Trade and Growth

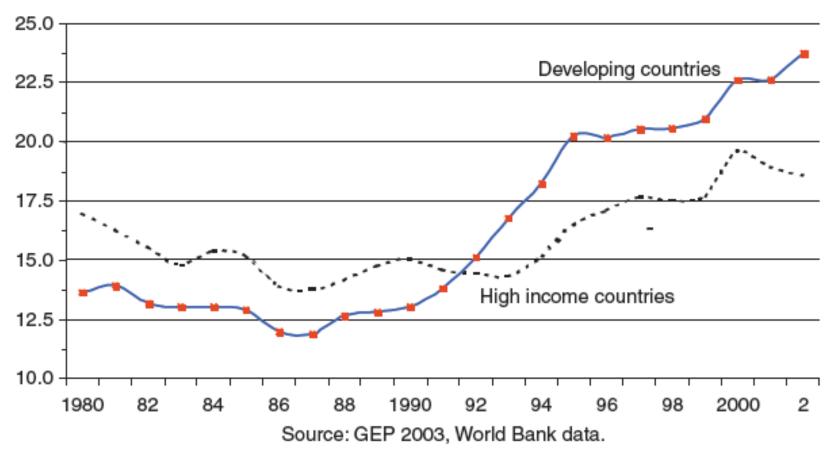**Figure 2** Export shares in developing and high-income countries.

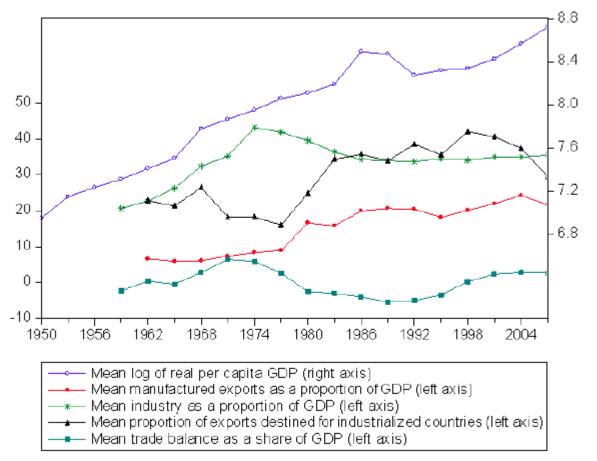Source: Harrison & Rodriguez-Clare, 2010.

Trade (Openness) and Growth

- What are the channels that international trade can stimulate long-run growth?

- What do data tell us?

- Given what we know about trade and growth so far, what role can the government play?

- What are the channels that international trade can stimulate long-run growth?

- What does economic theory tell us?

- **Static gains from trade**
  - **Comparative advantage and specialization**
    - Climate and natural resources
    - Relative abundance of labor and capital
    - Technology

- **Keynesian net export-led growth**
  - **External demand**
    - GDP = jobs

- Dynamic gains from trade
  - Scale economies
  - Selection and reallocation of production
  - Innovation: competition and profitability; scale
    - Who innovates? Those who can or those who must?
  - Emulation: vertical vs. horizontal spillover
  - Access to intermediates: specialized inputs; embodied technology
  - Consumption of increased variety

    - Which of these effects benefit domestic industries?

- Losers from trade
  - Any potential downside? How to address it?
  - Where does trade surplus/deficit fit in the discussion?

Figure 2: Mean of Real per Capita Gross Domestic Product and Other Variables for Asian Countries, 1950–2007

Legend:
- Mean log of real per capita GDP (right axis)
- Mean manufactured exports as a proportion of GDP (left axis)
- Mean industry as a proportion of GDP (left axis)
- Mean proportion of exports destined for industrialized countries (left axis)
- Mean trade balance as a share of GDP (left axis)

Source: Penn World Table (2011), United Nations COMTRADE (2011), World Development Indicators (2011), and authors' calculations

Source: Razmi & Hernandez, 2011.

Empirical Assessments

- What do data tell us?

