Re-Thinking Canada's BERD Gap

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All the Experts Agree

If there is one fact of innovation policy that every analyst can agree on, it is that Canada suffers a "BERD Intensity Gap" with the rest of the OECD; specifically, a gap between the amounts that Canadian business spends on R&D as a proportion of GDP, compared with its counterparts in other OECD countries. This is deemed to be a major national economic shortcoming.

The Council of Canadian Academies Expert Panel on Business Innovation reported in 2009[1] that *"Canada's BERD intensity has consistently remained near the back of its peer group, ranking 14th out of 20 economically advanced OCED countries in 2006 … Canada's ranking has been essentially unchanged over the past 25 years despite repeated calls and public policy initiatives …".*

The BERD intensity gap – and what Canada needs to do to eliminate it - is by now an article of faith for federal and provincial government innovation policies and programs.

A Tale of Two BERDs

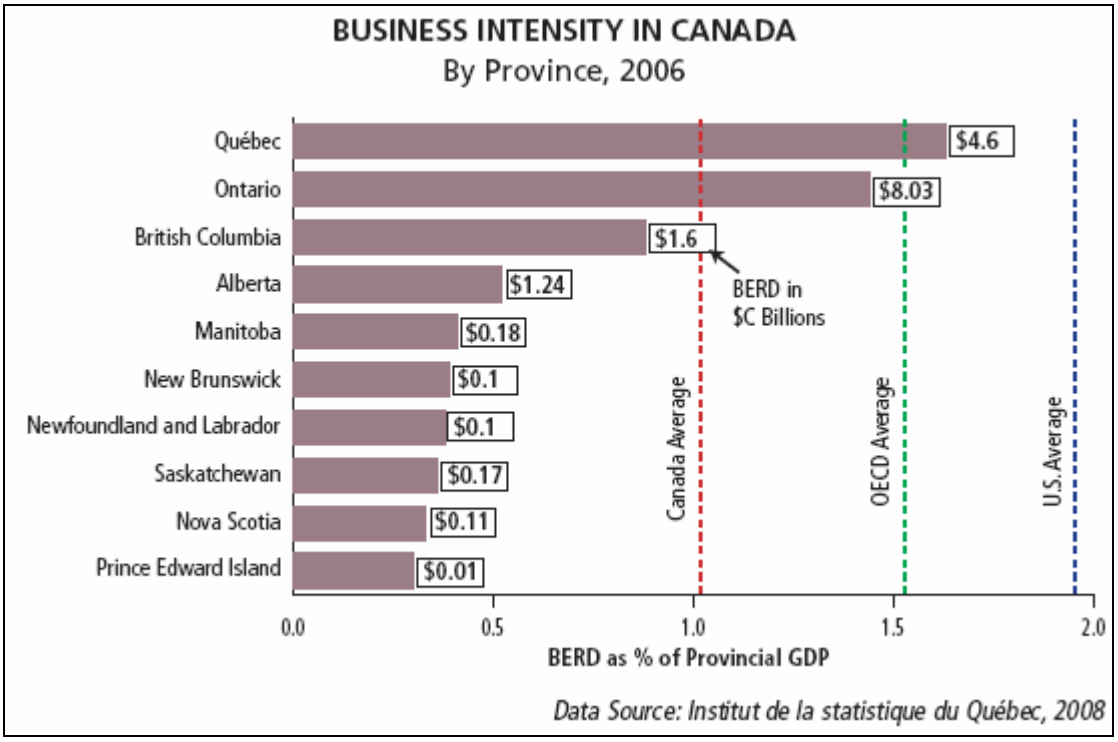
But a careful reading of the data in the CCA report paints a very different picture. It turns out that there are two very different circumstances at work (Figure 1).

In the two largest provinces that comprise about 2/3 of the population BERD intensity is practically identical with that of other OECD countries. In the other 8 provinces that account for 1/3 of population BERD intensity is below or substantially below the OECD average. In other words, in 2/3 of the country there is no BERD intensity gap.

