

### Normalized Revealed Comparative Advantage (NRCA)

The NRCA index is a refinement of Balassa's RCA index (BRCA). It is symmetric, with 0 being the comparative advantage- neutral point. For a commodity to be at that neutral point ( $\hat{E}_j^i$ ), the share of that commodity in a country's exports to a destination must be exactly the same as its share in the world's total exports to that destination. Any deviation from this neutral point indicates comparative advantage or disadvantage. NRCA computes this deviation and normalizes it according to the following formula:

$$NRCA_j^i = \Delta E_j^i / E = (E_j^i - \hat{E}_j^i) / E = E_j^i / E - E_j^i / EE$$

where:

$NRCA_j^i$  = comparative advantage of country  $i$  in commodity  $j$

$E_j^i$  = exports of commodity  $j$  by country  $i$  to a destination

$E^i$  = total exports by country  $i$  to a destination

$E_j$  = world exports of commodity  $j$  to a destination

$E$  = total world exports to a destination

If  $NRCA_j^i > 0$  country  $i$  has a comparative advantage in commodity  $j$ .

If  $NRCA_j^i < 0$  country  $i$  has a comparative disadvantage in commodity  $j$ .

market, Canada held a large comparative advantage in the automotive, wood and paper, and energy sectors; a small advantage in the aerospace, agri-food, and metals and minerals<sup>24</sup> sectors; a small disadvantage in chemicals and miscellaneous manufacturing; and a large disadvantage in the machinery and electrical equipment sector.

However, after excluding the United States, the pattern of NRCA in the rest of the world is quite different (Figure 5). Canada's comparative advantage in the agri-food, metals and minerals, and aerospace sectors increases greatly, while the wood and paper sector preserves its advantage. However, automotive products and particularly energy become areas of comparative disadvantage, while the machinery and electrical equipment sector becomes even more disadvantaged than before. These changes reflect

Canada's different areas of specialization outside of the U.S. market.

Due to the enormous size and special character of the Canada-U.S. trading relationship, it dominates the patterns of Canadian RCA worldwide. Thus Canada's RCA in energy in the U.S. market causes Canada to post a high worldwide RCA in that sector, and yet Canada is very disadvantaged in energy exports to the rest of the world (Figures 4 and 5). It may be surprising to think of energy (or even automotive products) as an area of comparative disadvantage for Canada. Yet this is easily explained when we compare the share of energy in Canadian world exports (21.1 percent) with its share when the U.S. market is excluded (4.8 percent). Meanwhile, the share of energy in total global exports is 15.0 percent. Conversely, while Canada's

24 Advantage in metals and minerals dates from 2006 only.