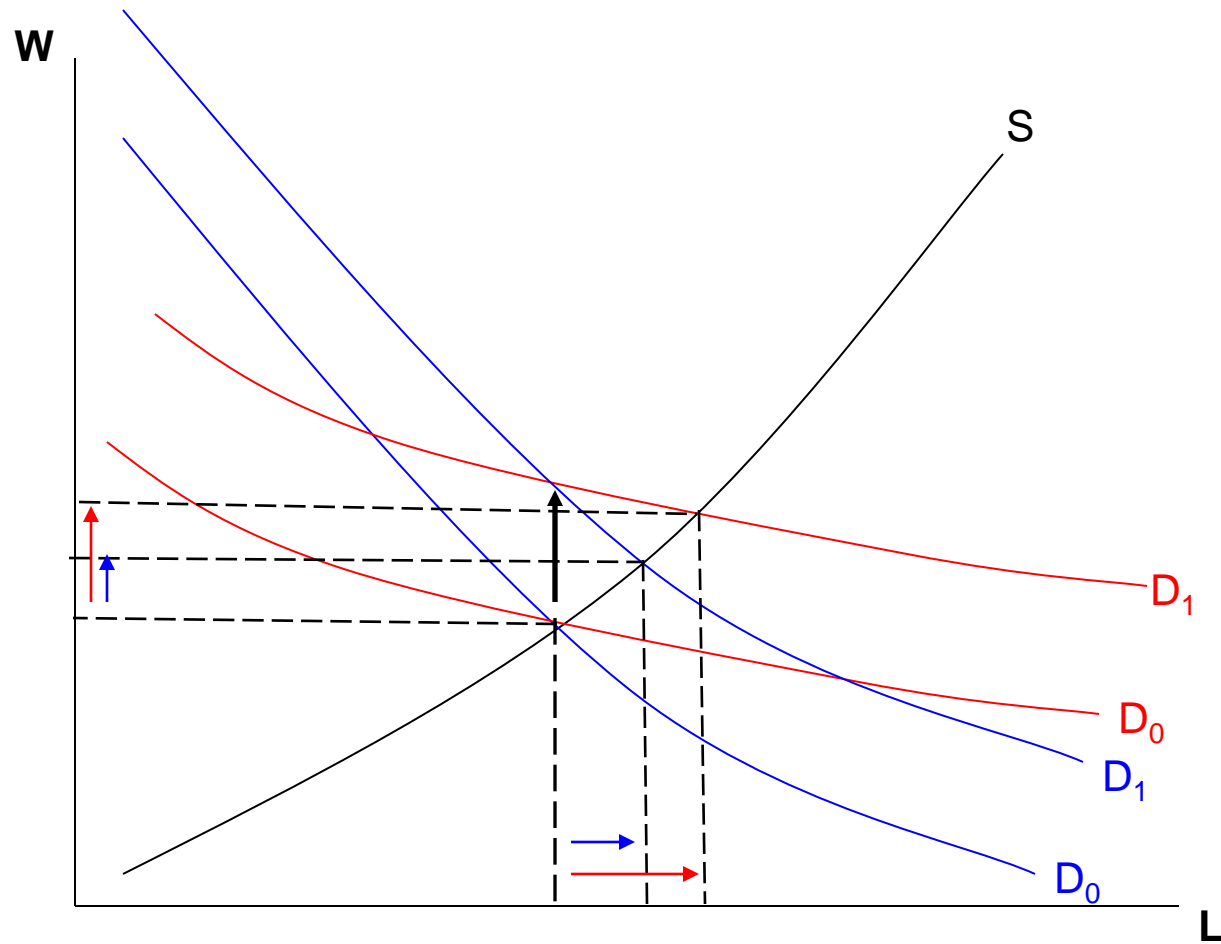Aggregate income distributions mask underlying transitions and volatility.

WHY WOULD OPENNESS AFFECT VOLATILITY?

o Trade leads to reallocation of factors

o Prices now reflect international demand as well: Uncertain impact

   o Lederman et. al (2011) – LAC integration leads to greater volatility of high human capital

o Increased competition leads to higher demand elasticities

   • (Rodrik 1997) "Has Globalization gone too far?"

