Financial Imbalances, Middle-East Industrialization, and CO_2 Emissions

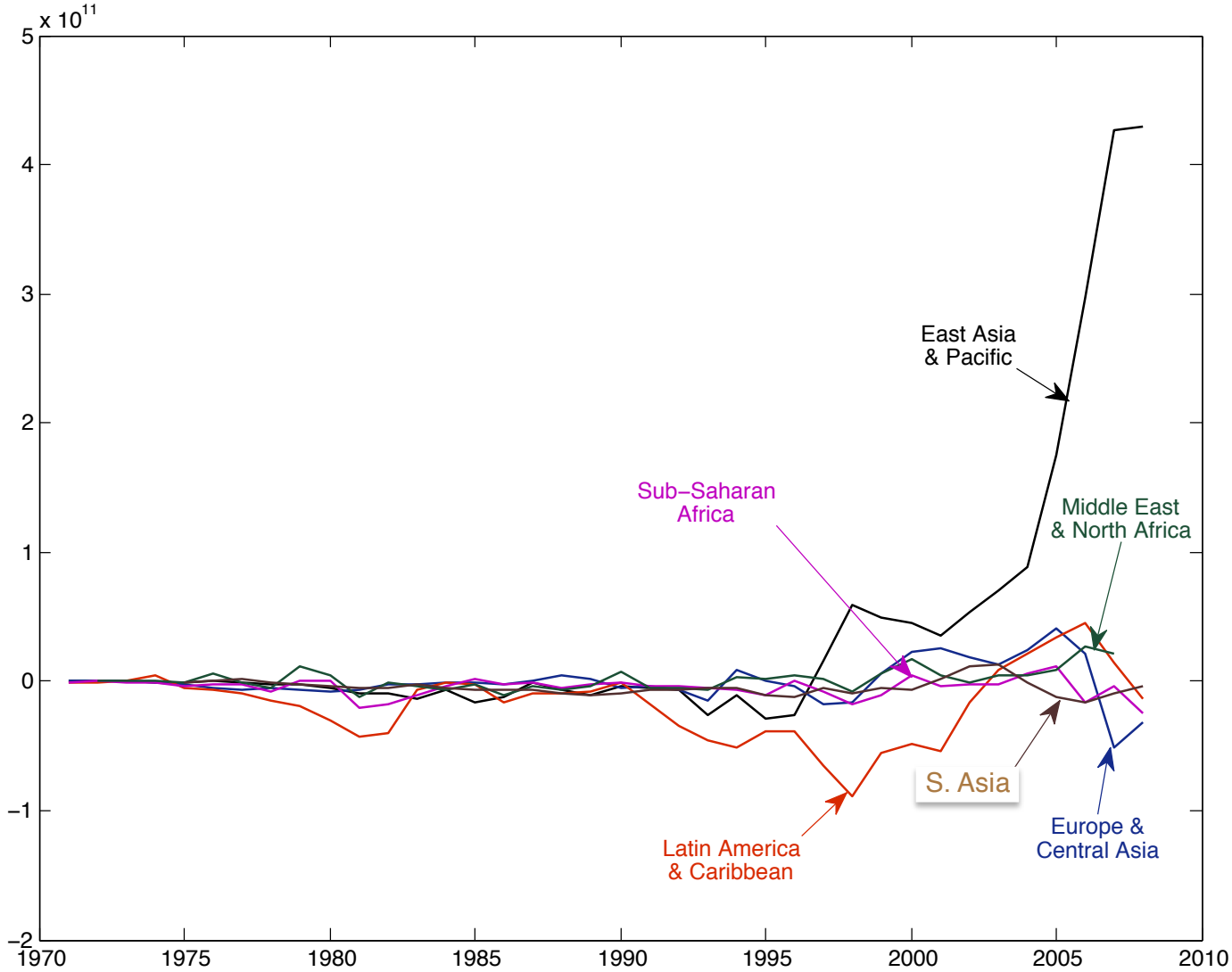
Mahmoud A. El-Gamal

Department of Economics, and
James A. Baker III Institute for Public Policy

