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Manufacturing Fetishism: The Neo-Mercantilist Preoccupation with Protecting Manufacturing

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Manufacturing Fetishism: The Neo-Mercantilist Preoccupation with Protecting Manufacturing[1]

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"Friends Don't Let Friends Buy Imports." (Advertising slogan from Coalition for a Prosperous America Buy American Store: http://www.cpabuyamerican.com/category_s/1827.htm).

"The WTO, great success. Job creation. Phenomenal job creation. The only problem is the jobs are being created in foreign nations because of our failed trade policies in this country. We are hemorrhaging jobs. This is the record over a decade: We lost 15 factories a day — 15. Now, some of them were kind of small, local small businesses, but Republicans love to talk about their advocacy for small business. Fifteen a day for 10 years, that's our current trade policy. So what else? Well, that figures out to about 1,370 manufacturing jobs a day over the last decade." (Mr. Peter Anthony. DeFazio, US Representative from Oregon, Congressional Record, October 11, 2011, vol 157, # 151)

"The metaphor of exchange as a zero-sum game, in fact, has been favoured by anti-economists since the eighteenth century. The subject is the exchange of goods and services. If exchange is a 'game' it might better be seen as one in which everyone wins, like aerobic dancing. No problem. Trade in this view is *not* zero-sum." (McCloskey, 1998, p.328)

Abstract

Two common views are that a country cannot develop without a strong manufacturing base and that trade restrictions are essential to facilitate the development of that strong manufacturing base and thus spur economic growth. We ask:

- Does a strong manufacturing share of GDP facilitate economic growth?
- Do trade restrictions ensure the development of a strong manufacturing base?
- How can governance affect manufacturing share?
- And are the relationships we find robust across regions?

We find the manufacturing share is not significantly correlated with a higher standard of living. Nor is it related significantly and consistently to economic growth. We also find that trade restrictions both at home and abroad shrink the manufacturing base and smother economic growth. A better way than protectionism and subsidies specific to industry to enhance economic growth is to

[1] Thanks to Omer Gokcekus, Mia Mikic, Lincoln Richards, Steve Rosefielde, Kevin Torck, Tom Willett and participants at the 2014 meeting of the Asia Pacific Economic Association for constructive comments. Their approval is not implied. For supplementary materials such as the datasets, code and other specifications, please contact Xiaolu Wang. This paaper continues the investigation started in Tower and Waite (2011). Tower is also a visiting professor at Chulalongkorn University.

improve governance effectiveness and the quality of regulation.

Keywords: manufacturing share, economic growth, trade restrictions

1. Manufacturing Fetishism Thrives

"Emotional arguments over protectionism today harken back to the second half of the eighteenth century, when Physiocracy, the philosophy that 'only the farmer really made something out of more or less nothing' was popular. The Physiocrats thus reasoned that manufacturing was unlikely to benefit an economy. Similarly, today, our gut reaction to the closing down of a factory is that we are allowing a central part of our economy to perish." (Gopnik, 2010). Like the farms of the Physiocrats, factories for the manufacturing fetishists are tangible symbols of a country's prosperity. We show in this paper that all of us need to be careful not to overstate its importance.

"Manufacturing fetishism – the idea that manufacturing is the central economic activity and everything else is somehow subordinate – is deeply ingrained in human thinking. The perception that only tangible objects represent real wealth and only real work is physical labour real work was probably formed in the days when economic activity was the constant search for food, fuel and shelter." (Kay, 2012).

Kay continues "When you look at the value chain of manufactured goods we consume today, you quickly appreciate how small a proportion of the value of output is represented by the processes of manufacturing and assembly. Most of what you pay reflects the style of the suit, the design of the iPhone, the precision of the assembly of the aircraft engine, the painstaking pharmaceutical research, the quality assurance that tells you products really are what they claim to be."

Yet, in spite of Kay's argument, manufacturing fetishism thrives. Ian Fletcher, in his *Free Trade Doesn't Work: What Should Replace it and Why,* argues that a strong manufacturing sector is crucial for providing jobs (2009, p.196). He equates services with haircuts and notes "the more of a nation's economy is in good industries, the stronger its economy will be today and the better its growth prospects will be tomorrow." (p.197). He advocates a uniform import tariff of 25% to bring industries home to the US (p.236) combined with an export subsidy (p.248). However, he ignores the circular flow of income. Chinese sales of goods to the US finance advanced degrees for Chinese students, a service provided at Duke University, making possible more research, more scholarships and financing the acquisition of skills by American students. He ignores the possibility that import restrictions perpetuate monopoly power which may incentivize American firms to take advantage of the ability to sell a smaller quantity at a higher price, thereby reducing employment. (Kaempfer, Tower, Willett, 2004). In his discussion of how a value-added export tax rebate subsidizes exporters, he seems to be unaware of the Lerner neutrality theorem which states that an across-the-board import tariff combined with an across-the-board export subsidy has no general equilibrium effect (Kaempfer and Tower, 1982).

Paul Craig Roberts (2013), a former Reagan administration Assistant secretary of the Treasury, supports manufacturing fetishism. In the preface to Roberts's "The Failure of Laissez Faire Capitalism," Johannes Maruschzik writes "The change towards a service society that has been promoted by apologists for globalization has proved to be a fatal delusion." (Roberts, 2013, p.15).

Maruschzik goes on to write "Nations are able to create wealth only with products and services they are able to sell in global markets." (p.15). He ignores the obvious point that if exports were truly the only path to wealth, the world would never create wealth, for the world is a closed economy. Maruschzik writes "Germany with 30 percent of the working population in industry is better off than the U.S. where only some 11 percent of the population still works in the manufacturing sector of the economy." (p.18). The fact that in 2012 U.S. GDP per capita was 23.5% higher than Germany's is one data point that casts doubt on his argument. Maruschzik also ignores Paul Krugman's (1993b) point that what creates wealth is the productivity of a country's factors of production.

Roberts follows up this introduction by arguing that "millions of jobs have been moved offshore."(p.33). This perpetuates the erroneous view that there are a fixed number of jobs in the world economy (Mussa, 1993). Roberts continues "Monetary and fiscal policy cannot help when the problem is that American jobs have been relocated offshore."(p.43). This ignores the mechanism that a trade deficit permits a fall in the interest rate, without igniting inflation which stimulates investment and job growth (Krugman, 1993b, pp.157-8).

2. *The Economist* Debate

The Economist (2011) considered the belief in the importance of manufacturing, what some have named "manufacturing fetishism," to bbe so important that it hosted an online debate on the proposition: "This House Believes that an Economy Cannot Succeed Without a Big Manufacturing Base." Cambridge University's Ha-Joon Chang argued in favor of the proposition against Columbia's Jagdish Bhagwati. Chang won the debate 76% to 24% according to the readers' vote. In the process of the debate, the share of manufacturing fetishists fell from 80% to 76%. So while Bhagwati did not win the debate, he shrank the proportion of manufacturing fetishists. These numbers illustrate the sway of manufacturing fetishists.

There is an alternative way to pick the winner. 95 comments were submitted from the floor by readers after introductory remarks by the chief protagonists. 53 comments were submitted after the debate was over. We counted the votes implied in the comments. We dropped all but one comment when multiple comments were submitted by the same contributor, and we dropped comments that did not take a side. After the opening remarks, the vote was 44 for Chang and 35 for Bhagwati, with Chang winning by 66% to 44%. The comments submitted after the closing statements voted 13 for Chang and 16 for Bhagwati with Chang collecting 44% to Bhagwati's 55%. Our assessment of these comments is admittedly subjective, but free of intentional bias. Sometimes a decision was hard to call, for example when a commenter remarked that for most countries manufacturing is essential but for some it is not. The discrepancy between the two ways of measuring who won leads us to conclude that the folks who evaluated the debate carefully enough to comment were less pro manufacturing than those voters who just reflexively clicked the "vote yes" or "vote no" buttons on their computer screens.

Chang (2014) reiterates the importance of manufacturing, and, in particular, advocates infant industry trade protectionism. Lin and Chang (2009) debate how much a developing nation's incentives should cause it to deviate from comparative advantage. Lin recommends interventions to

correct externalities, a position close to Bhagwati's, while Chang (2009, p.502) recommends interventions even when a favored industry will fail to be profitable for four decades "for example Japanese and Korean cars." He suggests these interventions should include trade barriers.

At its simplest level, the modern-day protectionist argument assumes that manufacturing is central to an economy. Hence, the logic goes, capital goods and knowledge accumulation in manufacturing is a tried-and-true recipe for growth. Moreover, concerns over structural unemployment and national security are used to argue that countries must keep manufacturing within their borders, and prevent offshoring.

3. Our Study

The *Economist* debate along with the Fletcher and Roberts books made us eager to find out what determines the share of manufacturing in GDP, what the relationship is between manufacturing share and prosperity as measured by per capita GDP, and what the relationship is between manufacturing share and economic growth.

