The Decline of Manufacturing in Canada: Resource Curse, Productivity Malaise or Natural Evolution?

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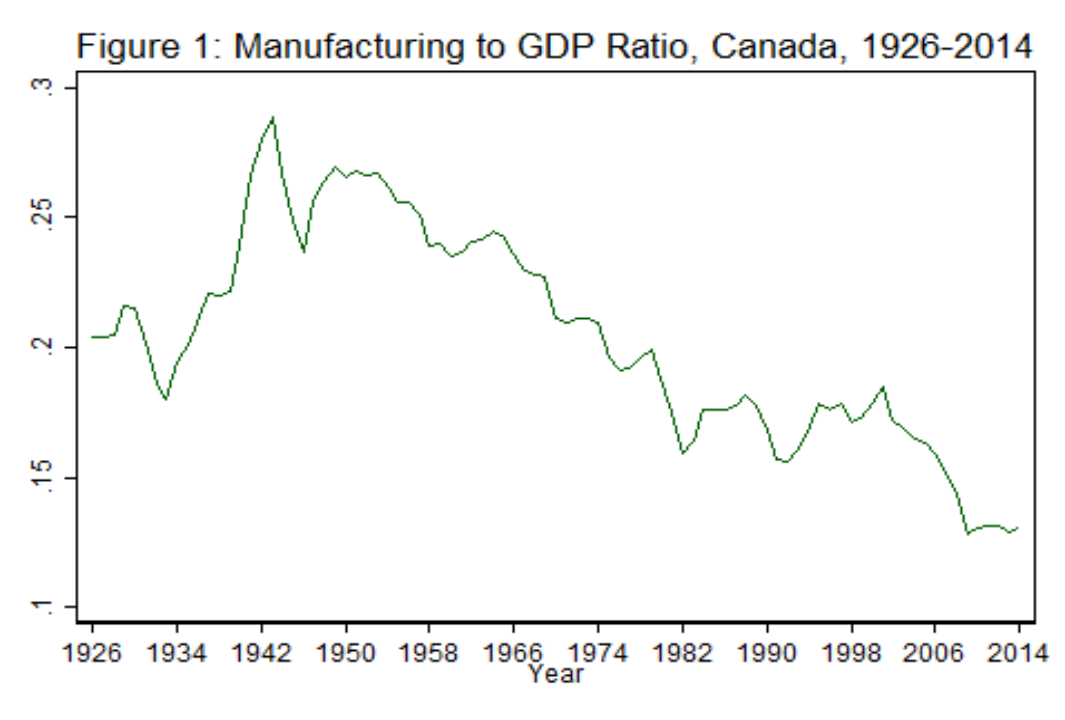
Summary

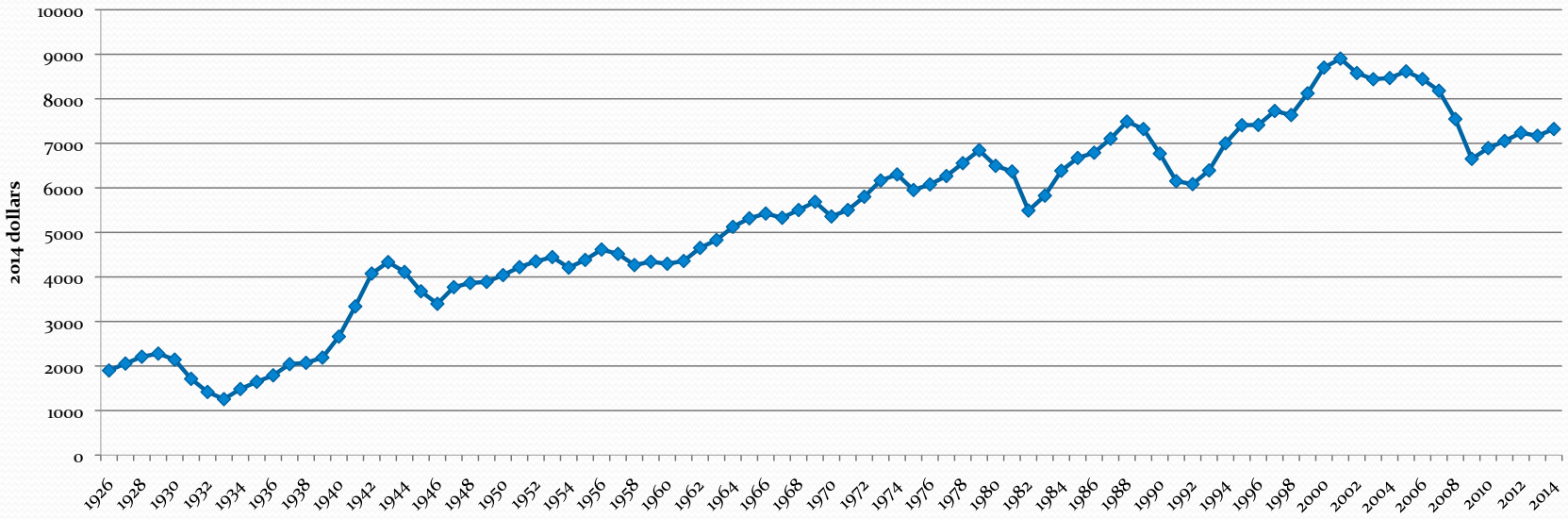
- What is driving the decline in the manufacturing share of the Canadian economy?
- Peak in early to mid 1940s → WWII Over 25 percent of economy in the 1950s
- Gradual drop off to below approximately 13 percent recently.
- Focus on both the long-term trend and short-term fluctuations (annual growth rate)
- Results suggest a more complex story with decline focused on evolution of advanced economies towards services and productivity rather than exchange rate forces.