Economic Shocks and Volatility of Outcomes under Autarky and Free Trade

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○ Increased competition leads to higher demand elasticities

  • No effect for Turkey (Krishna, Mitra and Chinoy 2001)
  • No/Limited effect for Chile, Colombia, Mexico (Fajnzylber and Maloney 2005)

○ Need direct test using risk itself!

2 DIRECT TESTS

- **US** (Krishna and Senses 2009)
  - Survey of Income and Program Participation (SIPP)
  - Three Panels: 1993-1995, 1996-1998, 2001-2003
  - Monthly data on earnings and labor force activity

- **Mexico** (Krebs, Krishna and Maloney 2010)
  - Encuesta Nacional de Empleo Urbano (ENEU)
  - Quarterly Rotating Panels 1987-1998
  - Monthly data on earnings and labor force activity
  - Major trade policy changes 87-88, NAFTA

How to Measure Risk?

$$y_{it} = \alpha_t + \beta_t x_{it} + u_{it}$$

$y_{ijt} =$ log of observed wage income

$x_{ijt} =$ vector of observable characteristics

$u_{ijt} =$ stochastic component of earnings

Volatility of the *unpredictable* changes in individual income:

$$u_{it} = \omega_{it} + \eta_{it}$$

$\omega_{it} =$ permanent component of y_{it} (unobserved)

$\eta_{it} =$ transitory component of y_{it} (unobserved)

Permanent component: Assumed to follow a random walk:

$$\omega_{i,t+1} = \omega_{it} + \varepsilon_{i,t+1}$$

$$\varepsilon_{it} \sim N(0, \sigma_{\varepsilon t}^2)$$

= measure of permanent income risk.

$$\sigma_{\varepsilon t}^2$$

Transitory component:

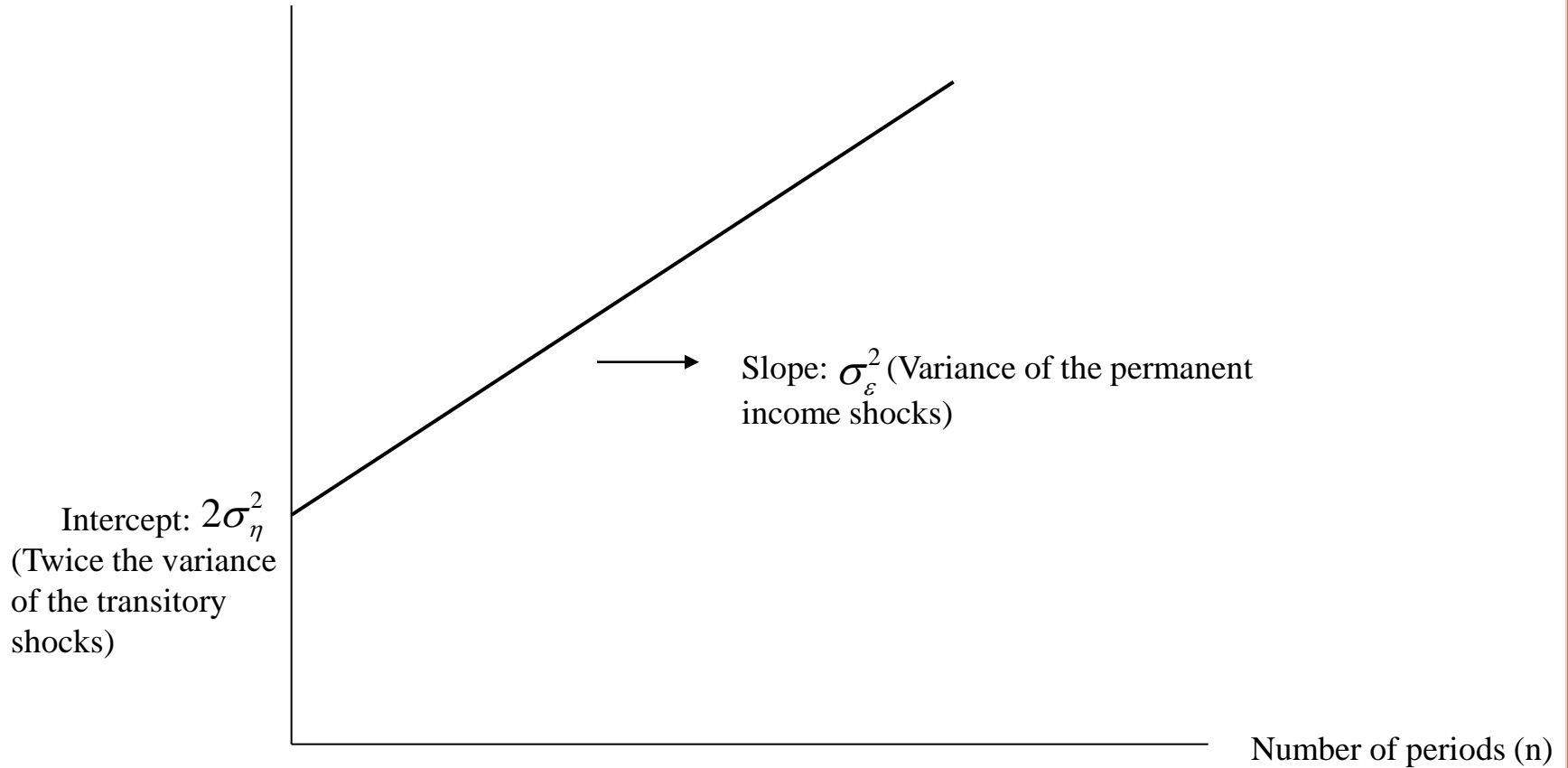$$\eta_{it} \sim N(0, \sigma_{\eta t}^2)$$