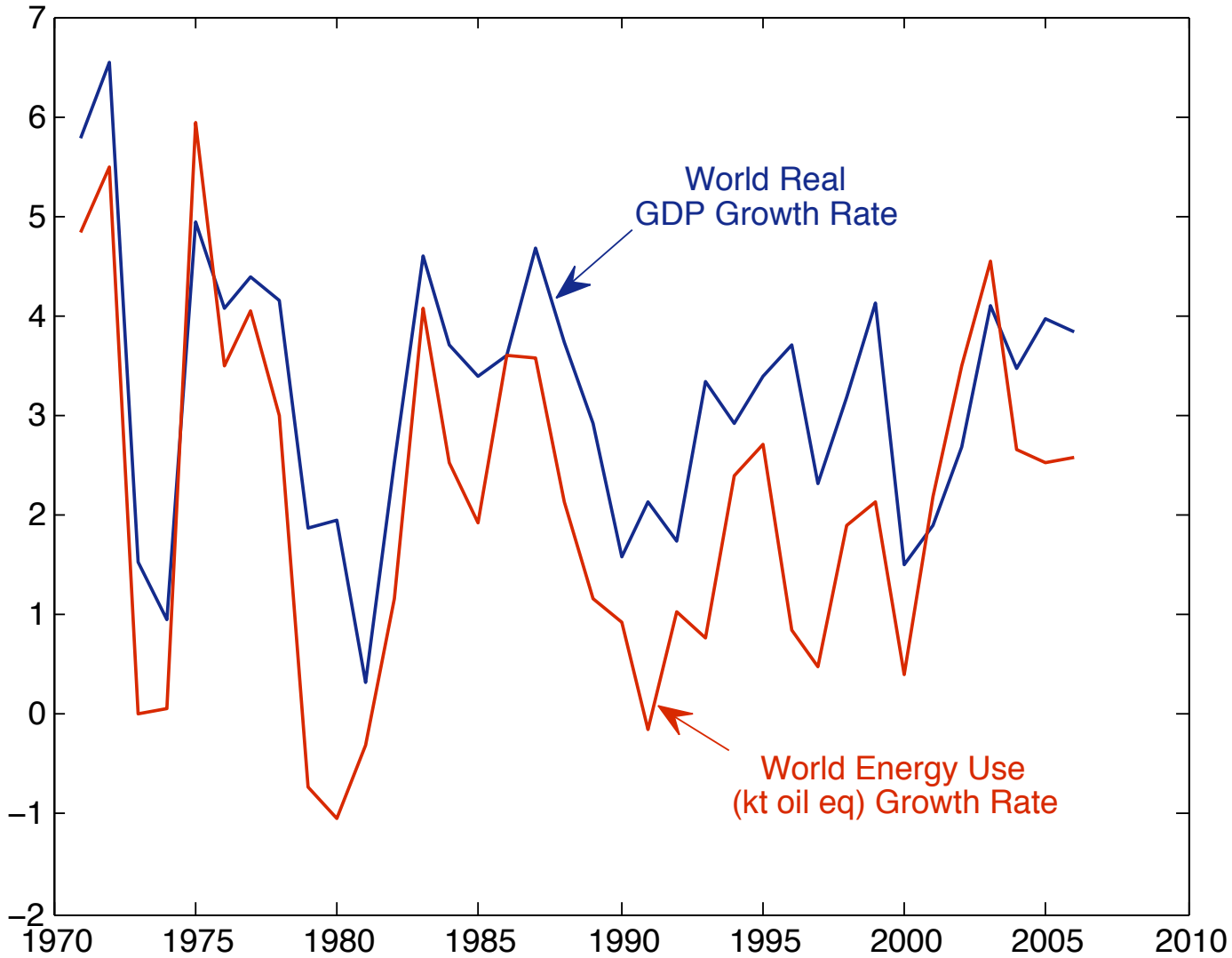
Rice University

September 27, 2010

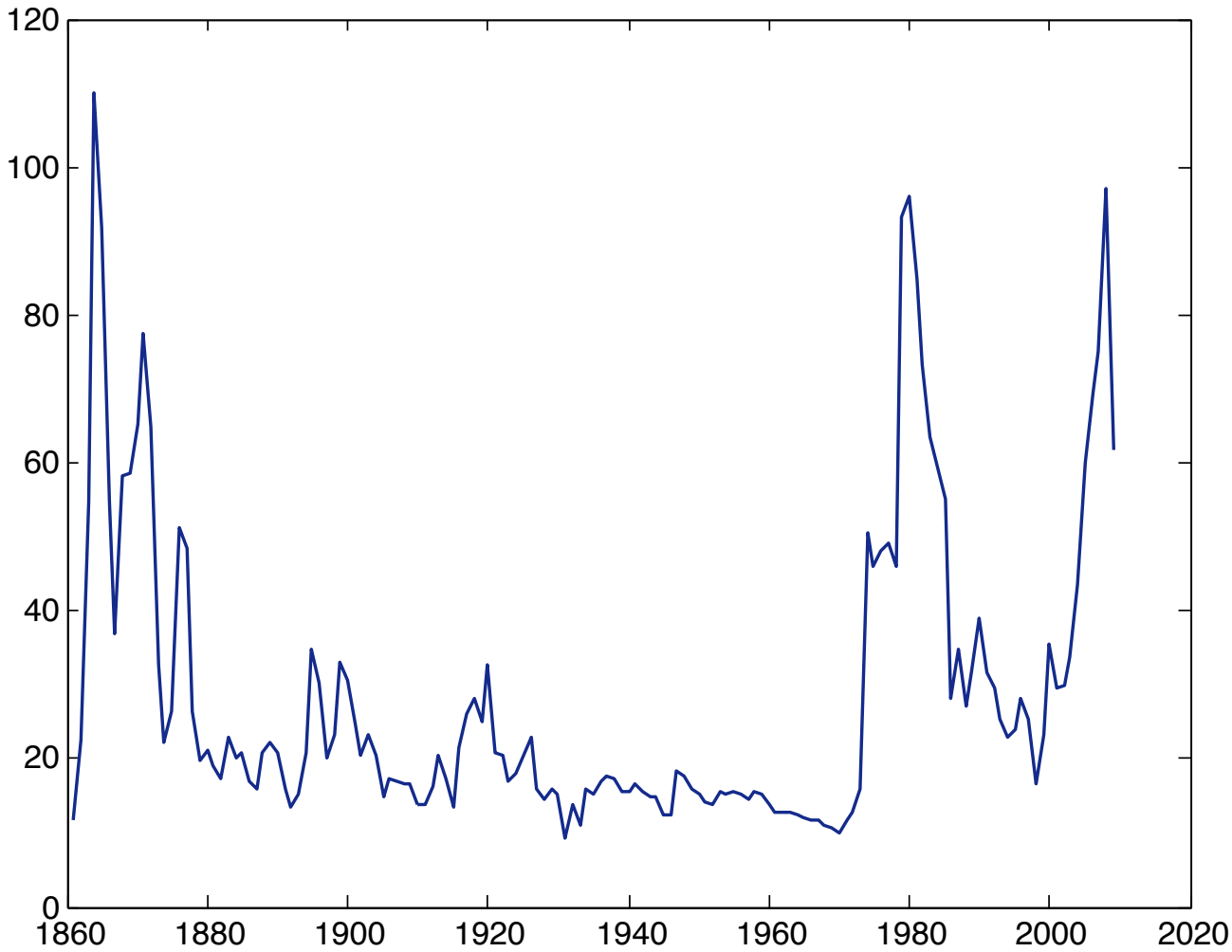
The Asia-Centered Story of Financial Imbalances