We would like to make strong statements about whether a high manufacturing share causes prosperity and growth, but proving a causal relationship is harder than showing an association, so we content ourselves with exploring the association in the presence of various controls. In the paper, when we say X positively affects Y holding Z constant, we just mean that a regression of Y on X and Z yields a positive coefficient for X.

4. Data

The five major public datasets relevant to this topic are: (1) the World Development Indicators (WDI) [2] dataset by the World Bank; (2) the World Governance Indicators (WGI) [3] dataset by the World Bank; (3) the National Accounts Main Aggregates Dataset (NAMAD)[4] by the United Nations; (4) the Manufacturing Industry Database by the National Bureau of Economic Research (NBER)[5]; (5) the Trade Restriction Indices 2009 dataset[6] by the World Bank. We summarize the characteristics of these datasets. Then we describe the datasets we constructed for our analysis.

(1) World Bank: *World Development Indicators (WDI)*

WDI is "the primary World Bank collection of development indicators, compiled from officially-recognized international resources." This dataset is the collection of the "most current and accurate global development data available, and includes national, regional and global estimates". The coverage is long: from 1960 to 2013, but is problematically replete with missing values in the earliest decades. The dataset includes six indicators. From this dataset we draw manufacturing share of GDP and per capita GDP.

[2] Data source: http://data.worldbank.org/data-catalog/world-development-indicators
[3] Data source: http://info.worldbank.org/governance/wgi/index.aspx#home
[4] Data source: http://unstats.un.org/unsd/snaama/Introduction.asp
[5] Data source: http://www.nber.org/nberces/
[6] Data source: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:22574446~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html;

(2) World Bank: *World Governance Indicators* (WGI)

WGI are indicators of six key dimensions of governance. These estimates are "constructed based on 30 underlying data sources reporting the perception of governance by a large number of survey respondents and expert assessments worldwide." The estimates range from -2.5 to 2.5. For each of the six indicators, we convert the estimates to a percentile rank as our explanatory variable, so these variables can be intuitively understood as the strength of each governance characteristic relative to all the countries in the dataset. These are described in Table 2. We combine the WDI and WGI (see below) to form our main dataset. For discussion of the WGIs see the articles by Kaufmann et *al*. in the references, Kraay et *al.* (2010) and the IBRD (2007).

(3) World Bank: *Trade Restriction Indices 2009*

This dataset "summarizes the trade policy stance of a country by calculating the uniform tariff that will keep its overall imports at the current level when the country in fact has different tariffs for different goods." It is one of the most recent and well-developed datasets measuring trade restrictions. Kee, Nicita and Olarreaga (2008, 2009) developed the empirical methodology, by calculating the weighted average tariff for many countries, where the weights are combinations of import volume and import demand elasticities of each imported product[7].

The manufacturing share of GDP recorded in the WDI dataset is typically larger than that recorded in the NAMAD dataset[8]. We constructed a dataset by merging the WDI and WGI datasets. After some data manipulation, we generate five datasets for our manufacturing share analysis and growth analysis. The merged dataset contains panel data from 1996-2011, where the years are restricted because the WGI dataset begins in 1996 (with some gaps afterwards). Table 1 tells the names and basic information from these datasets. Table 2 defines the WGIs. Table 3 defines the trade restrictiveness indexes.

[7] There are two intermediate datasets in the construction of the Trade Restriction Indices 2009 dataset: (1) Import Demand Elasticities; (2) Ad-Valorem Equivalents of Non-Tariff Measures. They are all included in the same page.

[8] There are two manufacturing shares recorded in the UN NAMAD dataset: Mining, Manufacturing, Utilities (ISIC C-E) and Manufacturing (ISIC D). We use the latter, because it is more like those defined in the WDI data.

Table 1: Summary of our datasets[9]

Analysis	***Information***
Section 5. Manufacturing share	Merged from selected information in WDI and WGI datasets. Data for 205 countries at country-year level, in 1996 - 2011.
Table 8A. Long term growth	15-year annual continuously compounded growth rate[10] calculated. Average level of World Governance Indicators over 1996-2011. Initial GDP, manufacturing share, and WGIs recorded in 1996.
Table 8B, Short term growth[11]	5-year annual continuously compounded growth rate. Average level of World Governance Indicators over 2006-2011. Initial GDP, manufacturing share, and WGIs recorded in 2006.
Table 10. Trade restrictions affect manufacturing share	Trade Restriction Indices 2009 dataset merged with manufacturing dataset 1996-2011. Based on trade restrictiveness indices estimates in 2009, for all trade and for manufacturing trade; measured for both tariff barriers and the combination of tariff and non-tariff barriers.
Table 11. Trade restrictions affect Short term growth	Trade Restriction Indices 2009 dataset merged with short term growth dataset. Aggregate dataset with 5-year continuously compounded growth rate, initial GDP and manufacturing share in 2006, average level WGI variables 2006-2009, and trade restriction indices in 2009.

We use World Governance Indicators. These indicators are based on various surveys and official data.

Table 2: Definitions of *World Governance Indicators*

Symbol	**Indicators**	**Meaning**
Voice	Voice and Accountability (VA)	Citizens' participation in government selection; Freedom of expression, of association and of media.
Stability	Political Stability and Absence of Violence (PV)	Governments' stability facing unconstitutional or violent means (e.g. politically-motivated violence and terrorism).
Effectiveness	Government Effectiveness (GE)	Quality of public and civil service; policy and government commitment.
Regulation	Regulatory Quality (RQ)	Quality of policy and government regulations that permit and promote private sector development.
Law	Rule of Law (RL)	Quality of contract enforcement, property rights, courts.
Honesty	Control of Corruption (CC)	Extent to which public power is used for private gain; Control of both petty and grand forms of corruption.

[9] We also added a regional indicator to all these datasets. We separate the regions by continent. Check http://en.wikipedia.org/wiki/List_of_intergovernmental_organizations for details.
[10] We focus on long term growth, since annual growth is strongly affected by random shocks and business cycles.
[11] We define short term growth rate as the most recent five year growth rate.

Table 3: Definitions of *Trade Restriction Indicators*

Indicators	Meaning
Import Barriers: **otri**: *Overall Trade Restrictiveness Index*; **otrit**: *Tariff-only Overall Trade Restrictiveness Index*.	**otri** captures "the trade policy distortions that each country imposes on its import bundle". It measures the uniform tariff equivalence of the country tariff and non-tariff barriers (NTBs) that generates the same level of import value for the country in a given year. For tariff measures **otrit**, we picked the series for Applied Tariffs (which takes into account the bilateral trade preferences and patterns).
Export Barriers: **maotri**: *Market Access Overall Trade Restrictiveness Index;* **maotrit**: *Tariff-only MAOTRI.*	**maotri** captures "the trade policy distortions imposed by the trading partners of each country on its export bundle". Similarly, it measures the uniform tariff equivalent of both tariff and non-tariff barriers that would generate the same export level in a given year. Again, we picked the measures for Applied Tariffs. In both **maaotri** and **maotrit**, the ad valorem equivalent of NTBs are used (Kee, Nicita and Olarreaga, 2009).

5.Manufacturing Analysis

5.1 Is a Higher Manufacturing Share a Marker for a Higher Living Standard?

What is the statistical relationship between living standards and manufacturing share? The variables are described in Table 4. We regress per capita GDP on manufacturing share and other controls. As shown in Table 5, the signs of coefficient estimates for manufacturing share are quite different across different regions, and the sign can flip after adding governance as extra controls.

Table 4: Notation

Symbol	***Meaning***
$manushare$	Manufacturing share, i.e. manufacturing value added (% of GDP)
$WGIs$	The 6-dimension governance indicators (va, pv, ge, rq, rl, cc as in Table 2)
$\log(pcGDP)$	Log (per capita GDP, measured in inflation adjusted US $).
$period(dummies)$	Separate 1996-2011 into three periods: 1996-2000, 2001-2005, 2006-2011
$regions(dummies)$	Separate 205 countries into 6 regions, by continents (dummy variables)
$region \times period$	Region-period interactions (assuming different time trends across regions).
AF	Africa
AS	Asia
EU	Europe
NA	North America
OC	Oceania
SA	South America

Table 5: How manufacturing share affects per capita GDP[12]

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
	World	AF	AS	EU	NA	OC	SA
Variables	Dependent variable is log of per capita GPD (inflation adjusted $)						
Panel A: Simple regression (only controls are regional and period dummies)							
Manushare	0.00253	**0.0419*** **	-0.0122	**-0.0283** **	**-0.0181** **	**0.0654*** **	**0.0637*** **
	(0.00376)	(0.00541)	(0.00807)	(0.0115)	(0.00785)	(0.0193)	(0.00731)
Period	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region	Yes	No	No	No	No	No	No
Observations	2,089	571	501	439	296	127	155
R-squared	0.435	0.114	0.054	0.073	0.097	0.120	0.394
Panel B: adding WGIs (Governance Indicators) as extra controls							
Manushare	**-0.00504** **	**0.0121** **	**-0.0229*** **	-0.00506	**0.00643** **	0.00474	**0.0589*** **
	(0.00253)	(0.00540)	(0.00453)	(0.00488)	(0.00305)	(0.0172)	(0.00642)
WGIs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Period	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region	Yes	No	No	No	No	No	No
Observations	2,051	570	500	432	290	104	155
R-squared	0.779	0.414	0.761	0.867	0.821	0.815	0.609

Robust standard errors[13] in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

where ps are for two tailed tests.

