1 INTRODUCTION

1.1 CLASSICAL DEVELOPMENT ECONOMICS AND CAPITALIST ECONOMIC DEVELOPMENT

The focus of classical mainstream economics, represented by William Petty, A. R. J. Turgot, Adam Smith, and others, is on the development implications of division of labor.[1] In a sense, the core of classical mainstream economics is development economics. This core includes the Smith theorem: Division of labor is the mainspring of economic progress (1776, ch. 1 of bk. I), division of labor is dependent on the extent of the market (ch. 3 of bk. I), and the extent of the market is determined by the transportation condition (pp. 25–32). Also, Smith's conjecture on the intrinsic relationship between specialization and the use of money (p. 37), his theory of capital according to which investment is a vehicle for increasing division of labor in roundabout production (p. 371), and his conjecture on the role of the invisible hand in coordinating the network of division of labor are part of this core. In addition, this core comprises Petty's theory of urbanization according to which cities can promote the division of labor by reducing transaction costs (Petty, 1683, pp. 471–2), and Turgot's conjecture on the relationship between the division of labor, the introduction of money, the extension of commerce, and the accumulation of capital (Turgot, 1766).[2] We refer to this core of classical mainstream economics as *classical development economics*.

The policy prescription of classical development economics is represented by this statement by Smith, which is consistent with Britain's liberal policy regime in the seventeenth to nineteenth centuries, as well as with liberalization policy reforms in nineteenth-century western Europe:[3] "Little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and tolerable administration of justice; all the rest being brought about by the natural course of things" (cited in Jones, 1981, p. 235).

We call the development experience that is associated with classical development economics *capitalist economic development*. Max Weber (1927), Rosenberg and Birdzell (1986), Braudel (1984), and North (1981) have stressed that capitalist economic development is a result of capitalist institutions. The capitalist institutions affect the level of division of labor and the related extent of the market via their effects on trading efficiency, while the level of division of labor and the extent of the market affect development performance, which in turn drives institutional changes. Also, the geographical and physical environment in western Europe and the north Atlantic were favorable for the evolution of institutions and division of labor. Many

historians consider the driving force of the development of capitalist institutions as the absence of a single overarching political power in Europe and the rivalry between hostile sovereignties, which created the opportunity for social experiments with a great variety of institutions within a relatively short period of time. This rivalry also created great pressure for rulers to creatively mimic those institutions that enhance economic performance and, thereby, their power.

Baechler (1976, p. 79) states: "Fundamental springs of capitalist expansion are, on the one hand, the coexistence of several political units within the same cultural whole and on the other, political pluralism which frees the economy." McNeil (1974, p. 125) also indicates that "The political pluralism of early modern Europe was, I think, fundamental and distinctive. When all the rest of the civilized world reacted to the enhanced power cannon gave to a central authority by consolidating vast, imperial states, the effect in western and central Europe was to reinforce dozens of local sovereignties, each consciously competing with its neighbors both in peace and, most especially, in war. Such a political structure acted like a forced draft in a forge, fanning the flames of rival ideologies and nurturing any spark of technical innovation that promised some advantage in the competition among states." Hall (1987), Mokyr (1990), Jones (1981, pp. 226–35), Braudel (1984, pp. 128–9), Weber (quoted in MacFarlane, 1988, pp. 186–7), and Laslett (1988, p. 235) also support this view.

Baechler (1976, pp. 77–113) indicates that the probability that such a pluralist geopolitical structure could be sustained for a long period of time in the absence of any political hegemonism is very low, since all power tends toward the absolute. Several explanations for the occurrence of this improbable phenomenon are proposed. One is to attribute it to particular geographical conditions of western Europe and the Mediterranean that are favorable for long-distance trade between city-states and unfavorable for a unification war (Baechler, 1976 and Mokyr, 1990, 1993). Around the Mediterranean and the English Channel, a great portion of highly populous areas were either coastal or island. The favorable conditions for trade were crucial for the emergence and evolution of capitalist institutions (Jones, 1981, p. 233). This pluralism in an international arena ensured that several cultures and sovereignties could challenge each other on a nearly equal footing. In contrast, east Asian geopolitical structures ensured the hegemonism of Chinese culture prior to the invasion by Occidental cultures. No other culture could challenge it. The Japanese, Mongolians, and Manchurians were conquered culturally by the Chinese, regardless of whether they were subordinated to, or were rulers of, China. China is a mainland country, so it is easy to win a unification war and very expensive for inland trade. Hence, the variety of institutional experiments in east Asia was much smaller than that in western Europe until Japan's Meiji Restoration.

In particular, Britain's geographic conditions ensured that she could avoid war with other countries, had lower defense expenses, a transportation advantage for trade; the evolution of its unique Anglo-Saxon culture and common law tradition. The pursuit of riches was legitimated under the prevailing ideology, so that talents were diverted from military, religious, and bureaucratic careers to business activities prior to and during the Industrial Revolution (Baechler, 1976, pp. 93–5). Competition among crown, local, and Church courts in Britain and amongst the state, the Church, and the decentralized feudal system also probably were conducive to the checks and balances on the top of the political arena in the western Europe (Baechler, 1976, pp. 78–80).