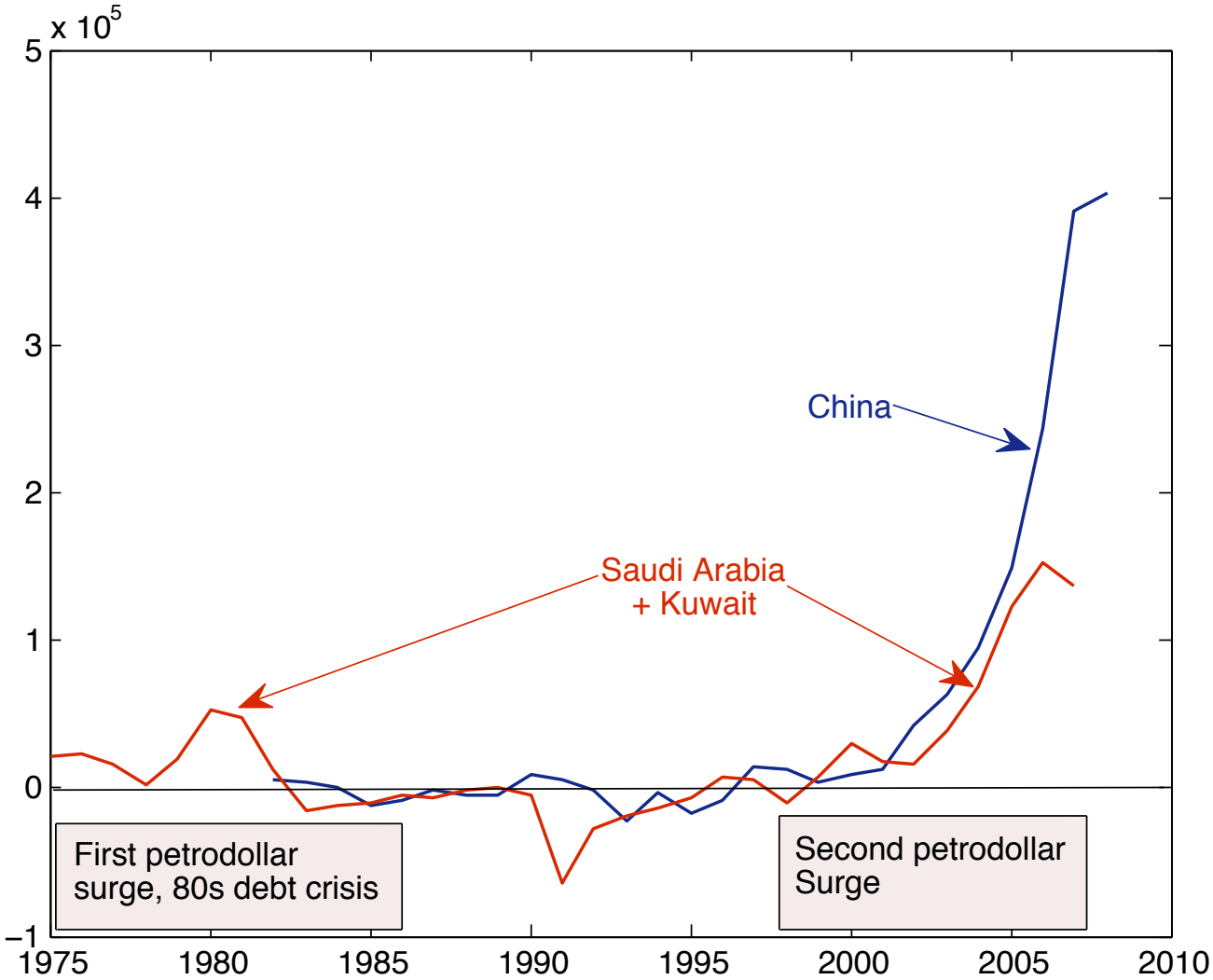
The Self-Perpetuating Secular Cycle Leading Up to the Crisis



Growth ⇒ Oil Demand ⇒ Real Price ↑ ⇒ Crisis

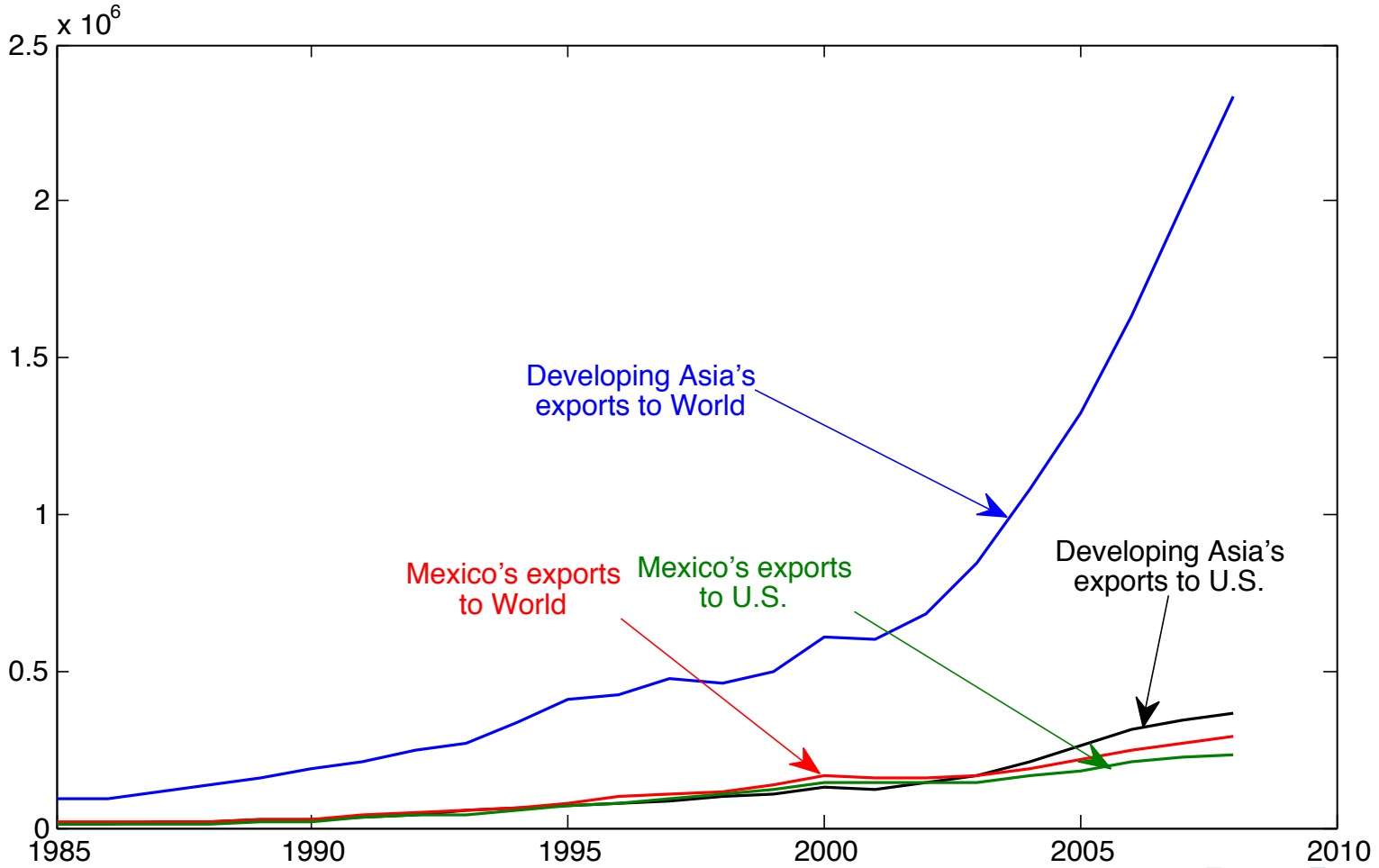


Destailizing Petrodollar Surges



Post-Crisis Recoveries: Export-led Growth & Industrialization

Mexican post-crisis recovery: NAFTA, industrialization, exports to U.S.
ASEAN post-crisis recovery: Industrialization, exports ($m, IMF, DOT)



