



A Multinational Investigation of Softwood Sawmilling Innovativeness

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Description: Examination of innovativeness in softwood sawmilling in Australia, Canada, Chile, Norway, and the US.

Methods: Mail surveys in each country

Data Source: Mill managers in Australia (10), Canada (33), Chile (28), Norway (46), US (76)

Key Findings:

- Product and process innovativeness were not statistically different from each other, but were significantly higher than business systems innovativeness.
- Larger mills were more innovative than their smaller counterparts.
- Process innovativeness was positively associated with firm performance, product and business systems innovativeness were not.

Introduction

Most of the recent research on innovativeness in the forest sector has been focused on the North American industry. Here we compare innovativeness of sawmilling in other countries utilizing data from North American reported in one of our previous Research Briefs:

Measuring Innovativeness in North American Softwood Sawmills.

Specifically, we compare among key sawmilling countries:

- The innovative focus of sawmills
- The relationship between size and innovativeness
- The impact of export orientation on innovativeness

Methods

Data for this study was collected through mail surveys in each of the five countries. Valid sample sizes were Australia (10), Canada (33), Chile (28), Norway (40), and US (76).

Results

Table 1 outlines some of the basic characteristics of the forests and softwood lumber industries in each of the studied countries. Australia

and Chile operate primarily through plantation forests. These countries are, however, both the high and low cost countries from the perspective of operating costs.

Table 1: Basic Industry Statistics for Study Countries

	Australia	Chile	Norway	USA	Canada
Forest Area (million hectares) ¹	163.7	16.1	9.4	303.1	310.1
Plantation Area (million hectares) ²	1.0	1.9	0.3	15.9	--
Production (million m ³) ³	3.9	7.0	2.2	49.4	40.4
Net Exports (million m ³) ³	-0.09	3.3	-0.5	-19.8	23.0
Average Sawmill Operating Cost - excluding log cost ⁴ (\$/US/m ³)	\$104	\$42	\$53 ⁵	\$70	\$77

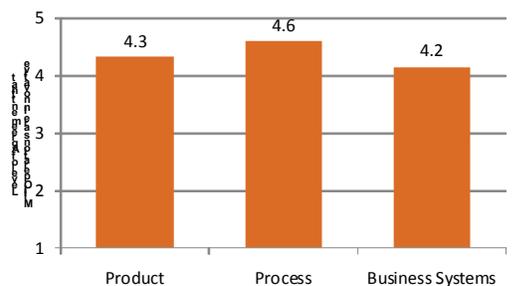
¹FAO 2007 (includes coniferous and non-coniferous), ²FAO 2008 (coniferous only), ³FAO 2010, ⁴The Beck Group 2006, ⁵Value is for all regions of Europe but excludes Russia

Respondents indicated their agreement regarding the level of innovativeness of their operation (the closer to 5 the more innovative). Overall, the mean for process innovativeness was 4.6, followed by product (4.3) and business systems (4.2) innovativeness. Overall, mean performance was 3.3. Chilean managers rated their operations as being highest in each type of innovativeness, Australian firms were lowest with respect to product and process innovativeness and US firms were lowest with respect to business systems innovativeness. There were, however, few significant differences.

Australian and Canadian mills were the largest with an average of 116 and 115 employees, respectively. US mills had average employment of 97 and Norwegian mills 53.

Previous research suggests that sawmills tend to be process innovative, but results from this sample indicate no difference between process and product innovativeness (Figure 1). Business systems innovativeness was lower than the other two types. The concept of business systems innovativeness can be problematic to communicate to managers and this may have influenced the results.

Figure 1: Average Innovativeness, Total Sample



A balanced focus on product and process innovativeness corroborates the findings of Hugosson and McCloskey (2009) where they suggest that, in the context of Sweden, the commodity view of sawmills is no longer current. A balanced approach to product and process innovativeness suggests a recent evolution in the industry.

Larger firms are slightly more innovative in each of the three areas when compared to smaller firms. Size has the largest impact on process innovativeness and the smallest impact on business systems innovativeness. For Canadian mills, size only correlates significantly with process innovativeness. In Chile, size only correlates significantly with product innovativeness. Although non-significant, in Australia size is negatively correlated with each type of innovativeness (possibly due to small sample size). This is just opposite of US mills where size is significantly and positively correlated with each type of innovativeness.

Our results show a strong connection between process innovativeness and firm performance, but no significant impact from product or business systems innovativeness. While these findings are similar to past research, we were concerned that this approach did not sufficiently distinguish among companies that were truly process versus truly product innovative. Accordingly, we identified 14 firms that were truly product innovative. Similarly, we identified 19 firms that were truly process innovative. The two sets were then compared based on performance. Although process innovative companies had a slightly higher mean for performance (4.1 versus 3.7; $p=0.41$), there was no significant difference between the two. This lack of a difference suggests that firms that are truly product innovative can be equally successful as firms that are truly process innovative.

Finally we explored the role of export orientation on firm innovativeness. Chile and Canada were considered exporting countries (see Table 1) and the US, Australia and Norway as non-exporters. Although mean values for exporting countries for both product and process innovativeness were higher than for non-exporting countries, no significant differences were found. Our data did not include a specific measure of export orientation for individual firms, rather we compared based on net exports by country. This is, of course, less than ideal and may explain why we found no differences. On the other hand, specific characteristics of the country sectors and their export markets may help explain the lack of difference. For example, the US is the largest export market for Canadian mills and much of the volume exported is standard, construction grade lumber. In this case, the theory that export markets require a higher customer focus and improved innovativeness may not hold. In this particular marketplace situation, exporting large volumes of commodity products could require fewer special skills. In another example, although Norway was treated as a non-exporting country, it in fact exports about 20% of its production and imports a slightly larger volume. In many cases the demands of the domestic Norwegian market are higher than those of export markets, something contrary to theory.

Managerial Implications

Although the history of the industry suggests a focus on process innovation, current findings show an industry that is equally product and process innovative. Findings also suggest that those firms that are most focused on product innovativeness can attain equal performance as those that are most focused on process innovativeness. Findings were generally similar country-to-country. Although innovation is both a costly and risky venture, our findings show that process innovativeness has a positive effect on performance, thus managers in the traditional wood industry can gain from being innovative. Our additional analyses indicated that firms that are highly product innovative have equal performance to those that are highly process innovative, indicating that for some firms, product innovativeness can be a path to enhanced performance.

Firm size is positively associated with each type of innovativeness for firms in this study. While we have no insight from this study regarding why this may be the case, it suggests that smaller companies should be cognizant of where they place their innovation investments vis-à-vis their larger competitors. The country analyses show some differences in the impact of size suggesting that data from the US heavily influenced the overall results. It is worth noting that the relationship between size and innovativeness was very small. Thus, size does not appear to be a major factor in the ability of sawmills to attain and maintain innovativeness.

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