INTERNATIONAL TRADE AND ECONOMIC GROWTH

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Outline

- **Introduction**
- **East Asia versus Latin America as case study**
- **Why would trade foster economic growth?**
- **Some main findings**
- **How to identify the effect of trade liberalisation?**
- **Trade and growth: an endogenous relationship?**
- **Trade openness, growth, investment and growing trade**
- **Discussion**

Literature

- Singh, T. (2010) Does international trade cause growth? A survey. The World Economy, vol. 33.11, p. 1517-1564

- Frankel, J.A. and Romer, D. (1999) Does trade cause growth? The American Economic Review, vol. 89.3, p. 379-399
  - Skip sections II.D and II.E

- Wacziarg, R. and Horn Welch, K. (2008) Trade liberalisation and growth: New evidence. The World Bank Economic Review, vol. 22.2, p. 187-231

Introduction

- **Period following WWII characterised by growing level of globalisation**
- **Rising international trade primary component**
- **Group of developed countries experienced rapid growth whilst increasing international trade**
- **International organisations promoted free trade doctrine**
  - IMF, GATT, World Bank
- **Supported by standard trade theory**
- **Developing countries**
  - Import substitution versus export promotion

Free trade, income and growth

- OECD (1998) "More open and outward oriented economies consistently outperform countries with restrictive trade and (foreign) investment regimes"

- IMF (1997) "Policies toward foreign trade are among the more important factors promoting economic growth and convergence in developing countries"

- Stiglitz (1998) "Most specifications of empirical growth regressions find that some indicator of external openness – whether trade ratios or indices of price distortions or average tariff levels – is strongly associated with per-capita income growth"
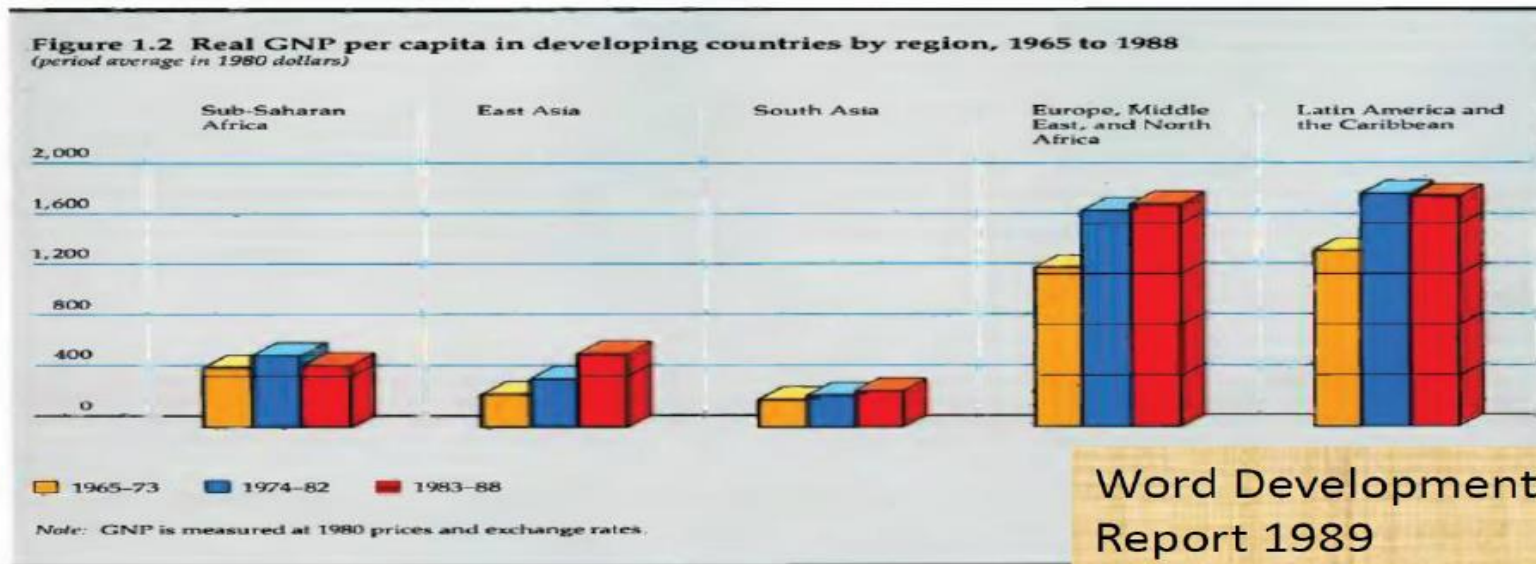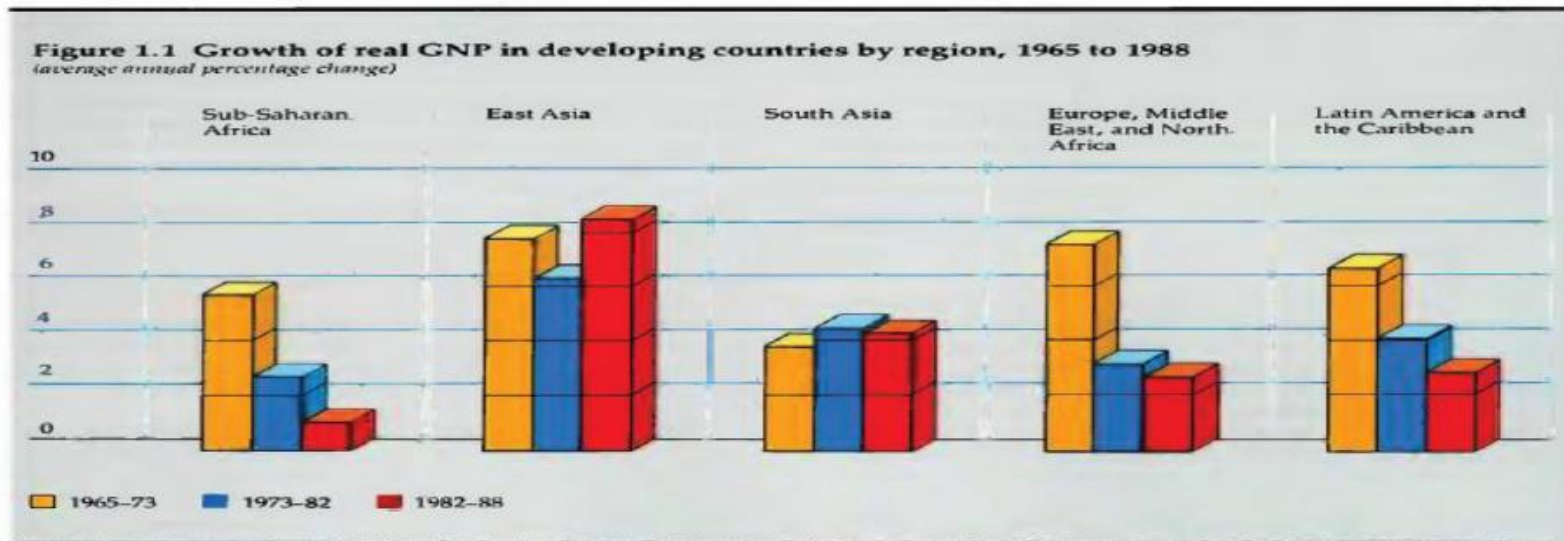
Stiglitz changed his mind
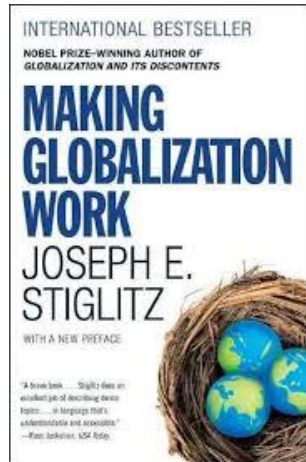
Trade liberalisation has not lived up to its promises.

