

## Discussion of “Productivity Trends and Determinants in Canada” by Erwin Diewert

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It is a pleasure to have the opportunity to comment on a paper by Erwin Diewert on productivity. It is also a challenge, because so much of what I know about this subject I learned from Erwin. So let's look to see what we learned from Erwin this time.

As you know, Erwin's paper has two parts. The first is a review and reconsideration of the data on economy-wide labour and total factor productivity in Canada and the US. Erwin provides us with new and improved time series, and a very interesting decomposition of GDP growth into various factors.

The new series are valuable for a number of reasons. One is that Erwin uses a different method to calculate real industrial output, a method that does not rely on the prices used in the input-output tables. The results are reassuring, in that the stylised facts seem to be robust to the choice of deflation method.

This section also provides a very interesting decomposition of real output growth into its various components, including productivity. This is very useful, because it situates the productivity data in the context of economic growth in general.

Erwin then goes on to consider what factors determined Canadian productivity growth, with a some emphasis on policy-related factors. Here he takes a rather Talmudic approach, organizing his thoughts as a commentary on a paper by Rick Harris (those of you who don't know me should know that when I refer to something as “Talmudic” it is a compliment). This section also provides a very intuitive brief guide to the long list of things that influence productivity growth.

I have only enough time to comment on one aspect of the paper. I will focus on what, to me, is the most striking thing about the paper: the connection between its two parts.

There isn't any.

Erwin draws his conclusions about the determinants of productivity growth and the most promising avenues for policy intervention without any reference to the aggregate productivity series that he has just presented.

If the paper had been written by almost anyone else, we might think that this was an oversight. But that can't be the case. If anyone knows the meaning and importance of aggregate productivity data it is Erwin. And it is doubtful that any two people have thought more carefully about productivity policy in Canada than the tag team of Erwin and Rick Harris. If Erwin can't link the aggregate productivity numbers to his policy recommendations it is because it can't be done.

Why can't it be done?

The most obvious reason is that simply describing what happened in the past does not tell us if and how that past could have been different. Somehow, we have to break the past

down into its components, and use that to determine not only what happened, but what could have happened instead.

Perhaps the most common way of trying to do this is through cross country comparisons. Canada-US comparisons are in vogue at the moment, but comparisons to other countries are also undertaken. Unfortunately, there are many reasons why such comparisons invariably fail to convince anyone of anything that they didn't already believe before they saw the comparison.

One reason is that, as we were all taught in when we were in our late teens or early twenties, correlation is not causation. Let's consider one simple correlation that we might find in the data. The share of raw materials in total exports in Canada is much higher than the US share. One possible interpretation is that this is a *cause* of the productivity gap. According to this line of reasoning, abundant raw materials have made Canadians content to be to dig ore out of the ground instead of digging ideas out of our brains. However, another possible interpretation is that the difference in the raw materials share in exports is not a cause of the productivity gap, but a *consequence*. After all both Canada and the US have been amply endowed with raw materials. If productivity growth in the US has been faster than in Canada for some other reasons, that faster growth would have squeezed the export share of raw materials by raising end product exports more rapidly than raw material exports, and by increasing domestic demand for raw materials.

Even if we were able to isolate the proximate causes of productivity differences, we would not know if how these drivers could be altered by policy interventions. Suppose, for example, that you are convinced that faster growth of machinery and equipment investment in the US is the source of their relatively fast productivity growth. Does that point to an investment tax credit, lower corporate income taxes, lower capital taxes, lower capital gains taxes, lower inflation, indexation of corporate income taxes to inflation, or perhaps lower personal income tax rates so as to attract and retain the skilled labour that is needed to use the that equipment effectively?

We can, of course, try to focus directly on the policy differences across countries. But that cannot be conclusive, because policies are not randomly assigned to countries. For example, one of the most striking policy differences between Canada and the US is the amount of spending on military R&D. That could be a cause of the productivity difference; after all this led to the Jeep, the Global Positioning System, and (indirectly) Corning Ware. Or it could be a consequence of the productivity difference: *ceteris paribus*, a richer country is more interested in reducing its casualties in wartime, and hence tries to substitute capital (in the form of advanced military hardware) for labour.

Finally, even if we can be confident that a policy worked well in one country, that does mean that it would work well here. A few years ago I asked a group of Norwegian bureaucrats what they had done to turn around Norway's economic performance. One of the things that they were proudest to point to was an agreement with their major labour unions that had curbed excessive wage demands. That is, they felt that they had unlocked economic growth by solving a problem that we do not have.

We might hope to get around the problems inherent in cross-country comparisons by looking at time series data from a single country, presumably our own. We might hope

that looking at 50 years of data from one country would lead to clearer results than looking at data from 50 countries.

Unfortunately, the idea that the post-war data for a single country provides 50 independent data points is an illusion. It is implausible that changes in things like tax rates and investment at an annual frequency lead to changes in productivity or economic growth at an annual frequency that are large enough to see in the very noisy data that we are obliged to use. This is particularly acute given the long and variable lags that are certain to be a necessary part of the process of moving from investment (in innovation or physical capital or whatever) to increased productivity.

Of course, you may be interested in trolling through the aggregate productivity data not to obtain any new insights, but to find evidence that you can use to convince other people about the insights that you already have. There is nothing wrong with doing that, in my view, and I urge you to keep looking.

You may instead be interested in economic measurement, index number theory, or positive (that is to say descriptive) economic history. In that case, go ahead and collect, estimate, and present aggregate productivity data of every description.

But if you are looking for something that will shed some new light on what policies we should be pursuing, don't look for it in the aggregate productivity series. If Erwin can't find it, nobody can.