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INTELLECTUAL PROPERTY AND NATIONAL INNOVATION POLICY

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Best Practices or False Promises?

Technological innovation drives long-run national economic growth (Romer, 1986, 1990). Contemporary economic growth theory explains that economic development depends on technology change: Technology stasis leads to economic stagnation; technology progress leads to economic growth (Grossman and Helpman, 1991). "It is the spectacular and historically unprecedented growth rates of the industrialized market economies—the growth rates of their productivity and their per capita incomes—that, above all, set them apart from all alternative economic systems. Average growth rates for about one and a half *millennia* before the Industrial Revolution are estimated to have been approximately *zero*…"—eighteenth century elites in England had more-or-less the same per capita income as their counterparts had in third century Rome (Baumol, 2003:3, 14).

Practical, useful knowledge into the eighteenth century tend to be "unsystematic and informal, often uncodified and passed on vertically from master to apprentice or horizontally between agents. …The true question of the Industrial Revolution is not why it took place at all but why it was sustained beyond, say, 1820. …Much of the likelihood that knowledge will be transmitted depends on the social organization of knowledge, storage technology, and who controls access to it" (Mokyr, 2002:30, 31, 8). The explanation lies in the successive improvements over the course of the nineteenth and twentieth centuries in techniques to organize and transfer technology and useful knowledge within and across societies, that technology and useful knowledge cumulated, and that the capacity to manage technology and useful knowledge became institutionalized into societal life and practice.

In our era, national comparative advantages are measured by how technology institutions manage and apply technology and practical knowledge (Ziegler, 1995). Yet, technologies and practical knowledge do not necessarily cross national boundaries easily and organizational capabilities may be especially slow to enter some countries: "Best practice is more fraught with difficulty than the acquisition of technologies" (Kogut, 1991:39). The absorptive capacities of organizations in developing countries, their capacities for organizational learning and for the integration of know-how into routines and practices, vary considerably but tend to be poor (Keller, 1996). A World Bank symposium (1994) cautions that the acquisition of technology is the most important and difficult challenge faced by developing countries. A World Bank report (1996) recommends that a "National Knowledge System" model aimed at building the institutions that help create and sustain innovation, imitation, and knowledge networks guide the strategies of developing country policymakers. The 1998 *World Development*
Report of the Bank, which concerned the them "knowledge and development" emphasizes that "poor countries—and poor people—differ from rich ones not only because they have less capital but because they have less knowledge." Developing countries, if they are to acquire knowledge, must establish the *institutional, organizational* foundations for technological innovation.

The economics of institutions explain that 19th century U.S. and German institutions favored productive activity while 20th century developing country institutions afforded re-distributive and even predatory activity (North, 1990). The notion of the "national innovation system" focuses analysis on "the cluster of institutions, policies, and practices that determine an industry or nation's capacity to generate and apply innovations" (Nelson, 1993; Steil, Victor, and Nelson, 2002). Post-industrial countries, e.g., Germany, France, Japan, and the United

States, possess distinctive national innovation systems that owe to long-established patterns of political economy.

Germany's corporatist, co-determinist model produced remarkable post-war catch-up and sector-leading, world-class firms in, especially, craft-oriented industries due to cooperative management-labor relations, long-term oriented management and corporate governance; dependable *Mittelstand* SME supplier networks; patient, bank-financed investment; and facilitating regulatory and export policy environments (Kreile, 1978; Herrigel, 1996). Nevertheless, Germans did not lead technology innovation in the 1990s, despite considerable scientific potential (Siebert and Stolpe, 2002). France's "national champions" and "technology mission" model paired government-forced firm mergers with mission-directed technology systems, planning-oriented regulation, import and direct investment protectionism, and subsidy-laden organizations (Zysman, 1978). The technology missions were all more-or-less failures, the champions have largely been globally uncompetitive, and the whole system tends toward fragmentation and inflexibility (Messerlin, 2002).

The Japanese model, once called "capitalist developmental corporatism but perhaps better described now as "capitalist stagnation corporatism," was quite successful for quite some time at industrial, technological catch-up. The Japanese government, in partnership with Japanese *keiretsu* groups and banks, targeted key industries with subsidies, technology licenses, patent pools, R&D consortia, government procurement, import and direct investment protectionism, and export promotion (Johnson, 1982; Okimoto, 1989; Calder, 1993). The Japanese model produced the world's most efficient automobile and electronics makers but everything else is almost unbelievably inefficient: Markets are highly concentrated and stagnant (Posen, 2002); government at all levels is ponderous and stifling (Lincoln, 2001).

The American liberal-regulatory political economy has proved superior to the versions of corporatist political economy established in Europe and Japan with respect to creating technological innovation, introducing it into the marketplace, encouraging sector-leading high-tech firms, and producing higher economic growth. U.S. technological leadership owes to several identifiable strengths, including public financing of basic research through private universities and public laboratories; strong patent rights that have encouraged the commercialization of basic technologies into the marketplace; easily established start-up enterprises; adaptable, flexible organizations; flexible labor markets, MBA-educated, professional managers; and risk-taking, innovative financial markets (Chandler, 1977; Fligstein, 2002). Americans led innovation in computers and software, the Internet, composites, and materials, drugs, crops, and foods, and biotechnology (Gordon, 2002).

Whether born of revolution (Mexico in 1917), de-colonization (India in 1947), or civil war (China in 1949), developing countries in the 20th century typically adopted state-led models of development, investing public resources into establishing state-owned enterprises to lead industrialization and energy creation—Mexico by the 1930s, India and China by the 1950s. These new regimes, led by Cardenas, Nehru, and Mao as well as Ataturk and Nasser, mistrusted their own business interests as much as they mistrusted multinational business enterprises, identified high barriers to entry in mining, energy, and steel as compelling rationales for public enterprise, and seem genuinely to have believed that state-owned enterprises would achieve national goals (Waterbury, 1993). The developing countries adopted an import-substitution industrialization model of economic development, thereby rejecting the liberal, GATT-based, free-trade and open investment regime institutionalized after World War II (Biersteker, 1987; Haggard, 1990).

Nevertheless, whether the measure is growth rates, current account balances, or income distribution, the ISI strategy performed poorly. ISI failed because it depended on markets that were too small or too poor to provide economies of scale, on demand conditions that were too isolated to produced globally competitive industries, and typically resulted in inefficient production of bad products by insulated state-owned and private enterprises.

Resource abundance, thought in the 1950s to be a good thing for development if a country had it, is now understood to result in weak political and governmental institutions (Ross, 1999) and these institutions have become appreciated as absolutely key to development (Clague, 1997). "Whatever the form of government, economic progress tends to occur in societies in which there are clear incentives to produce, invest, and engage in mutually advantageous trade. By contrast, societies in which predation is the norm… are unlikely to be productive" (Olson, 1997). The conditions for economic growth in developing countries today remain essentially no different from the conditions that led to economic growth in 19th century Germany and United States and 20th century Japan: It's all about the institutions and in particular about the "establishment of such a set of property rights [that] allow individuals in highly complex interdependent situations to be able to have confidence in their dealings with individuals of whom they have no personal knowledge…" (North, 1989).

Korean economic development owes to the internalization of imitative technology into large firms by American-educated engineers, through study of foreign products, tours of foreign plants, the licensing of foreign technologies, and by the acquisition of small, often American firms with specialized technologies (Amsden, 1989; Kim, 1997). Since the 1997 Asian financial crisis, Korean policy has encouraged foreign direct investment. Taiwanese economic development, though similar to the Korean model, has long encouraged SMEs, entrepreneurship, technology licensing, and FDI (Simon, 1992).

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