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# Has the rate of economic growth changed?

## Evidence and lessons for monetary policy

Summary of professorial lecture by Professor Matthew Shapiro<sup>1</sup>

Christopher Plantier, Economics Department

This article is a brief summary of a lecture given by Professor Shapiro on 8 April 2003 at Victoria University in Wellington. Professor Shapiro was a visiting professor under the Professorial Fellowship<sup>2</sup> programme sponsored by the Reserve Bank.

In order to implement monetary policy appropriately, the Reserve Bank must continually update and evaluate its view of trend productivity growth, so that it can assess how much of New Zealand's economic growth in any period is attributable to productivity changes and how much is due to increases in factor inputs (such as labour and physical capital). This distinction is important because it enables the Reserve Bank to assess the extent to which economic growth over a given period may be placing pressure on the productive capacity of the economy, and therefore potentially creating inflationary pressures. All else being equal, the higher the growth in productivity in the economy, and the greater its contribution to total economic growth, the faster the economy can grow without placing excessive pressure on productive capacity and the lower the risk of inflation rising as a result of rapid growth in the economy.

However, assessing trend productivity for any given period, and over time, is fraught with difficulties. One source of that difficulty is the inadequacy of economic data, which restricts the ability to assess precisely the extent to which productivity growth has contributed to total economic

growth over a given period. Moreover, there are difficulties in clearly determining the stage of the business cycle, and hence the cyclically-adjusted level of economic growth in any given period. This creates further obstacles to the accurate assessment of trend productivity growth. These difficulties create uncertainty about the extent to which the economy's growth over a given period may be placing pressure on resources in the economy and creating underlying inflationary pressures.

Professor Shapiro has studied the apparent acceleration of trend productivity growth in the United States in the 1990s. He has developed some techniques for better understanding and measuring the component of measured growth that is attributable to the business cycle, as opposed to being attributable to the trend.<sup>3</sup> Most attempts to measure productivity growth trends allow for cyclical factor utilisation, such as variations in overtime or capacity utilisation. These variations in factor utilisation can look like variations in productivity, but they are inherently related to the business cycle, and are not lasting. Accordingly, they can distort one's view of trend productivity growth.

On the other hand, there is another component that is not normally allowed for in attempts to differentiate trend from cycle. This concerns adjustment costs. Adjustment costs are incurred, for example, when businesses invest, which often happens in accelerated fashion late in the upswing of a business cycle. The investment diverts people and sometimes existing physical capital away from current production in order to put new productive capacity in place. During this phase, productivity appears to drop, since less current output is being produced by the same volume of inputs. But not only is this drop temporary, it results from the actions that are needed to increase trend productivity.

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<sup>1</sup> Matthew D. Shapiro is Professor and Chair of Economics and Senior Research Scientist of the Survey Research Center at the University of Michigan. He is also a Research Associate of the National Bureau of Economic Research. His website is <http://www.econ.lsa.umich.edu/~shapiro/>

<sup>2</sup> The Professorial Fellowship in Monetary Economics at Victoria University of Wellington was initiated by (and is funded by) the Reserve Bank. Fellows spend part of their time at Victoria University and part at the Reserve Bank, interacting with staff at both institutions and conducting research relevant to central banking in New Zealand. The views expressed by fellows do not necessarily reflect the views of the Reserve Bank of New Zealand.

<sup>3</sup> See Basu, Susanto, John G Fernald and Matthew D Shapiro (2001), "Productivity growth in the 1990s: Technology, utilization, or adjustment?" Carnegie-Rochester Conference Series on Public Policy 55: 117-165.

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Conversely, during downswings, businesses tend to invest less, using proportionately more of their current resources to produce current output, which appears as increased productivity. Again, this is attributable to the cycle rather than the trend.

In the research described in his lecture, Professor Shapiro asked whether there was any evidence that trend productivity growth in New Zealand had also accelerated in the 1992 to 2002 period, and he explored the nature of the cyclical adjustments relevant to the measurement of trend productivity growth in New Zealand.

The key findings from Professor Shapiro's research were the following:

- According to his estimates, trend total factor productivity (TFP) growth – referred to as trend productivity growth in the remainder of this note – in New Zealand appears to have been 1.1 per cent per annum from 1992 to 2002. TFP growth is the component of real GDP growth not explained by increased quantities of labour or capital with their embedded qualities.
- This trend productivity growth compares favourably with that achieved by leading countries in the 1980s, but is less than the nearly 2 per cent achieved by the US from the mid - 1990s.
- At projected labour growth rates, and without significant additional capital deepening, New Zealand's trend productivity growth rate would have to more than double to achieve the United States' performance of 3.5 to 4 per cent real GDP growth.
- Although an increase in trend productivity growth is by no means impossible, New Zealand's trend productivity growth rate has actually slowed since the mid-1990s. According to Shapiro, trend productivity growth was more rapid from 1992 to 1995 than from 1996 to 2002, falling from 1.5 per cent in the earlier period to 0.8 per cent in the latter period. Based on his calculations, much of the growth in the late 1990s and early 2000s came from increased capital accumulation, rather than trend productivity growth.
- The adjustment for cyclical factors that might bias productivity measurement over time *does not* have a dramatic effect in the New Zealand context.

- There are not unusually large problems with the statistics in New Zealand that would invalidate comparisons with other countries, at least when comparing growth rates across countries.
- In Shapiro's view, unlike the mid-1990s case for the United States, there is no support available from the New Zealand data for assuming strong trend productivity growth when assessing the appropriate stance of monetary policy and "taking a gamble" as he puts it. Shapiro notes that if central banks are to adjust monetary policy on the basis of an *assumed* trend productivity growth, they would need to commit to reversing the inflation consequences of getting it wrong by tightening monetary policy to such a level as to re-attain stability in the price level.

## What role does monetary policy play in fostering growth?

Shapiro argues that monetary policy can do little or nothing to affect the level of productivity in the economy in the long run, but that central banks should still be cognisant of potential changes in productivity of the economy over time, so as to be better informed of the inflation consequences of a given growth rate in total output. For example, the introduction of new technology or a new way of doing business may lead to one-off increases in aggregate productivity (or a sequence of one-off increases if economy-wide adoption takes time). Because of these jumps, monetary policy must diligently track trends in aggregate data that may signal when spurts in productivity have occurred.

In regard to forecasting trends in productivity growth, Shapiro suggests that monetary policy should be operated so that it can achieve "good outcomes even when forecasts of economic growth prove to be wrong." As noted above, his suggestion is that a central bank should commit itself to unwind any inflationary consequences arising from an incorrect view of trend productivity growth, so that they can credibly take a "growth gamble".

The analysis behind Professor Shapiro's lecture was published as a discussion paper, and can be found at [http://www.rbnz.govt.nz/research/discusspapers/dp03\\_07.pdf](http://www.rbnz.govt.nz/research/discusspapers/dp03_07.pdf).