Another unique feature of western Europe was the development of free cities prior to the formation of nation-states. The free cities and related international trade became the cradle of capitalist institutions and economic development. In contrast, cities were princely fortresses in ancient Asia.

The particular conditions nurtured the political and legal institutions in Britain in the eighteenth century, then the institutions spread to the rest of western Europe via creative imitations and revisions in the nineteenth century. These fundamental institutions provided

conditions for the emergence of many important economic institutions, which significantly reduced transaction costs and therefore promoted the evolution of division of labor. Structural changes caused by this evolution are called industrialization, which includes increases in the income share of industrial output and in investment rate and saving rate (Lewis, 1955, Chenery, 1979, Kaldor, 1957, Kuznets, 1966).

According to classical development economics, the increase in income share of industrial output is a transition from a self-sufficient society, where no division between agriculture and industry exists and each individual produces all industrial and agricultural goods for herself, to a high level of division of labor between professional farmers and manufacturers (Lewis, 1954 and Ranis, 1988, p. 88). Increases in the income share of the sector producing producer goods and in related investment imply the development of division of labor in roundabout production, which endogenously generates technical progress. This industrialization process increases aggregate productivity and individuals' utilities (real income). The development performance then, in turn, affects the evolution of ideology and related institutions in a competitive arena between rival sovereignties.

Hence, capitalist economic development can be analyzed at five levels. At first, we consider geopolitical structure, such as the absence of an overarching political power in Europe. This structure determines the evolution of ideology, norms, moral codes, and political and legal institutions at the second level, which determines the evolution of commercial institutions, industrial organization, and business practices at the third level, which determines the evolution of division of labor and related economic structure at the fourth level, which determines aggregate productivity and welfare at the fifth level, which in turn affects the evolution of ideology, norms, and institutions (North, 1994). The second and third levels of analysis (institutions) have received substantial attention from the literature of property rights and the "new school of economic history." According to the literature, the evolution of capitalist institutions has the following features.[4]

1) The government's credible commitment to constitutional order with due process emerged from the significant variety of institutional experiments in western Europe. The legal basis for private property rights and state enforcement of private contracts based on rational procedure emerged from this constitutional order. Also, predictable laws and a professional bureaucratic administration were conducive to the reduction of transaction costs. Under this credible commitment mechanism, the rational state not only provided many services, such as standard measures of weight and distance, currency, and infrastructure (the highway system, the census, etc.), but also the state itself was governed by law (constitutional and public law). Automatic registration of private firms replaced the approval system and government monopoly for enterprise. The licensing system has not been subject to state opportunism since free association became a legitimate ideology and practise in western Europe in the nineteenth century. State taxation power became subject to the approval of representatives, and the king's coffer was separated from the Bank of England (Huang, 1991 and Pipe, 1999). These new institutions effectively restricted state opportunism. Also, Equity Law created a mechanism under which new cases could override outdated cases in the presence of justice, which made common law very adaptive to a changing world (Huang, 1991). This very adaptive legal system spontaneously created many rules to protect private property rights, in particular rights to residual returns and control of firms, business names, and brands. According to Mokyr (1990, 1993), the legal protection of residual rights was more important than patent laws for technical and managerial inventions and innovation. This institutional evolution in Britain and western Europe in the seventeenth to nineteenth centuries created an opportunity for solving the paradox of state power: how to tame the Leviathan. Legitimate and powerful state violence could then be used to protect individuals' rights via checks and balances at the top level of the political arena (MacFarlane, 1988, pp. 189–91).[5]

2) A special government policy regime of laissez faire and many government institutional innovations emerged in Britain after the Glorious Revolution and were later mimicked by other western European countries. Under this regime, mercantilist industrial policies, interventionist trade policy, and medieval regulations were abolished. This is represented by unilateral free trade in the UK in 1846, and by the 1860 Cobden Chevalier Treaty (Sachs and Warner, 1995a). Many innovative government institutions, such as the central bank system (for instance, the Bank of England as the first central bank, 1694), bankruptcy laws, the postal system, the government library system, the public school system, the publicly funded highway system, and national galleries and museums emerged from the rivalry between national governments. The tradition of free migration in western Europe also created great pressure for enhancing government's capacity for managing public affairs.

3) In this institutional environment, a set of market institutions emerged and developed. Private contracting for labor, land, capital, and other properties gradually substituted for non-market institutions. For instance, the labor market substituted for serfdom, slavery, and corvée. Private ownership of land and related markets substituted for, hereditary, non-alienable, and patrimonial land relationships, common fields, and estates with servile obligations. The capital market took the place of government's predatory, monopolistic, and interventionist role in money lending (for instance, the repeal of usury laws in Britain). Also, the market for technology and intellectual property superceded the government monopoly on technology and its infringement upon intellectual property rights (for instance, the Statute of Monopolies of 1624 in Britain). Many commercial institutional innovations emerged from this liberal institutional environment. They include modern double-entry accounting and bookkeeping, commercial instruments such as loans, stock shares, mortgages, bills of exchange, deeds of trust, insurance, power of attorney, franchising, and joint stock companies with limited liability.