- Empirical assessment
  - focuses on particular industries that have received protection
  - exploits the variation in productivity growth and different measures of support across industries
  - cross-country analysis on openness and growth

- Empirical assessment (industry/country level)

$$Y_{it} = \text{Constant} + \beta \text{OPENNESS}_{it} + \phi Z_{it} + \alpha_i + \tau_t + \varepsilon_{it}$$

(Harrison & Rodriguez-Clare, 2010)

- **How to measure OPENNESS**

  Policy vs. volume

- **Endogeneity b/t Y and OPENNESS**

  Granger causality (lags)

  Instrumenting for OPENNESS (geography; partner tariffs)

- **Which variables to include in controls Z**

  Institutions, investment, barriers to entry…

Table 3 All countries

	Exchange rate	Revenue tariffs (Trade taxes/ Trade volumes)	Statutory Tariffs	Openness ($X + M$/ GDP)	Real openness	DFI/GDP
Correlation between different openness measures						
Revenue tariffs (Trade taxes/ Trade volumes)	0.0452 283	1.0000 919				
Statutory Tariffs	−0.0314 274	0.6271* 666	1.0000 716			
Openness ($X + M$/GDP)	−0.0172 291	−0.2459* 561	−0.2470* 464	1.0000 607		
Real openness	−0.0662 293	−0.2200* 579	−0.2970* 461	0.8921* 566	1.0000 630	
DFI/GDP	−0.0066 281	−0.2501* 559	−0.3016* 445	0.3708* 567	0.4129* 576	1.0000 607

Notes: Data from World Bank. Time period includes 1970–2004. The asterisk indicates significant at the 5% level. Number of observations are underneath correlation coefficient.

Source: Harrison & Rodriguez-Clare, 2010.

- Empirical assessment (industry/country level)

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Table 7: Growth Regressions for Cross-Sectional and Temporal Subsamples