SHOCKS

- Transitory: temporary change in hours worked, temporary job loss

- Permanent: Job loss or sectoral changes that lead to permanent changes in income.

- We're concerned with permanent shocks
  - Transitory shocks – self insurance - welfare consequences relatively minor Aiyagiri (1994), Heaton and Lucas (1996)
  - Transitory shocks are inseparable from measurement error in income (Moffitt and Gottschalk (1993), Carroll and Samwick (1995))

Variance of n period income differences:

Slope: σ_ε^2 (Variance of the permanent income shocks)

Intercept: $2\sigma_\eta^2$ (Twice the variance of the transitory shocks)

Number of periods (n)

$$Var([\Delta_n u_i]_t^{t+n}) = n\sigma_\varepsilon^2 + 2\sigma_\eta^2$$

BASE ESTIMATION:

Linear specifications of the type:

$$\widehat{\sigma}^2_{\varepsilon js} = \alpha_0 + \alpha_j + \alpha_s + \alpha_M \cdot M_{js} + v_{js}$$

j = 1…J Industries

s = 1…S panels

$\widehat{\sigma}^2_{\varepsilon js}$ = estimate of the permanent component for panel s and industry j

α_j = industry fixed effect

α_s = panel fixed effect

M_{js} = import penetration for panel s and industry j

Welfare

Framework: Dynamic Stochastic General Equilibrium Model with idiosyncratic income risk and incomplete markets (Krebs, 2004)

- Infinite horizon discrete time model
- Ex-ante identical, infinitely lived agents with CRRA-preferences
- Individuals face exogenous permanent income risk
- Individuals make consumption and savings decisions

BASE ESTIMATION:

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SUMMARY OF RESULTS: US
(INCREASED INCOME PENETRATION)

	Increase in σ_ε	Decrease in Welfare
Increase in M penetration of 10%	20%	3-6%

Welfare effect in % of lifetime consumption, $\gamma = 1$

SUMMARY OF RESULTS: MEXICO
(DECREASE IN TARIFFS)

	Increase in σ_ε	Decrease in Welfare
Permanent fall in τ of 5%	NS	0
Fall in τ of 5% for 1 year	40%	.98

Welfare effect in % of lifetime consumption, $\gamma = 1$

Summary of Results: Mexico

	Increase in σ_ε		Decrease in Welfare	
	т=10%	т=5%	т=10%	т=5%
Exchange Rate App. 10%	35%	60%	.59	1.18
Fall in GDP 5%	25%	60%	.39	.98

Welfare effect in % of lifetime consumption, $\gamma = 1$

Openness and Mobility

MOBILITY-HART INDEX

$$m = 1 - corr\left(y_{io}, y_{it}\right)$$

- Shorrocks (1993)
- How much I'm NOT a prisoner of my initial state.