Capitalist institutions spread on a global scale in the nineteenth century. The first episode of global capitalism, of course, came about as much through the instruments of violent conquest and colonial rule as through economic reform and development of international institutions. Starting around 1840, western European powers wielded their superior industrial, and hence military, power to challenge traditional societies around the world. France began to colonize north Africa in the 1830s and 1840s; Britain forced its way into China in the Opium Wars, 1839–42; Britain and France defeated Russia in the Crimean War, 1854–6; and Britain completed the conquest of India in 1857. Among the populous societies of Asia and the Near East, only Japan was able to mobilize social and political institutions to support market reforms, implementing the first "shock therapy" reforms following the 1868 Meiji Restoration.[6]

By the 1870s, a global market had begun to take shape along the following economic lines. Western Europe and the United States constituted the main industrial powers. A major push toward industrialization, especially in east-central Europe, followed the unification of Germany. Russia began a period of rapid industrialization, partly through the building of foreign-financed railways across Russian Eurasia. Japan had begun its dramatic opening to the world economy through the adoption of capitalist institutions and free trade. Note that early Japanese industrialization took place entirely under free trade, since the dominant Western powers imposed low Japanese tariff levels through "unequal treaties" that lasted until the end of the century. Latin America, after a half century of post-independence upheaval, finally settled into market-based, export-led growth in the 1870s, based on raw materials exports and capital imports (primarily for railroad construction). Africa, which lagged farthest behind, was gobbled up by the western European powers in an orgy of imperialist competition that reached its height between 1880 and 1910. Trade barriers remained low among these economies for several decades, from the 1860s to 1914.[7]

As in the late twentieth century, the emergence of the first global capitalist system was based on the interaction of technology and economic institutions. Long-distance transport and

communications achieved breakthroughs similar to those in the present (Headrick, 1981). The Suez Canal, completed in 1869, and the Panama Canal, completed in 1914, dramatically cut international shipping times, as did the progressive development of faster and larger steamships from the 1840s. New railways in India, Russia, the United States, and Latin America, often built with foreign finance, opened vast, fertile territories for settlement and economic development. The spread of telegraph lines and transoceanic cables from the 1850s linked the world at electronic speed. Military innovations, particularly the breach-loading rifle introduced in the 1840s, combined with mass production made possible by industrialization, decisively shifted the military advantage to Europe. Medical advances, particularly the use of quinine as a preventative against malaria, played a pivotal role in the spread of European settlements, domination, and investment, especially in Africa. Without a doubt, these technological breakthroughs were as revolutionary in underpinning the emerging global system as those of our own age.

On the economic level, key institutions similarly spread on a global scale. International gold and silver standards became nearly universal after the 1870s, eventually embracing North and South America, Europe, Russia, Japan, and China, as well as other European colonies and independent countries. By 1908, roughly 89 percent of the world's population lived in countries with convertible currencies under the gold or silver standard.[8] Basic legal institutions, such as business and commercial codes, were widely adopted. These were based on European models, mainly the Napoleonic Code, which absorbed some important features of Common Law. New multilateral institutions were established, such as the Universal Postal Union in 1878.

The system was highly integrative, as in the present. A network of bilateral trade treaties kept protectionism in check in most countries (the United States and Russia, where tariff rates were relatively high, being the exceptions). Nations as diverse as Argentina and Russia struggled to adjust their economic policies, and especially their financial policies, to attract foreign investment, particularly for railway building. The adoption of a stable currency tied to gold was seen as a key step in the strategy of international integration. In Russia, Count Witte recalled how he outmaneuvered the conservative tsarist court to introduce the gold standard at the end of the nineteenth century (Owen, 1997, pp. 15–16). In Latin America, liberal market regimes stabilized under both democratic (Argentina and Chile) and authoritarian (Brazil and Mexico) political regimes. In all four cases, overall growth of GDP and exports was very rapid, indeed historically unprecedented. India similarly enjoyed rapid export growth between 1870 and 1914 under British rule.

In a series of important papers, Jeffrey Williamson and his collaborators have shown that the open international system at the end of the nineteenth century produced an era of economic convergence (Jeffrey Williamson, 1992, 1993, and O'Rourke and Williamson, 1994). Peripheral countries in Europe, such as Ireland and the Scandinavian countries, experienced rapid growth that narrowed the gap in real wages with the more advanced countries, the United Kingdom, France, and Germany. Former European colonies in Latin America and the South Pacific (Australia and New Zealand) similarly achieved convergent growth rates based on export-led growth.

In a massive study of long-term growth in 41 developing countries, Lloyd Reynolds similarly found that the open international economy of 1850–1914 was crucial in promoting the onset of rapid economic growth in much of the developing world outside of Europe and North America (Reynolds, 1985). Reynolds noted that "politics apart, the main factor determining the timing of turning points has been a country's ability to participate effectively in the trade opportunities opened by expansion of the world economy" (Reynolds, 1985). He then pointed out the wide range of countries that were indeed able to avail themselves of the burgeoning trade opportunities, including almost all of Latin America (with the exception of Venezuela); much of Asia, including but not limited to Ceylon, Burma, Malaya, Thailand, Japan, Taiwan,

and the Philippines; and parts of Africa, including Algeria, Nigeria, Ghana, the Ivory Coast, Kenya, Uganda, Tanganyika, and Southern Rhodesia (Reynolds, 1985, pp. 34–5).