What does Table 5A say? For the world, each one percent increase in the manufacturing share is associated with an insignificant increase in per capita income. The point estimate is that a one percentage point increase in the manufacturing share is associated with a 0.253% increase in the per capita real income. When this is broken down into regions, three show a positive relationship, and three show a negative relationship. For three regions: Asia, Europe, and North America the relationship is negative. There is no robust positive relationship between manufacturing share and per capita GDP.

What does Table 5B say? When governance indicators are introduced as controls, a higher manufacturing share is associated with a smaller per capita GDP. For the world, each one percent increase in manufacturing share, holding governance indicators constant reduces per capita income by 0.504%, and this is significant at the 5% level on a two tailed test. This indicates that increases in manufacturing shares induced by influences other than favorable governance indicators lowers per capita income. This might be taxation of agriculture, sector- and firm-specific subsidies to manufacturing or occupational licensing that holds back the service sector. The regional sign

[12] For all the worldwide analyses, we included regional dummies as controls for heterogeneous regional characteristics. This inclusion significantly increased the adjusted R-square and estimation significance.

[13] Robust standard errors: "In regression and time-series modelling, basic forms of models make use of the assumption that the errors or disturbances u_i have the same variance across all observations. When this is not the case, the errors are said to have heteroscedasticity, and this behaviour will be reflected in the residuals $\widehat{u_i}$ estimated from a fitted model. Robust standard errors are used to allow the fitting of a model that does contain heteroscedastic residuals. " (refer to: http://en.wikipedia.org/wiki/Heteroscedasticity-consistent_standard_errors)

patterns are a negative influence for Asia and Europe and a positive one for the others.

5. 2 What Determines Manufacturing Share?

Assuming the manufacturing share each year is exogenously affected by governance-related factors, we seek to analyze the determination of manufacturing share using linear regression models. A pooled cross-sectional specification performs better than an unbalanced panel specification.

If manufacturing share is solely determined by WGIs and affected by nonlinear time trend, then:

$$manushare = \beta_0 + \beta_1 \cdot WGIs + \beta_2 \cdot period(dummies) + \varepsilon \quad (1)$$

Manufacturing share should depend on income level. Adding the log of per capita GDP to control for living standards yields

$$manushare = \beta_0 + \beta_1 \cdot WGIs + \beta_2 \cdot period(dummies) + \beta_3 \cdot \log(GDP) + \varepsilon \quad (2)$$

Adding regional dummies to capture continent-specific effects gives

$$manushare = \beta_0 + \beta_1 \cdot WGIs + \beta_3 \cdot \log(GDP) + \beta_4 \cdot regions(dummies) + \varepsilon \quad (3)$$

Finally, including all the dummies and their interactions gives.

$$manushare = \beta_0 + \beta_1 \cdot WGIs + \beta_2 \cdot period(dummies) + \beta_3 \cdot \log(GDP) + \beta_4 \cdot regions(dummies) + \beta_5 \cdot region{\times}period\ (dummies) + \varepsilon \quad (4)$$

Table 6 presents the estimates of these four equations for the world.

Table 6: How governance indicators affect manufacturing share

	(1)	(2)	(3)	(4)
Variables	Dependent variable is manufacturing share (% value added in GDP)			
lgdp_per		0.473**	-0.716***	-0.399**
		(0.192)	(0.192)	(0.202)
Voice and Accountability	-0.0132	-0.0142	-0.0497***	-0.0485***
	(0.0115)	(0.0116)	(0.0135)	(0.0136)
Political Stability	-0.0363***	-0.0423***	-0.0337***	-0.0391***
	(0.00999)	(0.00982)	(0.00946)	(0.00949)
Government Effectiveness	**0.183*****	**0.171*****	**0.161*****	**0.155*****
	(0.0209)	(0.0226)	(0.0218)	(0.0221)
Regulatory Quality	0.0480***	0.0393***	0.0262*	0.0217
	(0.0142)	(0.0140)	(0.0147)	(0.0146)
Rule of Law	-0.0892***	-0.0852***	-0.0640***	-0.0607***
	(0.0167)	(0.0166)	(0.0177)	(0.0182)
Control of Corruption	-0.0464***	-0.0476***	-0.0137	-0.0174
	(0.0172)	(0.0172)	(0.0169)	(0.0168)
Observations	2,060	2,051	2,051	2,051
Adjusted R^2	0.126	0.126	0.194	0.201

R-squared	0.129	0.130	0.199	0.210

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In Table 6, progressing from specification (1) to (4), we observe increases in R square, as must be the case when more explanatory variables are introduced, and adjusted R square never falls. We see that government effectiveness positively influences manufacturing share. This is true in all four specifications, and government effectiveness has the largest influence of the six government performance indicators. The same is true of regulatory quality, except the effect is always less than 27% as strong. All of the government effectiveness coefficients are significant at the 1% level. The impacts of government effectiveness are similar whether we include as controls, per capita income, regional dummies, regional dummies interacted with time dummies, or none of them. **Taking the median value of 0.166, we see that improving the government effectiveness rank by ten percentiles, increases manufacturing share by 1.66 percent.** The median value for regulatory quality is 0.030. Thus increasing both ranks by ten percentiles raises manufacturing share by 1.96%. So a disturbance that reduces manufacturing share by that amount could be offset by a ten percentile improvement in government effectiveness plus regulatory quality.

Manufacturing share is reduced by increases in voice and accountability. Perhaps that is associated with a less docile labor force. Surprisingly, improvements in political stability, rule of law, and control of corruption have negative effects on manufacturing share and in most cases these effects are significant. The regressions indicate that these improvements have a larger favorable impact on the rest of the economy than on manufacturing. A rationale for why rule of law and control of corruption might have negative signs is that if laws are inefficient ways to preserve rents for an elete, corruption and other ways around the law might make the economy work better. See Bhagwati (1974) and Gokcekus and Bengyak (2014).

Based on equation (4), Table 7 separates the dataset into sub-samples and allows heterogeneous effects of governance performance across continents. Table 7 reproduces Table 6, column 4, for individual regions. The signs for effectiveness and regulation are the same as before, except that the sign for effectiveness in North America and regulation in South America changes. The median value for government effectiveness in the six regions is .0762, and for regulatory quality .0580 for a sum of 0.134, so increasing both by ten percentiles, should increase manufacturing share by 1.34%.

Table 7: Regional effects on manufacturing share: subsample analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	AF	AS	EU	NA	OC	SA	World
Variables	Dependent variable is manufacturing share (% value added in GDP)						
lgdp_per	0.586*	-1.932***	-0.544	2.415*	0.168	4.103***	-0.399**
	(0.299)	(0.399)	(0.529)	(1.352)	(0.607)	(0.652)	(0.202)
Voice	**-0.0885*** **	**-0.0558** **	**-0.204*** **	**0.125** **	**-0.152*** **	**0.106***	**-0.0485*** **
	(0.0253)	(0.0229)	(0.0432)	(0.0637)	(0.0319)	(0.0593)	(0.0136)
Stability	-0.0159	**-0.107*** **	**0.129*** **	**-0.193*** **	0.00860	-0.0144	**-0.0391*** **

	(0.0179)	(0.0155)	(0.0152)	(0.0429)	(0.0381)	(0.0374)	(0.00949)
Effectiveness	0.0519	**0.370*** **	**0.0776***	**-0.198****	**0.152*** **	**0.0748***	**0.155*** **
	(0.0385)	(0.0419)	(0.0457)	(0.0819)	(0.0417)	(0.0429)	(0.0221)
Regulation	**0.0666****	0.00741	0.00943	**0.114****	0.0443	-0.0381	0.0217
	(0.0326)	(0.0259)	(0.0425)	(0.0494)	(0.0365)	(0.0350)	(0.0146)
Law	-0.0267	0.0414	**-0.0976****	**-0.203*** **	-0.0197	**-0.0939***	**-0.0607*** **
	(0.0325)	(0.0436)	(0.0408)	(0.0780)	(0.0445)	(0.0503)	(0.0182)
Honesty	**0.108*** **	**-0.172*** **	**0.0838****	**0.121***	-0.0142	-0.0377	-0.0174
	(0.0315)	(0.0349)	(0.0372)	(0.0698)	(0.0265)	(0.0375)	(0.0168)
Observations	570	500	432	290	104	155	2,051
adjusted R^2	0.193	0.240	0.257	0.218	0.634	0.252	0.201
R-squared	0.206	0.254	0.273	0.242	0.666	0.296	0.210

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

A comparison of Table 6 and Table 7 suggests that: (1) subsample analysis supports our hypothesis of heterogeneous government behavior and government effect in manufacturing share determination, as the coefficients on WGI indicators are quite different (both in sign and in magnitude) across regions; (2) the coefficient of determination also increases in all specifications, even after we adjusted the potential over-fitting (the R^2 and adjusted-R^2 give us basically the same information); (3) the six governance indicators are most significant in the subsample of Europe and North America, with most indicators significant – even though they tell us different stories in these two continents. This suggests that observed differences in multi-dimensional government performance might have stronger effects for countries in Europe and North America; (4) Stronger voice and accountability correlates with higher manufacturing share in North America and South America (coefficient estimates of Voice); a more effective government increases manufacturing share in every region except in North America.