Decline in manufacturing as a share of GDP



However, note that Canada is producing more manufacturing output per capita…

Figure 1a: Real Per Capita Manufacturing Output Value, Canada, 1926-2014
(Source: Statistics Canada & Historical Statistics of Canada)



Explaining Manufacturing Decline: Three Basic Stories

- *Decline* defined in relative terms: as share of GDP
- A natural "evolution" of economy away from manufacturing towards other sectors
  - Specific to Canada: Natural resource sector
  - Canada and other "rich" nations (G-7): Service sector
- Productivity not growing - Capeluck (2015 a,b)
- Exchange rate movements - Cross (2013) and others
  - Rising Canadian dollar: 2003 to 2014
  - Resource curse argument

Provincial Variations & Differences

- Ontario and Quebec hold a disproportionate share of Canadian Manufacturing
  - 2000 - 76 percent of all manufacturing jobs
  - 2013 - 73 percent of all manufacturing jobs
  - Manufacturing is declining in these provinces
- Ontario manufacturing employment drop 1,072,000 to 777,300 between 2000 and 2013 (27 percent)
- Quebec manufacturing employment drop 629,000 to 486,000 between 2000 and 2013 (23 percent)

Data Sources: Canada and Provinces

- Provincial Manufacturing GDP (Nominal and Real):
  - 1971-2014 CANSIM tables 379-0028, 379-0009, 379-0025 Pre 1976: Historical Statistics of Canada
- Provincial GDP (Nominal)
  - 1961-2011 CANSIM tables 384-0015, 384-0038
- Canada Manufacturing and Total GDP:
  - 1961-2014 CANSIM tables 379-0030, 379-0023 Pre 1976: Historical Statistics of Canada
- Industrial Product Price Index for Manufacturing CANSIM 329-0077
  - Pre 1976: Historical Statistics of Canada
- Manufacturing Employment Canada and Provinces
  - 1976-2014 CANSIM table 282-0088
  - Pre 1976: Historical Statistics of Canada

Additional Data

- Manufacturing Value Added - Countries and World Regions UN Data - http://unstats.un.org/unsd/snaama/dnllist.asp
- Exchange Rates
  CANSIM table 176-0064

Explanation 1: "Natural Evolution"-Decline in Manufacturing around the World as Part of Long-Term Trend in Developed Countries

- *Long-term Trend*: Manufacturing share declining in most countries
- Generally true for G-7 and other rich countries
- Decline in Canada is more substantial in the post 1999 period
- Exception - China and other Asia countries see rising manufacturing share in post 2002 period
- *Short-term Fluctuations*: Canada's movements similar to movements in other G7 countries

Figure 2: Manufacturing Value Added as a Percent Share of Total Value Added, 1970 to 2014, G-7 Countries