Capitalist economic development has spread mainly as capitalist institutions have spread around the world from their home base in western Europe. This diffusion process is driven by challenges and competition between different societies, which might be associated with war, conquest, and colonization. Hence, the spread of capitalist institutions could be either a creative imitation process or a painful imposition process.

1.2 THE BREAKDOWN OF THE FIRST GLOBAL CAPITALIST SYSTEM AND NEOCLASSICAL DEVELOPMENT ECONOMICS

Keynes (1971) rightly intuited in 1919 that the Humpty Dumpty of world markets and shared institutions would not soon be put back together in the harsh peace that followed the First World War. Indeed, the war and its aftermath laid waste to the emergent global capitalist system for more than half a century. The financial underpinnings of the late nineteenth-century liberal order were not reestablished. British dominance in the international financial system was ended by the Great War, and neither US leadership nor international cooperation took its place (Kindleberger, 1973, Eichengreen and Flandreau, 1994). Financial instability and the failure of the gold standard rocked the 1920s and contributed to the Great Depression of the 1930s. The export-led growth of the primary producers in Latin America and elsewhere was undermined by low and unstable commodities prices in the 1920s, and then was devastated by the Great Depression, which brought about the utter collapse of the terms of trade, intense protectionism in Europe and the United States, and the end of capital inflows.

Political upheaval accompanied economic and military upheaval. Most important was the Bolshevik Revolution in Russia in 1917, and the emergence of fascist states in Italy and Germany in the 1920s and 1930s, respectively. In Latin America, the traditional political power of the landholders and mine owners was undermined by the collapse in the terms of trade. The free trade regimes of the late nineteenth century were replaced by a revolutionary regime in Mexico and authoritarian regimes in Argentina, Brazil, and Chile that were heavily influenced by the state planning of the communist and fascist regimes in the Soviet Union and Europe.[9] Throughout the world, state planning, authoritarianism, and militarism competed with limited government and market-based economies. Whether or not economic theory offered insights and predictions about these alternative strategies, political leaders felt compelled to push for new and radical experimentation.

Two events prior to the Second World War strengthened the tendency of economics to move away from classical development economics. One is the Great Depression in 1930; the other is the relatively successful industrialization of the Soviet Union in the 1930s. Krueger (1995) indicates that the two events and Keynes' advocacy for state intervention and investment fundamentalism were crucial for the formation of the spirit of neoclassical development economics.

According to an inframarginal analysis of the trade-off between the positive network effect of division of labor on aggregate productivity and the reliability of a larger network of transactions in chapter 10, as transaction conditions are improved and the risk of coordination failure for each transaction declines, the benefit of a larger network of division of labor outweighs the increased aggregate transaction risk. Hence, the equilibrium network size of division of labor and the equilibrium aggregate risk of coordination failure of the whole network increase side by side. This implies, on the one hand, a greater degree of industrialization and higher aggregate productivity, and on the other hand, greater likelihood of a coordination failure in the larger

network of division of labor. Hence, to a certain degree, the Great Depression is a "crisis of success" and a sort of cost of successful industrialization and globalization that we had to pay. This is similar to choosing a higher risk of being killed when we choose to drive on a freeway. The decision is rational and efficient as long as the expected benefit from doing so outweighs the higher risk of being injured or killed in a traffic accident. If people really understood this mechanism for economic development, they would not turn to communism and distrust of the market mechanism when such an event takes place.[10]

Also, as the cobweb model in chapter 19 will show, when globalization and liberalization develop, the sensitivity of the feedback mechanism in response to a coordination failure will increase. The efficient balance of the trade-off between stability and sensitivity of the market feedback mechanism implies that the stability of the larger network of division of labor will decrease and the risk of devastating crisis will increase. When Keynes did not understand the trade-off, he suggested we go back to the autarchic state to avoid the risk of a great crisis.[11] We would conjecture that if development economics had been better able to explain the mechanism behind the Great Depression, the thinking in the 1950s on state-planned development would not have been as influential.[12]

In chapter 10 we cover general equilibrium models that explain the development mechanism with concurrent increases in aggregate productivity and in aggregate risk for coordination failure. The complicated trade-offs among moral hazard, transaction costs, and the positive effect of insurance on the reliability of the network of division of labor are investigated in connection with the recent Asian financial crisis. These models formalize Sachs' (1998) seemingly paradoxical notion of a "crisis of success." They show that as transaction conditions are improved, the equilibrium network of division of labor expands and the efficient aggregate risk for coordination failure increases because of trade-offs among economies of division of labor, reliability of the network of transactions, and transaction costs. Insurance can be used to enlarge the scope for trading-off one against the other conflicting forces, at the cost of increasing moral hazard. Hence, there is a trade-off between the positive effect of insurance on the reliability of the network of division of labor and the distortions caused by moral hazard. The complicated trade-offs imply that simply reducing moral hazard or following a simple slogan of liberalization will not necessarily ensure the efficient balance of these trade-offs. Repeating the overreaction to the Great Depression by resorting to communism, central planning, protectionism, or interventionism is also not the right way out. An inframarginal analysis of the general equilibrium mechanism of the crisis in chapter 10 will provide a balanced comprehension of new development phenomena generated by globalization.