But the basic logic of trade – its potential to make most, if not all, better off – remains. If that potential is to be realised, first we must reject two of the long-standing premises of trade liberalisation: that trade liberalisation automatically leads to more trade and growth, and that growth will automatically "trickle down" to benefit all. Neither is consistent with economic theory or historical experience.

Switch in trade policy

- Developing countries differed in the type of trade policy they used to promote development.

- **In 1980s one of the largest policy interventions of the 20th century!**

- From import substitution to export promotion in Latin America

Why the policy intervention?

Figure 1.1 Growth of real GNP in developing countries by region, 1965 to 1988
(average annual percentage change)

Sub-Saharan Africa | East Asia | South Asia | Europe, Middle East, and North Africa | Latin America and the Caribbean

☐ 1965–73 ☐ 1973–82 ☐ 1982–88

Figure 1.2 Real GNP per capita in developing countries by region, 1965 to 1988
(period average in 1980 dollars)

Sub-Saharan Africa | East Asia | South Asia | Europe, Middle East, and North Africa | Latin America and the Caribbean

☐ 1965–73 ☐ 1974–82 ☐ 1983–88

*Note: GNP is measured at 1980 prices and exchange rates.*

Word Development Report 1989

Latin America versus East Asia

TABLE 1

GROWTH AND EXPORTS IN LATIN AMERICA AND EAST ASIA: 1965–1989

(PERCENTAGE DISTRIBUTION)

	Annual Rate of Growth of Real GDP		Annual Rate of Growth of Manu-facturing		Annual Rate of Growth of Exports	
	1965–80	1980–89	1965–80	1980–89	1965–80	1980–89
A. *Selected Latin American Countries*						
Argentina	3.5	−0.3	2.7	−0.6	4.7	0.6
Brazil	8.8	3.0	9.8	2.2	9.3	5.6
Chile	1.9	2.7	0.6	2.9	7.9	4.9
Colombia	5.8	3.5	6.4	3.1	1.4	9.8
Mexico	6.5	0.7	7.4	0.7	7.6	3.7
Peru	3.9	0.4	3.8	0.4	1.6	0.4
Venezuela	3.7	1.0	5.8	4.9	−9.5	11.3
Latin America &						
Caribbean (Average)	6.0	1.6	7.0	1.5	−1.0	3.6
B. *Selected East Asian Countries*						
Hong Kong	8.6	7.1	n.a.	n.a.	9.5	6.2
Indonesia	8.0	5.3	12.0	12.7	9.6	2.4
Korea	9.6	9.7	18.7	13.1	27.2	13.8
Malaysia	7.3	4.9	—	8.0	4.4	9.8
Singapore	10.1	6.1	13.2	5.9	4.7	8.1
Thailand	7.2	7.0	11.2	8.1	8.5	12.8
East Asia (Average)	7.2	7.9	10.6	12.6	10.0	10.0

Source: World Bank (1989, 1990).
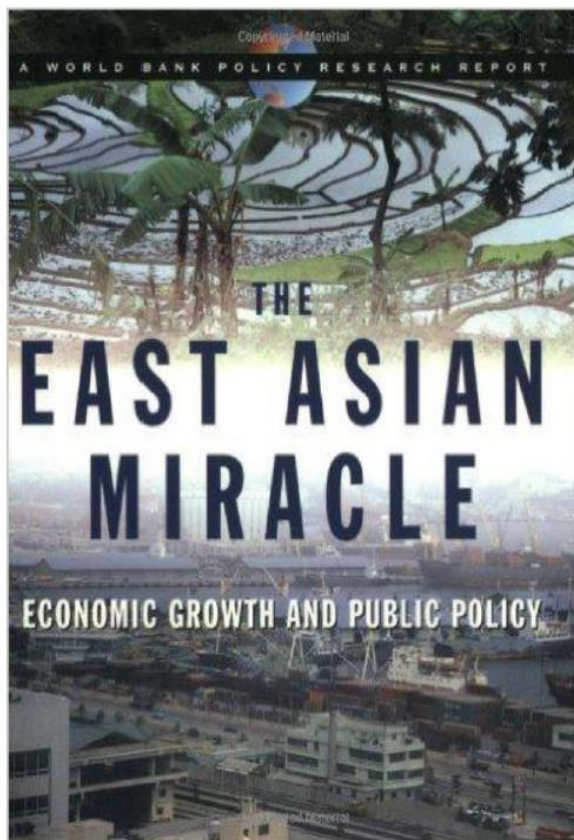
World Bank 1993
Study on economic success
of Asian countries

Export driven economic
growth

Japan, Hong Kong,
Singapore, Taiwan, South
Korea, Indonesia, Malaysia,
Thailand

Not just trade liberalisation!

- **Report stresses the importance of a set of common, market-friendly economic policies, fostering**
  - Higher accumulation
  - Better allocation
- **"Getting the fundamentals right"**
- **In addition to this**
  - Relation between government and markets
  - Government intervention
  - Relation with international goods and capital markets

Implications for Latin America

- **Follow the example of East Asia!**
  - World Bank's advice
  - Export promotion
  - Liberalisation of economy
- **High sustained growth possible**
- **Should not have detrimental effect on inequality**
- **Trade liberalisation should lower inequality**
  - Heckscher-Ohlin model
  - Low skilled labour abundant input in Latin America
- **Much less attention paid to the role of government, institutions, etc.**
  - Neo-liberal structural adjustments sufficient?

Impact trade liberalisation in LA

- **Impact on growth varied between countries**
  - Increase in inequality
  - No major reallocation of labour between industries
  - ↑ use of skilled labour in all industries

- **Why?**
- **Unskilled labour intensive industries where heavily protected**
  - Trade liberalisation lowered prices
- **China more abundant in low skilled labour**
- **Skill biased technological change**
- **Foreign Direct Investment and Outsourcing**

Maybe it takes some time?
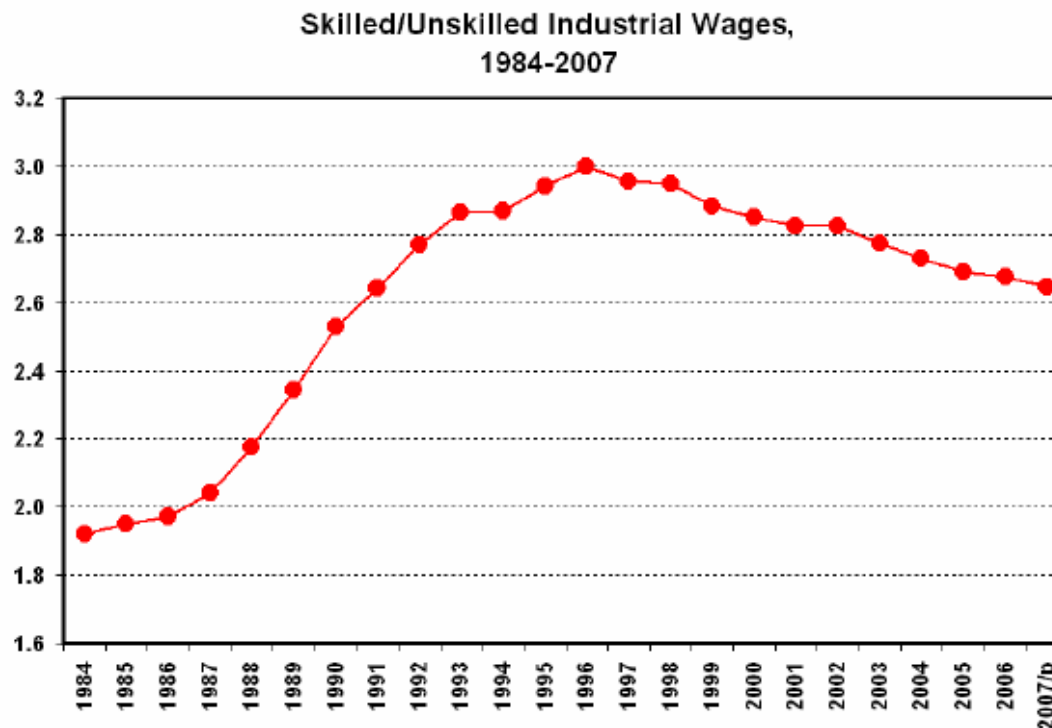
Esquivel, G. (2010) The dynamics of income inequality in Mexico since Nafta. Economia, vol. 12(1), p. 155-179