Trade, Industrialization, and Growth

Lewis, Rodrik, et al. – stylized facts on trade and industrialization:

- Industrialization is the true engine, not just exports
- Industrial policies are not sufficient, but seem (empirically) to be necessary for sustained growth
- They are essentially WTO-friendly, e.g. training, subsidies for high-value-added industrial tradables

Twist: Regional economies can coordinate investments and specializations for regional industrialization and trade

Spence, El-Erian, et al. – decoupling hypothesis, "new normal":

- Slower growth in advanced economies continuing
- Increased reliance on *domestic* savings, and less dependence on foreign banks and investments

Twist: "Domestic" markets are too small, think regionally

RICE

Trade, Industrialization, and Growth

Lewis, Rodrik, et al. – stylized facts on trade and industrialization:

- Industrialization is the true engine, not just exports
- Industrial policies are not sufficient, but seem (empirically) to be necessary for sustained growth
- They are essentially WTO-friendly, e.g. training, subsidies for high-value-added industrial tradables

Twist: Regional economies can coordinate investments and specializations for regional industrialization and trade

Spence, El-Erian, et al. – decoupling hypothesis, "new normal":

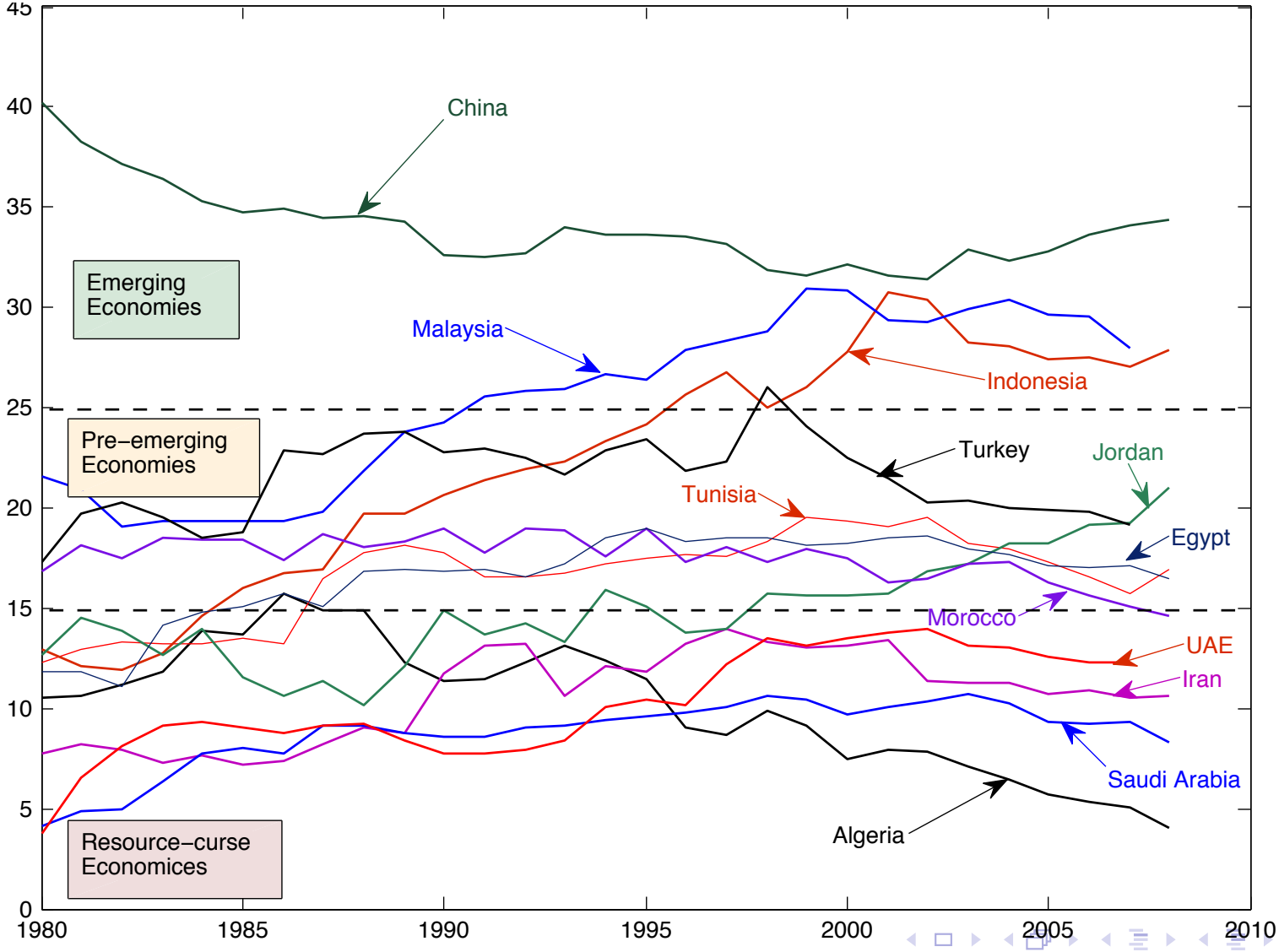
- Slower growth in advanced economies continuing
- Increased reliance on *domestic* savings, and less dependence on foreign banks and investments