The second event that reversed the tide came from the industrialization experience of the Soviet Union in the 1930s and that of China in the 1950s. This is a special pattern of state-planned, big-push industrialization. The major features of this pattern are as follows.[13]

China and the Soviet Union mimicked successful patterns of industrialization in developed capitalist economies, such as a high saving rate, an increasing income share of heavy industry producing capital goods, the Taylor scientific management approach, mass production, standardization, comprehensive investment programs, and internal organizational patterns of large capitalist corporations. However, the mimicry was not associated with a market and private property rights, as happened in Taiwan and South Korea in the 1960s and 1970s. Instead, the imitation was conducted by the central planning system through infringements upon the private property rights which created the industrialization patterns in capitalist economies. The precondition for the success of state-planned big-push industrialization is to mimic whatever succeeds in a capitalist economy. Many economists predicted that such a system could not succeed, since it destroyed the incentive mechanism that created the successful industrialization pattern (see, for instance, von Mises, 1922). But they were surprised by the relatively successful industrialization in the Soviet Union in the 1930s.

The short-run success impressed the leaders of many newly independent countries, who were busy with the task of state building. In particular, they believed that in a reverse engineering of capitalist institutions, they could repeat industrialization by mimicking capitalist industrial patterns and by ignoring fundamental capitalist institutions, including the legal system, constitutional order, behavior norms, and moral codes. Mainstream thinking on economic development converted from liberalism to the convictions of state-planned economic development and industrialization. Since classical development economics did not establish a sound theoretical foundation, economists could not really comprehend the mechanism of modern economic development and the real reason for the Soviet Union's short-run success. They were easily converted to ideas of state-planned industrialization. Despite the short-run success of Soviet-style big-push industrialization, the fall of the Soviet Union announced the long-run failure of state-planned economic development, compared to Hong Kong's pattern of market-led industrialization, which is a modern version of Britain's development pattern. As Britain's original capitalist development experience spread to Europe in the nineteenth century, Hong Kong's capitalist development experience was followed by Taiwan, South Korea, Thailand, and China. As Sachs (1996) suggests, the fatal long-run negative effects of Soviet-style industrialization will outweigh its short-run positive effect on economic development once the potential for mimicking has been exhausted. The disintegration of the Soviet Union, along with reforms in China and other developing countries, symbolize a shift in development policy regime, which is associated with a shift of development economics back to its classical origin.

The final support for a move away from classical development economics came from the idea that a great variety of institutional experiments might be helpful for discovering the institutions that are most conducive to economic development. Keynes (e.g. 1933) stressed that countries simply demanded the right to experiment with new economic models, since the old ones no longer commanded respect and assent. He joined the chorus for experimentation, vividly exemplifying the end of intellectual faith in global capitalism by the 1930s. His point was that there is no prospect for the next generation of a uniformity of economic systems throughout the world, such as existed, broadly speaking, during the nineteenth century; that we all need to be as free as possible of interference from economic changes elsewhere in order to make out own favorite experiments towards the ideal social republic of the future; and that a deliberate movement towards greater national self-sufficiency and economic isolation would make our task easier, insofar as it can be accomplished without excessive economic cost (Keynes, 1933, p. 241). This line of thinking is supported by documentation of the fact that experiments with a more active government role and different institutions in the US and on the European continent generated growth performance superior to Britain's in the second half of the nineteenth century (see Craft, 1997).[14]

In response to these events, the term "development economics" was coined after the Second World War, when it became a field of applied economics relevant only to less-developed or underdeveloped countries.[15] We call this version of development economics *neoclassical development economics*; it pays more attention to the fourth and fifth levels of analysis of development (structural changes, such as an increase in income share of industrial output, and productivity progress).

Neoclassical development economics rejects the universal applicability of classical development economics and the capitalist development experience. It does not pay much attention to the intimate relationships between the evolution of division of labor and the institutional evolution that affects transaction costs, and between the evolution of division of labor and structural changes. It is characterized by the following features: the belief in protectionist trade policy (import substitution) to provide shelter for infant industries and industrialization; distrust of private entrepreneurship, the market, and related international trade; specific and comprehensive government industrial policies and investment programs; the belief that government,

as a paternalistic benevolent planner, and state-owned firms should take the leading role in development (state-planned industrialization); pessimism that exports from developing countries could grow (the theories justifying worries about a shortage of foreign investment and a shortage of foreign exchange); investment fundamentalism (i.e., a high saving rate is the engine of growth); specific and sometime comprehensive planned targets for development;[16] urban-biased price controls and other interventionist policies; marginal analysis; and partial equilibrium or disequilibrium analysis (see Krueger, 1995, 1997 and Behrman and Srinivasan, 1995 for a critical assessment of development strategies). We call economic development guided by neoclassical development economics *state-planned economic development*.

The shift from capitalist economic development to state-planned development was associated with the shift of development economics from the core of mainstream economics to its periphery. The latter shift started with Alfred Marshall (1890). Chapters 8–12 of book IV in Marshall's keystone text are full of insights into the development implications of division of labor. He described the network of division of labor as an economic organism. Unfortunately, Marshall could not formalize his insights into development economics in a mathematical framework. This formalization must specify an individual's decision in choosing her occupation and her level of specialization.