Trade and economic growth (1)

- **Variety of approaches in the literature**
- **Trade, trade openness, trade liberalisation**
- **Income, income growth, productivity**
  - Static trade effects
  - Dynamic trade effects

- **Demand-side analysis: Relation between exports and growth**
  - Time series approach
  - Majority of studies find positive relation
    - But period specific
  - Discussion on direction of causation

Trade and economic growth (2)

- **Cross-sectional and panel data approaches**
- **Mostly focused on supply-side issues**

- **Country level studies**
- **Relation between variety of trade and openness indicators and output, growth or productivity**
  - Decrease in inefficiency
  - Increase in competition
  - Scale economies
  - Flows of technology
    - Imports, spillovers

Trade and economic growth (3)

- **Overall, positive effect of trade variables**
- **More recent studies are characterised by larger degree of heterogeneity**
- **Findings have received substantial scrutiny**
  - On the other hand: no findings that trade restrictions can exercise positive effects!

- **Firm level studies**
  - Increasing importance of firm heterogeneity
  - Trade fosters productivity improvements
  - Higher productivity firms engage in trade

How to identify effect of trade

- **Country case study**
  - Very informative, but difficult to generalise

- **Natural experiment**
  - Exogenous introduction of free trade
  - Difficult to find

- **Cross-sectional and panel data approach to relate indicators of trade or openness to outcome variable**

Key challenges

Say we want to identify effect of trade or trade liberalisation

$$Y_i = \beta_0 + \beta_1 \, Trade_i + \beta_x \, X_i + \varepsilon_i$$

$$Y_{it} = \beta_0 + \beta_1 \, Trade_{it} + \beta_x \, X_{it} + \mu_i + \vartheta_t \; \varepsilon_{it}$$

- How to capture trade, openness, liberalisation?
- How to aggregate and distinguish between different types of trade restrictions?
- Issue of endogeneity
  - Estimated effect of trade biased upwards
- Effect of trade liberalisation conditional on other policies and characteristics?

Problem of endogeneity

Frankel and Romer (1999) AER Does trade cause growth?

$$(1)\ lnY_i = \alpha + \beta T_i + \gamma W_i + \varepsilon_i$$

$$(2)\ T_i = \psi + \phi P_i + \delta_i$$

$$(3)\ W_i = \eta + \lambda S_i + v_i$$

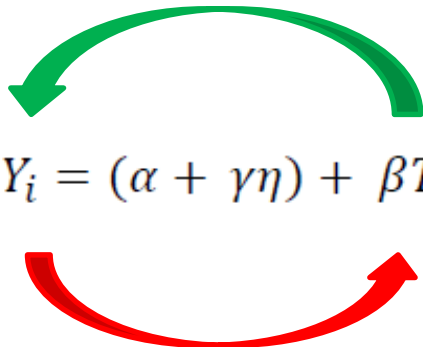$$(4)\ lnY_i = \alpha + \beta T_i + \gamma(\eta + \lambda S_i + v_i) + \varepsilon_i$$

Y = income
T = international trade
W = intra-country trade
P = proximity
S = size

$$\ln Y_i = (\alpha + \gamma\eta) + \beta T_i + \gamma \lambda S_i + (\gamma v_i + \varepsilon_i)$$

Solution: geography based instrument

- Find variable that is sufficiently related to trade and unaffected by income
- Use this as instrument for endogenous trade variable
- Geography based trade

$$(6) \ \ln(\tau_{ij}/\text{GDP}_i)$$

$$= a_0 + a_1 \ln D_{ij} + a_2 \ln N_i + a_3 \ln A_i$$

$$+ a_4 \ln N_j + a_5 \ln A_j + a_6(L_i + L_j)$$

$$+ a_7 B_{ij} + a_8 B_{ij} \ln D_{ij} + a_9 B_{ij} \ln N_i$$

$$+ a_{10} B_{ij} \ln A_i + a_{11} B_{ij} \ln N_j$$

$$+ a_{12} B_{ij} \ln A_j + a_{13} B_{ij}(L_i + L_j) + e_{ij},$$

ij = countries
D = distance
N = population
A = area
L = landlocked countries
B = common border

Use estimated coefficients to calculate trade/GDP for each country
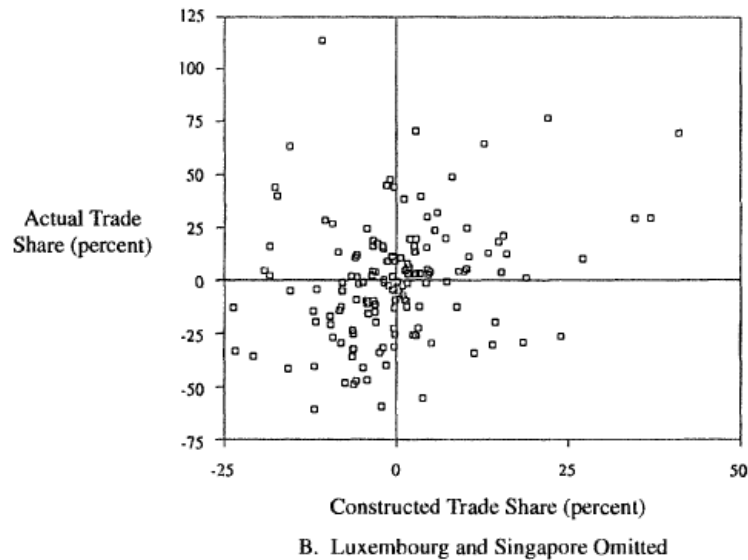
Suitability of instrument

125
100
75
50
Actual Trade
Share (percent)   25
0
-25
-50
-75
        -25   0   25   50

Constructed Trade Share (percent)

B. Luxembourg and Singapore Omitted

TABLE 2—THE RELATION BETWEEN ACTUAL AND
CONSTRUCTED OVERALL TRADE

	(1)	(2)	(3)
Constant	46.41	218.58	166.97
	(4.10)	(12.89)	(18.88)
Constructed trade share	0.99		0.45
	(0.10)		(0.12)
Ln population		−6.36	−4.72
		(2.09)	(2.06)
Ln area		−8.93	−6.45
		(1.70)	(1.77)
Sample size	150	150	150
R^2	0.38	0.48	0.52
SE of regression	36.33	33.49	32.19

Notes: The dependent variable is the actual trade share. Standard errors are in parentheses.