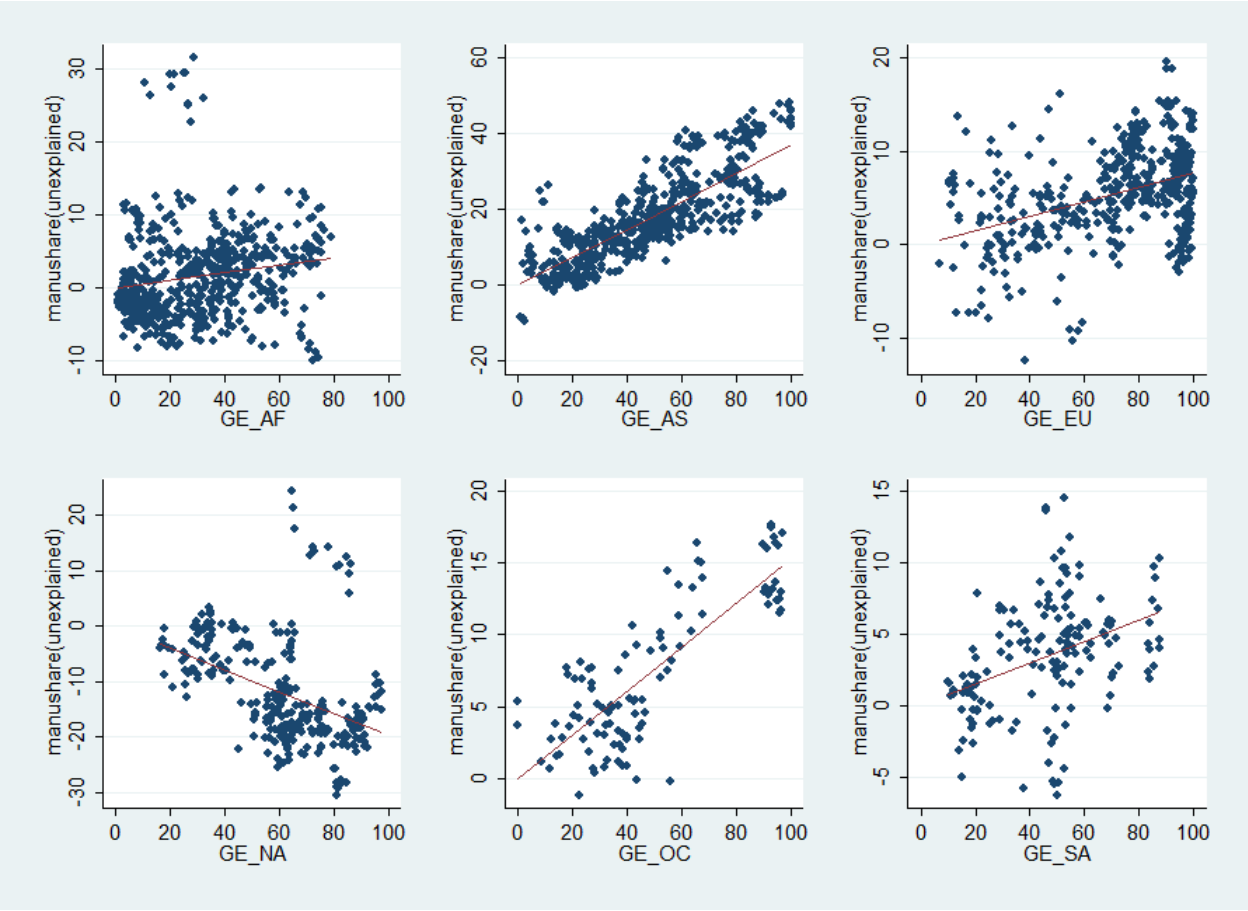

Figure 1: Manufacturing share and government effectiveness, by region

Figure 1 graphs the portion of manufacturing share unexplained after controlling all other explanatory variables except government effectiveness versus government effectiveness, by region. In each case, except for North America, the relationship is positive. For example in Asia according to the regression line, improving government effectiveness from worst to best raises the manufacturing share by around 38 percentage points. To sum up, our graphical results indicate that: (1) the linear fittings for the scatter plot work well for almost all regions (except Africa), which is good evidence that government effectiveness is an important attribute in the determination of manufacturing share; (2) the magnitude of the slope (the effect of government effectiveness) is different across regions, with positively significant slopes for Asia, Europe, and Oceania, while these effects in Africa, North America and South America are somewhat ambiguous; (3) the unexplained manufacturing share is best explained by government effectiveness in Asia. The fact that the percentile ranks vary from close to zero to close to 100 corroborates our hunch that in some Asian countries, governments play a strong role in resource allocation and make relevant policy efficiently and in others they do a remarkably bad job.

6 Explaining Growth

6.1 Measures of Growth

We label the annual continuously compounded growth rate over 15 years (1996-2011) and that over 5 years (2006-2011) as long-term and short-term growth rates, respectively. Denote the annual continuously compound growth rate as r. Then the per capita GDP after N years, starting in year 0, is given by $GDP_{0+N} = GDP_0 \cdot e^{rN}$. Thus, we have

$$\text{annual continuously compounded growth rate over N years} = \frac{\ln(GDP_{0+N}) - \ln(GDP_0)}{N}.$$

6. 2 Model Specifications

The long term growth dataset we used is a cross-sectional dataset for 205 countries in 6 continents. There are 179 countries with non-missing per capita GDPs. The base year is defaulted as 1996. We use initial levels of GDP, manufacturing share, WGIs are calculated as the average values of the six indicators over 1996-2011

$$\text{growth} = \beta_0 + \beta_1 \cdot manushare + \beta_2 \cdot \log(GDP) + \beta_3 \cdot regions(dummies) + \varepsilon \quad (5)$$

$$\text{growth} = \beta_0 + \beta_1 manushare + \beta_2 \cdot \log(GDP) + \beta_3 regions(dummies) + \beta_4 WGIs + \varepsilon \quad (6)$$

6.3 Results Comparison and Discussion

Table 8: Regional effects of manufacturing share on growth

	(1)	(2)	(3)	(4)	(5)
	AS	EU	SA	world	World
Variables	***(A) Dep var:15-year continuously compound growth rate***				
manu96	-0.0165	-0.0593	**-0.379*** **	0.0117	0.00760
	(0.0708)	(0.0555)	(0.0946)	(0.0303)	(0.0319)
lpcGDP96	-1.255***	-2.031***	-0.351	-1.045***	-1.359***
	(0.288)	(0.235)	(0.600)	(0.164)	(0.279)
Observations	39	33	12	161	161
R-squared	0.298	0.745	0.565	0.312	0.359
	(6)	(7)	(8)	(9)	(10)
	AS	EU	NA	world	World
Variables	***(B) Dep var: 5-year continuously compound growth rate***				
manu06	-0.0375	0.0415	**0.107***	0.0260	0.0162
	(0.0953)	(0.0695)	(0.0597)	(0.0377)	(0.0365)
lpcGDP06	-1.955***	-2.556***	-1.310**	-1.642***	-1.532***
	(0.472)	(0.390)	(0.467)	(0.257)	(0.390)
Observations	38	37	22	163	163
R-squared	0.358	0.616	0.337	0.524	0.543

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8 presents the effects of manufacturing share on growth rate. We only report the regressions with relatively high prediction power (R square higher than 0.25) and relatively reliable inferences (coefficients of variables cannot be all insignificant). Note that columns (1)-(3) and (6)-(8) are subsample analysis for equation (5), with regional dummies excluded; column (4) and (9) are worldwide analysis using all countries and controlling for regional fixed effects; column (5) and (10) are estimations based on equation (6), which includes WGIs.

Table 8A column 4 shows that a ten percent increase in manufacturing share increases the fifteen-year growth rate of the economy by 0.117% per year without governance indicators as controls. Table 8A column 5 shows that the same increase in manufacturing share increases fifteen-year growth by 0.08% per year, holding WGI's constant. So about a third of the effect of manufacturing share on growth is due to good WGI's. The manufacturing share coefficients for five-year growth rates are slightly higher for the world but not in all regions. The coefficients for the first three regions on manufacturing share are negative. They are presented as examples of regressions without WGIs as controls.