Choosing a professional occupation is a yes-or-no decision. If you choose economics as your major during your college education, you do not go to classes in chemistry and physics; you go to classes in micro- and macroeconomics and econometrics. To say "yes" to a major and say "no" to other majors is an inframarginal decision, in the sense that decision variables discontinuously jump between zero and a positive value as one shifts between majors. For a given major which you have chosen, you compare the relative marginal cost and relative marginal benefit between two fields to choose the optimum allocation of your limited time between different fields in the major that you have chosen. This is called a marginal decision. In terms of mathematics, marginal analysis is classical mathematical programming, and inframarginal analysis is associated with linear and nonlinear programming and other kinds of nonclassical mathematical programming. Inframarginal analysis is a total benefit–cost analysis across corner and interior solutions, in addition to marginal analysis of each corner and interior solution.[17] When you compare your life with the lives of secondary-school classmates who currently specialize in other occupations, you can see that an inframarginal decision is often more important than a marginal decision.

Inframarginal analysis is essential for formalizing classical development economics. But Marshall did not know how to handle inframarginal analysis when he tried to formalize classical mainstream economics within a mathematical framework. Hence, it is not surprising that Marshall could not formalize his insights into classical development economics within a mathematical framework. In order to get around the corner solution, he made the very unrealistic assumption that society is divided between pure consumers, who do not make production decisions, and firms, which are exogenously given. This dichotomy, together with the assumptions of a quasi-concave utility function and a convex production set, ensure that interior solutions may occur in equilibrium.[18] Then, marginal analysis of interior solutions can work. Within this neoclassical framework of marginal analysis, pure consumers have to buy all goods from the exogenously given market and firms, and cannot choose their level of self-sufficiency or its reciprocal, the level of specialization. Thus the focus has shifted from the development implications of division of labor to marginal analysis of demand and supply. Marginal analysis cannot be used to investigate individuals' decisions in choosing their occupation patterns and levels of specialization. It cannot explain the emergence and evolution of markets as a result of the evolution of division of labor.

The fatal flaw in this framework is that the equilibrium and Pareto optimum allocation of resources are always associated with an exogenously given production possibility frontier (PPF).

Hence, we cannot use this framework to address the classical question of economic development: why aggregate productivity can be increased by an increase in the level of division of labor in the absence of changes in production functions and endowments, and how the invisible hand coordinates division of labor to promote economic development. Since it cannot predict the emergence and evolution of markets, it is not applicable to studies of economic development and a decrease of the degree of scarcity.

Marshall was aware of the fatal flaw in neoclassical marginal analysis of demand and supply. He suggested the use of the concept of external economies of scale to describe the effects of social division of labor on economic development. However, Allyn Young (1928, p. 533) argued that use of a notion of large-scale production misses the phenomenon of economies of division of labor. He emphasized Smith's classical general equilibrium view of the network of division of labor: "The mechanism of increasing returns is not to be discerned adequately by observing the effects of variations in the size of an individual firm or of a particular industry, for the progressive division of labor and specialization of industries is an essential part of the process by which increasing returns are realized. What is required is that industrial operations be seen as an interrelated whole" (p. 539).

However, Marshall's formalization of marginal analysis of demand and supply established the neoclassical economic mainstream in the following sense. Marshall's mathematical structure of marginalism gives the teaching of economics a well-organized structure. Within this structure, not only can different generations of economists and students share a common dictionary, but teachers can also set up good questions and exercises in classrooms and in examinations for which unique, correct answers are expected. What teachers demonstrate on the blackboard can be exactly duplicated by many students. This common mainstream facilitates division of labor between different generations of economists and between different fields of economics. Unfortunately, the neoclassical mainstream does not carry the core of classical mainstream thinking on the development implications of division of labor. As an unexpected consequence of Marshall's success in formalizing marginal analysis of demand and supply, the core of classical economics concerning economic development has been forgotten. As indicated by Young (1928, pp. 538–40), the "possibility of economic progress" can not be fully understood without this core.

The failure of the Soviet-style experiment with the socialist system shows that it is impossible to have successful social experiments if the rights for experimentation are monopolized by a totalitarian government and if individuals have no rights to experiment with various institutions via voluntary trade of property rights in the free market and under a fair constitutional order. The conviction that less-developed countries can catch up by mimicking the legal and economic systems of capitalist developed countries in the absence of a constitutional order was challenged by the defeat of Nazi Germany and Japan in the Second World War. It has been challenged again by the transition of Taiwan, South Korea, and other Asian countries from an authoritarian regime to democracy.

1.3 A RETURN TO CLASSICAL DEVELOPMENT ECONOMICS

There were scattered efforts to keep classical development economics alive when it shifted from liberalism to advocacy for state-planned development. Rosen (1983, p. 44) suggests that Young (1928) was "the zenith of the analysis of the connection between specialization and economic development." Young criticized technological fundamentalism, which claimed that exogenous technological progress was the engine of economic development, and investment fundamentalism, which claimed an if-and-only-if positive relationship between current saving and future productivity. He considered increases in per capita capital as increases in division of

labor in roundabout production. This view of capital is consistent with Smith's classical view of investment, that investment is a vehicle for increasing division of labor in roundabout production (Smith, 1776, p. 371). According to Young and Smith, society's capacity to create and absorb new knowledge and to invent new technology is determined by the extent of the market, which is in turn determined by the level of division of labor. Marshall (1890, p. 256) also attributed the invention of the steam engine by Boulton and Watt to a deep division of labor in inventing activities. Young proposed the Young theorem: "The securing of increasing returns depends on the progressive division of labor"; "Not only the division of labor depends upon the extent of the market, but the extent of the market also depends upon the division of labor"; "Demand and supply are two sides of the division of labor" (this is also known as the reciprocal law of demand). The Young theorem implies that, in the absence of a sufficiently high level of division of labor and a related sufficiently extensive market, not only can new technology not be invented but also, even if it were invented, it would be a commercially nonviable luxury.

