

**Essays on International Economics**  
**By Jacob Wibe**

**Essay 1: The Role of Production Sharing and Trade in the Transmission of the Great Recession (Job Market Paper)**

The great recession of 2008-2009 resulted in a large fall in North American trade relative to output. Real trade fell roughly three times more than real GDP in the U.S. and Mexico, and by a factor of five in Canada. The decline in trade and output was particularly large in sectors with high levels of production sharing (goods produced in multiple, sequential stages in more than one country). In North America, about half of intra-regional manufacturing trade involves production sharing.

Motivated by these observations, this paper asks two quantitative questions: 1) What was the role of trade in the transmission of the recession in North America? 2) What was the contribution of production sharing and trade linkages to the large fall in trade? To answer these questions I develop a small open economy model with two tradable sectors, a non-tradable sector, and convex adjustment costs for capital. Production sharing is represented by a tradable sector that produces a composite good exclusively for the foreign market. Following a demand shock, this mechanism amplifies the impact on trade as it generates a fall in exports *and* a fall in demand for imported intermediates used in the production of exports. The capital adjustment costs further exacerbate the effect as the composite export good cannot be absorbed domestically, and the reallocation of productive factors is distorted.

I use OECD Input-Output tables and bilateral trade data to calibrate the model to Canada and Mexico. In the quantitative exercises I introduce shocks into the foreign import demand equations. In the benchmark calibration, the model can account for 72% of the fall in output in Canada, 19% of the fall in output in Mexico, and two-thirds of the fall in trade for both countries. In the counterfactual experiments I find that production sharing can account for about 40% of the fall in trade.

**Essay 2: The Impact of Climate Change and Climate Policy on the Canadian Economy**  
**With James C. MacGee and James B. Davies.**

This paper quantifies the net economic impact of climate change and climate change policy on the Canadian economy. We compare the economic costs and benefits from different emission reduction targets on the Canadian economy with their average economic impact in the rest of the world economy. We combine a small open economy model of Canada with the ANEMI model. The ANEMI model is an integrated assessment model developed at the University of Western Ontario that incorporates an energy sector as well as fossil fuel production into a neoclassical growth model. We use the ANEMI framework to develop our baseline analysis of the impact of carbon taxes on the world economy, and to generate paths of carbon emissions, climate, and (relative) prices of fossil fuels which we feed into our small open economy model of Canada. We compare the results from our Canadian economy to those of the ANEMI model for a carbon tax designed to maintain the level of CO<sub>2</sub>e below 550 PPM. We find that the economic benefits to Canada of this carbon tax are much smaller (in fact, negative) than they are for the rest of the world. This finding is mainly due to large differences in the calibrated damage function in the Canadian and world model ANEMI economies.

**Essay 3: Migration, Remittances, and the Domestic Sectoral Structure**

In this paper I study how the inflow of remittance transfers impacts the allocation of productive factors across sectors in developing countries. Remittances are an important source of income for many developing countries. The World Bank estimated that world remittances reached U.S. \$250 billion in 2007, about 2.5% of gross national income in the developing world. I develop an open economy OLG model with free labour mobility and varying tradability of sectors. The model predicts that countries that are net recipients of remittance payments experience a reallocation of productive factors from the tradable sector to the non-tradable sector. I find that the model prediction is consistent with data for a large panel of remittance receiving countries. Controlling for GDP and official aid per capita, the size of the agricultural sector relative to the service sector is about 80% larger in high-remittance countries.