Technological Change in the New Zealand Sawmilling Industry

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Abstract

This thesis addresses the role of technological change in the New Zealand sawmilling industry.

It consists of an examination of the importance of technological change on economic and industrial growth. The mechanisms by which technological change occurs in industries are examined, particularly the technological push model of Schumpeter, the demand pull model of Schmookler, and the technological paradigm/trajectory model of Dosi.

The technological paradigm/trajectory model is expanded upon and operationalised to examine the New Zealand sawmilling industry in terms of that model's parameters.

Two empirical studies were conducted to ascertain the historical effect of technological change in the development of sawmilling in New Zealand.

The first study examined various input and output variables in an econometric framework, with an emphasis on a production function approach. The second study utilised a factor analytic approach to reduce various technology related variables to a lesser number of variables. This was in order to describe a pathway of technological change in as simple terms as possible. The factor analytic approach facilitated the use of the technological

paradigm/trajectory model.

Generally, results showed that the economic and technological development of New Zealand sawmilling was characterised as having an emphasis on throughput of timber, possibly because economies of scale are difficult to achieve in sawmilling.

Specific findings were that the production of sawn timber in New Zealand has been increasing in an exponential manner, that there has been a slow but steady increase in the number of persons engaged in the industry, that the number of kilowatts in the industry has been increasing rapidly, that value added to timber, while being erratic, has been rising, that the level of value added per person has been rising, whilst the level of value added per kilowatt has been static. It was concluded that capital was substituted for labour in the production of sawn timber, and that the skill levels of labour in sawmilling increased. It was estimated that through time, the effects of technological change were such that an additional 2,402 cubic metres of sawn timber were added to the national output every year.

It was concluded that, given the globalisation of manufacturing, and process value adding in general, New Zealand sawyers need to saw to particular customer standards, in smaller order lots, and with greater degree

of manufacturing flexibility than has hither to been the case. This implies that sawmilling technology might well be on the point of a paradigm shift.

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Table of Contents.

List of Figures and Tables