OLS and IV findings

TABLE 3—TRADE AND INCOME

	(1)	(2)	(3)	(4)
Estimation	OLS	IV	OLS	IV
Constant	7.40	4.96	6.95	1.62
	(0.66)	(2.20)	(1.12)	(3.85)
Trade share	0.85	1.97	0.82	2.96
	(0.25)	(0.99)	(0.32)	(1.49)
Ln population	0.12	0.19	0.21	0.35
	(0.06)	(0.09)	(0.10)	(0.15)
Ln area	−0.01	0.09	−0.05	0.20
	(0.06)	(0.10)	(0.08)	(0.19)
Sample size	150	150	98	98
R^2	0.09	0.09	0.11	0.09
SE of regression	1.00	1.06	1.04	1.27
First-stage F on excluded instrument		13.13		8.45

Notes: The dependent variable is log income per person in 1985. The 150-country sample includes all countries for which the data are available; the 98-country sample includes only the countries considered by Mankiw et al. (1992). Standard errors are in parentheses.

Components of income

$$(10) \qquad Y_i = K_i^\alpha [e^{\phi(S_i)} A_i N_i]^{1-\alpha},$$

$$(11) \qquad Y_i = (K_i/Y_i)^{\alpha/(1-\alpha)} e^{\phi(S_i)} A_i N_i.$$

$$(12) \qquad \ln(Y_i/N_i) = \frac{\alpha}{1-\alpha} \ln(K_i/Y_i)$$

$$+ \phi(S_i) + \ln A_i.$$

$$(13) \quad \ln(Y_i/N_i)_{1985}$$

$$= \ln(Y_i/N_i)_{1960}$$

$$+ \left[\ln(Y_i/N_i)_{1985} - \ln(Y_i/N_i)_{1960}\right].$$

Y = output
K = capital
S = schooling
N = labour
A = productivity

Effects of trade

TABLE 4—TRADE AND THE COMPONENTS OF INCOME

|	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable	$\frac{\alpha}{1-\alpha}\ln(K_i/Y_i)$		$\phi(S_i)$		$\ln A_i$		$\ln(Y/N)_{1960}$		$\Delta \ln(Y/N)$	
Estimation	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Constant	−0.72	−1.29	0.10	−0.37	7.47	3.05	7.45	4.27	−0.50	−2.65
	(0.34)	(0.93)	(0.30)	(0.81)	(0.74)	(2.84)	(1.03)	(3.07)	(0.39)	(1.66)
Trade share	0.36	0.59	0.18	0.37	0.27	2.04	0.38	1.66	0.45	1.31
	(0.10)	(0.36)	(0.08)	(0.31)	(0.21)	(1.10)	(0.29)	(1.19)	(0.11)	(0.65)
Ln population	0.02	0.04	0.06	0.07	0.21	0.32	0.09	0.17	0.12	0.18
	(0.03)	(0.04)	(0.03)	(0.03)	(0.06)	(0.11)	(0.09)	(0.12)	(0.03)	(0.06)
Ln area	0.04	0.07	−0.01	0.01	−0.13	0.08	−0.02	0.13	−0.03	0.07
	(0.02)	(0.05)	(0.02)	(0.04)	(0.05)	(0.14)	(0.07)	(0.15)	(0.03)	(0.08)
Sample size	98	98	98	98	98	98	98	98	98	98
R^2	0.13	0.13	0.09	0.08	0.14	0.06	0.03	0.02	0.24	0.20
SE of regression	0.32	0.33	0.28	0.29	0.69	0.92	0.96	1.06	0.36	0.47
First-stage F on excluded instrument		8.45		8.45		8.45		8.45		8.45

Note: Standard errors are in parentheses.

Growth effect of economic openness

- **Wacziarg and Horn Welch (2008) World Bank Economic Review**
- **Extend upon Jeffrey Sachs and Andrew Warner (1995) Economic reform and the process of global integration. Brooking Papers on Economic Activity, vol. 1995(1)**
  - Cross section of countries
  - Average GDP/Cap growth 1985-1970 as function of initial GDP/Cap plus additional regressors
  - Dummy variable whether a country was "open" or "closed" to trade in this period
  - Findings show significant, positive and sizable effect
  - Received substantial criticism
- **Wacziarg and Welch**
  - Update, extend and use time variation

Openness to trade 1960-2000

FIGURE 1. Openness to Trade, 1960–2000 *Note:* Openness is defined according to the Sachs and Warner (1995) criteria. Sample includes 141 countries.
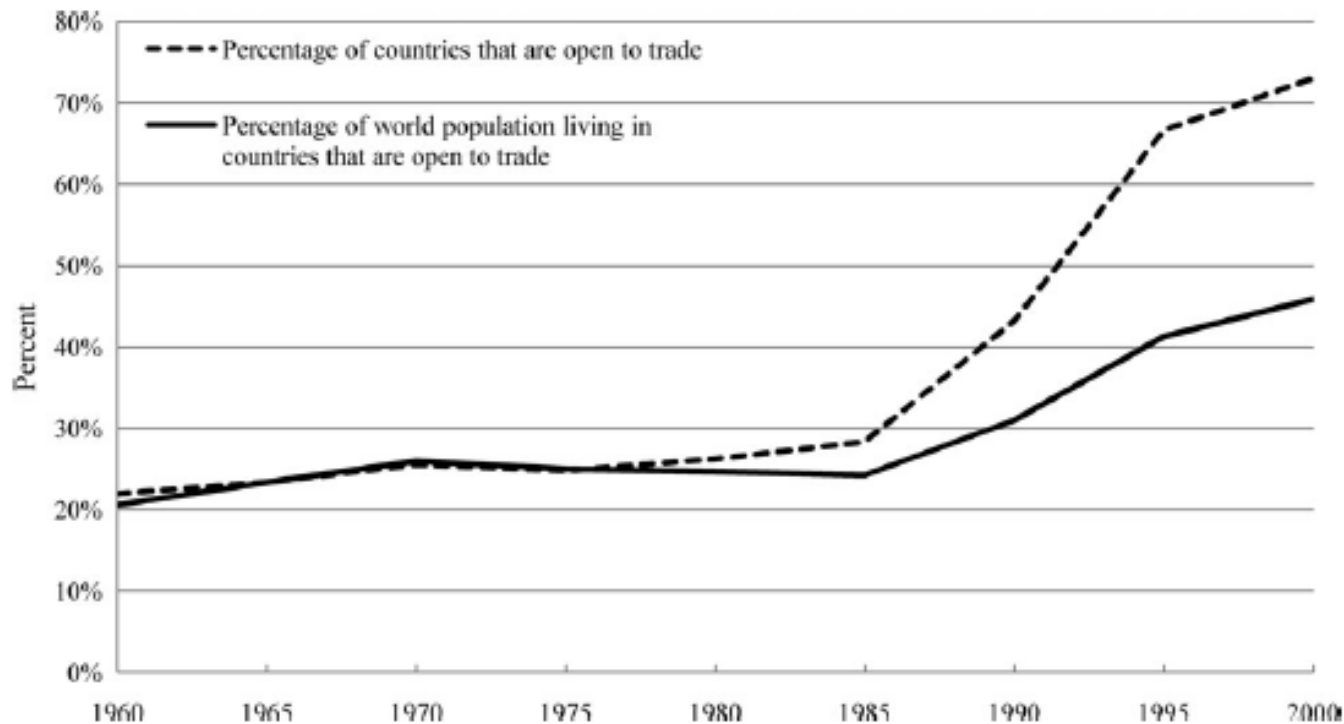
Source: Authors' analysis based on data described in the text.