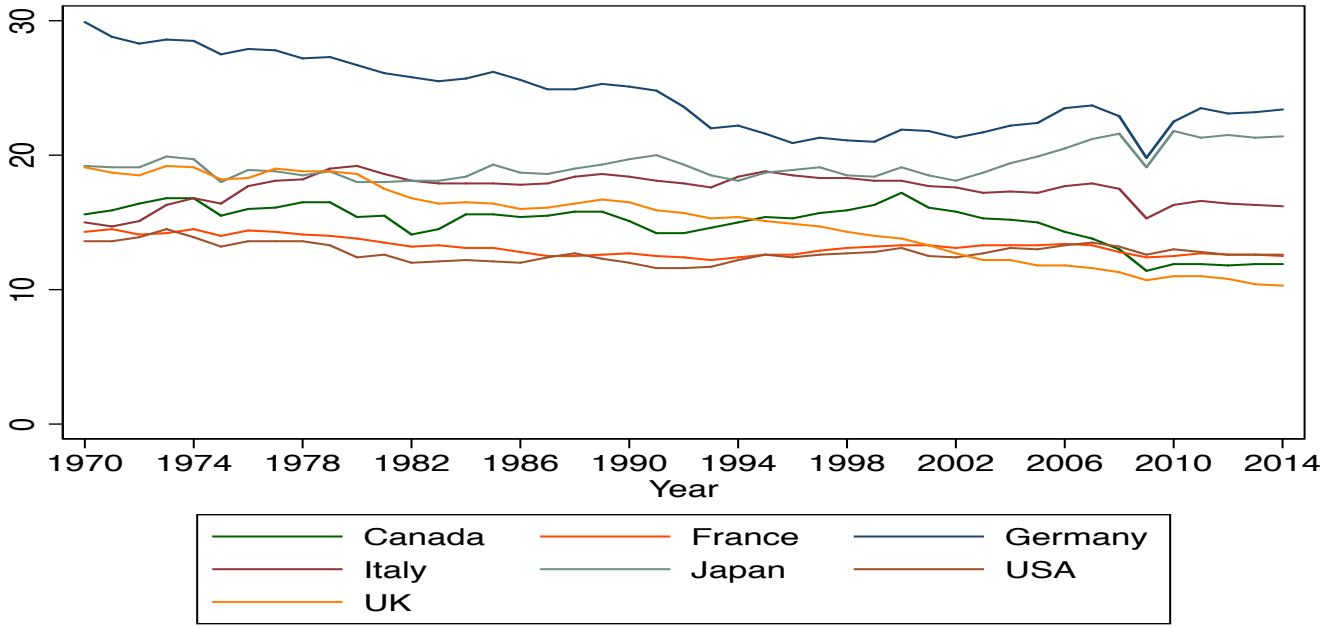
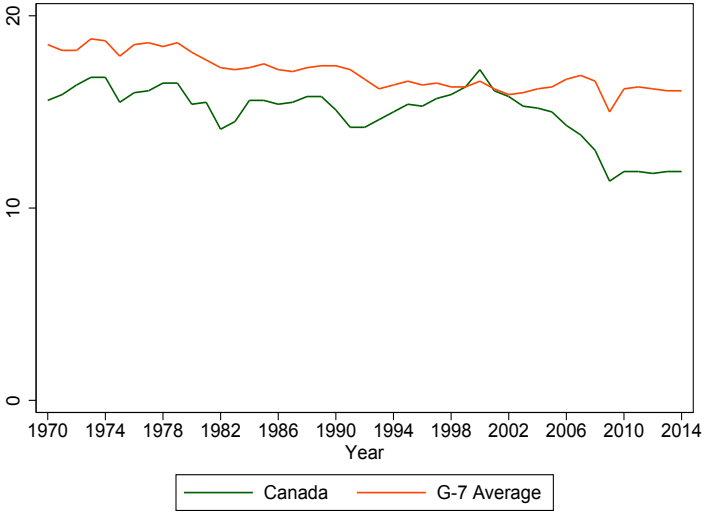


Figure 3: Manufacturing Value Added as a Percent Share of Total Value Added, 1970 to 2014, Canada versus G-7 countries minus Canada Average