PREVIOUS INCOME PROCESS

$$\mu_{it} = \omega_{it} + \eta_{it}$$

- Replace random walk with more general AR-1

$$\omega_{it+1} = \rho\omega_{it} + \varepsilon_{it+1}$$

$$\varepsilon_{it} \sim N(0, \sigma_{\varepsilon t}^2) \quad \eta_{it} \sim N(0, \sigma_{\eta t}^2)$$

..Yields the Determinants of Mobility

$$m = 1 - \frac{\rho^t \sigma_{\omega 0}^2}{\sqrt{\sigma_{\omega 0}^2 + \sigma_\eta^2} \sqrt{\rho^{2t} \sigma_{\omega 0}^2 + \sigma_\eta^2 + (1 - \rho^{2t})(1 - \rho)^{(-1)} \sigma_\varepsilon^2}}$$

Mobility

- Increases in transitory shocks, σ_η
- Increases in permanent shocks, σ_ε
- Decreases in persistence, ρ

DOES MOBILITY IMPLY WELFARE?

$$
\begin{aligned}
W &= E\left[\sum_{t=0}^{\infty}\beta^t lnc_{it}\right] \\
&= E\left[E\left[\sum_{t=0}^{\infty}\beta^t lnc_{it}|\omega_{i0}\right]\right] \\
&= \mu - \frac{1}{1-\beta\rho^2}\sigma_{\omega_0}^2/2 - \frac{1}{1-\rho}\left(\frac{1}{1-\beta|} - \frac{1}{1-\beta\rho^2}\right)\frac{\sigma_\epsilon^2}{2}
\end{aligned}
$$

- Welfare
  - Decreases in risk, σ_ε
  - Decreases with persistence, ρ

- Convergence $(1-\rho)$ is the only good mobility

SUMMARY

		Mobility	Welfare
Transitory Shocks	σ_η	Increase	None
Permanent Shocks	σ_ε	Increase	Decrease
Convergence	$(1-\rho)$	Increase	Increase

So What?

- Conceptual
  - Mobility is not always a good thing.
  - Hard to map standard measures to welfare
  - Convergence $(1-\rho)$ is the only "good" mobility

- Trade
  - Induced increase in variance increases "mobility," but not welfare.
  - Research agenda: Trade impact on $(1-\rho)$

CONCLUSIONS

- Greater openness can increase risk with important welfare consequences.
- Can also induce apparent increase in mobility
- Policy
  - Focus more on risk implications of policies
  - Policies to mitigate them (social protection)
  - Facilitate convergence-labor markets, education, infrastructure etc.

REFERENCES

- Krebs,T., P. Krishna and W. Maloney, (2010) "Trade Policy, Income Risk, and Welfare" *Review of Economics and Statistics*

- Krishna, P. and M. Z. Senses, (2009), "International Trade and Labour Income Risk in the US." NBER, Working Paper, Number 14992, NBER, Cambridge MA.

- Krebs,T., P. Krishna and W. Maloney (2011) "Income Dynamics, Mobility and Welfare in Developing Countries," mimeo.

Summary Statistics: Explanatory Variables

- These summary statistics are calculated at the beginning of each panel. Share of MNE is not available after 1996 and for industries 25 (Furniture and Fixtures) and 31 (Leather and Leather Products).

- Import Penetration=Imports/Shipments-exports+imports

- Share of Exports=Exports/Shipments

- Share of ICT= (Software+Computers and peripheral equipment+Communication equipment + Photocopy and related equipment+Instruments)/K. *Source: BEA, NIPA*

- Share of MNE= Employment of non-bank US affiliates by industry of sales , as a percentage of total US employment in non-bank private industries. *Source: BEA*

$$\text{Outsourcing} = \sum_j \left[\frac{\text{purchases of input } j \text{ by industry } i \text{ at time t}}{\text{total non}-\text{energy inputs used by industry } i \text{ at time t}} \right] * \left[\frac{\text{imports of input } j \text{ at time t}}{\text{production}_j + \text{imports}_j - \text{exports}_j \text{ at time t}} \right]$$

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