Results for both long term and short term growth rates are: (1) manufacturing share didn't always contribute to economic growth, with most coefficients of manufacturing share being insignificant; (2) in the long term: base level manufacturing share in 1996 has a significantly negative effect on economic growth in South America; (3) in the short term: base level manufacturing share in 2006 has a positive effect on economic growth in North America; (4) the estimates in columns (3) and (8) are partially restricted by the small sample size (12 and 22 respectively).

Table 9: Regional effects of WGIs on growth (subsample analysis)

	(1)	(2)	(3)	(4)	(5)
	AS	EU	World	EU	NA
Variables	***Dependent variable is growth rate***				
Span	Long	Long	Long	Short	Short
manu_t0	0.0222	-0.0994	0.00760	-0.0172	0.0100
	(0.0818)	(0.0656)	(0.0319)	(0.0936)	(0.0785)
lpcGDP_t0	-1.289**	-2.878***	-1.359***	-2.138**	-2.892**
	(0.471)	(0.451)	(0.279)	(0.816)	(1.007)
Voice_avg	-0.0423	-0.0691	-0.0310	**-0.131****	**0.205****
	(0.0334)	(0.0651)	(0.0190)	(0.0478)	(0.0925)
Stability_avg	**0.0576****	**0.0805*****	**0.0436*****	0.0321	-0.00976
	(0.0239)	(0.0274)	(0.0162)	(0.0341)	(0.0440)
Effectiveness_avg	-0.0582	-0.0439	0.0197	0.0533	**-0.210***
	(0.0811)	(0.0587)	(0.0295)	(0.0827)	(0.112)
Regulation_avg	0.0325	**0.122***	0.0330	-0.0118	**0.381*****
	(0.0505)	(0.0711)	(0.0243)	(0.0919)	(0.0973)
Law_avg	0.0746	-0.121	-0.0121	0.150*	0.0254
	(0.0940)	(0.0867)	(0.0369)	(0.0758)	(0.0694)
Honesty_avg	-0.0706	**0.117***	-0.0297	**-0.125****	**-0.177****

	(0.0836)	(0.0631)	(0.0305)	(0.0610)	(0.0786)
Observations	39	33	161	37	22
R-squared	0.444	0.862	0.359	0.697	0.688

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9 provides subsample analysis with WGIs as extra control variables, measured in average values over the growth period.[14] Again we selectively report the regression results as for Table 8. Here are some conclusions:

(1) Log per capita GDP is always significantly negative: poorer countries grow faster;

(2) for long-term growth: political stability and absence of violence have highly significant positive impacts on long term economic growth, especially for Europe;

(3) for short-term growth: voice and accountability decreases growth in Europe but raises growth in North America. This can be a result of different levels of democracy in the two continents. Barro (1999) concludes there is a growth-maximizing level of democracy;

(4) Higher control of corruption raises long-term growth in Europe but reduces growth in the most recent 5 years; while higher control of corruption leads to decreased short term growth rate in North America;

(5) Europe is best predicted.

The EU manufacturing share has a negative, but insignificant, coefficient. For the world, an autonomous decrease in the manufacturing share by 10 percent could be counterbalanced by an increase in effectiveness and regulation by .0760/(.0197+.0330)=.0760/.0527=1.44 percentiles. So there are ways to get growth up besides directly increasing manufacturing share (the coefficient of which is insignificant). For the world regressions, stability enhances growth. The other WGIs are insignificant.

[14] We compared the estimation results using both WGIs in 1996 (2006) and average WGI over 1996-2011 (2006-2011), and the latter performs much better in both prediction power and estimation inferences.

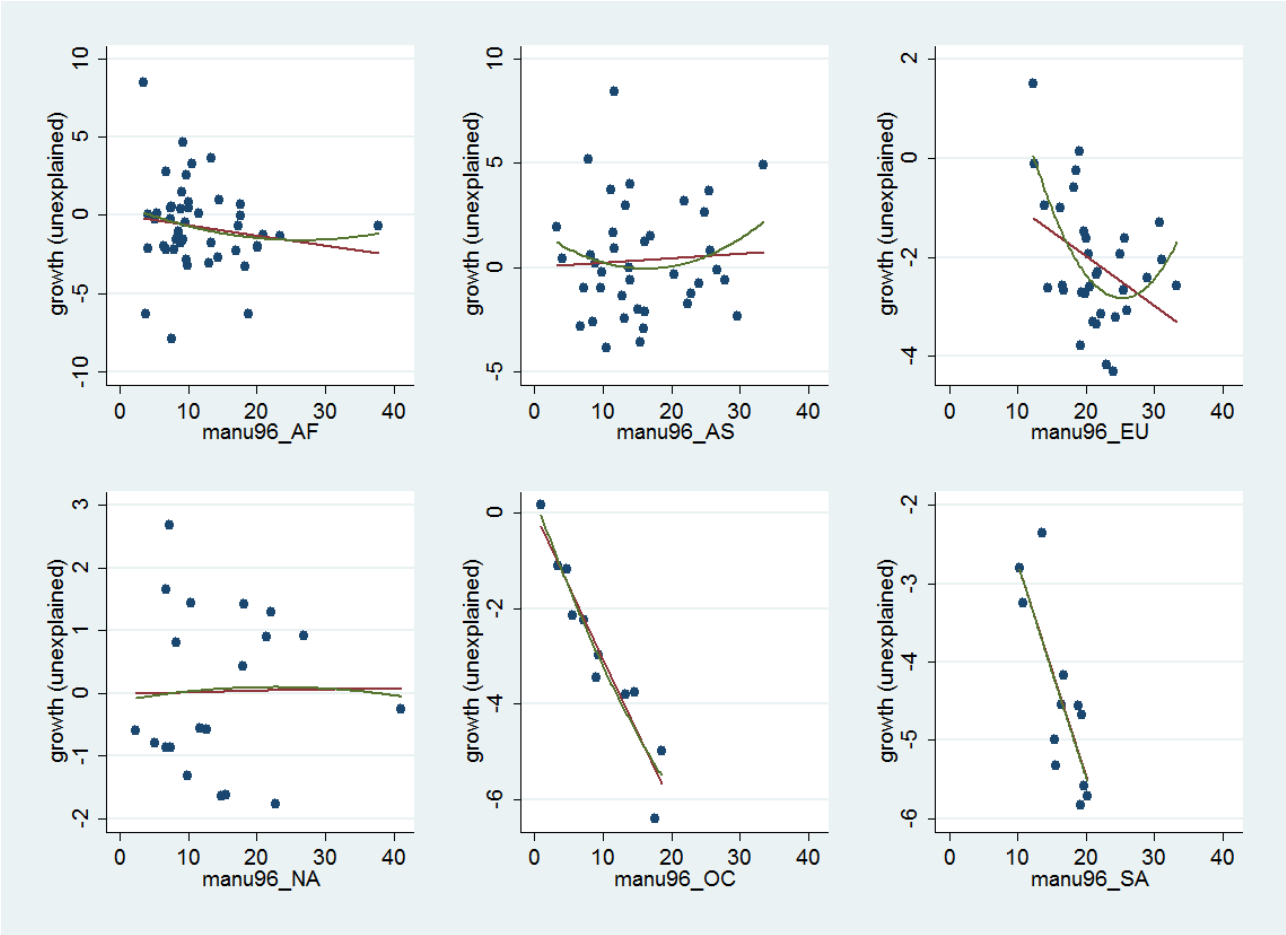

Figure 2: Long term growth explained by base level manufacturing share, by region

Figure 2 reports the scatter plots of long term growth rate (unexplained by manufacturing share) *versus* base level manufacturing share in 1996, and described in equation 6, except that the regional dummies are excluded. They show that for four regions the effect of manufacturing share on growth is negative when WGIs are included as controls. For one it is very close to zero, and for one it is positive. However, most of the points are quite scattered, which also mirrors the insignificant estimates in Table 8.

7 Trade Restriction Analysis

7.1 Assumptions and Model Specifications

Do trade restriction determine manufacturing share and economic growth? A newly constructed dataset developed by Kee, Nicita and Olarreaga (2008; 2009) enables us to explore this issue. The specifications used here are similar to equation (4) & (6). We added a pair of indices (for export and import barriers) and got rid of period region interactions to avoid over fitting.

$$manushare = \beta_0 + \beta_1 \cdot WGIs + \beta_2 \cdot period(dummies) \cdot 1(worldwide) + \beta_3 \cdot \log(GDP) + \beta_4 \cdot trade\_barriers + \varepsilon \quad (7)$$

$$\text{growth} = \beta_0 + \beta_1 manushare + \beta_2 \cdot \log(GDP) + \beta_3 regions \cdot 1(worldwide) + \beta_4 WGIs + \beta_5 \cdot trade\_barriers + \varepsilon \quad (8)$$

where worldwide is an indicator that is 1 for worldwide analysis and 0 for regional analysis.

