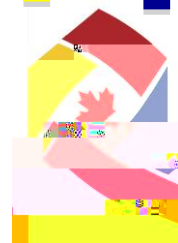


INSTITUTE OF INTERGOVERNMENTAL RELATIONS WORKING PAPER

Terms-of-trade changes, the Dutch disease, and
Canadian provincial disparity

In this paper, I first show that Canadian provincial disparities in 2012 have been essentially shaped by the relative evolution of regional terms of trade during the resource boom of 2002 to 2008. Differences in productivity growth across provinces in the past 25 years have not contributed to provincial disparities in living standards. Second, I argue that the resource boom might have been detrimental to the economy of some provinces because of a Dutch disease.

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Introduction

In an economy opened to international trade, improvements in living standards are determined in the long run by productivity gains and terms of trade changes. To illustrate this, suppose the economy produces only cakes that are sold in international markets for other goods. The economy will get richer when productivity gains generate an increase in the numbers of manufactured cakes. Improvements in terms of trade also make the economy richer with the increase in prices cakes are sold for other goods in international markets.

The primary purpose of this paper is to show that the favourable evolution of terms of trade during the resource boom of 2002 to 2008 has largely shaped Canadian provincial disparity in 2012. This results from the uneven spread of valuable natural resources across the territory and the provincial ownership of resources. In the second part of the paper, I will argue that the resource boom might not have been beneficial to all Canadian provinces due to a

The relative importance of productivity gains and terms of trade changes depends on the degrees of openness and diversification of an economy. In a large and diversified economy such as the United States, exports do not account for a substantial portion of GDP (14 % only in 2011¹) and the export base is well diversified. We should not be surprised that American economists are not very interested in measuring and analysing the contribution of terms of trade changes to living standards. For American economist, the only driver that matters is productivity gain. Canadian economists, however, should devote more attention to terms of trade changes since exports in Canada account for a larger part of GDP (31 % in 2011). Furthermore, Canada is a net exporter

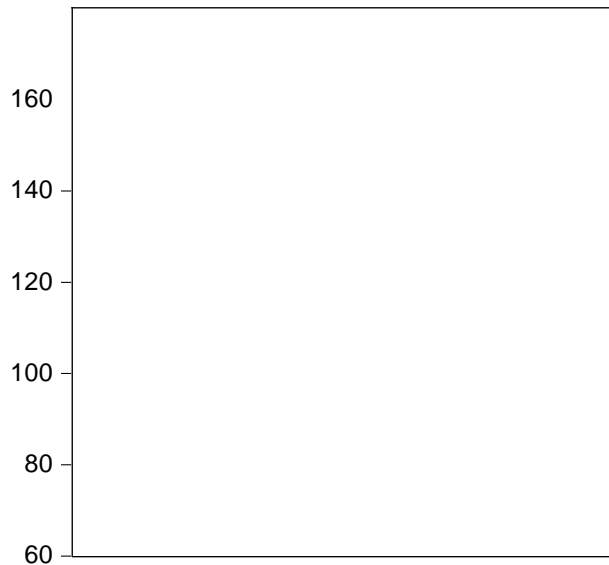
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and 2008 as depicted in Figure 1). The R-square and the p-value (significance level) of the estimated coefficient (the slope in Figure 3) are shown below the regression equation.

With just ten observations (one per province) for the variables (ten points only to fit in Figure 1) it is usually extremely difficult for any variable to reach statistical significance in a regression. Statistical theory tells us that significance levels increase (ceteris paribus) with the number of observations. In our case, however, the coefficient of terms of trade is significant well below the 1% level. In order to have the slope coefficient significant at the 1% level with only ten

$$\begin{array}{r}
 FS_{2012} \quad 81.3 \quad 15.76 * TT_{2002-2008} \\
 R^2 \quad 0.83 \quad (0.000)
 \end{array}
 \quad (R1)$$



Another interesting result coming from the regression analysis is the high level of the R-square (0.83). This number indicates that 83% of the fiscal capacity of Canadian provinces in 2011-

changes. That does not left much room for other explanations.