Houthakker (1956) formalizes Smith's concept of endogenous absolute advantage using a graph. He shows that this concept might be more general than Ricardo's concept of exogenous comparative advantage, and that the trade-off between economies of specialization and transaction costs may be used to explain the endogenous progress of aggregate productivity. But as Stigler (1976, pp. 1209–10) notes, "The last of Smith's regrettable failures is one for which he is overwhelmingly famous – the division of labor. How can it be that the famous opening chapters of his book, and the pin factory he gave immortality, can be considered a failure? Are they not cited as often as any passages in all economics? Indeed, over the generations they are. The failure is different: almost no one used or now uses the theory of division of labor, for the excellent reason that there is scarcely such a theory . . . there is no standard, operable theory to describe what Smith argued to be the mainspring of economic progress. Smith gave the division of labor an immensely convincing presentation – it seems to me as persuasive a case for the power of specialization today as it appeared to Smith. Yet there is no evidence, so far as I know, of any serious advance in the theory of the subject since his time, and specialization is not an integral part of the modern theory of production."

The scattered efforts to keep classical development economics alive gradually became an increasingly more influential flow of thought. Several separate literatures contributed to this development. First, the literature on the economics of property rights, transaction costs, and institutions, represented by Coase, pioneered the renaissance of classical development economics. The literature of new school of economic history, represented by North, and the literature of constitutional economics and new political economics, represented by Buchanan, pushed this line of thinking further. The literature of formal models of transaction costs and contracts then consolidated the position of this research line in mainstream economics. Second, criticisms of state-planned development since the 1980s by World Bank and prominent development economists, such as Krueger and Srinivasan, put this tendency into policy practice.[19] Finally, a recent surge in the literature of general equilibrium models of high development economics, represented by Fujita, Krugman, Venables, Murphy, Shleifer, and Vishny, the literature of endogenous growth, represented by Aghion and Howitt, Lucas, Grossman and Helpman, and Romer, and the literature of endogenous specialization, represented by Becker, Murphy, Rosen, and Yang, provides sophisticated technical vehicles for formalizing classical development economics. The main purpose of this text is to systematically cover all of the new literatures that resurrect classical development economics in a modern body of formalism. We call the synthesis of the new literatures *new development economics*. In what follows, we briefly outline the new literatures one by one.

A group of economists who study the economics of property rights, transaction costs, and institutions consider their theories as the inheritor of classical development economics. They

are very critical of neoclassical development economics. Among them, Coase (1946, 1960) and Buchanan and Stubblebine (1962) have proposed the notion of inframarginal analysis.[20] Cheung (1970, 1983), Coase (1937, 1960), and Barzel (1982, 1985) apply this inframarginal analysis to criticism of Pigou's marginal analysis of externality and public goods. Their theory of the endogenous degree of externality suggests that this degree is determined by the efficient trade-off between transaction costs in specifying and enforcing property rights, and the distortions caused by inaccurate specification and enforcement. The theory is later formalized by models of Holmstrom and Milgrom (1994), Milgrom and Roberts (1992), and Yang and Wills (1990) in the literature of endogenous externality. In particular, Yang and Ng (1993) and Lio (1996) explore the intimate relationship between distortions, transaction costs, aggregate productivity, and the level of division of labor. Many models of the principal–agent relationship, general equilibrium models with transaction costs and endogenous specialization, and game models with strategic interactions have formalized ideas about property rights, transaction costs, contracts, and institutions. Milgrom and Roberts (1992), Hart (1995), Bolton and Scharfstein (1998), Gibbons (1998), Holmstrom and Roberts (1998), Maskin and Xu (1999), and Yang and S. Ng (1998) have provided reviews of the literatures.

Also, the new school of economic history represented by North (1981, 1990), Mokyr (1990, 1993), and others has echoed the new development of the economics of property rights, transaction costs, and institutions. It shows that the development experience of eighteenth- and nineteenth-century Britain and western Europe, and the classical thinking of economic development, are very relevant to currently developing countries. According to exponents of this approach, impediments to economic development consist of various transaction costs that are caused by state opportunism and deficient institutions. In particular, North spells out the intimate relationship between the evolution of division of labor, transaction costs, institutions, and economic development.

