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Does the Data Support the Neo-Mercantilist Preoccupation with Protecting Manufacturing?

by

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Abstract

This paper explores the relationship between manufacturing and growth rate in recent years. We undertake a simple cross-country analysis using UN data. When controlling for variables relevant to growth, we find no significant relationship between the two variables. We argue that manufacturing protectionism cannot be rationalized by the data for this time period. Then, we look at developed countries like the United States and find that whereas a positive relationship between 10 year forward GDP growth and manufacturing was likely present in the 1970's, the same relationship does not hold today. Our findings shed light on recent debates over protectionism.

JEL classification: O24, O25, F13, O43

Introduction

"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, manufacturing is a tangible symbol of a country's prosperity. We show in this paper that all of us need to be careful not to overstate its importance.

The Economist (2011) assessed that the belief in the importance of manufacturing, what some have named "manufacturing fetishism," is 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 favour 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 assessments 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 contributors who evaluated the debate carefully enough to comment were less pro manufacturing than those voters who just reflexly clicked the "vote yes" or "vote no" buttons on their computer screens.

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 offshore outsourcing.

In Part 1 of this paper, we seek to address the simple and crucial assumption that manufacturing value added share of gross domestic product (GDP) propels economic growth. Our motivation for addressing this assumption is that it is often used as a justification for protectionist measures such as tariffs and subsidies, which cause costly economic distortions. This part is an attempt to rationalize the protectionist assumption with cross-country empirical data.

In Part 2 of this paper, we limit our study to the most developed economies and examine the relationship over time that share of labour in manufacturing has on future economic growth. We will show that care should be taken not to overstate the desirability of a high manufacturing share for the economies of developed countries, especially in today's globalized economy.

In Part 3 we ask whether greater government effectiveness raises the share of manufacturing in GNP. We find an economically strong and statistically significant positive relationship. Thus, we conclude that manufacturing can be promoted by either protectionism or better governance. The choice? Better governance raises economic efficiency while protectionism lowers it.

1. Does Manufacturing Share of GDP Propel Economic Growth?: A Sample of All countries

In this part, we use crossplots and two econometric models to analyse the relationship between manufacturing share of GDP and average growth rate of per capita GDP. We find that there is no conclusive evidence to support the claim that manufacturing enhances growth and therefore is crucial to an economy.

1.1 Data

Years Chosen

We start our study with the year 1996, and study the impact of manufacturing share of GDP on the growth rate of per capita GDP between the years of 1996 and 2009. We chose 1996 because that was the earliest date for which the World Bank publishes its world governance indicator “government effectiveness,” which plays an important role as a variable in our model. For robustness, we also investigate the year 1998, which was the second year for which data was published.

Manufacturing Data

Our manufacturing data comes from the United Nations National Accounts Aggregates database (UNNAAD). The UNNAAD divides a country’s GDP into various categories, one of which is called Manufacturing ISIC D, which is what we use. The dataset has fewer missing records than the other manufacturing dataset available. The dataset covers

the time period from 1970 to 2009. It includes GDP components data from all 216 UN member countries.

The UNNAAD defines manufacturing as any process that transforms raw materials into new products. It should be noted however, that the classification of economic activities based on this definition can be ambiguous, and can lead to somewhat arbitrary distinctions between what is deemed a manufacturing activity or not. For example, activities like tyre retreading and wood preserving are included in the ISIC D, whereas the breakdown of bulk raw materials and subsequent bottling and packaging thereof is not included in the ISIC D (United Nations Statistics Division, 2011).

When using this data, it is also important to acknowledge that many manufacturing companies either contract out services or have "evolved" into service providers. For example, Neely's (2011) found that roughly 30% of firms studied provided both manufacturing and services. Only about 2% were pure manufacturing firms. An example of this trend is IBM, which was once a manufacturing firm, but reinvented itself as a service firm. "Servitisation" might obscure our analysis because it is more prevalent in developed countries, and therefore represents a potential systematic bias in our dataset.

GDP data

Our GDP data also comes from the United Nations National Account Aggregates database. We selected a GDP dataset from the same source because we assume that any systematic biases in calculating GDP will also be prevalent in the data for Manufacturing ISIC D, so our calculations of the share of GDP that manufacturing represents will be as accurate as possible. The GDP data covers a time period between 1970 and 2009, for the same countries as the Manufacturing ISIC D data. Both manufacturing output and GDP are specified in current US dollars.

Governance data

We use the World Bank's (January 2011) government effectiveness point estimator for our governance variable. This is a composite of perceptions of various aspects of governance: "the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies" (World Bank, January 2011, p.5). The estimator is calculated from surveys of thousands of informed stakeholders, including policy experts, households, firms, and NGOs. We use this variable as a proxy for judicious policymaking that contributes to growth.

Other data

Additionally, we use two indicators from the World Bank's World Development Indicators dataset: population and percent of labour force with secondary education. The WDI population data is complete for all members of the United Nations. The percent of labour force with secondary education indicator was chosen because we needed a proxy for human capital in our growth model.