Trade openness

(1) Average tariff rates of 40 percent of more (TAR).
(2) Nontariff barriers covering 40 percent or more of trade (NTB).
(3) A black market exchange rate at least 20 percent lower than the official exchange rate (BMP).
(4) A state monopoly on major exports (XMB).
(5) A socialist economic system (as defined by Kornai 1992) (SOC).

Trade openness

- Dummy approach

(1) Average tariff rates of 40 percent of more (TAR).
(2) Nontariff barriers covering 40 percent or more of trade (NTB).
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- Trade liberalisation data
- When did a country start to meet all five criteria?

- Two approaches in W&W paper
  - Between effects (in line with Sachs and Warner)
  - Within effects; panel data approach

Replication of Sachs and Warner

Variable	(1) Growth 1970–89	(2) Growth 1989–98	(3) Growth 1970–80	(4) Growth 1980–89	(5) Growth 1989–98
Real GDP per capita (t)	−1.5929	−1.150	−1.292	−1.397	−1.261
	(4.89)	(1.95)	(2.83)	(3.84)	(2.13)
Sachs-Warner openness dummy variable(1970–89 or 1990–98 periods)	1.9845	0.136			
	(3.87)	(0.21)			
Openness status based on liberalization dates (t)			1.387	2.574	0.521
			(1.86)	(4.17)	(0.84)
Secondary-school enrollment rate (t)	0.8059	4.689	0.169	1.822	4.872
	(0.68)	(2.43)	(0.10)	(1.40)	(2.52)
Primary-school enrollment rate (t)	1.4003	1.381	2.455	−0.139	1.616
	(1.65)	(0.86)	(2.01)	(0.11)	(0.99)
Government Consumption to GDP ratio ($t, t + X$)	−0.0844	−0.063	−0.005	−0.065	−0.059
	(3.02)	(1.32)	(0.19)	(2.51)	(1.26)
Number of revolutions per year ($t, t + X$)	−0.4359	−0.986	−1.238	−0.211	−1.030
	(0.58)	(1.08)	(1.12)	(0.21)	(1.13)
Number of assassinations per capita per year ($t, t + X$)	0.0296	0.483	0.276	0.188	0.473
	(0.13)	(1.56)	(0.94)	(0.54)	(1.54)
Deviation of the price level of investment (t), as in Sachs-Warner	−0.1709	−0.734	−0.476	0.350	−0.721
	(0.53)	(1.24)	(0.99)	(0.87)	(1.23)
Gross domestic investment/ real GDP ($t, t + X$)	0.0757	0.051	0.076	0.103	0.040
	(2.64)	(1.01)	(2.02)	(2.30)	(0.76)
Extreme political repression (from Sachs-Warner)	−0.6974	0.165	−0.907	−0.780	0.224
	(1.66)	(0.28)	(1.47)	(1.51)	(0.38)
Population density ($t − 10$)	0.0006	0.0009	0.001	0.001	0.001
	(0.90)	(1.40)	(0.60)	(0.87)	(1.49)
Intercept	12.2482	7.752	9.334	10.635	8.288
	(4.87)	(1.81)	(2.84)	(3.86)	(1.92)
Adjusted R^2	0.546	0.211	0.35	0.53	0.32
Number of observations	91	89	99	97	89

Liberalisation and growth

$$\log y_{it} - \log y_{it-1} = \alpha_i + \beta LIB_{it} + \varepsilon_{it} \qquad \varepsilon_{it} = v_i + \eta_t + \mu_{it}$$

TABLE 5. Fixed-Effects Regressions of Growth, Investment, and Openness on Liberalization Status, 1950−98

Item	(1) 1950−98	(2) 1950−70	(3) 1970−90	(4) 1990−98
Dependent variable: Growth				
Liberalization	1.417	0.611	1.787	2.547
	(5.05)	(1.29)	(3.11)	(2.39)
Number of observations	4,936	1,728	2,312	1,116
Number of countries	133	108	112	133
Adjusted R^2	0.05	0.03	0.04	0.04
Dependent variable: Investment rate				
Liberalization	1.937	2.545	1.237	0.762
	(9.06)	(7.57)	(2.91)	(2.16)
Number of observations	5,078	1,844	2,321	1,140
Number of countries	136	110	117	136
Adjusted R^2	0.04	0.10	0.11	0.02
Dependent variable: Openness				
Liberalization	5.531	2.302	4.097	−1.803
	(7.42)	(1.89)	(3.74)	(0.83)
Number of observations	5,078	1,844	2,321	1,140
Number of countries	136	110	117	136
Adjusted R^2	0.22	0.02	0.14	0.08

LIB_{it} = 1 if t is larger than year of liberalisation and no reversal of trade policy reforms have occurred