The definitions of trade barriers in specification (7) and (8) are different. Equation (7) predicts resource allocation, so relative trade barriers in manufacturing sector is the relevant indicator of trade barriers in this case. Equation (8) uses the indicator of all trade barriers to predict growth.[15] The trade restriction indicators are treated as exogenous and holding constant over years at the reference level in 2009. This assumption is too strong, but we suffer from this curse since the data series has not been updated.

Specifically, the relative barrier in manufacturing sector, is: rmanu or rtmanu = $\frac{(1+T_{manu})}{(1+T_{overall})}$, where T denotes the tariff equivalent of trade barriers expressed as a proportion (either pure-tariff barriers or the combination of both tariff and non-tariff barriers).

7.2 Do Trade Restrictions Raise Manufacturing Share?

The time period ranges from 1996 to 2011 in this updated manufacturing analysis with trade restrictions, to keep it in line with the previous manufacturing analysis. Import and export combined restrictions in manufacturing sector are denoted as rmanu_im and rmanu_ex, respectively; the corresponding import and export pure-tariff restrictions in manufacturing sector are denoted as rtmanu_im and rtmanu_ex, repectively. Im refers to the country's barriers. Ex refers to the barriers of its trading partners.

[15] Recall that we did both cross-sectional and unbalanced panel analysis in the original manufacturing share analysis without trade restriction, and the results showed that cross-sectional outputs are better than the panel analysis: higher adjusted R^2, more significant estimates.

Table 10: Manufacturing analysis with trade restrictions (specification (7))

	(1) AF	(2) AS	(3) EU	(4) NA	(5) OC	(6) SA	(7) World
Variables	***Dependent variable: manufacturing share (% value added in GDP)***						
Panel A: manufacturing analysis with relative barriers (tariff + NTB)							
rmanu_im	**-58.96*****	**-421.8*****	**296.7*****	**-89.28*****	**-653.1*****	7.375	**-87.97*****
	(14.84)	(41.79)	(38.04)	(33.41)	(162.6)	(20.61)	(13.14)
rmanu_ex	**-41.39*****	8.033	**69.74*****	**-176.6*****	-7.595	-0.898	-3.411
	(7.583)	(5.837)	(13.54)	(18.14)	(7.743)	(8.742)	(4.626)
lgdp_per	2.388***	-2.292***	3.675***	-2.418**	1.131	1.465***	-0.0942
	(0.517)	(0.371)	(1.068)	(1.093)	(1.057)	(0.356)	(0.335)
Observations	389	319	114	150	54	129	1,155
R-squared	0.289	0.631	0.781	0.603	0.874	0.543	0.186
Panel B: manufacturing analysis with relative sector-tariff barriers							
rtmanu_im	**-147.1*****	**-525.5*****	**84.69***	**302.4****	**1,848*****	**127.0***	**-64.66*****
	(35.01)	(41.21)	(47.70)	(120.9)	(141.2)	(74.94)	(24.72)
rtmanu_ex	**-68.39*****	**-128.9*****	**-553.7*****	**-598.3*****	**-97.83*****	20.74	**-69.88*****
	(19.75)	(25.49)	(194.6)	(51.59)	(4.785)	(21.20)	(15.70)
lgdp_per	2.396***	-2.256***	0.584	-2.533***	-3.122***	1.358***	0.348
	(0.538)	(0.399)	(0.987)	(0.945)	(0.509)	(0.323)	(0.331)
Observations	389	319	114	150	54	129	1,155
R-squared	0.242	0.604	0.749	0.710	0.972	0.555	0.188
Other controls variables for both:							
WGIs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
period	Yes	Yes	Yes	Yes	Yes	Yes	Yes
region	No	No	No	No	No	No	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 10A says that for the world, protecting manufacturing with tariffs and non-tariff barriers lowers the manufacturing shares. Starting from free trade, the -87.97 is Δ [Manufacturing share]/ Δ[relative manufacturing tariff equivalent]. Thus if a country's imports are 50% manufactured goods, raising the manufacturing tariff from 0 to 1%, raises the relative manufacturing tariff equivalent by 0.5%, so the x variable takes on a value of .005, and the manufacturing share falls by 0.8797/2=0.44 percentage points. Assuming a 50% manufacturing share of a country's exports, an increase in the foreign tariff on manufacturing from 0 to 1% cuts the manufacturing share by (an insignificant) 0.017 percentage points.

Panel B gives similar results for just import tariff barriers. It gives much stronger results for foreign tariff barriers than for foreign tariffs and NTPs in Table 10A. We are not sure why. It may be that some of the non-tariff barriers are voluntary export restraints which if set low enough may facilitate monopoly power and profits on the part of the exporter. In both cases WGIs are in place.

The negative coefficients on the relative import tariff and relative import tariff and NTB may be due to import tariffs or anti-dumping restrictions on intermediate inputs into manufacturing, which make manufacturing less competitive. It may also be that countries with high degrees of protection on average are likely to vary their levels of protection more frequently, and this creates uncertainty for manufacturing, thereby shrinking that sector.

7.3 Do Trade Restrictions Smother Growth?

Table 11: Short term analysis with trade restrictions (specification (8))

	(1)	(2)	(3)	(4)	(5)	(6)
	otri	otrit	otri_manu	otrit_manu	otrit_AF	otrit_AS
Variables	***Dep var: 5 year continuously compound growth rate (% per year)***					
barrier_im	-0.0351	-0.149	-0.0200	-0.146	-0.0690	**-0.660*** **
	(0.0339)	(0.116)	(0.0357)	(0.105)	(0.155)	(0.211)
barrier_ex	**-0.152*** **	**-0.542*** **	-0.0758	**-0.540** **	**-0.374***	**-0.967** **
	(0.0549)	**(0.162)**	(0.0685)	**(0.239)**	(0.188)	(0.411)
manu06	0.0609	0.0567	0.0415	0.0241	-0.0611	-0.0333
	(0.0651)	(0.0761)	(0.0661)	(0.0695)	(0.0875)	(0.142)
lgdp_06	-1.851***	-1.636***	-1.624***	-1.482***	-0.0789	-2.289
	(0.607)	(0.527)	(0.605)	(0.555)	(0.430)	(1.295)
WGI_avg	Yes	Yes	Yes	Yes	Yes	Yes
regiondum	Yes	Yes	Yes	Yes	No	No
Observations	90	90	90	90	30	24
R-squared	0.458	0.491	0.415	0.457	0.558	0.711

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

We focus on short term growth with trade restrictions, since the trade restriction indices with 2009 as reference year are a better proxy for short term trade restrictiveness. We selectively reported results in Table 11. We see (1) even after adding trade barriers, the coefficient estimates of base year manufacturing shares are still insignificant; (2) Export trade barriers, no matter whether measured as pure tariff barriers or overall trade barriers including tariff and non-tariff barriers, negatively impact the growth rate across regions and worldwide; (3) Import trade barriers also have negative coefficient estimates, but most of them are insignificant, except for tariff import trade barriers in Asia. (4) Africa and Asia are the two regions have relatively largest negative impact from export barriers to short term growth. We find Asia is the largest victim of both import and export tariff trade barriers compared to other continents. This might due to the international trading structure across countries: some Asian countries embraced tremendous economic growth at least partially thanks to the increasing smoothly and well-developed international trade in manufacturing goods, and African countries have a high variance of trade restrictions. More open economies and economies with higher variance of trade restrictions typically exhibit more significance.

Now what is interesting in Table 11? All the coefficients of home and foreign barriers to imports have negative effects on economic growth. Columns (1)-(4) are the world. Trade barriers, either just tariffs or tariffs plus NTBs, lower growth. Tariff barriers at home and abroad lower growth, manufacturing trade barriers at home and abroad lower growth. That also happens for Africa and Asia. Let us take the most significant estimates in column (6) for Asia. A ten percentage point increase in the tariff lowers the growth rate by 6.6% per year. For column (2) a 10% point increase lowers the growth rate by 1.49% per year. Foreign trade barriers are typically worse, i.e., decrease economic growth with larger magnitude. For column 2, a ten percentage point increase in foreign trade barriers reduces the five year growth rate by 5.4% per year, while a rise in the manufacturing share by 10% raises the growth rate by 0.567% per year. Foreign protection worsens the terms of trade; domestic protection does not always do so. Hence, foreign protection is more damaging than domestic protection to economic growth.

Figure 3 plots the part of unexplained growth versus different measures of export barriers. The graphical results match our regression estimates, with the linear fitting and quadratic fitting lines all downward sloping.