Omitted Values

Some of our data sets suffer from omitted values for certain countries. We are concerned that the missing values could be systematic (e.g. data could be missing for poorer or more volatile countries, thus skewing our results). For this reason, we decided to investigate two models, one for which few values were missing (Model I), and one for which more values were missing (Model II). In Model II, we make the trade off between relevant explanatory variables and observations.

1.2 Analysis

Simple Regressions

We perform a simple regression of average geometric per capita growth rate from 1996-2009 inclusive on the manufacturing share of GDP in 1996. These are annualized growth rates. They are calculated as:

Per capita growth rate ={[2009 per capita GDP]/[1996 per capita GDP]}$^{1/(2009-1996)}$

$$per\ capita\ growth\ rate = \left(\frac{2009\ per\ capita\ GDP}{1996\ per\ capita\ GDP}\right)^{\frac{1}{2009-1996}}$$

To convert to growth rates of real GDP per capita one must subtract the geometric average inflation over the period. This figure is 2.18% per year.

The formula is

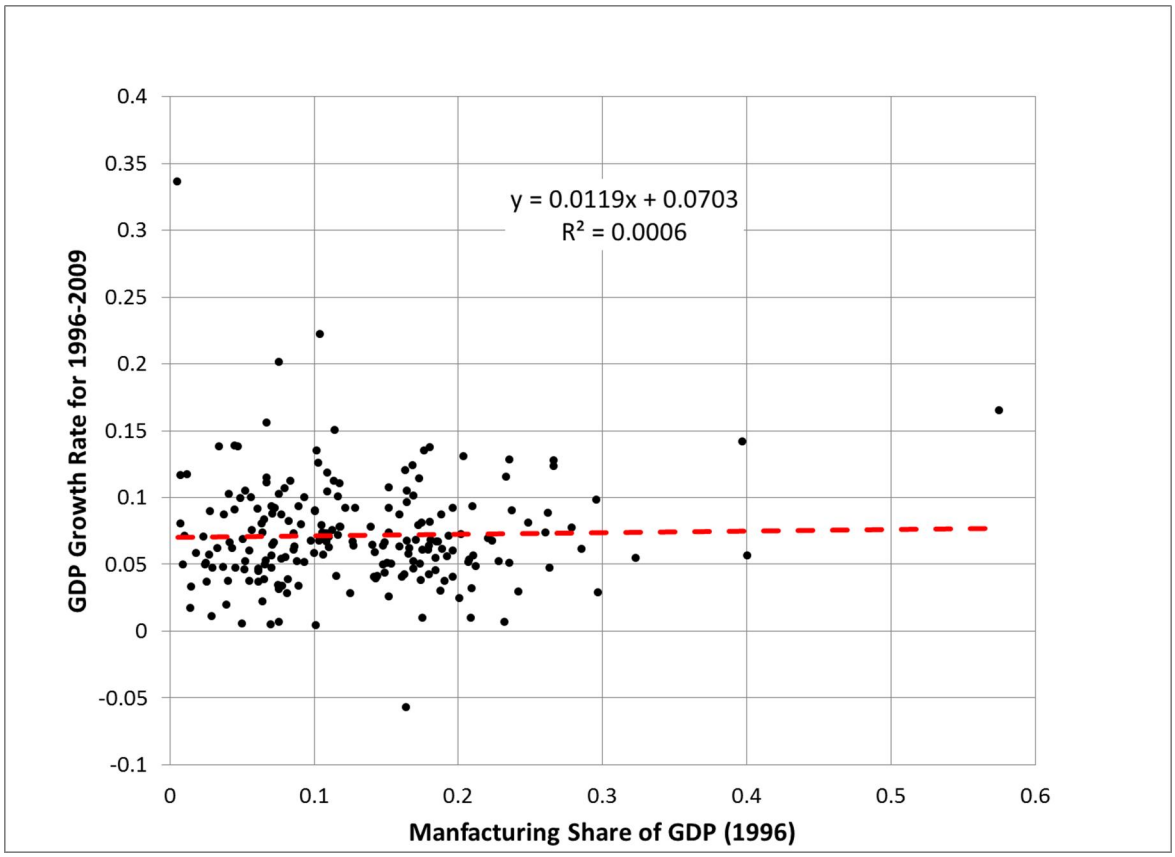
$$Real\ per\ capita\ GDP\ growth\ rate = \left(\frac{Nominal\ per\ capita\ GDP\ growth\ rate - inflation\ rate}{1 + inflation\ rate}\right)$$

where growth rates and inflation rates are expressed as proportional change per year.