Indeed, the CCA research further confirms that if Canada's industrial structure were to be normalized with that of the US, then part (though not all) of the apparent national BERD intensity gap between the two countries would disappear. This outcome would also apply to Ontario and Quebec, probably putting them above the OECD average. Remember, that in Ontario's case it has been able to achieve its OECD-level BERD performance without help from domestic automotive R&D, which is concentrated in the US and Asia. And in Quebec's case, it has leveraged comparatively high pharmaceutical and aerospace R&D, together with a higher participation rate by R&D firms, into a BERD intensity ratio that is somewhat above the OECD average. What about the other 1/3 of provinces (by population)?

[1] http://scienceadvice.ca/en/publications/assessments.aspx

Figure 1.



Source: CCA, p. 57

Clearly, all of the 8 provinces that apparently under-perform the OECD average are more reliant on their resource industries to generate GDP than Ontario and Quebec, each of which have correspondingly higher levels of manufacturing and business services. (Ontario and Quebec still have higher exposure to resource industry-generated GDP than most other OECD countries.) A feature of low-BERD jurisdictions such as these is that their resource industries are able to generate large amounts of GDP without the need for correspondingly large investments in R&D. That said, the CCA report demonstrates that the Canadian resource industries - Pulp and Paper, Basic Metals, Mining and Quarrying and Utilities - all out-perform their US counterparts in BERD intensity, so clearly they are not culprits.

A significant feature of the BERD-intensity measure (especially in the resource sector) is the "denominator effect". The more successful industries are (the higher the value of their output) the higher the value of the GDP they generate. This in turn lowers their BERD intensity, and vice versa. (Fixed rate of R&D spending divided by expanding output/GDP.) Resource industries in particular (plus agriculture, which was excluded from the CCA analysis) are almost entirely at the whim of world commodity prices, which are typically more volatile than goods or services prices. Thus we would expect, all things being equal, the BERD intensity performance of the 8 resource-intensive provinces to decline substantially under the influence of recent commodity price rises. So, even with no actual reduction in R&D spending the BERD gap would grow. This

would arithmetically pull down the apparent national-level performance, demonstrating the fault of using the BERD-GDP ratio as an indicator.

Implications for Policy

The very idea that Canada may not have a meaningful BERD intensity deficit after all will undoubtedly come as a shock to many. The country might have other deficits – an innovation deficit, venture capital investment deficit, machinery and equipment investment deficit or multifactor productivity deficit – but on the evidence it is hard to argue that we have a meaningful BERD intensity deficit, rather than a statistical artefact of our way of counting.

We would argue that what contributes to our national policy angst over BERD is that we don't read past the headlines to comprehend the underlying story – in this case the story of the two BERDs. But a more important point is that BERD intensity is not really a good measure of national research investment. R&D decision making is after all a microeconomic (firm level) activity, not a macroeconomic (national level) one. Firms do not earn or spend GDP, they deal in revenues, EBITDA[2] and profits. So a better comparative measure of research spending would focus on these indicators.

An interesting finding of the CCA report that has received little attention is that Canadian companies tend to be more profitable than their US counterparts, but spend less on R&D. The expert panel failed to make the connection. US companies obviously re-invest a higher proportion of their profits in research. Why are they able to do this while their Canadian cousins are not?

Just as Canadian governments have historically been forced to pay higher yields on their bonds to attract investment, Canadian companies need to earn higher profits to attract investment. After all, why would any investor put money into a Canadian firm when he or she could invest in an identical US firm, with its attendant higher growth prospects? So, Canadian firms need to earn higher profits to satisfy footloose investors, and thus have less money remaining to invest in research. It's not that business owners and managers don't want to pursue what the CCA calls "innovation-based business strategies" – they don't have as much cash to do so as their competitors.

We suspect that on a firm-by-firm basis our leading companies perform as well as their direct competitors, which is what counts in the end. We may not have enough leading companies in every industry sector to propel our overall research spending, GDP or standard of living, but that is another story for another time.

In sum, in policy (and programming) terms we would be better off worrying about our other possible deficits than our BERD intensity deficit.

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[2] Earnings before interest, taxes, depreciation and amortization.