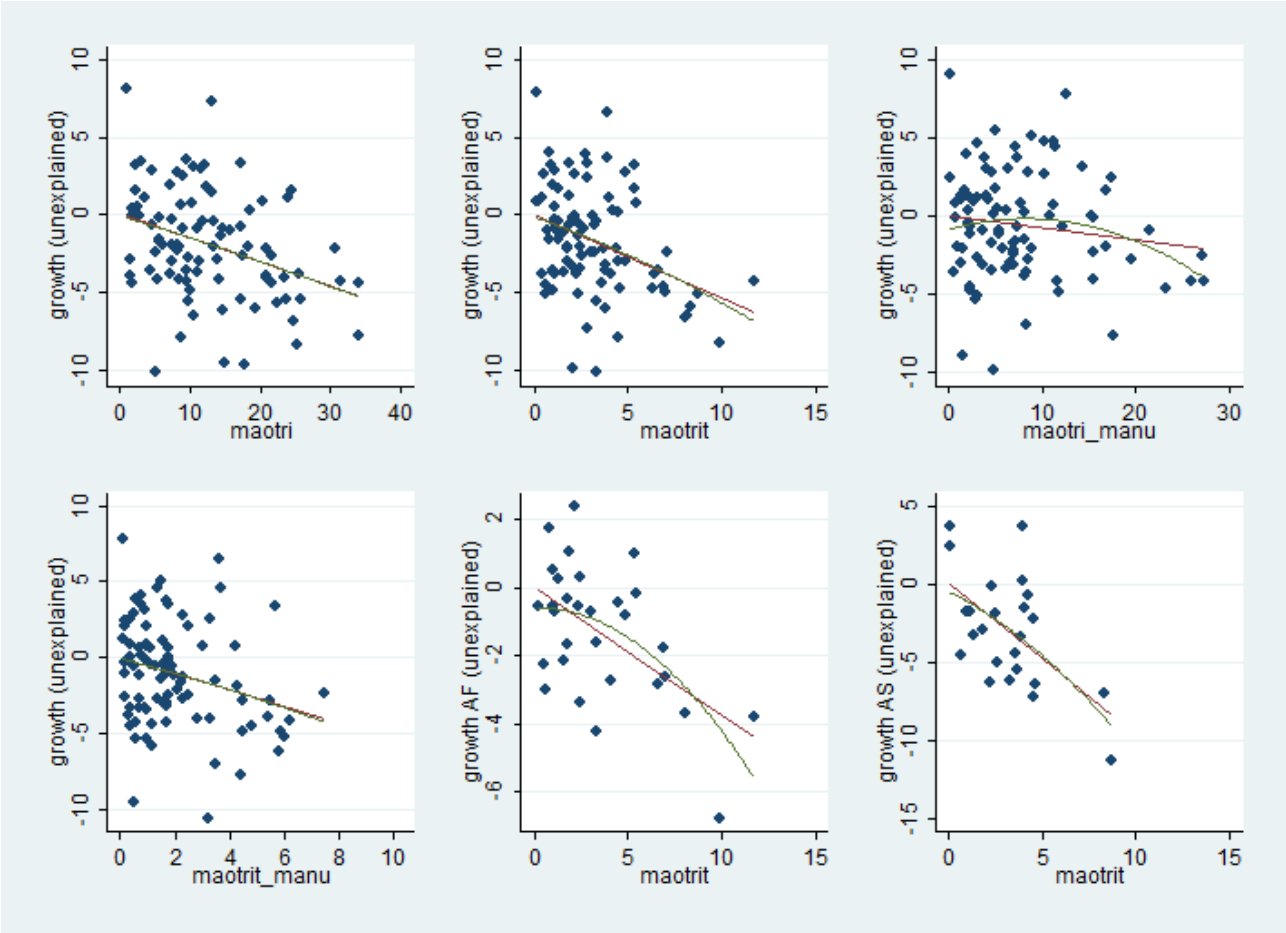

Figure 3: Short term growth (unexplained part) vs. export trade restrictions
(the six subplots are corresponding to the 6 specifications in Table 11; order: first by row, then by column.)

8 What Should We All Take Away From These Tables and Graphs?

Our findings are based on examining the relationship between manufacturing share, protection, per capita GDP, and economic growth over a wide range of countries over a fifteen year period. Our main findings are :

(1) An increase in the manufacturing share of GDP increases per capita income insignificantly, and the point estimate is that a ten percent increase in manufacturing share increases per capita GDP by only 2.5%. (Table 5A)

(2) When governance indicators are held constant the manufacturing share of GDP decreases per capita income significantly. (Table 5B)

(3) One representative calculation shows that an autonomous decrease in manufacturing share of GDP by 1.96 percentage points, could be counterbalanced by a simultaneous increase of 10 percentiles in government effectiveness and regulatory quality to leave manufacturing share unchanged. Thus, domestic reforms are effective in increasing the manufacturing share (Table 6).

(4) One representative calculation shows that an autonomous decrease in the manufacturing share by 10% would cut growth by an insignificant, but not economically unimportant, 0.076% per year over the next 15 year period. However, this effect on growth could be counterbalanced by an increase in government effectiveness and the quality of regulation by 1.44 percentiles. (Table 9).

(5) An increase in the protection of the manufacturing sector relative to the rest of the economy actually reduces the manufacturing share. Similarly, an increase in an exporter's trading partners' barriers to its exports of manufactures relative to its other exports reduces the exporter's manufacturing share. (Table 10).

(6) Trade barriers at home and abroad significantly reduce economic growth. (Table 11). Thus, domestic protection diminishes both the manufacturing sector and economic growth by more to the extent it preciptiates a trade war..

Our primary conclusion is that while a larger manufacturing share may have a salutatory effect on economic growth, it can be balanced by a small improvement in governance effectiveness and regulatory quality. Our secondary conclusion trade restrictions hamper economic growth, so it makes no sense to use trade restrictions to improve economic growth via the impact of trade restrictions on manufacturing share.

9 Reflections

Our paper provides support for remarks by Corden, Mussa, Mill, and Irwin.

Is it wise to use trade policy to achieve domestic objectives such as a high manufacturing share? Corden (1998, p.284) closes his book *Trade Policy and Economic Welfare* with the statement

"Complex interventions pursued by well informed, analytically well-trained and high-minded officials or politicians might well be optimal, but information and understanding are often limited, and policymakers are rarely immune from various sectional pressures."

Mussa (1993, p.374) makes a similar argument "When the political power of special interests combines with the pernicious effects of the fixed-number-of-jobs fallacy, the result will almost inevitably be some divergence from the free-trade policies that would probably best serve the broad public interest. Realizing that the battle will be unending and that the contest will be somewhat uneven, the practical question for economists working on trade policy is how to keep the damage to a minimum."

Liu and Ornelas (2014) find that free trade agreements "can critically reduce the incentive of authoritarian groups to seek power by destroying protectionist rents, thus making democracies last longer. This gives governments in unstable democracies an extra motive to form FTAs." They "find robust support for these predictions."

Irwin (1991, p.203) notes "[John Stewart] Mill condemned any general policy of protection—'an organized system of pillage of the many by the few,' he called it—but reiterated that, in principle, the infant industry claim to protection was valid (Elliot, 1910, II, p. 295)". Irwin continues (p. 207)

> Theories emerge periodically suggesting how tariffs can be beneficial, under certain and particular circumstances and these theories struggle to gain acceptance into the main body of economic theory. When legitimate exceptions to free trade are accepted into economic theory, there may come a period of diminished confidence among economists in free trade as a policy. Yet repetition of this pattern over the decades has not ultimately led to uneasiness among economists in their belief that the gains from international trade are substantial and that a free trade policy is difficult to improve upon. Identification of possible exceptions to free trade by economic theorists means neither that such circumstances can be isolated and identified in practice nor that such exceptions would constitute sound economic policy. If the past is any guide, new theories related to strategic trade policy will indeed provide important economic insights, but will not fundamentally challenge the belief of economists in free trade.

Liu and Ornelas (2014) find that free trade agreements "can critically reduce the incentive of authoritarian groups to seek power by destroying protectionist rents, thus making democracies last longer. This gives governments in unstable democracies an extra motive to form FTAs." They "find robust support for these predictions."

As Copeland (1989) *et al.* reiterate, the optimum tariff is not the best way to transfer resources between countries. A preferable alternative is an explicit transfer.

A report by Joel Popkin and Karhryn Kobe (2010) makes recommendations which are consistent with our findings.

- Reduce the corporate income tax rate on profits earned from production in the United States to match those of our major trading partners.
- Make the research and development (R&D) tax credit permanent to provide more certainty

for private sector decisions to undertake R&D.

- Continue to improve our education system to enhance the pool of science, technology, engineering and math (STEM) graduates and support programs of technical training and certification.
- Invest in all levels of infrastructure – transportation, communication channels and the energy grid."

Nowhere in the report is protectionism recommended in service of jobs, productivity, or competitiveness.

Baily and Bosworth (2014) write,

> We agree with those who think manufacturing is important, but we do not agree that this justifies special treatment for the sector, such as special tax rates or other subsidies. Such policies are hard to enforce and an invitation to arbitrageurs who seek ways to capture the gains from such subsidies with little or no actual change in real behavior. However, certain policy decisions have had a particularly large adverse impact on manufacturing because it is so exposed to global completion. (p.19). … While we do not support special subsidies, it is important to ensure that existing policies are supportive of manufacturing—or at least do not discriminate against it. (p.22).