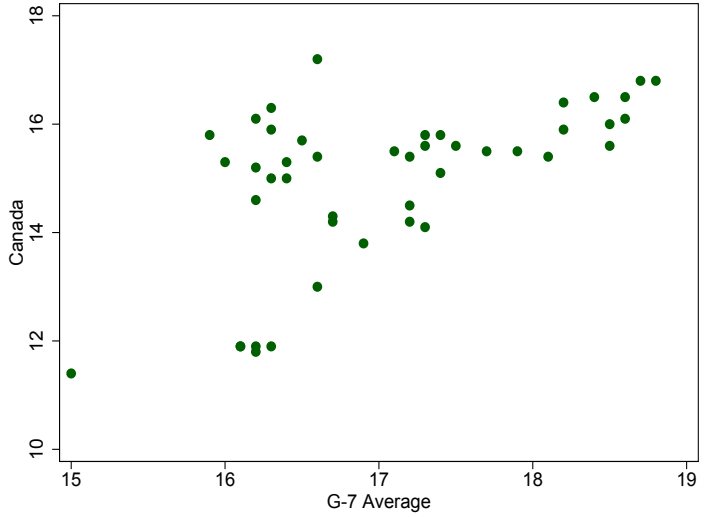
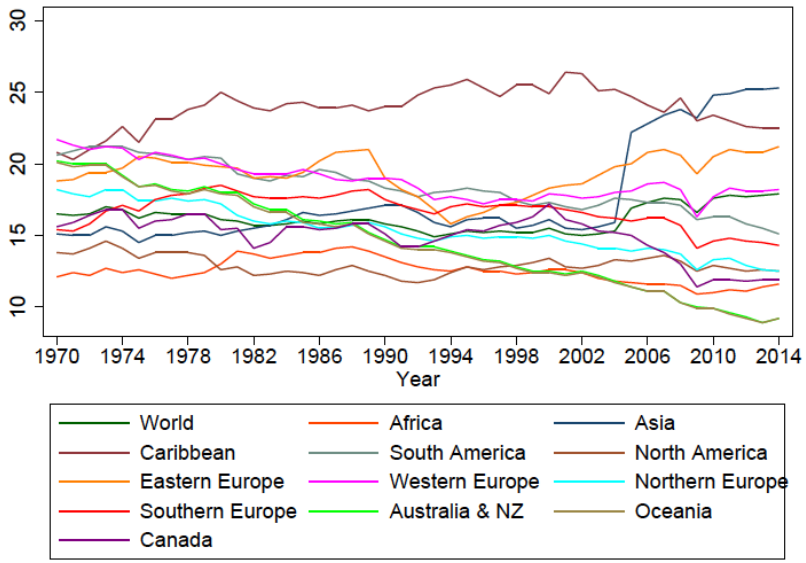


Figure 4: Manufacturing Value Added as a Percent Share of Total Value Added, 1970 to 2014, Canada, Australia & New Zealand, and World



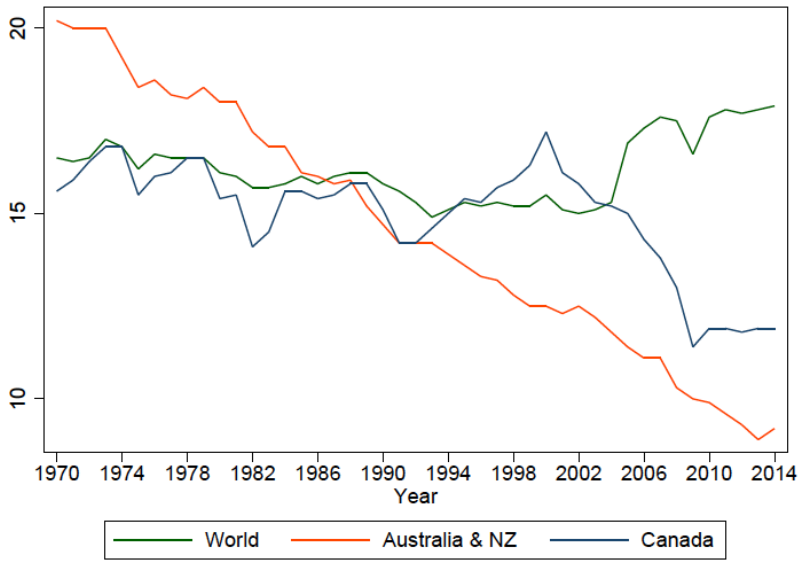
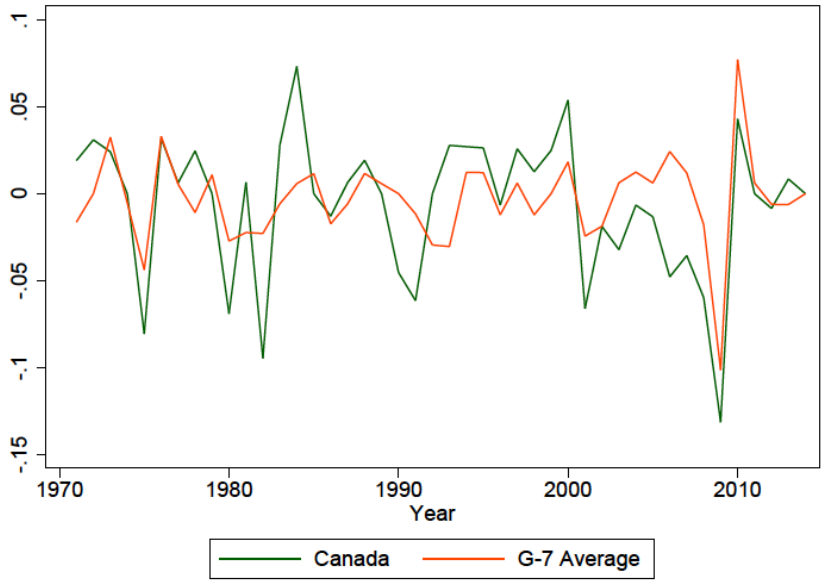
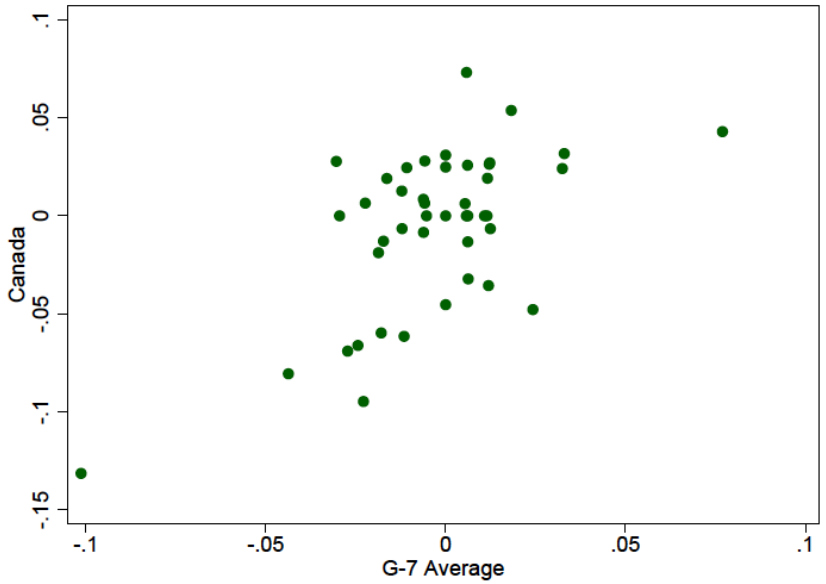


