

**Title of the Project** : **Appropriability Of Innovations In Indian Manufacturing**

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### **EXECUTIVE SUMMARY**

1. This report is based on information collected through a survey of the R&D managers of firms belonging to the Indian manufacturing sector. The Directory of R&D Institutions compiled by the Department of Science and Technology (DST), Government of India (2010) was used extensively to obtain the contact details of the respondent firms.
2. A total of 156 firms were surveyed, with those belonging to the drugs and pharmaceuticals, chemical and chemical products, machinery, and electronics industries, represented more heavily.
3. The key questions asked in the survey related to the:
  - effectiveness of alternative appropriability mechanisms
  - total number of innovations, and the number that were patented
  - motivations to patent
  - limitations in using patents
4. Respondents were asked to rank the effectiveness of various appropriability mechanisms for capturing and protecting the competitive advantage resulting from their new products and processes, on a scale of 1 to 7, where 1 equals 'not effective', 4 equals 'moderately effective', and 7 equals 'very effective'. The alternative mechanisms were:
  - Patents
  - Other IPRs - Copyrights, Trademarks, Industrial Design Rights
  - Secrecy

- Continuous Innovation (Lead Time)
- Complementary Sales And Manufacturing Services
- Technical Complexity
- Production Scale

Consistent with earlier studies relating to developed countries, patents and other IPRs are found to be the least effective appropriability mechanisms, both for product as well as process innovations. Secrecy turns out to be of paramount importance for the majority of the firms.

5. Further, the study attempts to look more formally at the factors associated with the effectiveness of patents as an appropriability mechanism. Based on the effectiveness scores given to patents as an appropriability mechanism by the responding firms, we classify firms into two categories – those that consider patents to be important, and those that do not. Using suitable regression techniques, it is found that the importance of patents does not vary systematically with firm size or a firm's age. Patent importance increases with the innovative potential of firms, where the latter is measured by increases in their R&D expenditures. Another factor that significantly increases the probability of a firm considering patents important is whether the firm is part of a larger group. Sectoral differences were not found to be significant.
6. Patent propensity rates, defined as the number of patents per employee and alternatively as the number of patents per unit of R&D expenditures, are low across the board, with the highest values for the pharmaceuticals and chemicals sector. Group firms show higher average patent propensity rates than the nongroup firms.
7. The most important motivation for firms to patent is to enhance their reputation and strengthen their position in inter-firm negotiations. The least important motivation is to earn license revenue. These results are invariant across discrete and complex industries.
8. The most significant reason for not patenting is the high costs involved, and the difficulty in proving patentability, and these results do not vary with firm size.