without a clear sense of when these things are causes rather than partial correlates of actual growth and rationalizations of policy stances. While it is possible to argue for an active role of the centralized state in economic growth, or at least a role for it in shaping growth's form, growth did also occur in parts of the medieval world, not to mention the early modern Netherlands. It therefore remains undemonstrated that nationalism was the sole motivator of the individual actions that together produced this outcome.

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O Economic Development, Technological Change, and Growth


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In his acceptance speech for the 1991 Nobel Prize in Economics, Ronald Coase lamented what he called "... 'blackboard economics.' The firm and the market appear by name but they lack any substance" (R. Coase 1992, "The Institutional Structure of Production," Amer. Econ. Rev. 82:713–719). Coase would love this volume, for it combines careful institutional analysis with formal economic theory in a domain that has seen much abstract theory, and much less attention to the context and structure of actual markets for technology.

This volume is based on a ten year research project on the theory and practice of technology licensing in the engineering services market in the petroleum industry. The prevalence of specialized engineering services firms has created a fascinating division of labor between the suppliers of specialized technologies and their downstream petrochemical company customers.

In the initial chapters, the authors present a lucid review of earlier literature, and offer extensive qualitative evidence on the market for technology in a variety of industries including petroleum, software, biotechnology, and semiconductors. These chapters would ably serve as a foundation for a masters or doctoral level course on the topic due to their comprehensive treatment of the subject and their inclusion of a variety of perspectives.

A basic model, first introduced in chapter 5, analyzes the case in which upstream technologies can be sold to downstream users, who compete in the product market. The problem limiting this market is one of double-sided moral hazard: once the licensor has paid for the technology license, she may underperform on transferring the knowledge embodied in the license. Knowing this, the licensee will insist on making payment only after receiving the knowledge. Once he has received the knowledge, however, the licensee has no incentive to pay up. Moreover, much of the knowledge may be tacit in character, and may be difficult for a third party, such as a court, to verify. The canonical prescription here is that integrated ownership of both activities will outperform separate ownership, due to imperfections in the market for know-how.

The authors show that the canonical prescription is not borne out if a slight variation is introduced into the setup. If the licensor can bundle a complementary good with the technology, the complement acts as a "hostage." By credibly threatening to withhold the complement after transferring the technology to the licensee, the licensor can motivate the licensee to perform, while the licensee now has the assurance of receiving the transfer, prior to making payment. This allows the contract to become self-enforcing, even in the absence of verification by a third party. The authors note that many technology licensing agreements contain provisions that function very much like such complements, including know-how, and consulting advice.

In chapter 7, the authors develop a model for a licensing market, upstream from the product market. The authors demonstrate that the firm faces offsetting incentives, in choosing whether to license its technology or not, in addition to producing on its own. There is a direct revenue effect from licensing payment receipts. However, there is an offsetting rent dissipation effect that comes from increased competition in the product market, enabled by the licensing of the technology. A specialist firm (not engaged in the downstream product market) is more inclined to license than a firm engaged in downstream production, which leads to greater product market
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competition. The presence of a specialist firm can cause an integrated firm to license more, since it is likely to face greater product market competition.

This has important policy implications for the appropriate strength of intellectual property rights (IPRs). Much has been written about how strong patents can deter product entry and dampen innovation. The authors point out that while this may be true in the downstream product market, strong IPRs can facilitate entry in the upstream market for technology. Thus, the overall effect of strong IPRs on the amount of innovation in an industry is more subtle and nuanced than much of the argument to date has noted.

Having sung the book's praises, let me offer two critical observations. First, while the treatment of IPRs is extensive, the ambiguity of patent claims and the high enforcement costs of patents (Jean Lanjouw and Joshua Lerner 1998, "The Enforcement of Intellectual Property Rights: A Survey of the Empirical Literature," Annales d’Economie et de Statistique, 49/50:223-246) receive far too little attention.

Second, I found the organization of the chapters confusing. In chapter 4, the authors discuss why knowledge is context-specific and costly to transfer, which impairs the development of markets for technology. In chapter 5, the authors show that this tacitness need not impair the development of a market for technology, if a complementary good can be offered as well. Another odd juxtaposition arises in chapter 6 and chapter 7. Chapter 6 recounts the special case of licensing general purpose technologies, which are particularly well-suited to the development of an upstream technology supply market. Then chapter 7 presents a formal model of upstream and downstream industry structure, which takes no account of general purpose technologies. Surely the order of these chapters should have been reversed.

Notwithstanding these concerns, the book is essential reading in this area, is very well done, and is well worth your time. Read it yourself, and then assign it to your masters and doctoral students.

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Between 1985 and 1994, Mexico changed from one of the most closed economies in the world to one of the most open. This policy change, culminating in NAFTA, ended a long tradition of Mexican protectionism. In addition, Mexico’s governments freed prices, abolished exchange controls, privatized industries, and removed limits on foreign investment. A veritable economic revolution occurred in less than a decade. Equally importantly, this revolution seems to have been long-lasting. Mexico’s new policies have survived a severe economic crisis in 1995 and the tumultuous shift from control by the authoritarian PRI political machine to a multi-party democracy in 1997-2000. The Mexican experience, therefore, must contain useful lessons for anyone interested in the preconditions for credible economic reform.

Why did Mexico’s trade policies change so dramatically, and what made the new policies credible? The existing conventional wisdom, as Thacker points out in the first two chapters, does not adequately explain the facts. Most current explanations of Mexico’s opening depend on sudden shifts in either the beliefs of Mexican policymakers or in the country’s external economic environment. Explanations dependent on endogenous changes in the beliefs of Mexico’s policy-makers fail to account for the fact that very large and very influential interests had congealed around a century of trade protection. (Thacker refers to 40 years of protection, but Stephen Haber and Edward Beatty have pointed out that industrial protectionism in Mexico dates back to the nineteenth century.) Bureaucrats had made their career under the closed economy, industries had grown up dependent on favors from the state, and the official labor unions overrepresented workers in the industries most vulnerable to foreign competition. It is difficult to explain the policy shift by some endogenous change in the preferences of the groups that dominated the Mexican government.

Exogenous changes in Mexico’s economic situation also fail to explain the shift towards free trade. After all, as Thacker writes, "a country facing severe macroeconomic instability normally would not be expected to open its border to free
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