Figure 5: Growth of Manufacturing Percent Share of Total Value Added, 1970 to 2014, Canada and G-7 Countries minus Canadian Average

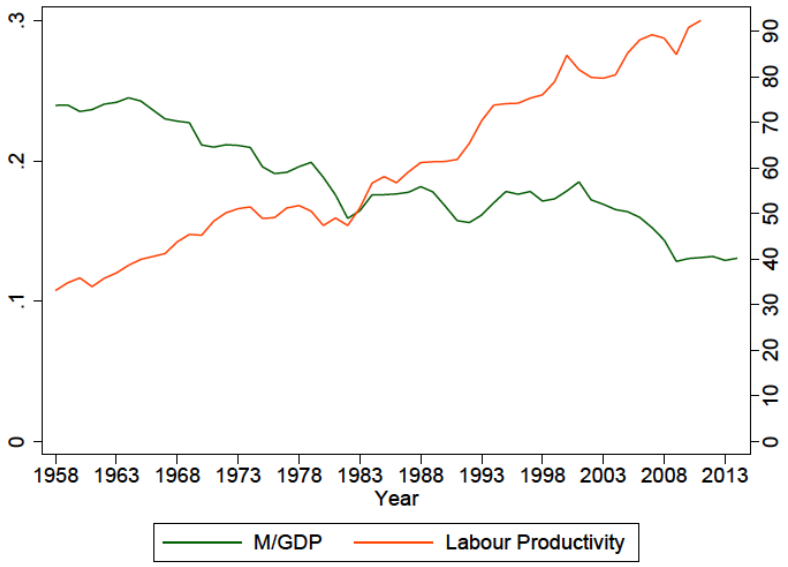




Explanation 2: Manufacturing Productivity Malaise (Two Trends)

- Long-term Trends:
  - Falling manufacturing share
  - Rising labour productivity in manufacturing (like agriculture in 20th century)
- Short-term Fluctuations: More relevant
  - Positive co-movement in growth of manufacturing share and labour productivity – improvements in productivity boost manufacturing in short term.

