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A smooth ride: Terms of trade, volatility and GDP growth ☆

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Abstract

International evidence indicates that higher terms of trade levels and lower terms of trade volatility contribute to enhanced growth outcomes, especially for commodity-export and developing countries. New Zealand's terms of trade have been high and remarkably stable since the early 1990s compared with past experience. We analyse the proximate reasons behind these high, stable terms of trade and then examine whether this terms of trade behaviour explains growth outcomes since 1960. Attention is paid to growth outcomes over a variety of economic regimes. Approximately half the variance in annual GDP growth over 45 years can be explained by the level and volatility of the terms of trade. The relationship is robust across four economic regimes.

JEL classification: F43; N17; O56

Keywords: Terms of trade; New Zealand; Economic growth

1. Introduction

Econometric analysis in Buckle, Haugh and Thomson (2004) indicates that "New Zealand GDP growth experienced an unusually long period of time in high growth and low volatility regimes during the 1990s." This conclusion built on the work of an earlier paper, Buckle, Haugh and Thomson (2003), that decomposed the GDP growth rate by sector, concluding that "the principal explanation for the decline in GDP volatility is a decline in the Services and Manufacturing sector production growth variances." While the decline in Services and

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Manufacturing growth rate variances arithmetically may be the cause of the decline in GDP volatility over the past decade, the study notes that they are not necessarily the causal factor behind the smoother growth rate.

A number of prior studies indicate that the terms of trade (ratio of export prices to import prices) are a key determinant of New Zealand cycles (e.g. Easton, 1997; Wells & Evans, 1985). This relationship is likely to reflect the importance of agricultural commodity exports within New Zealand's economy. A rise (fall) in export prices relative to import prices raises (lowers) returns to producers, so raising (lowering) capital investment and production within the economy. The effect is similar to a discrete change in total factor productivity since real producer returns (expressed as a ratio of consumer prices) are raised for a given level of inputs. Internationally, there is evidence that the level and volatility of the terms of trade are important determinants of economic cycles and of longer term growth trends in many small open economies, particularly developing countries and commodity-producing developed countries.

Our purpose here is to subject the relationship between New Zealand's terms of trade and the country's GDP growth rate to empirical test. Before doing so, we need to understand why the terms of trade may affect a country's economic performance. We draw on recent theoretical contributions in development economics and also on cross-country studies of economic performance. In the former group, two studies stand out: Hsieh and Klenow (2003) and Caselli and Feyrer (2005).

Hsieh and Klenow confirm the standard positive relationship between physical capital intensity and per capita incomes across countries. Using their own estimates, and citing the work of Eaton and Kortum (2001), they find that prices of imported capital goods do not explain the bulk of capital intensity differences across countries. Instead they find that consumption prices differ markedly internationally, being low in poor countries. Building on this work, Caselli and Feyrer find that marginal revenue products tend to be equalised across countries more than do marginal physical products. They state (p. 19): "One way to put this is to say that the main reason for capital's failure to flow to poor countries is that what it produces there is of little value, compared to the cost of installation."

A corollary of this finding is that a country's terms of trade are as important as its multifactor productivity in determining capital investment and production. A rise in the terms of trade induces greater capital investment and thence an increase in output. In a dynamic setting, high terms of trade lead to an increase in the growth rate for as long as the flow of extra new investment required to build the capital stock to the new equilibrium occurs. In practice, for sizeable changes in the terms of trade, this may yield a prolonged positive relationship between the level of the terms of trade and the country's growth rate. This relationship is further strengthened if net migration flows respond positively to the level of the terms of trade.

Traditional empirical analyses covering the relationship between the terms of trade and economic performance find that an adverse terms of trade shock depresses real demand and real incomes, resulting in lower growth (Barro & Sala-i-Martin, 1995; Easterly, Kremer, Pritchett, & Summers, 1993; Lutz & Singer, 1994). More recent analyses (Edwards & Yeyati, 2003) suggest that this effect is particularly relevant under fixed exchange rate regimes, but is mitigated when a country has a floating exchange rate since the real income effects are cushioned through exchange rate adjustment.

In addition to the level of the terms of trade, volatility in the terms of trade may be important. Turnovsky and Chattopadhyay (2003), building on the analysis of Ramey and Ramey (1995), theorise that various sources of volatility, including terms of trade volatility, can affect the equilibrium growth rate. The volatility may reduce capital intensity, especially where a country