Dependent variable: GRGDPCH (Growth rate of real GDP per capita)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	East and South-east Asia		Rest of Asia		1953–95		1989-2009	
	General	Specific	General	Specific	General	Specific	General	Specific
Constant	0.0629	-0.0267	0.5464*	0.7107***	0.3417	0.1375	0.4634**	0.5973***
	(0.29)	(-1.07)	(1.79)	(3.35)	(1.64)	(0.74)	(2.03)	(2.83)
Ln RGDPCH$_{t-1}$	-0.0006		-0.0779*	-0.0963***	-0.0565**	-0.0211	-0.0495*	-0.0609
	(-0.33)		(-1.96)	(-3.48)	(-2.11)	(-0.82)	(-1.83)	(-2.57)
INDUSTRY_PROP_GDP	0.0048***	0.0011**	0.0025**	0.0022***	0.0072***	0.0056***	0.0008	
	(3.13)	(1.95)	(2.35)	(3.79)	(3.963)	(5.90)	(0.92)	
INDUSTRY_PROP_GDP$_{t-1}$	-0.0043***		0.0006		-0.0021		-0.0004	
	(-3.61)		(0.44)		(-1.10)		(-0.33)	
INDUSTRY_PROP_GDP$_{t-2}$	-0.0000		0.0007		-0.0009	-0.0041***	-0.0010	-0.0007**
	(-0.05)		(0.61)		(-0.99)	(-3.53)	(-0.82)	(-1.98)
MANUF_X_GDP	0.0001	-0.0005**	0.0000		-0.0005		-0.0010***	-0.0005***
	(0.31)	(-2.54)	(0.07)		(-0.76)		(-3.47)	(-2.62)
MANUF_X_GDP$_{t-1}$	0.0002	0.0013**	0.0020*		0.0010	0.0007*	0.0009***	
	(0.39)	(2.20)	(1.76)		(0.86)	(1.70)	(3.33)	
MANUF_X_GDP$_{t-2}$	-0.0003	-0.0011**	-0.0011		-0.0001		-0.0004	
	(-0.65)	(-2.34)	(-0.91)		(-0.11)		(-1.40)	
TB_PROP_GDP	-0.0022***		0.0002		-0.0012*	-0.0011*	0.0004	
	(-2.88)		(0.32)		(-1.72)	(-1.82)	(1.24)	
TB_PROP_GDP$_{t-1}$	0.0019***		-0.0025***	-0.0014**	-0.0012	-0.0011*	-0.0009	
	(2.74)		(-2.78)	(-2.12)	(-1.66)	(-2.16)	(-1.15)	
TB_PROP_GDP$_{t-2}$	-0.0005		-0.0005		0.0008**	0.0015***	0.0002	
	(-0.61)		(-1.04)		(2.4)	(3.46)	(0.38)	
PROPORTION_X_DEVELOPED	-0.0170		0.0155		-0.0157		0.0579	
	(-0.27)		(0.38)		(-0.48)		(0.95)	
PROPORTION_X_DEVELOPED$_{t-1}$	0.0235	0.0373**	-0.0197		-0.0143		0.0283	
	(0.75)	(2.57)	(-0.28)		(-0.43)		(0.77)	
PROPORTION_X_DEVELOPED$_{t-2}$	0.0271	0.0646***	-0.0317		0.0442*		0.0073	0.0334***
	(1.24)	(3.69)	(-0.72)		(1.77)		(0.43)	(2.77)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Time Dummies	yes	yes	yes	yes	yes	yes	yes	yes
Country Dummies	yes	yes	yes	yes	yes	yes	yes	yes
$LnIND_t + LnIND_{-1} + LnIND_{-2}$	0.0004		0.0039		0.0042	0.0015	-0.0007	
Wald statistic	0.59		5.68		9.66	3.64	2.06	
p-value	[0.44]		[0.02]		[0.000]	[0.057]	[0.151]	
$LnMAN_t + LnMAN_{-1} + LnMAN_{-2}$	0.0000	-0.0003	0.0009		0.0004		-0.0005	
Wald statistic	0.003	1.30	0.35		0.51		3.04	
p-value	[0.955]	[0.257]	[0.556]		[0.438]		[0.081]	
$LnTB_t + LnTB_{-1} + LnTB_{-2}$	-0.0007		-0.0028		-0.0015	-0.00075	-0.0003	
Wald statistic	1.99		2.82		4.47	2.65	0.12	
p-value	[0.162]		[0.09]		[0.025]	[0.1034]	[0.726]	
$LnPRO_t + LnPRO_{-1} + LnPRO_{-2}$	0.0335	0.1020	-0.0358		0.0141		0.0935	
Wald statistic	0.84	32.37	1.08		0.22		3.22	
p-value	[0.362]	[0.000]	[0.30]		[0.640]		[0.073]	
Adjusted R-squared	0.70	0.59	0.51	0.33	0.56	0.60	0.67	0.6
Cross-sections included	11	11	18	26	20	23	29	30
Observations	95	116	114	222	119	149	142	160

[a] (t-statistic), *p<0.10, **p<0.05, ***p<0.01

Source: Razmi & Hernandez, 2011.

- Empirical assessment (industry/country level)

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(Harrison & Rodriguez-Clare, 2010)

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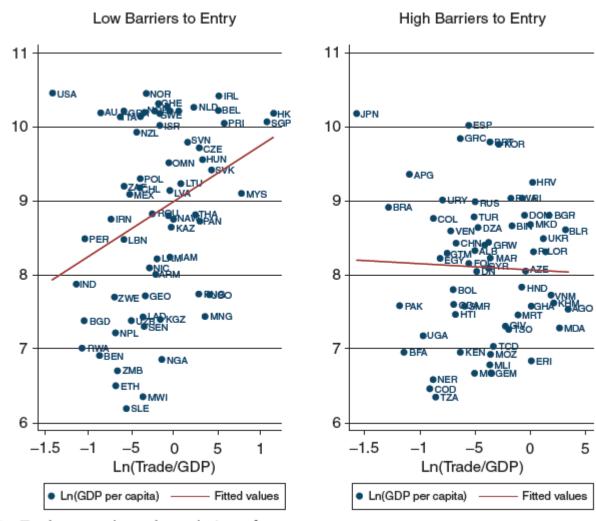 - Institutions, investment, barriers to entry…

Figure 4 Trade, growth, and regulation of entry.

Source: Bolaky and Freund (2004).

- An industry level analysis on Japan
  - TFP growth
  - Import-led or export-led?