Figure 6: Manufacturing Share of GDP Versus Manufacturing Labour Productivity ($000), 1958-2011



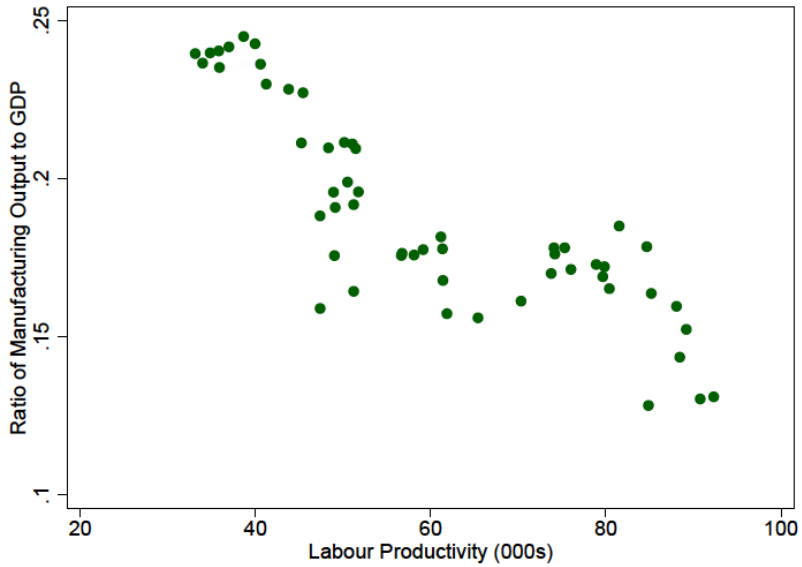
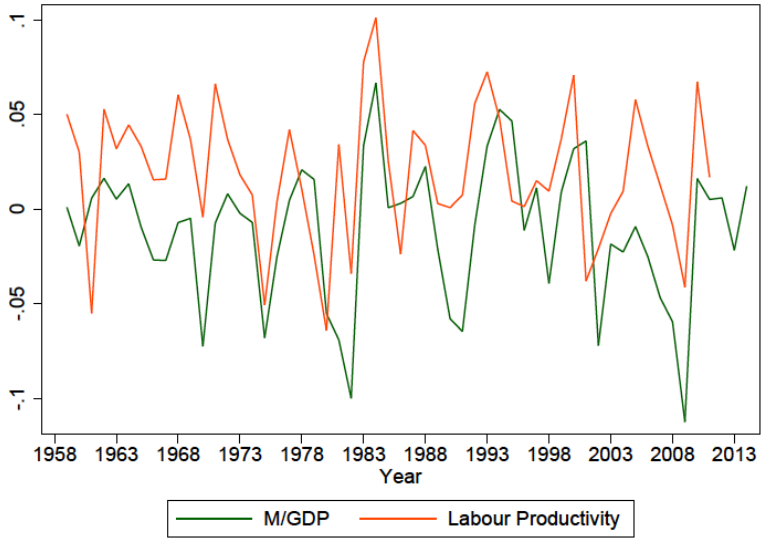
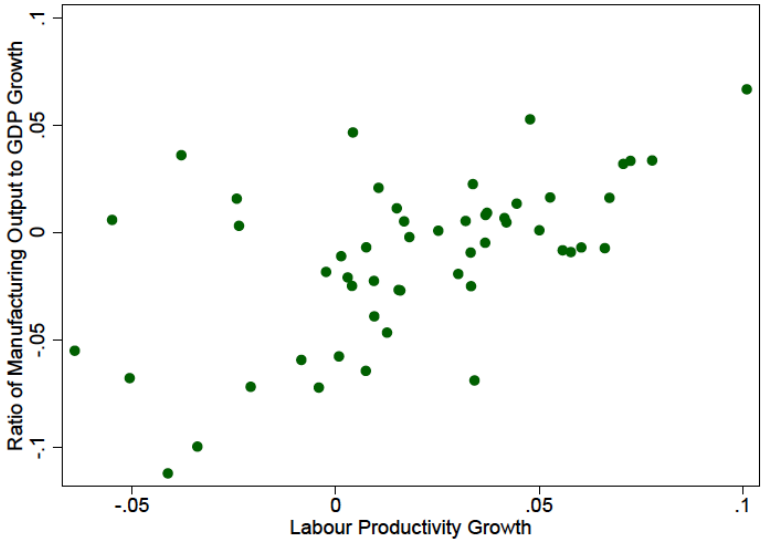


Figure 7: Manufacturing Share of GDP Growth versus Manufacturing Labour Productivity Growth, 1958 - 2011





Explanation 3: CAD/USD Exchange Rate Movements

- Long-term Trends:
  - Slight negative relationship dominated by pre 1970 years
  - No relationship post 1970
- Short-term Fluctuations:
  - Very slight positive association
- Note: Similar results occur when using trade weighted exchange rate