Twist: "Domestic" markets are too small, think regionally

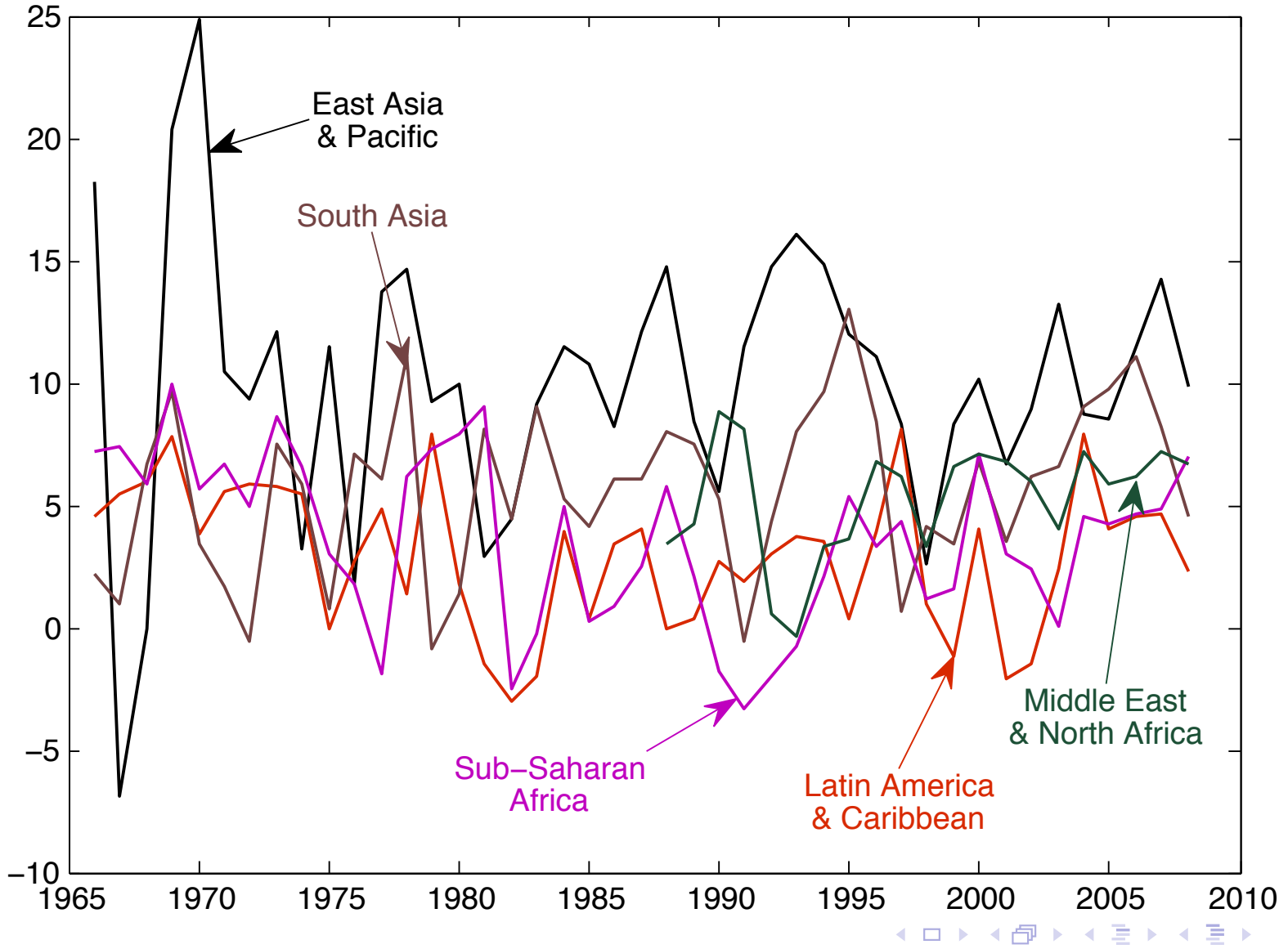
RICE

Emerging, Pre-Emerging, and Resource-Curse Economies

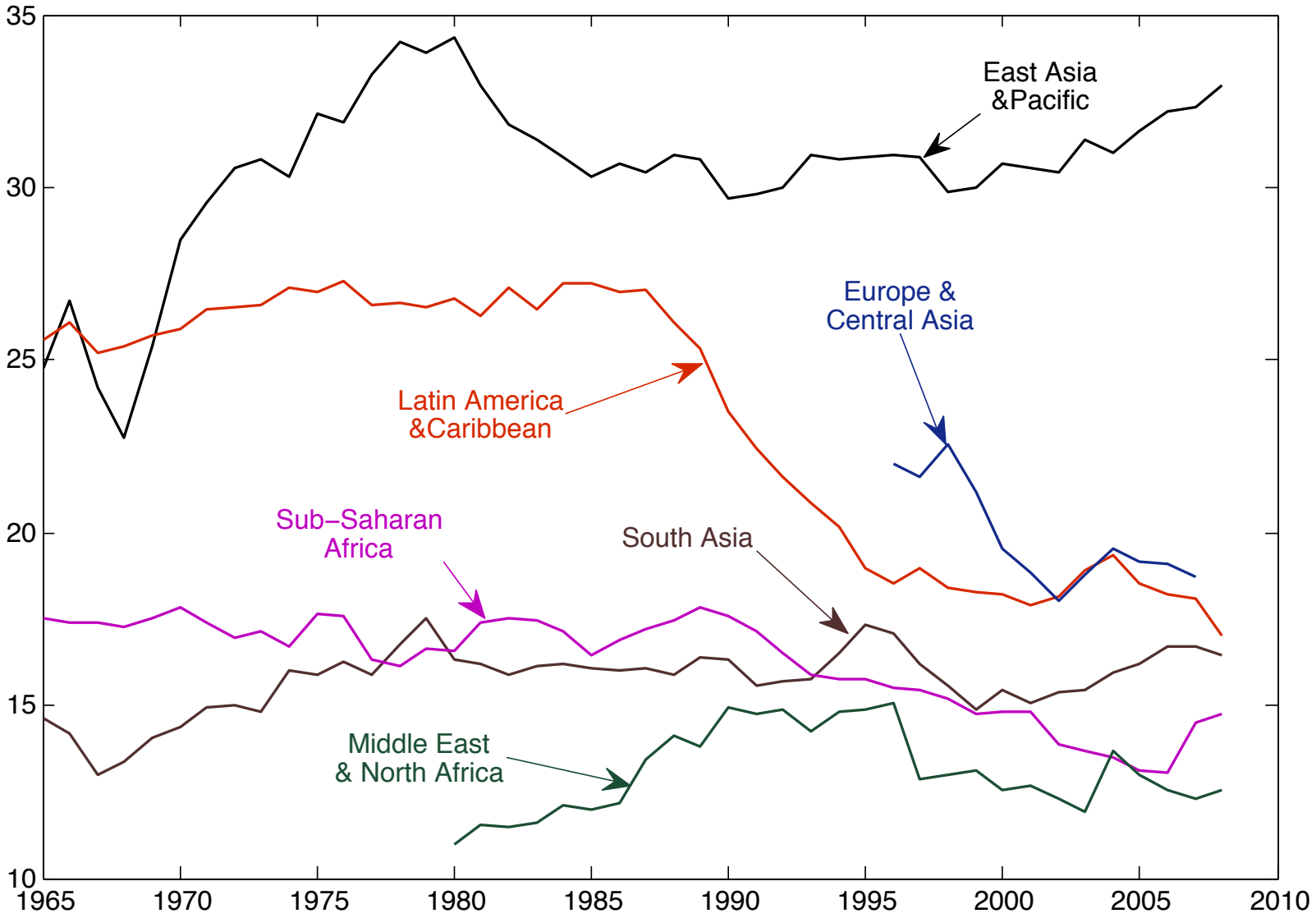
Manufacturing Value Added as percentage of GDP – WB, WDI