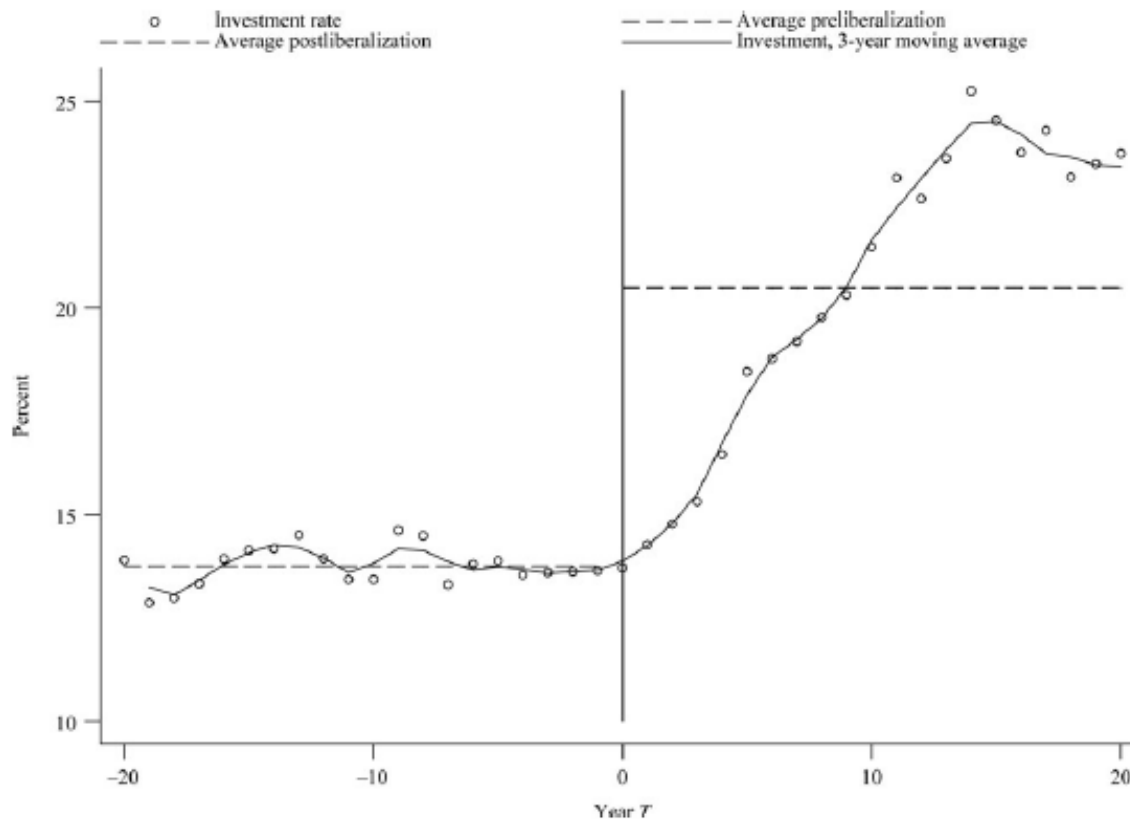# Timing of effects: growth

FIGURE 2. Sample Means for Growth before and after Liberalization
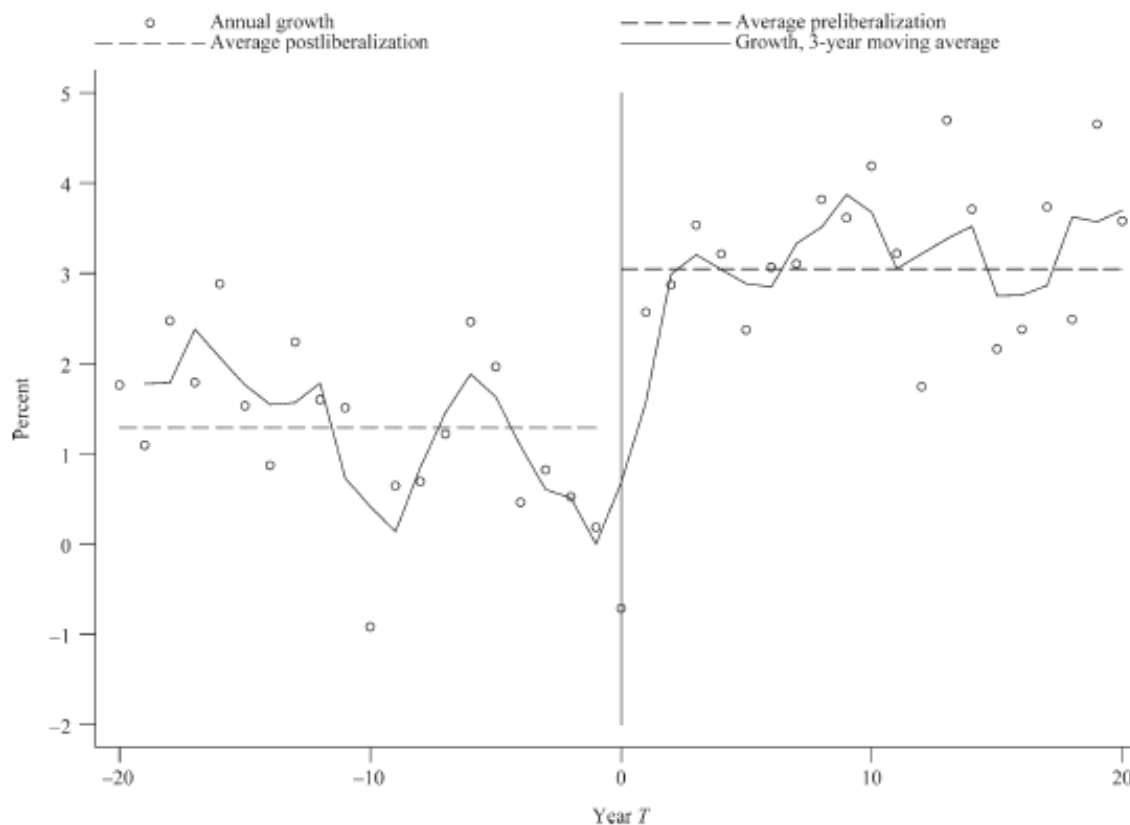
Source: Authors' analysis based on data described in the text.
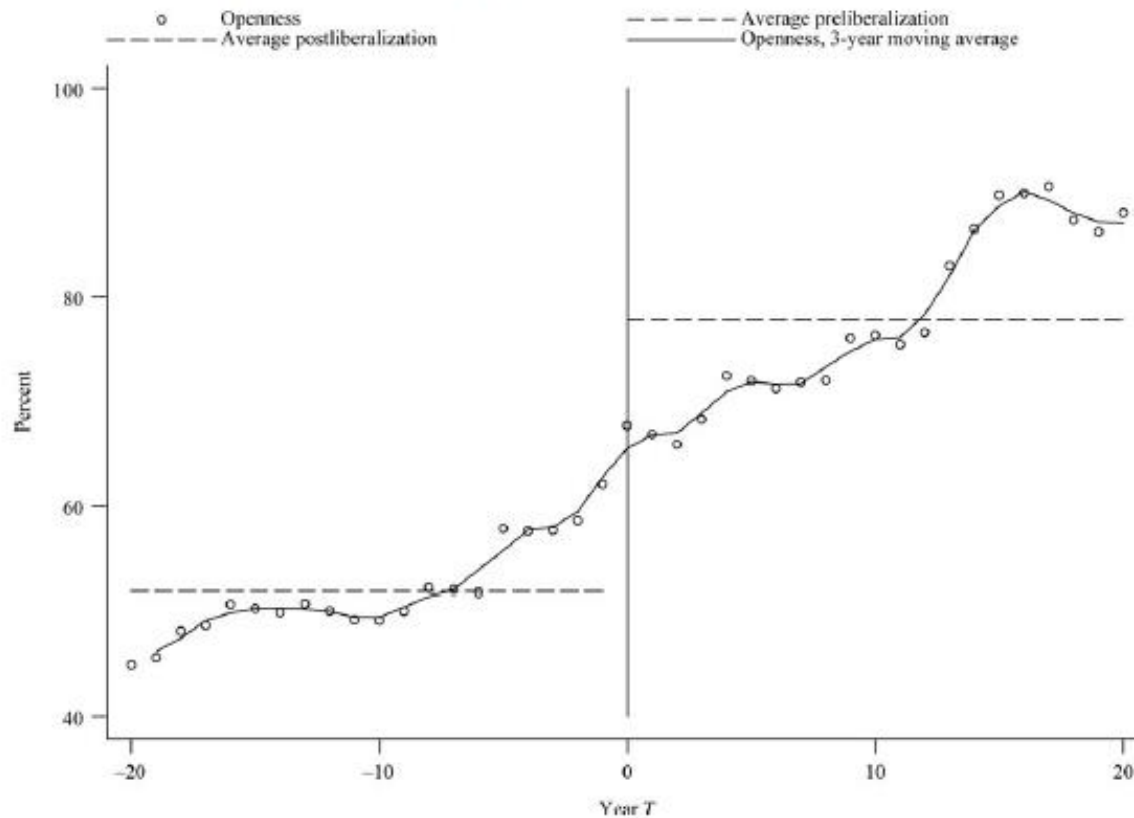
Timing of effects: investment

FIGURE 3. Sample Means for Investment before and after Liberalization

Source: Authors' analysis based on data described in the text.

Timing of effects: (exp+imp)/GDP

FIGURE 4. Sample Means for Openness before and after Liberalization

Source: Authors' analysis based on data described in the text.