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$$\begin{array}{r}
 FS_{2012} \quad 100.00 \quad 16.84 * TT_{2002 \text{ } 2008} \quad 21.3 * LPG_{1984 \text{ } 2009} \\
 R^2 \quad 0.84 \quad (0.000) \quad (0.497) \quad (R3)
 \end{array}$$

The results for R3 and R2 illustrate the robustness of the key stylized facts highlighted in this section. Provincial disparities in 2012 have been to a large extent shaped by terms of trade changes that occurred during the relatively short period of time between 2002 and 2008. Productivity differences across provinces do not matter statistically. Of course, economically, productivity growth does matters for Newfoundland.

The fruits from the resource boom are unevenly distributed across provinces. The

Of course it is not possible today to know if the manufacturing activities lost in Canada due to the resource boom will come back or not when the resource boom will be over. There is too much uncertainty. It is possible however to quantify if some manufacturing economic activities in Canada have been lost because of the resource boom. This is precisely the subject of the empirical analysis of Beine, Bos and Coulombe (2012) (BBC thereafter).

The BBC (2012) analysis consists of three steps. First, the evolution of the Canada-US bilateral (real) exchange rate (CAD) is divided into a Canadian and a US component. The division is based on the observation that an exchange rate is a relative price, i.e., the ratio between the value of the Canadian and the US dollar in international markets. Second, they show that the Canadian component is driven by commodity (energy and non-energy) prices whereas the US component is not. Third, they show that employment in the trade-exposed manufacturing sector have been negatively affected by the evolution of the Canadian component during the resource boom of 2002-2008.

During the 2002 to 2008 period, the results of BBC (2012) suggest that 42 % of the appreciation of the CAD was due to the resource boom (the Canadian component). The remaining 58% was the results of the depreciation of the US component following the bust of the dot.com bubble and other events unrelated to the Canadian resource sector. They also find some evidence that the appreciation of the CAD resulting from commodity prices has harmed the employment in trade-exposed manufacturing industries. They found that around 100 000 job loss in the manufacturing sector between 2002 and 2008 can be related to the resource boom and the consequent appreciation of the CAD. Not all manufacturing industries have been affected but those affected negatively were generally exposed to international competition. The employment model they are estimating is a dynamic adjustment model. Consequently, the numbers reported represent long-run job lost.

Other factors have also affected negatively the contraction of the manufacturing sector during the resource boom. Only the employment lost associated with the Canadian component is Dutch-disease related. That accounts for only 31% of the 328,000 employment positions lost in the manufacturing sector in Canada between 2002 and 2008. Another 55% (180,000) are due to the depreciation of the US component that occurred mainly between 2002 and 2005. Finally, 14% of employment positions lost (46,000) are the result of the structural decline in the manufacturing sector that affects most developed countries and that can be associated in part with the rise of China economy.

Since the end of 2008, the developed economies have gone through five years of financial crisis, deep recession, and Euro crisis. The US economy, still our main trading partner, has been particularly affected by the turmoil. The resource sector has been negatively affected early in the crisis but has rebounded thereafter. The manufacturing sector has also been negatively affected initially due to the substantial drop in international trade. Consequently, most of the employment lost in Canadian manufacturing since the beginning of 2009 are cyclically related and cannot be associated to a structural shift such as a Dutch disease.

Manufacturing employment in Canada is unevenly distributed. The best way to understand the geography of the Canadian economy is to borrow the core-periphery model of Krugman (1991). In this celebrated (Nobel Prize) modelling, Canada served as a practical illustration. Krugman assumes economies of scale for the production of manufacturing goods and transportation costs. Krugman argues that the production of manufacturing goods will tend to concentrate geographically in the center, or the core, of the economy. The main economic activity