Manufacturing Growth Rates

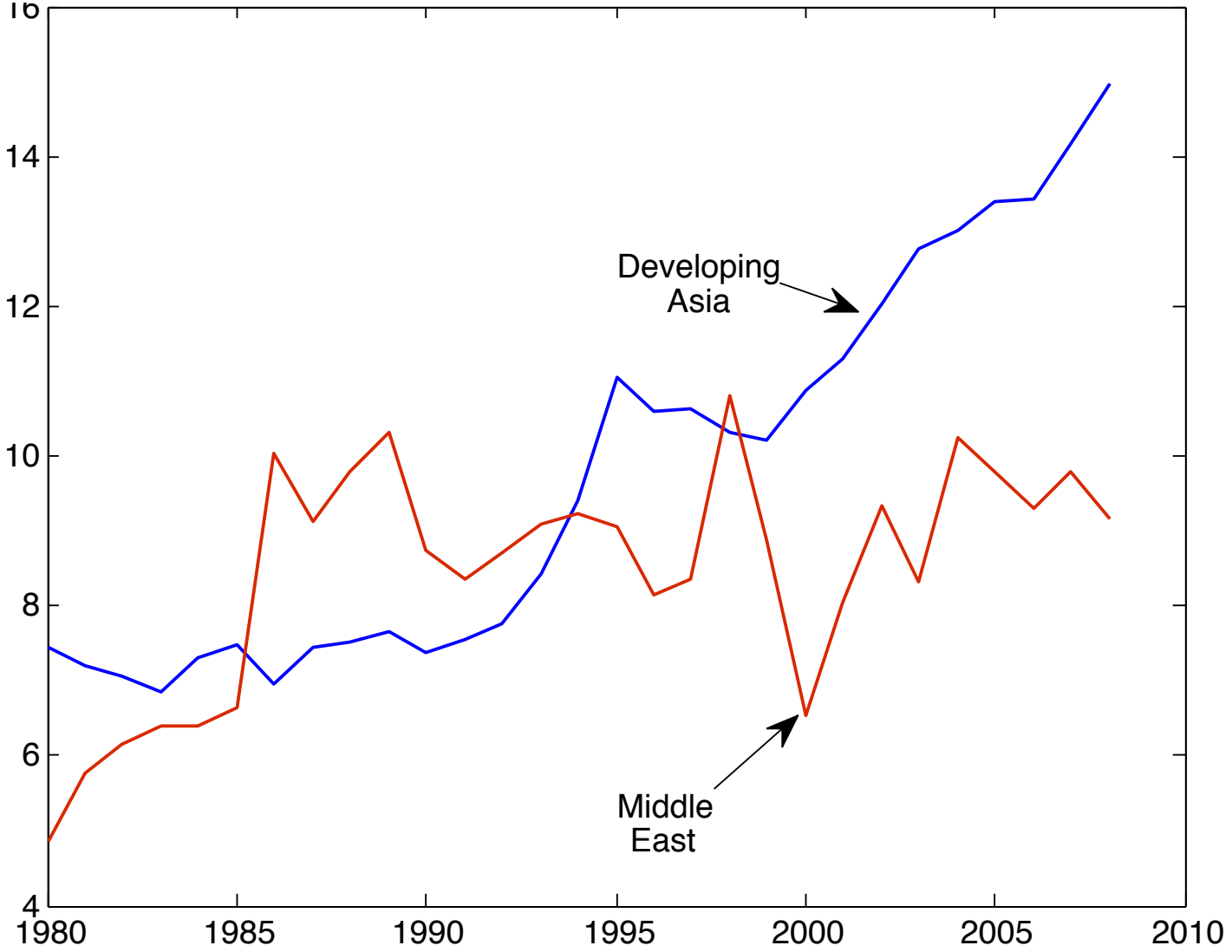


Manufacturing Growth Rates



Intraregional trade (especially after Asian crisis)

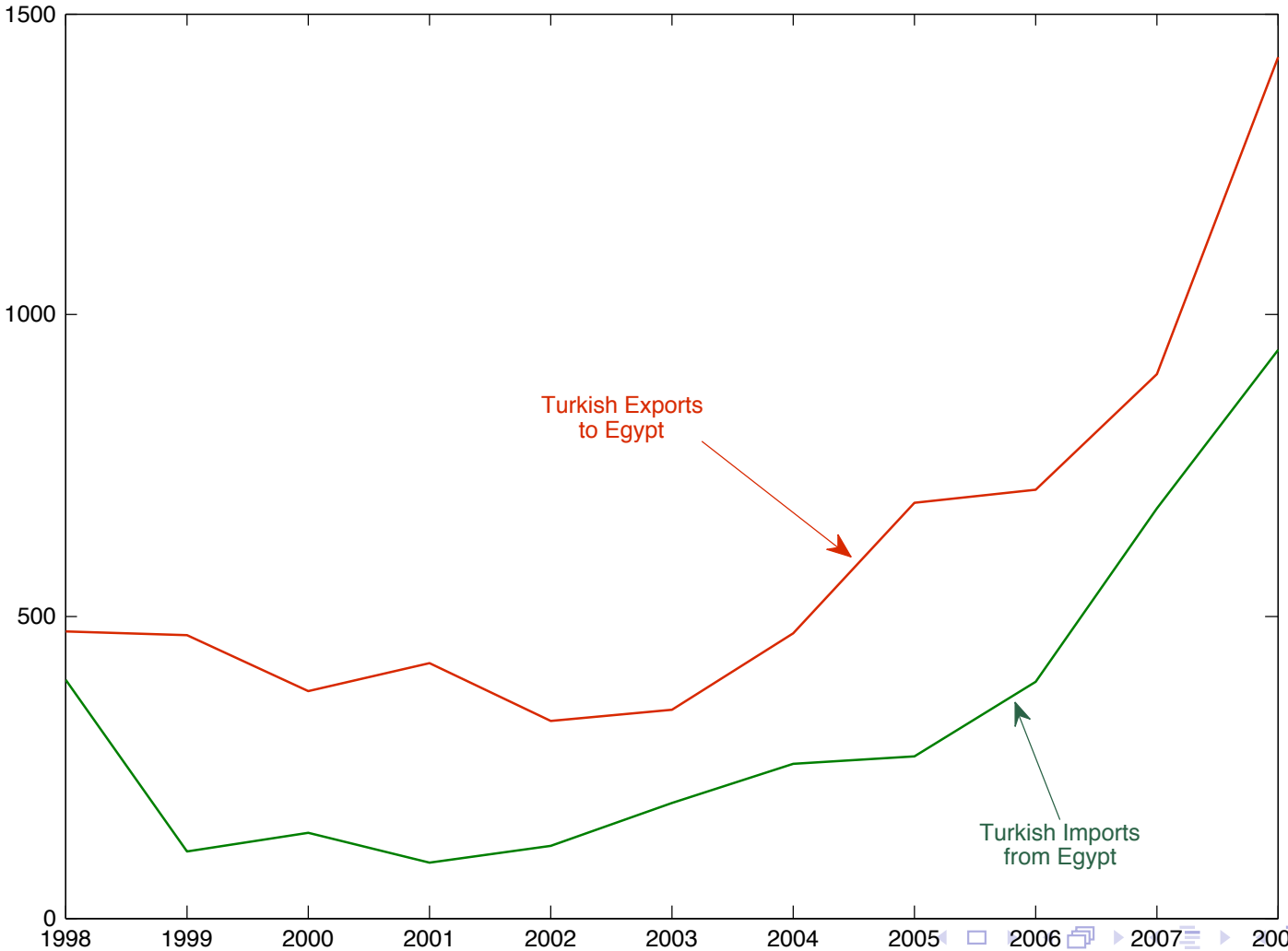
Intraregional trade as percentage of regional exports – IMF, DOT



