

## 5.2 High-value production in Canada

The automobile industry is surprisingly high tech. The five biggest companies (GM, Toyota, Ford, DaimlerChrysler and Volkswagen) combined spent a total of \$33.7 billion USD on R&D in 2004! There is not a single other industry with five firms spending an average of almost \$7b on R&D. One can count the number of industries with *any* firm spending that much on one hand. R&D spending by suppliers is also increasing rapidly. By 2005, the automotive firm holding most U.S. patents was Robert Bosch GmbH, now the largest OEM supplier worldwide. The Ford Motor Company was runner-up. A search of the NBER patent database reveals that these two companies combined hold more than 11,000 patents and indirectly through subsidiaries countless more.

R&D is not only concentrated by firm, it is also predominantly carried out in Michigan. Its importance is not only apparent from the location of headquarters (more than 50% of the 150 largest North American suppliers are located there), but also in terms of recorded R&D spending. The Michigan Automotive R&D directory estimates that in 1999 total R&D spending in Michigan totalled US\$18b, almost all of which was privately funded, and involved 65,000 employees. Only California performs more R&D, but on a per-capita basis Michigan is unrivalled in the United States<sup>67</sup>. 70% of the research, US\$13.1b, was on automotive applications and Michigan alone represents 85% of total U.S. R&D spending in the industry.

It is not immediately obvious how Canada will attract a piece of the research pie. The vast majority of Canadian suppliers is in favor of government support for R&D activities; see below. Recent capital investment subsidies under the (federal) Canadian Skills & Innovation Project and the Ontario Automotive Investment Strategy have tied funding to locating some innovative activities in Canada. Ford is adding a research centre to its Oak-

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<sup>67</sup> At \$180,000 per capita of R&D, Michigan is only rivaled by Massachusetts (#3 at \$151,000) and tiny states with many headquarters like Delaware (#2) or Rhode Island (#4).