The regression is based on the results from 216 countries. We see in the chart below that the expected strong positive linear relationship between these two variables is not apparent. The regression p-value is .73, indicating that manufacturing share of GDP is not a significant explanatory variable for manufacturing share of 1996 GDP.[1]

Figure 1. GDP Growth for 1996-2009 as explained by manufacturing share in GDP (1996)

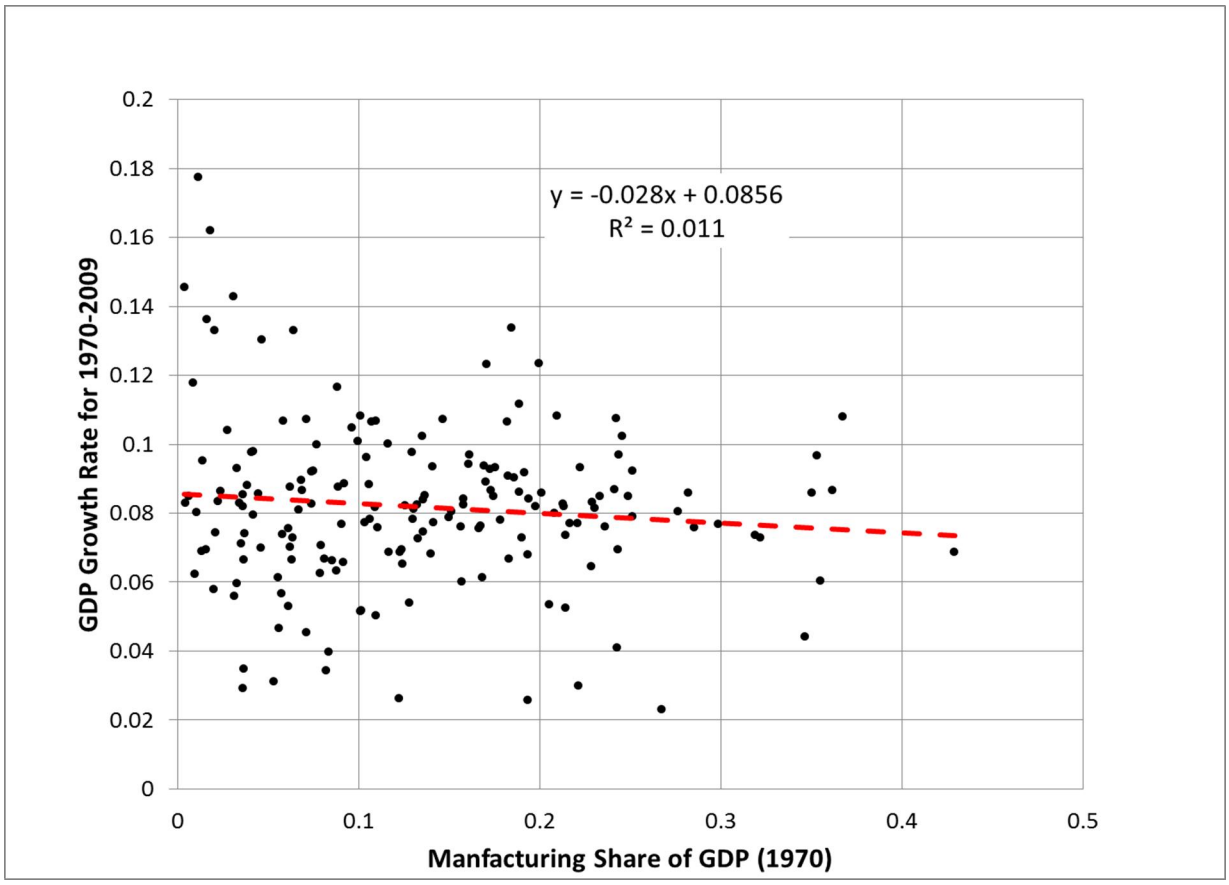
[1] See Figure I of appendix for regression details. The appendix is available from Waite (alecia.waite@duke.edu) upon request. The p-value is the probability of obtaining a test statistic at least as extreme as the one that was actually observed, assuming that the null hypothesis is true. The country with the highest growth rate (just under 35% per year) is Equatorial Guinea. This growth rate seemed too good to be true. We double checked this entry with an additional data source and it is correct.



The advantage of a simple "uncontrolled" regression is that, because we are not tied down by availability of governance data (which starts in 1996), we can perform this analysis for a longer time interval. We construct a cross plot of average geometric per capita GDP growth rate for the years 1970-2009 below, with a similar conclusion, except here manufacturing share negatively affects the estimated growth rate,[2] (see Figure 2).

Figure 2. GDP growth for 1979-2009 as explained by manufacturing share in GDP (1970)

[2] See Figure II of appendix for regression details.



Model I: three independent variables

In Model I, we control for level of development and governance:

$$growth = \beta_1 manshare + \beta_2 \ln(gdp) + \beta_2 gov't + \varepsilon$$

Where:

- $growth$ is the compound annual growth rate of per capita GDP for the country for the years from 1996-2009
- $manshare$ is the manufacturing value added share of the country's total GDP in 1996
- $gov't$ is the World Bank's governance effectiveness point estimator
- $\ln(gdp)$ is the [illegible] GDP in constant USD in the initial

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