Egypt and Turkey – Some Positive Developments

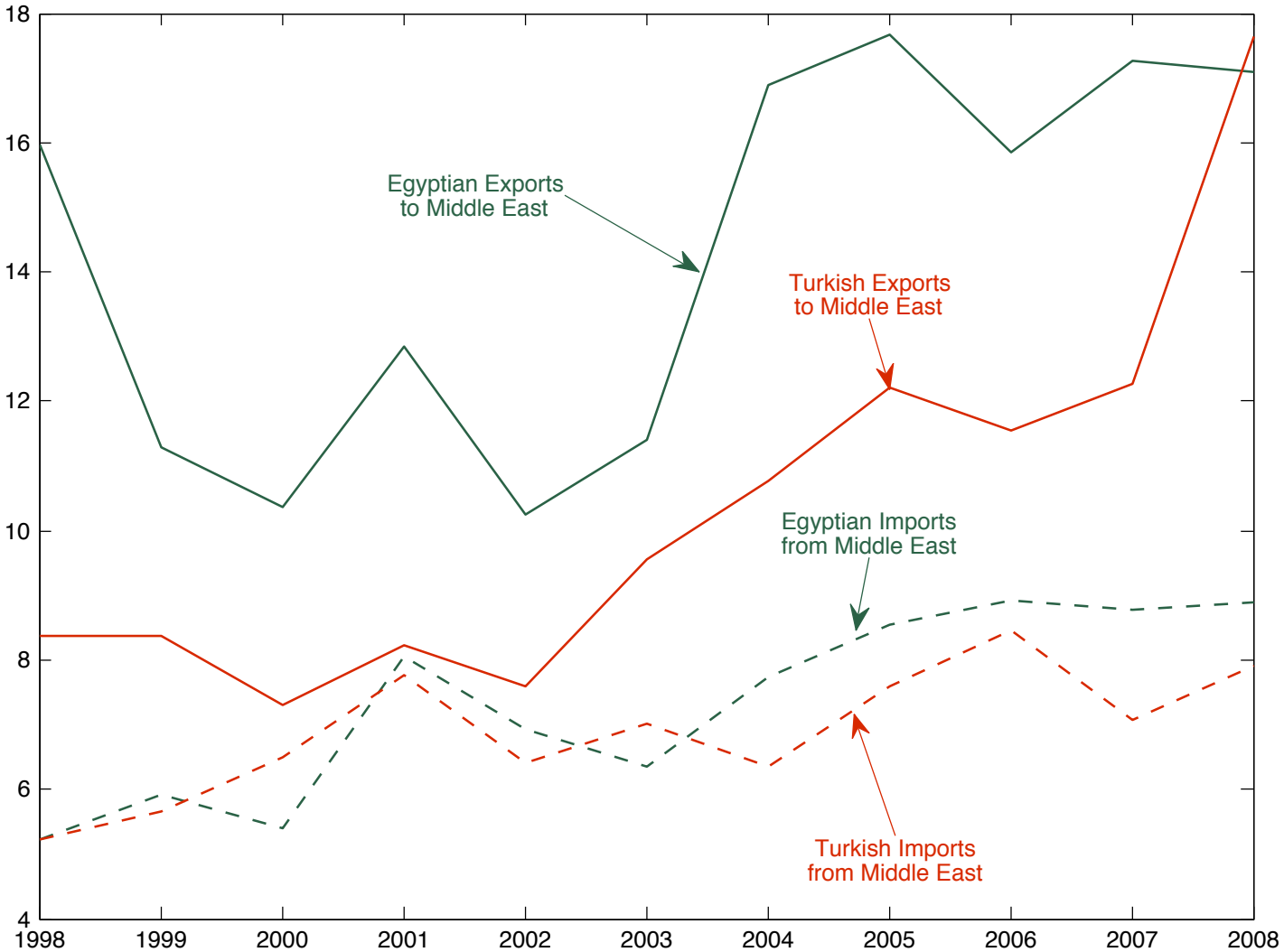
FTA signed 2005, in effect 2007 – *Data*: IMF, DOT, Millions of Dollars