Table 10.2 Basic Trade and Growth Results

Variable	Exports as a share of output	Imports	Net trade	Imports and exports entered separately
TFPJ(-1)	-0.083	-0.082	-0.070	-0.077
	(-0.077)	(0.077)	(0.0763)	(0.078)
RELTFP(-1)	-0.274**	-0.273**	-0.283**	-0.277**
	(0.098)	(0.097)	(0.097)	(0.098)
CUMOUT	0.263**	0.267**	0.276**	0.272**
	(0.093)	(0.094)	(0.094)	(0.095)
AVERD	5.105**	4.989**	3.586**	4.327*
	(2.114)	(1.788)	(1.500)	(2.402)
AVEX	-0.092			-0.057
	(0.133)			(0.143)
AVENET		-0.095		
		(0.109)		
AVEIMP			0.266	0.221
			(0.300)	(0.143)
Adjusted R^2	0.151	0.152	0.152	0.149

Note: * Significant at the 1 percent level; ** significant at the 5 percent level.

Source: Jorgenson and Kuroda (1990).

Source: Lawrence & Weinstein, 2001.

Table 10.3 Interreaction between Convergence and Growth

Variable	Exports as a share of output	Net trade	Imports	Average
TFPJ(-1)	-0.075	-0.064	-0.066	-0.077
	(0.075)	(0.073)	(0.078)	(0.075)
RELTFP(-1)	-0.210**	-0.200**	-0.298**	-0.309**
	(0.089)	(0.087)	(0.098)	(0.098)
CUMOUT	0.225**	0.226**	0.214**	0.215**
	(0.73)	(0.073)	(0.095)	(0.075)
AVERD	2.975*	3.286**	1.775	1.519
	(1.686)	(1.457)	(2.402)	(1.866)
AVEX	-0.197			-0.169
	(0.275)			(0.273)
AVEIMP			-0.956	-0.169
			(0.687)	(0.689)
AVENET		-0.070		
		(0.253)		
RELTFP*AVEX	0.176			0.220
	(0.312)			(0.309)
RELTFP *AVEIMP			1.760**	1.773**
			(0.848)	(0.852)
RELTFP*AVENET		-0.020		
		(0.292)		
Adjusted R^2	0.151	0.153	0.171	0.167

Note: * Significant at the 1 percent level; ** significant at the 5 percent level.
Source: Jorgenson and Kuroda (1990).

Source: Lawrence & Weinstein, 2001.

Table 10.4 Testing for Sample Breaks

Variable	Late interacted with exports	Late interacted with net exports	Late interacted with imports	Late interacted with exports & imports	Late
TFPJ(-1)	-0.144	-0.167	-0.129	-0.145	-0.099
	(0.069)	(0.069)	(0.067)	(0.069)	(0.067)
RELTFP(-1)	-0.110	-0.111	-0.118	-0.121	-0.119
	(0.076)	(0.075)	(0.076)	(0.075)	(0.077)
CUMOUT	0.023	0.038	0.119	0.072	0.103
	(0.115)	(0.112)	(0.112)	(0.115)	(0.113)
AVERD	2.021	2.661*	2.751**	0.649	2.772**
	(1.812)	(1.577)	(1.313)	(1.947)	(1.302)
AVEX	-0.309*			-0.032	
	(0.182)			(0.218)	
AVEIMP			0.949**	0.943**	
			(0.322)	(0.376)	
AVENET		-0.346			
		(0.131)			
LATE	-0.038**	-0.025*	0.008	0.943**	-0.008
	(0.016)	(0.013)	(0.016)	(0.376)	(0.012)
LATE*AVEX	0.322**			0.196	
	(0.115)			(0.127)	
LATE*AVEIMP			-0.449**	-0.467**	
			(0.224)	(0.229)	
LATE*AVENET		0.324			
		(0.096)			
Adjusted R^2	0.210	0.221	0.211	0.226	0.226

Note: * Significant at the 1 percent level; ** significant at the 5 percent level.

Source: Jorgenson and Kuroda (1990).

Source: Lawrence & Weinstein, 2001.