Identifying timing of effects from growth, investment and openness

(4) $\log y_{it} - \log y_{it-1} = \alpha_i + \beta_1 D_{1it} + \beta_2 D_{2it} + \beta_3 D_{3it} + \beta_4 D_{4it} + \varepsilon_{it}$

$$D1_{it} = 1 \; if \; T - 3 \leq t \leq T - 1$$

$$D2_{it} = 1 \; if \; T \leq t \leq T + 2$$

$$D3_{it} = 1 \; if \; T + 3 \leq t \leq T + 6$$

$$D1_{it} = t > T + 6$$

Empirical findings

TABLE 6. Fixed-Effect Regressions: Timing of the Effects of Liberalization on Growth, Investment, and Openness

Item	(1) Growth	(2) Investment	(3) Openness
D_1	−0.555	−1.040	−1.979
	(1.14)	(2.88)	(1.32)
D_2	0.300	−0.160	0.795
	(0.61)	(0.41)	(0.63)
D_3	1.438	1.197	3.606
	(3.27)	(2.98)	(2.21)
D_4	1.015	2.129	13.371
	(2.30)	(5.47)	(9.17)
Number of observations	4,230	4,357	4,357
Number of countries	118	121	121
Adjusted R^2	0.04	0.08	0.26

Note: Number in parentheses are robust-statistics. Regressions are based on the specification in equation (4). All regressions include time and country fixed-effects (estimates not reported). Definition of dummy variables, where T represents the date of liberalization, is as follows: $D_1 = 1$ if $T − 3 \leq t \leq T − 1$ and zero otherwise. $D_2 = 1$ if $T \leq t \leq T + 2$ and zero otherwise. $D_3 = 1$ if $T + 3 \leq t \leq T + 6$ and zero otherwise. $D_4 = 1$ if $t > T + 6$ and zero otherwise.

*Source:* Authors' analysis based on data described in the text.

Country heterogeneity

TABLE 7. Mean Growth, Investment, and Openness Changes in 24 Countries

| Country	Growth difference	Investment difference	Openness difference	Year of liberalization	Sample period
Mauritius	3.62	0.34	35.90	1968	1951–98
Indonesia	3.32	9.80	25.96	1970	1961–98
Uruguay	3.08	−1.01	11.22	1990	1951–98
Korea, Rep. of	3.02	18.44	43.40	1968	1954–98
Chile	2.80	−1.12	26.33	1976	1952–98
Taiwan	2.29	9.91	55.77	1963	1952–98
Uganda	2.24	1.63	−6.60	1988	1951–98
Ghana	1.99	−3.91	9.13	1985	1956–98
Guinea	1.85	−2.74	7.28	1986	1960–98
Guyana	1.80	−7.49	84.49	1988	1951–98
Benin	1.74	1.64	8.72	1990	1960–98
Mali	1.19	0.86	15.68	1988	1961–98
Poland	0.83	−4.30	3.35	1990	1971–98
Paraguay	0.42	2.01	49.71	1989	1952–98
Cyprus	0.34	−4.05	29.13	1960	1951–96
Colombia	0.18	0.48	5.91	1986	1951–98
Tunisia	−0.30	−5.58	31.94	1989	1962–98
Philippines	−0.40	1.03	39.54	1988	1951–98
Israel	−0.96	−6.10	21.42	1985	1951–98
Botswana	−1.99	3.98	22.27	1979	1961–98
Mexico	−2.16	−4.59	17.56	1986	1951–98
Hungary	−2.41	−1.19	−4.17	1990	1971–98
Guinea-Bissau	−2.95	5.59	9.89	1987	1961–98
Jordan	−4.28	5.75	40.61	1965	1955–98

Source: Authors' analysis based on data described in the text.
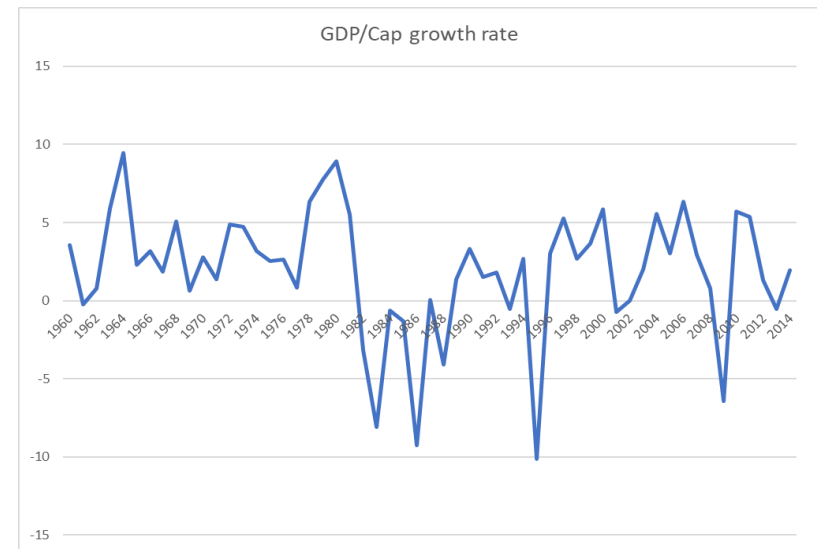
Success case: South Korea
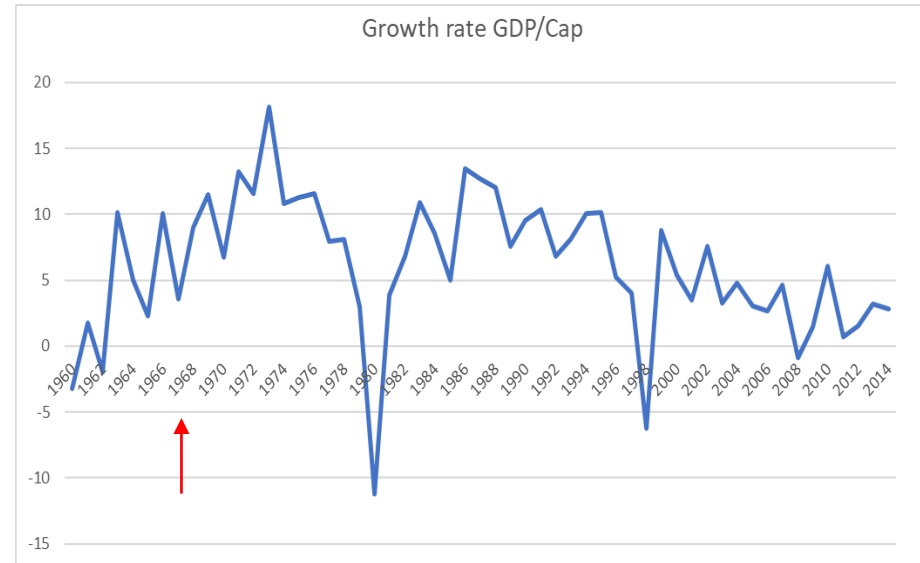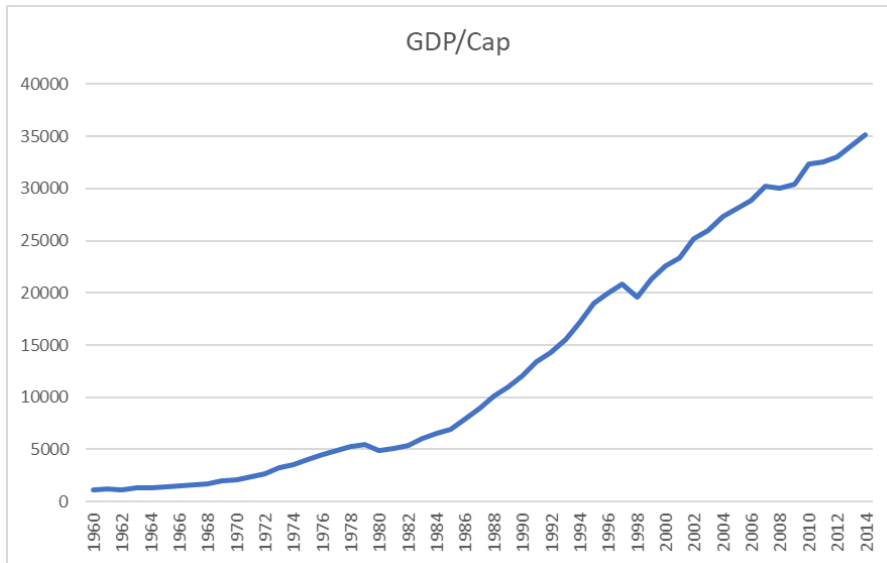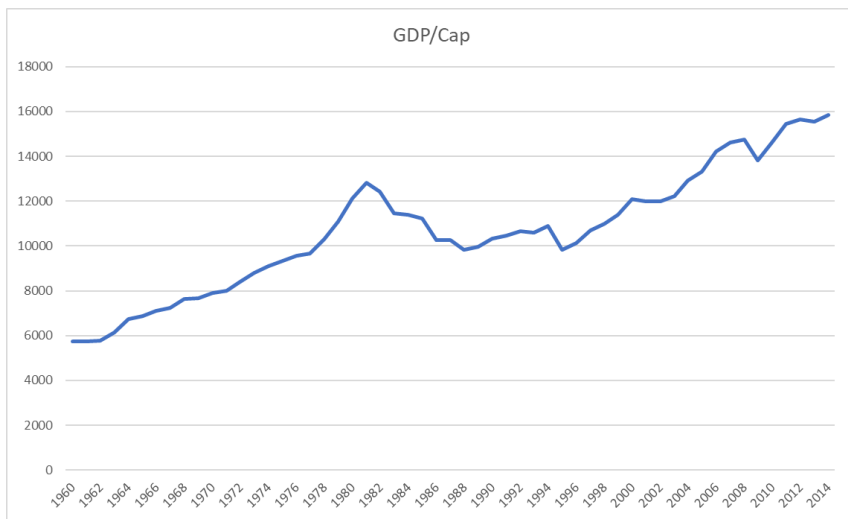