Figure 8: Manufacturing Share of GDP Versus Exchange Rate (CAD/USD),1926-2014

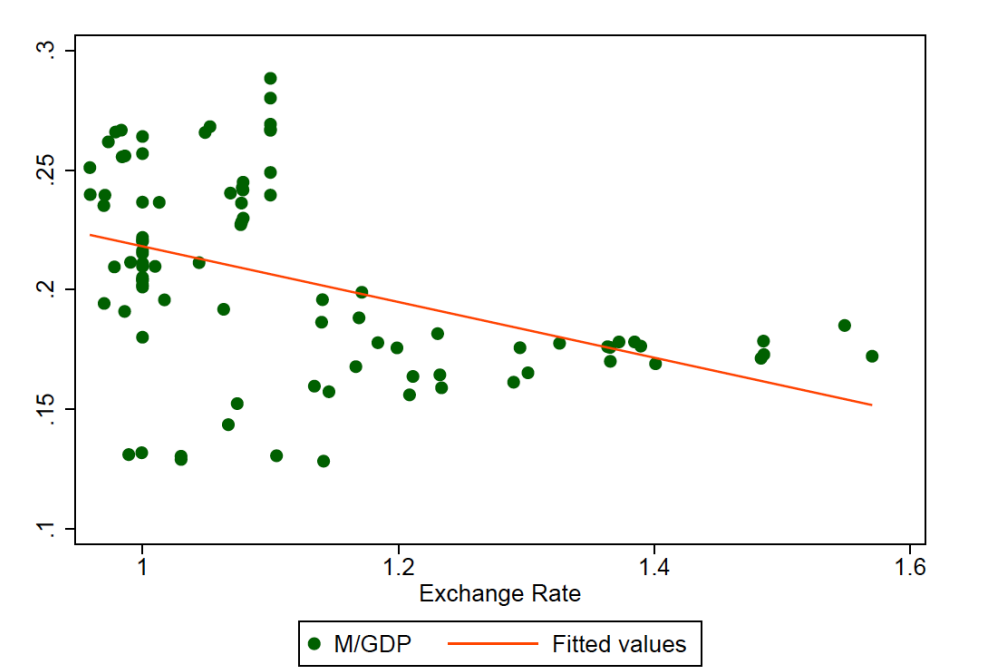
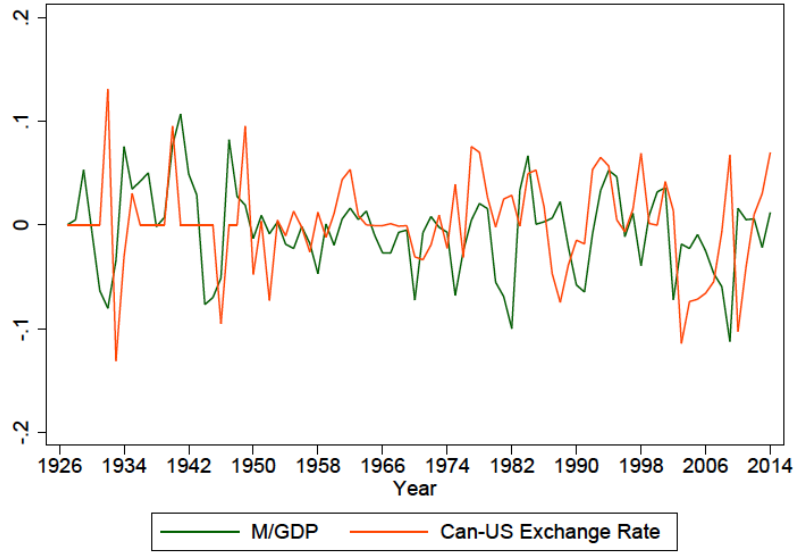
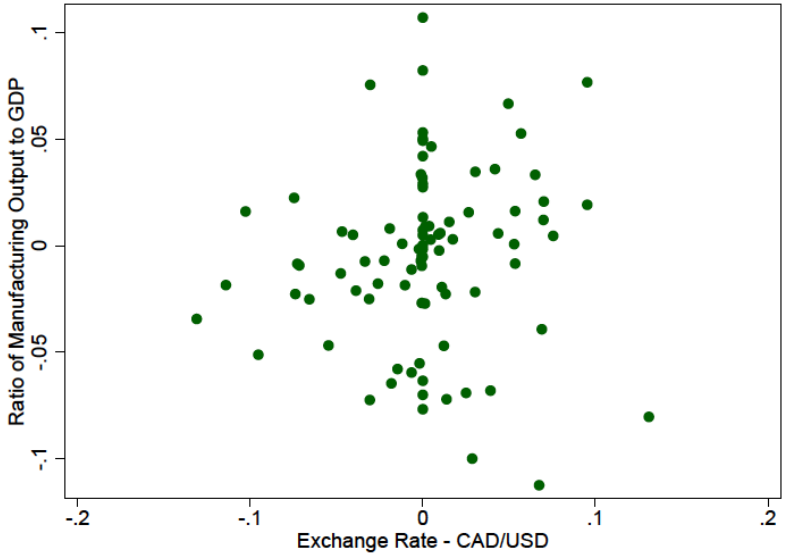


