

effects by introducing foreign technology and ideas into the domestic marketplace to consumers and producers alike. Unfortunately there is little empirical evidence on the impact of imports in Canada in this regard, but there are some international studies that quantify the spill-over effect. One such study examined the impact of Chinese imports on a sample of 200,000 European firms and found that competition from Chinese imports led to technology upgrading within firms as well as resource reallocation to technologically intensive plants. Between 15 to 20 percent of technology upgrading in the EU between 2000 and 2007 was attributed to competition from Chinese imports (Bloom et al. 2009). A link between imports and innovation was also found in Mexican plants. Teshima (2008) documents that sectors affected by greater tariff reductions were induced to increase R&D expenditures. However, in that case, R&D expenditures were more likely to go toward upgrading processes as opposed to products, suggesting that competition from imports generated greater incentives to increase production cost efficiencies rather than to create new products or increase product quality.

### *Trade and productivity in Canada*

Productivity performance is central to economic growth, competitiveness, and standards of living. This section examines two avenues by which opening trade has contributed to improvements in Canadian productivity: improvements in allocative efficiencies<sup>10</sup> and improvements in productivity efficiencies.<sup>11</sup>

Open economies tend to grow faster than closed economies because reduced barriers to trade improve productivity performance and support capital accumulation. For example, a recent study based on results from 14 OECD countries and 15 manufacturing sectors found that an increase in openness by one percentage point increased productivity in manufacturing by an average 0.6 percent (Badinger and Breuss 2008).

One of the best-known examples of open trade leading to improved productivity performance is the North American Auto Pact of 1965. Prior to the signing of the Auto Pact, the Canadian automotive industry produced most car models for Canadian consumers and the U.S. automotive industry did likewise for U.S. consumers. Since the Canadian auto market was much smaller than the U.S. market, the Canadian auto sector was at a substantial disadvantage in terms of scale of production in the Canadian market, and productivity in the sector was about 30 percent below that of the U.S. auto sector. The establishment of a free trade area for automotive products under the Auto Pact allowed manufacturers to consolidate the production of car models in one partner country, and export those models to consumers in the other partner country. This rationalization of production resulted in the reduction of the number of car models assembled in Canada. However, by concentrating resources into fewer models, total Canadian auto production actually increased while average costs for auto production decreased. Canadian

10 Allocative efficiencies refer to gains arising from reallocation of resources (labour and capital) across countries, industries, firms and varieties to the production of goods and services that a firm or a country can produce most efficiently to meet consumer demand.

11 Productive efficiencies occur when a country, an industry or a firm uses all of its resources efficiently, producing most output from least input.