http://www.mfti.gov.eg/english/downloads/Turkey_Egypt_FTArea.pdf



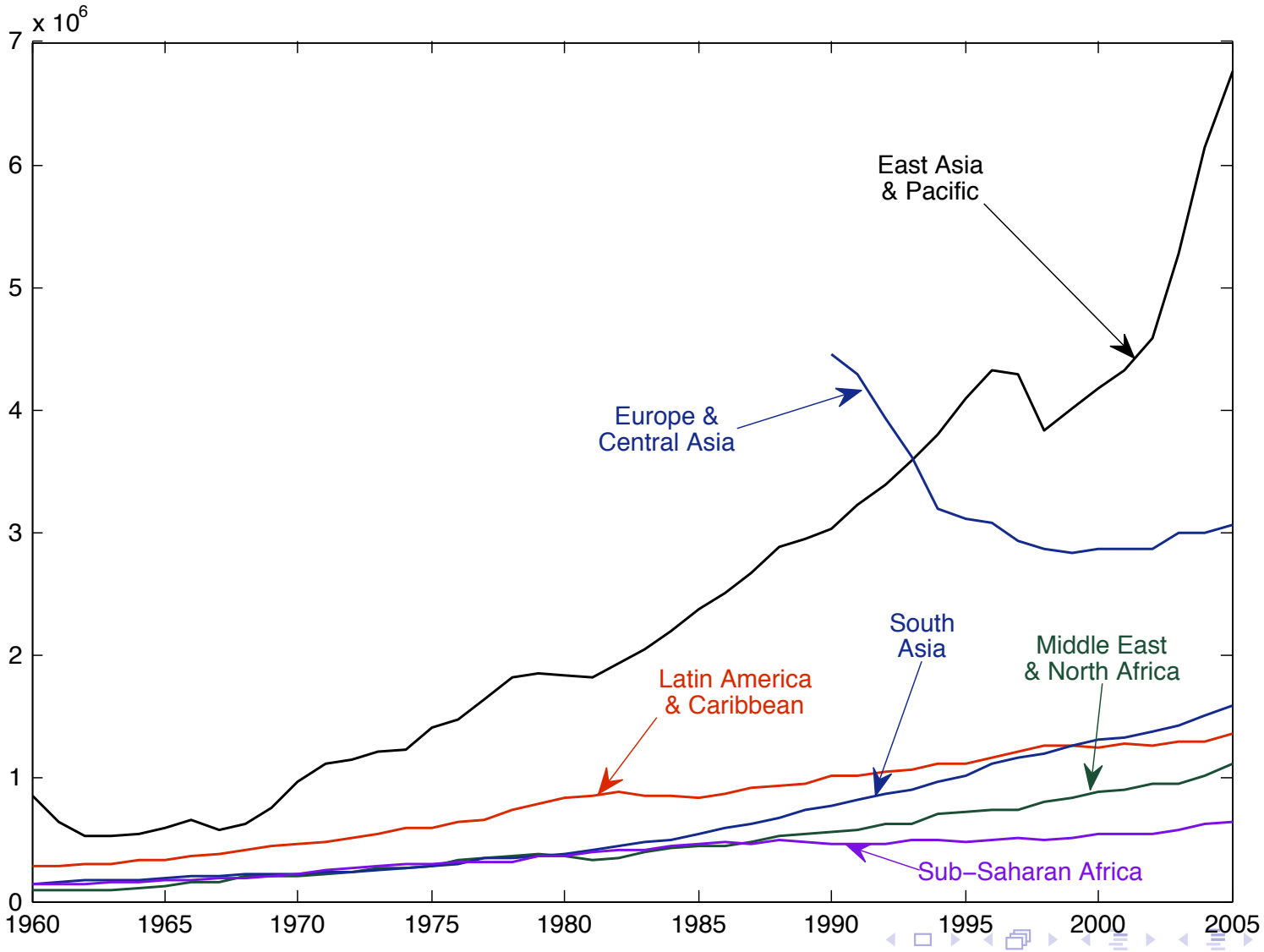
Much More Is Needed at the Regional Level

Percentage of Total Exports to and Imports from World, respectively – IMF, DOT



Region's Carbon Emissions (kT) Growth

Would Industrialization Cause Acceleration of CO_2 Emissions?



Dynamic Panel Analysis of CO_2 Emissions Growth

- Difference between industrial and manufacturing value added
- Construction and supporting industries as prime emitters
- Data: World Bank, WDI, 1969-2008
- Model to estimate:

$$\text{CO}_2\text{Emit GR}_{it} = \beta_0 + \beta_1 \text{ CO}_2\text{Emit GR}_{i(t-1)} + \beta_2 \text{ Elect GR}_{it} + \beta_3 \text{ GDP GR}$$

$$+ \beta_4 \text{ Industr VA GR}_{it} + \beta_5 \text{ Manuf VA GR}_{it} + \beta_6 \text{ Urban Pop GR}_{it} + u_i + \epsilon_{it}$$

- Estimation method: Arellano and Bond, *RES*, 1991.

RICE

Full Model Estimation

L.H.S. Variable = CO_2 Emissions (kT) growth		
R.H.S. Variable	**Coefficient**	**(Robust S.E.)**
Lagged CO_2 Emissions growth	-0.019*	(0.003)
Electric power consumption growth	-0.104	(0.115)
GDP growth	-0.189	(0.327)
Industry, value added growth	0.397*	(0.200)
Manufacturing, value added growth	-0.122	(0.152)
Urban population growth	1.931	(1.065)
Intercept	1.013	(2.794)
	* = Significant at 0.05	
Number of Countries	118	
Time series for each country (where available)	1970–2008	
Total Number of Observations	2458	
$\chi^2_{(6)}$	232.47	p-value = 0.000
Specification Tests:		
Sargan Test of over-identifying Restrictions:	$\chi^2_{(103)}$ = 108.28,	p-value = 0.342
Arellano-Bond Test of zero AC (order 2)	z = -1.0631	P-value = 0.288

Estimation Without Industrial Value Added

L.H.S. Variable = CO_2 Emissions (kT) growth		
R.H.S. Variable	**Coefficient**	**(Robust S.E.)**
Lagged CO_2 Emissions growth	-0.019*	(0.003)
Electric power consumption growth	-0.094	(0.114)
GDP growth	0.169	(0.256)
Manufacturing, value added growth	-0.011	(0.128)
Urban population growth	1.805	(1.072)
Intercept	1.103	(2.536)
	* = Significant at 0.05	
Number of Countries	119	
Time series for each country (where available)	1970–2008	
Total Number of Observations	2490	
$\chi^2_{(5)}$	182.14	p-value = 0.000

Concluding Remarks

- A number of Middle-East countries are aggressively pursuing industrialization policies
- The big push in infrastructure building was funded by and executed during past oil booms
- Coordination is required to ensure observance of potential comparative advantage through early intraregional trade (beyond this paper)
- Whether or not industrial policies succeed at regional or individual-country levels, acceleration of CO_2 emissions is unlikely to be caused by accelerated manufacturing output, as long as construction booms and other non-manufacturing industrial output growth does not accelerate unreasonably