Figure 9: Growth of Manufacturing Share of GDP and Growth of Exchange Rate (CAD/USD), 1926-2014





Regression Analysis

Regression Approach: National Level Data

Two sets of regressions:

- Long-term Trend: Manufacturing Share of Canadian GDP
  - G7 excluding Canada average manufacturing share of value added
  - Canadian manufacturing labour productivity
  - CAD/USD exchange rate
- Short-term Fluctuations: Growth Rate Manufacturing Share of Canadian GDP
  - Growth rate G7 excluding Canada average manufacturing share of value added
  - Growth rate Canadian manufacturing labour productivity
  - Growth rate CAD/USD exchange rate

Regression Results: Long-Term Trends

Table 1: Manufacturing Sector's Share of GDP (1971-2011)

	1	2	3	4	5	6	7
G7 Manu Share	1.93			2.00		2.25	2.42
	(.20)***			(.36)***		(.18)***	(.32)***
Lab Prod		-.00		-.00	-.00		.00
		(.00)***		(.00)	(.00)***		(.00)
CAD/USD ER			-.01		.02	.04	.04
			(.02)		(.01)	(.01)***	(.01)***
Constant	-.15	-.23	.19	-.17	.22	-.25	-.29
	(.03)***	(.01)***	(.02)***	(.07)***	(.02)***	(.04)***	(.07)***

Note: Standard errors are reported in parentheses. *, **, and *** indicates statistical significance at the 10%, 5% and 1% levels, respectively.

Regression Results: Short-Term Fluctuations

Table 2: Growth Rate of Manufacturing Sector's Share of GDP (1971-2011)

	1	2	3	4	5	6	7
G7 Manu Share Gr	.87			.54		1.10	.77
	(.20)***			(.21)***		(.21)***	(.23)***
Lab Prod Gr		.66		.45	.67		.40
		(.14)***		(.15)***	(.14)***		(.14)***
CAD/USD ER Gr			.02		.08	.29	.24
			(.13)		(.11)	(.11)**	(.11)**
Constant	-.01	-.02	-.01	-.02	-.02	-.01	-.02
	(.03)***	(.01)***	(.01)***	(.01)*	(.01)***	(.01)	(.01)***

Note: Standard errors are reported in parentheses. *, **, and *** indicates statistical significance at the 10%, 5% and 1% levels, respectively.

Conclusions-I

Long-Term: Falling manufacturing share of Canadian economy

- Unconditionally:
  - Positive association with manufacturing share in other G7 countries
  - Negative association with manufacturing labour productivity
  - No association with CAD/USD exchange rate movements
- Conditionally:
  - Positive association with manufacturing share in other G7 countries and CAD/USD exchange rate
  - Slight negative or no association with labour productivity trend

Conclusions-II

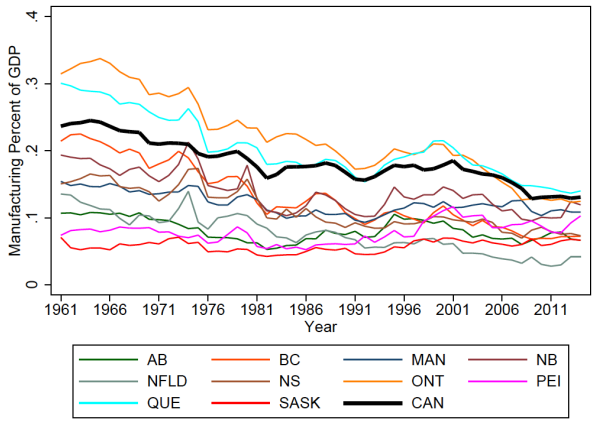
Short-Term fluctuations: Annual growth rate of manufacturing share

- Unconditionally:
  - Positive association with growth rates of both labour productivity and manufacturing share in other G7 countries
  - No association with exchange rate movements
- Conditionally: Positive association with all three variables

Future Work: Provincial Level Analysis

Provincial Level Analysis

Figure 11: Manufacturing Share of GDP, Canada and provinces, 1961-2014



Productivity

- productivity story reinforced by the fact that resource intensive provinces appear to have done a better job in maintaining their manufacturing sector GDP shares.
- Alternative measures - Total Factor Productivity
- Manufacturing productivity relative to other sectors