They suggest (p.23) "trade negotiations to pry open foreign markets, [and] negotiations with countries that manage their exchange rates about the appropriate level of their exchange rates," and write "The marginal rate of corporate taxation in the United States is too high, particularly in relationship to the tax rates of other countries. … The United States has the highest corporate tax rate within the OECD, and, at a combined 39 percent, it exceeds the average by 14 percentage points. The United States needs to follow the lead of other countries in shifting toward greater reliance on consumption-based taxation. … "US 15-year-olds rank 25th in math and 17th in science … among OECD nations. … Greater attention needs to be paid to reversing the deterioration in US workforce skills." … "the United States suffers from a deteriorating physical infrastructure that raises the costs of production and limits the location of export activities." "The key to expanding US exports and reaching manufacturing's employment potential is to have companies, domestic and foreign, judge it is profitable to manufacture here." Nowhere do they suggest protection against foreign completion.

It seems to us that the best way to keep manufacturing high and income distribution decent is to eliminate the corporation income tax, allow everybody to accumulate income in a tax deferred account and then to levy a progressive income tax on assets withdrawn from those accounts, using the proceeds for an earned income tax credit to benefit the relatively unskilled.

Two foci of the American trade policy debate also deserve contemplation. Irwin (1991) notes,

> "Current international trade negotiations that affect patents often occur as part of either the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which was signed in 1995 as part of the World Trade Organization negotiations, or as part of the World Intellectual Property Organization, an agency of the United Nations. The nature of these agreements and organizations is well indicated by the use of the propaganda term "intellectual

property" in their titles. In both cases, these talks are often focused on how to prevent ideas from high-income countries from being used in low-income countries—what we would characterize as essentially a neo-mercantilist approach toward free trade in goods and ideas. We should be highly cautious about this agenda. Within a couple of decades, the "balance of trade in ideas" between the US and European economies and emerging economies in Asia might easily equalize or reverse. Engaging in "mercantilism of ideas" may seem favorable to certain large US firms now, but such rules may become costly to the US economy if they are applied to protect patents held in the future by producers in the now-developing Asian economies."

This conjecture is supported by Kerr (2013). He finds (p.14) "The contribution of Chinese and Indian ethnic inventors [in the U.S.] displays exceptional growth [over the last 30 years], increasing from under 2 percent each to 9 percent and 6 percent respectively." He goes on to say "[his] work quantifies how a larger ethnic community in the United States aids the transfer of new technologies to the home country. This transfer is strong enough to show up in manufacturing output and productivity data for the home country, and it is even evident in trade patterns."

On the issue of intellectual property Boldrin and Lavine ((2013). write "The case against patents can be summarized briefly: there is no empirical evidence that they serve to increase innovation and productivity, unless productivity is identified with the number of patents awarded—which, as evidence shows, has no correlation with measured productivity. … Our preferred policy solution is to abolish patents entirely and to find other legislative instruments, less open to lobbying and rent seeking, to foster innovation when there is clear evidence that laissez-faire undersupplies it.

A second issue is raised by Roberts's (2013, p.76) comment "The excess supply of labor in China and India today exceeds the total of the employed labor forces of the U.S. and Europe. How far will U.S. and European wages have to fall in order to become equalized with Chinese and Indian wages? " This argument ignores that China is adding to its physical capital at an amazing rate. It is even conceivable that China could ultimately become a capital intensive country given its saving rate and the US saving rate, and the US could be importing capital intensive goods and exporting labor intensive goods. China is also augmenting its human capital rapidly. For example, in Fall 2013, of the 29 junior students in the Duke economics department with the top grades, 22 have Chinese or Korean family names; and of our MA entering class of 2013, 64% are Chinese or Korean.

Moreover, offshoring and immigration need not cost American jobs. Ottaviano *et al*. (2013) write "When immigrant and offshore workers become increasingly employable, efficiency gains can be reaped by hiring them to perform tasks in which they have a comparative advantage, giving native workers the opportunity to specialize in the tasks in which they exhibit their own comparative advantage. If strong enough, the productivity effect associated with this improved task assignment may offset the displacement effect of immigration and offshoring on native workers' employment.

Despite the widely held belief that immigration and offshoring are reducing the job opportunities of US natives, we have found instead that, during our period of observation, manufacturing industries with a larger increase in global exposure (thorough offshoring and immigration) fared better than those with lagging exposure in terms of native employment growth."

10 Some Reflections on *The Economist*'s Bhagwati-Chang Debate

In closing we return to some of the issues raised in the Bhagwati-Chang debate on the importance of manufacturing. We looked for a plea for subsidies to manufacturing or for manufacturing protectionism through all 103 pages of the debate. No one made such a plea explicitly. However, we are not clear whether the pro forces are justifying subsidizing manufacturing through explicit subsidies or through trade policy or by eliminating distortions that frustrate manufacturing. Moreover, Bhagwati refers to "the revival in the public domain of the view that therefore manufactures must be supported."

He also makes the classic point: "… if the returns to better technology accrue to the firm, there is no reason to subsidize: one needs to establish an externality to advocate a subsidy" (*The Economist*, 2010).

We argue, furthermore, that even if subsidies are desirable to correct externality nothing should be subsidized until there is a consensus methodology of how to determine optimal subsidies. And the objective should be global welfare, not national welfare, with transfer payments handling the distribution of welfare between countries. All this is a preposterously tall order, especially since we can think of many interventions which do not even serve national welfare.

However, there is much to be said for leveling incentives by eliminating subsides elsewhere, such as in agriculture, both to reallocate resources directly and to free up funds for efficiency-enhancing government spending and distortion-removing tax shrinkage as discussed in Cutherbetson, Stoeckel and Vincent (1989).

Sir Geoffrey Owen, of the London School of Economics and previously editor of the *Financial Times*, in his comment on the debate (as part of the interchange hosted by *The Economist* writes:

> There are plenty of things the government can do to improve the supply side of the economy, but trying to alter the balance between manufacturing and services is not one of them.

He adds

> Past experience in Europe suggests that attempts by governments to alter the structure of their economies by favouring one sector over another generally cause more problems than they solve. The effect in many cases has been to preserve uncompetitive businesses, often at great cost to the taxpayer, and to slow down the redeployment of resources into areas where they can be put to better use.
>
> Countries should specialize in what they are best at. One of the weaknesses in British

> industrial policy in the 1960s and 1970s was the reluctance to accept that Britain could not expect to compete against America in all the major high-technology industries; for example, a great deal of effort was wasted in trying to create a national champion in computers that could hold its own against IBM. Similarly, today many people envy Germany's manufacturing strength and look for ways of emulating it. But for a mixture of historical and institutional reasons Britain's competitive advantage lies in different areas, some of which are outside manufacturing—financial services, business and professional services, creative industries and the like.

Returning to one of our favorite articles, Paul Krugman (1993a, p.26) writes:

> Now there are reasons, such as external economies, why a preference for some industries over others may be justified. But this would be true in a closed economy, too. Students need to understand that the growth of world trade provides no additional support for the proposition that our government should become an active friend to domestic industry.

Finally, to the extent that a small share of manufacturing in an economy is a marker for business-hostile economic policies, we agree that a larger share of manufacturing predicts economic success. So in that sense one can vote for the proposition without being a manufacturing fetishist, just an efficiency fetishist.

11 The Red Threads

The red threads running through the fabric of our analysis are

- Effective governance is positively related to a high manufacturing share. We interpret this as supporting the idea that effective governance creates an economy in which firms feel safe to build up their capital stocks, and this stimulates manufacturing relative to less capital-intensive services.
- The manufacturing share is not significantly correlated with a higher standard of living measured by per capita GDP. Nor is it related significantly and consistently to economic growth.
- Trade restrictions both at home and abroad shrink the manufacturing base and smother economic growth.
- A better way than protectionism and subsidies specific to industry to enhance economic growth is to improve governance effectiveness and the quality of regulation and taxation.

12 Some Reactions to the Paper

One reader suggested that technological advance can't occur without a strong manufacturing sector. We believe that open borders to migration are an even more important channel of technological advancement. Another cited the "the beggar thy neighbor" Chinese policy of maintaining a trade surplus. We see no reason why that need cause unemployment. In fact to eliminate the trade surplus might even cause more unemployment. Suppose China expanded absorption and the US raised taxes to reduce absorption. If the US tax takes the form of a value added tax, part of the incidence of that tax will be borne by labor, thereby reducing the demand for

labor and if real wages are inflexible downward, causing unemployment. Thus, perhaps we should thank the Chinese for helping with our unemployment problem.

A similar argument is made by Pettis (2013) who argues that Greece's unemployment can be blamed in part on the German export surplus. He ignores that any country with a surplus of saving drives down world interest rates, encourages its trade partners to invest, which shifts outward their demand for labor and either raises employment or wages.

One reader noted the rampant agricultural fetishism in the US and Europe and in some less developed countries, leading to policies that reduce manufacturing share.

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