Table 10.5 Riccardian Regressions

Variable	Relative TFP	Lagged relative TFP
Dependent variable: LOGOUT		
LOGOUT(-1)	0.754**	0.788**
	(0.024)	(0.027)
RELTFP	0.494**	
	(0.097)	
RELTFP(-1)		0.089
		(0.104)
Adjusted R^2	0.986	0.984
Dependent variable: EXOUT		
EXOUT(-1)	0.834**	0.845**
	(0.030)	(0.029)
RELTFP		0.067**
		(0.022)
RELTFP(-1)	0.070**	
	(0.022)	
Adjusted R^2	0.962	0.962

Note: * Significant at the 1 percent level; ** significant at the 5 percent level.

Source: Jorgenson and Kuroda (1990).

Source: Lawrence & Weinstein, 2001.

Table 10.7 Protection and Growth Regressions

Variable	Control	Exports
TFPJ(-1)	-0.088	-0.085
	(0.067)	(0.068)
RELTFP(-1)	-0.149**	-0.149**
	(0.078)	(0.078)
CUMOUT	0.080	0.079
	(0.113)	(0.113)
AVERD	2.685**	2.026
	(1.384)	(1.829)
AVEX		0.071
		(0.129)
DELTAERP(-1)	-0.002**	-0.002**
	(0.001)	(0.001)
LATE	-0.012	-0.012
	(0.012)	(0.013)
LATE*DELTAERP(-1)	0.0014**	0.0014
	(0.0006)	(0.0006)
Adjusted R^2	0.198	0.195

Note: * Significant at the 1 percent level; ** significant at the 5 percent level.
Source: Jorgenson and Kuroda (1990).

Source: Lawrence & Weinstein, 2001.

Table 10.9 Competing versus Noncompeting Imports

Variable	Competing and noncompeting imports alone	Full specification	Competing imports alone
TFPJ(-1)	-0.087	-0.101	-0.094
	(0.077)	(0.082)	(0.072)
RELTFP(-1)	-0.292	-0.297	-0.289
	(0.097)	(0.010)	(0.092)
CUMOUT	0.202	0.200	0.195
	(0.077)	(0.079)	(0.073)
AVERD	1.694	1.690	1.727
	(1.254)	(1.889)	(1.229)
AVEX		-0.167	
		(0.287)	
AVEX*RELTFP		0.193	
		(0.331)	
NCOMPIM	-0.063	-0.089	
	(1.207)	(1.227)	
COMPIM	-1.808	-1.692	-1.909
	(1.157)	(1.207)	(1.081)
NCOMPIM*RELTFP	0.285	0.250	
	(1.995)	(2.048)	
COMPIM*RELTFP	2.939	2.835	3.081
	(1.518)	(1.554)	(1.363)
Adjusted R^2	0.168	0.163	0.175

Source: Jorgenson and Kuroda (1990).

Source: Lawrence & Weinstein, 2001.

Industrial Policy

- Given what we know about trade and growth so far, what role can the government play?

- Is there a place for industrial policy?
  - Import substitution
    - Infant industry
    - External economies of scale
    - Other market failures: information; credit; coordination
  - Export promotion
    - Learning by exporting
  - Encourage inward FDI – "soft" IP
    - increase the supply of skilled workers, encourage technology adoption, and improve regulation and infrastructure
    - Are these more effective?

- Empirical evidence on FDI

  - Firms that receive FDI (joint ventures) or are acquired by multinationals generally exhibit higher productivity levels.

  - Positive vertical spillovers from foreign buyers to domestic suppliers (backward linkages) and from foreign suppliers to domestic buyers (forward linkages).

  - Generally insignificant horizontal spillovers to firms within the same industry.

- Korean industrial policy
  - Encouraging exports using neutral policies

  - Promoting infant industries using non-neutral policies – "picking winners"
    - used information gained during implementation to evaluate and revise intentions
    - closely monitored the magnitude of incentives, the relationship of domestic to world prices, and other relevant information including indicators of product quality

  - What role did the *chaebol*s play?

  - Did the planners knew what they were doing?

Further Discussion

- America's protectionist policies:
  - Should the U.S. adopt protectionist policy?
  - What would be the effects?
  - What's different for a developed economy?

- What determines a country's openness?
  - Latent comparative advantages; geography (regional integration); macroeconomics policies; trade policies

- Future topics: regionalization, inequality, etc.