

The New Economics of International Technology Transfer and Intellectual Property Rights

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Annotated Outline

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Abstract:

Our intention in this paper is to suggest that traditional concepts of the channels, determinants and effects of international technology transfer (ITT) need to be updated to reflect the new realities of global markets and policies. This is perhaps especially the case in the context of how intellectual property rights (IPRs) affect such processes. We will review the traditional approaches, noting where they come short in thinking about the new competitive landscape. We then try to place ITT into an updated framework, accounting for such elements as global production networks, R&D outsourcing, technical standards, and the emergence of open-source means of innovation and diffusion. This framework requires some reconsideration of the impacts and roles of IPRs in supporting ITT. We also overview the cross-cutting capacities of IPRs with respect to ITT in critical public goods. Conditional policy recommendations conclude the paper.

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1. Introduction

This section will argue that standard conceptions of ITT remain viable and important but need to be updated. Globalization of production networks, new opportunities for outsourcing, and internationalization of R&D have changed the fundamental market-based channels of ITT. Generally there is no longer a “linear” progression from research to commercialization to a single form of global use of technology. ITT flows are also increasingly dependent on global deployment of knowledge workers, both within firms and across networks. Innovation increasingly reflects multiple channels of innovation and diffusion, including from developing to developed countries. And public sectors are increasingly devoting resources to science, technology and innovation, often with competitiveness concerns in mind but also with a view toward improving provision of global public goods. In this evolving landscape the roles played by IPRs are increasingly complex. While many argue that IPRs may be characterized as impediments to ITT this is a simplistic and misleading conception in important circumstances. Still, the evolving role of IPRs needs to be studied closely.

2. Traditional Concepts of International Technology Transfer

- A. The meaning of technology transfer: what must happen for technical knowledge to be “transferred”?
- B. Market-mediated channels and the extent of ITT.
 - a. Trade in capital goods and intermediates.
 - b. Foreign direct investments in production facilities.
 - c. Licensing within and across firms; joint ventures and sharing arrangements.
- C. Informal means of ITT
 - a. Spillovers and learning.
 - b. Reverse engineering and imitation.
 - c. Labor turnover.
 - d. International mobility of knowledge workers.
- D. Brief data overview of recent trends.
- E. Are there really market failures in ITT? Classic policy responses:
 - a. Trade restrictions and investment subsidies.
 - b. Policy preferences for licensing on advantageous terms.
 - c. Variable IPRs favoring diffusion and learning.
- F. Evidence about the roles of IPRs in this context. What do patent statistics tell us about technology diffusion?
- G. What remains relevant of this standard approach? What is missing?

3. Updated concepts: new markets and changing innovation models.

- A. Specific markets for trading technology have developed over time, what are the characteristics supporting this emergence? How have IPRs affected this emergence?
 - B. Probably the most significant trend has been toward increasingly complex global production networks, with multiple channels of information flows to vertical and horizontal production and distribution facilities.
 - a. New characteristics of outsourcing: what do new economic theories say about determinants of outsourcing and information flows?
 - b. How does this trend affect learning by upstream suppliers?
 - c. The role of downstream complementary assets and products.
 - d. What seem to be the impacts of IPRs on such trends? Do they matter at all? There is evidence of increasing *externalization* of knowledge flows associated with differences in incomes and patent regimes.
 - C. It is worth noting the remarkable growth in the internationalization of R&D activities. To a significant extent this is a horizontal, North-North reflection of complementary skills and endowments. But increasingly it reflects advantages of performing R&D for both local and global markets in major developing countries (DCs).
 - a. Basic evidence on geography and scope of R&D globalization. Note that some of this is focused on South-South technology development and transfer.
 - b. What are the basic reasons for this trend?
 - c. Importance for ITT of expanding flows of human resources from location of education and initial training to performing science and technology development and commercialization in DCs.
 - d. Does all this presage an increase in local learning and spillovers and what seems to be the role that IPRs play in supporting or limiting such spillovers?
 - e. How important is it for entities in developing countries to develop and trade their own IP assets?
 - D. Summary section on complex tradeoffs for IPR policy in this new competitive environment. Do IP rules restrict or enhance access of firms in DCs to global technological information? What specific IPR standards would matter most here?
4. Public-sector support for technology development and licensing. Another major change affecting ITT is the increasing concern of governments and international organizations to find means of transferring publicly developed or purchased technologies to DCs. This section would review recent significant policy trends and their implications.
- A. Invigoration of public investments in science and technology. Note the expenditures on public R&D tend to exceed those in private R&D in most DCs, though this may be changing.
 - B. Commercialization as a competitive issue. Bayh-Dole and its extensions to many emerging economies.
 - C. Emerging forms for transferring research results and products to DCs: the roles of international organizations and public-private arrangements. It is important here to

characterize the ways in which IPRs support or diminish such flows. Arguably, the ability to allocate exclusive rights and separate them geographically and/or on income grounds is a key to effective ITT.

- D. When is there a legitimate argument for public supports for ITT? What kinds of supports?
 - a. The situation with respect to global public goods – what are the impediments to transfers?
 - b. An innovation interest in supporting entrepreneurial activity.
 - c. What kinds of policy supports may be effective here? In these cases resort to “TRIPS flexibilities” may be most critical.

5. Summary and policy recommendations.

- A. Based on this review and analysis, what seem to be the major barriers to ITT? What remaining market failures would support policy interventions?
- B. Is there scope for unilateral policy space in DCs hoping to attract ITT?
- C. What might be recommended for the international community of nations to encourage ITT? Some examples to think through:
 - a. Additional public research supports (from both developed and developing countries) and prizes for particular technological needs, with low-cost distribution and access, including patent buyouts.
 - b. Recognition of research exemptions and other limitations on patent rights.
 - c. Greater opportunities for developing-country scientists to participate in research grants.
 - d. With respect to recognized global public goods, tying participation of firms commercializing new technologies emerging from publicly financed research to some obligations for deployment in poor countries.