Source: Based on data Penn World Tables
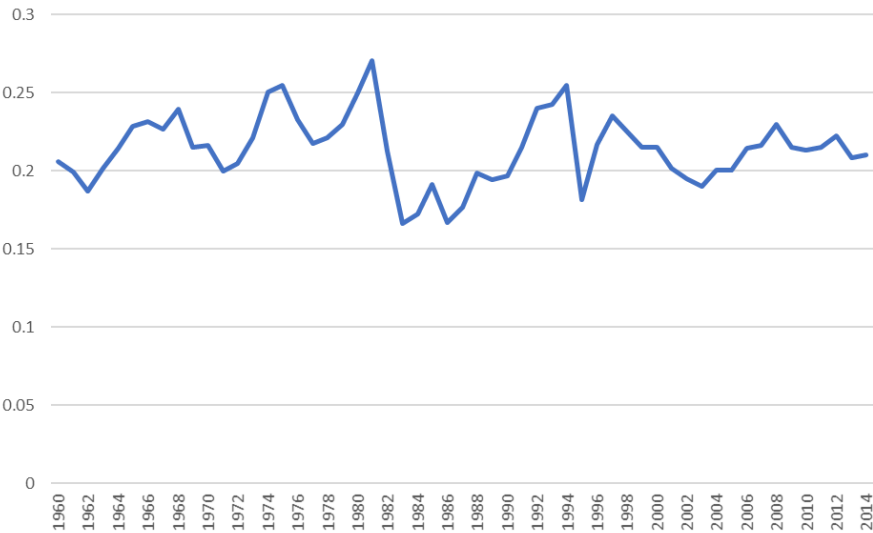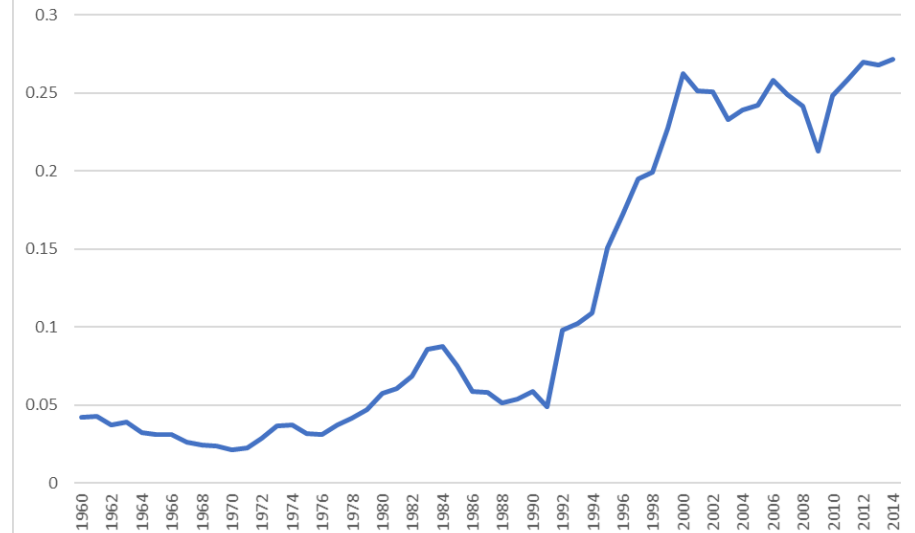
Investment and trade
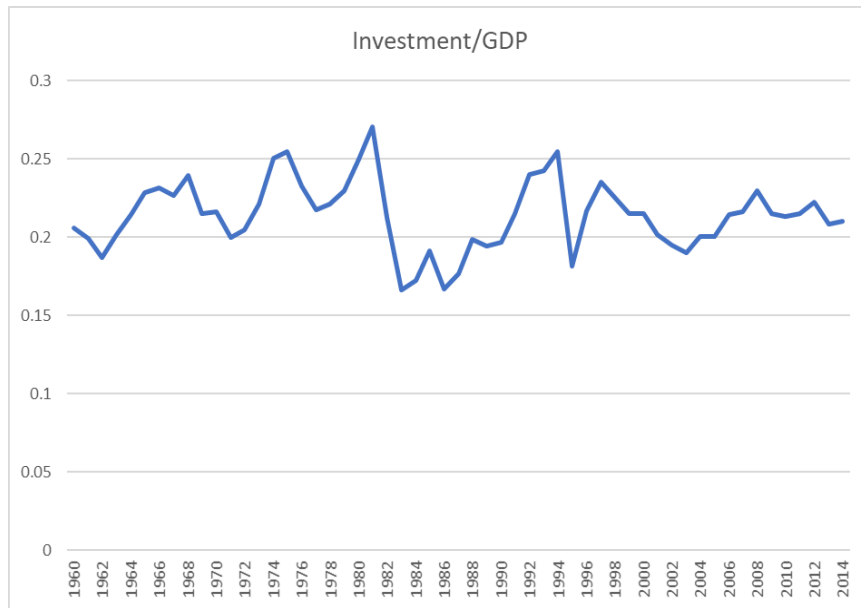
Mexico as Latin American case

Investment and trade

Trade and growth

- **Strong notion that trade is good for income, growth, etc.**
- **International organisations clearly follow this line**
- **LA versus EA**
- **Evidence: global support for positive association trade and growth**
- **Empirical studies**
  - Variety of settings, measurements of trade and trade liberalisation
  - Important to recognise limitations of empirical approaches
  - But where is evidence that trade restrictions foster growth?
- **Papers good examples of key topics and issues**
- **Likely that trade liberalisation is necessary but insufficient condition?**

Discussion points (1)

How does research on the growth effects from trade relate to trade theory?

Discussion points (2)

What types of effects could/should we expect from trade / trade liberalisation / trade openness?

Discussion points (3)

What are the policy implications of the empirical findings?