

# Demand Pull Innovation: An Empirical Test Based on the Survey of Manufacturing Firms in China

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**Extended abstract:** Despite the little empirical support for demand pull innovation, it has important impact at the macroeconomic, sectoral and firm level both from theoretical and application view.

There are two effects on the influence of demand on innovation in the literatures. Demand can pull innovation by decrease innovative firm's production costs and extend market share on the one hand, on the other hand demand can provide incentives to innovate by reducing firms' uncertainty about future profit, the former is stronger for process innovations (Schmookler, 1962), and the latter is more suit for product innovation (Morrison et al., 2000).

In this paper, we study the influence of demand upon firm's innovation by using Chinese firm data from a survey of manufacturing sector. The survey was carried out by World Bank and National Bureau of Statistics of China in 2001 and covers five cities (Beijing, Chengdu, Guangzhou, Shanghai and Tianjin) and five sectors: apparel and leather goods, Electronic Equipment, Electronic Components, Consumer Products, Vehicles and Vehicle parts

Similarity to Guerzoni and Fontana(2006), we have an empirical joint test on the two effects because it is hard to distinguish the two effects clearly, but we further distinguish the differential between different firms' and try to examine whether there is an equal demand pull innovation, finally we have a

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comparison about demand pull innovation between Chinese firms and European firms, we think it is more interesting because the developed countries (European firms) are more focus on product innovation and the developing countries (Chinese firms) may be more focus on process innovation. As a result, The pulling are mostly driven by incentive effect in China as a technology import and imitation country

The following main hypotheses will be tested: a) The size of market has a positive impact on innovation, especially on process innovation. b) Interaction with customer has a positive impact on innovation, especially on product innovation.

Based on the main result, we also examine the possible difference about demand pull innovation between firms, the following hypotheses are tested: c) Firms producing exported goods have a higher probability on demand pull innovation, because exports as a main component of demand in china and have a large stimulus to innovation, d) the firms were affected by liquidity is smaller, the degree of demand pull innovation is lower, because these firms have more opportunities to financing R&D and share the uncertainty, so they are less sensitive to current sales when deciding to engage in R&D.

We test two types of analysis for main hypothesis: firstly, we focus on firms who have innovation (including process and product innovation both), try to identify whether there exists the demand pull innovation in china, secondly we focusing the process innovation, to test the demand pull innovation whether driven by market size.

Our explanatory variables include: the size of the market (the log of the number of competitors in the main business as stated by respondents), communication with user (equal to 1 if firms think the innovation is developed in cooperation with client and 0 otherwise),

We have following controls: R&D activity (equal to 1 if the firm performs R&D and 0 if not), firm size (the market share), sector fixed effect (a set of industry dummies),

For test hypothesis c), d), we use another two restrictions on dependent variable: for c): the export share of the entire sale (export share  $\geq 50$  and export share  $\leq 50$ ), for d) the liquidity constraint (yes or no).

The findings support our hypotheses, there exists demand pulled innovation in Chinese manufacture firms, the incentive effect is statistically significant and consistent with our intuition that china as a developing and technology import country, the innovation is more focus on process innovation, we also find the export's positive influence on innovation is also significant, and

liquidity constraint has a negative influence on innovation. But we cannot provide empirical support for uncertainty sharing.