Recently, many general equilibrium models of endogenous specialization and transaction costs have formalized ideas proposed by the new school of economic history. We shall cover this line of rethinking of development economics, comprising the literature of endogenous transaction costs caused by opportunism and the models formalizing the ideas of the new school of economic history, in Part III.[21]

Even if the new literatures can be dismissed as the voices of those who are outside the field of development economics, the critique of neoclassical development economics by policy-makers, represented by the World Bank (1996, 1997) and by the prominent development economists Krueger (1995, 1997) and Behrman and Srinivasan (1995), can hardly be ignored. According to these critics, governments' predatory and expropriative policies, their noncredible commitment to constitutional order, their distrust of the market (domestic as well as international), state opportunism that takes economic development as a hostage of the vested interests of the privileged class, rather than market failure, are real obstacles for economic development. More precisely, a great deal of market failure in developing countries is indeed caused by state opportunism and the absence of constitutional order (Sachs and Pistor, 1997 and Sachs and Woo, 1999). Again, their new policy prescriptions are quite similar to those suggested by the successful development experience of eighteenth-century Britain and nineteenth-century western Europe and advocated by Smith and other classical development economists. The distinctive feature of our era is that capitalist institutions have spread to virtually all of the world for the first time in history.

In addition, the new political economics, represented by Buchanan (1991), develops the research on the effects of constitutional rules on rent-seeking and state opportunism, which affect economic development in the developed countries. This literature shows that the political-economic mechanism dictating the evolution of constitutional rules is much more important than the political-economic mechanism that determines policy-making under given constitutional rules.

Some ideas in the rethinking of development policies and in the literature of new political economics have been formalized by models of the commitment game (surveyed in Maskin and Xu, 1999) and other game models, which will be covered later in this text.

Development economics has come full circle. This circle suggests that if we did not really understand the development mechanism underlying the early successful development experience of Britain and western Europe along with new development phenomena such as the Great Depression, previous mistakes will be repeated again and again and useful lessons cannot be exploited.

Although many economists since the 1950s have become familiar with the technical substance of inframarginal analysis (nonlinear programming), which is essential for formalizing classical development economics, economists did not apply the new tools to formalization until the end of the 1970s. Since then, three literatures have stimulated the rethinking of development economics. They provide the technical substance for formalizing classical development economics. All three research lines feature general equilibrium analysis of the network of division of labor. This text will cover all three of the lines of rethinking and synthesize them with the above three literature areas (economics of property rights and transaction costs, the new school of economic history, and studies of liberal reforms and political economy).

In chapter 3, inframarginal analysis is applied to the Ricardian model and the Heckscher–Ohlin model. It is shown that equilibrium aggregate productivity can endogenously increase as a result of the evolution of the network of division of labor. This inframarginal analysis of the Ricardian model and the Heckscher–Ohlin model identifies a general equilibrium mechanism of economic development. The equilibrium and efficient aggregate productivity are not on the PPF if the transaction cost coefficient for a unit of goods traded is very large. As transaction conditions are improved, the equilibrium network of division of labor expands and aggregate productivity becomes closer to the PPF. The interesting feature of this model is that the equilibrium aggregate productivity increases as the equilibrium network of division of labor and the related extent of the market expand, even if economies of scale are absent. This type of increasing returns to a larger network of division of labor in the absence of economies of scale is called by Young (1928) "social increasing returns," by Buchanan (1994) "generalized increasing returns," and by Rosen (1978) "superadditivity." Also, this general equilibrium mechanism for economic development implies that aggregate productivity increases as an outcome of the interactions between self-interested decisions.

In the two types of model, as the equilibrium network of division of labor expands in response to improvements in transaction conditions, the following development phenomena concur. The equilibrium level of specialization for each individual or each country increases, the extent (or thickness) of the market increases, and the degree of market integration, degree of production concentration, and variety of occupation configurations increase. The degree of commercialization and trade dependence, degree of interpersonal dependence, and aggregate productivity increase. The inframarginal analysis can also explore a general equilibrium mechanism that simultaneously determines the interdependent policy regime and the level of division of labor.

In chapters 4 and 7 we formalize Smith's notion of endogenous comparative advantage, which means that differences in productivities between various specialists are consequences rather than causes of division of labor (Smith, 1776, p. 28). The notion of endogenous absolute advantage may be more general than Ricardo's notion of exogenous comparative advantage, since the former may exist between *ex ante* identical individuals, while the latter does not exist if all individuals are identical in all aspects. The Smith–Young models of endogenous comparative advantage are used to investigate the equilibrium mechanism of economic development. This equilibrium analysis of economic development suggests that aggregate productivity and the degree of endogenous comparative advantage will increase in response to improvements in transaction conditions even if tastes (demand side) and production conditions (supply side) do not change.

In Part III, the Smith–Young models of endogenous comparative advantage are used to explore the implications of entrepreneurship and the institution of the firm for economic development. There we also investigate how endogenous transaction costs caused by opportunism prevent the realization of economic development and evolution in division of labor. In chapter 11, several Smith–Young models with endogenous urbanization formalize Petty's idea with regard to the intimate relationship between urbanization and division of labor. In chapter 12, Young's idea about the relationship between industrialization and division of labor in roundabout production is formalized.

Chapter 14 uses a Smith–Young dynamic general equilibrium to formalize Young's idea on the spontaneous coevolution of network of division of labor and extent of the market. In chapter 15, a Walrasian sequential equilibrium model formalizes Austrian theory of entrepreneurial discovery and bounded rationality. It predicts spontaneous coevolution in organization information acquired by the society via social experiments and in division of labor. In chapters 16, 17, and 18, Smith, Turgot, and other classical economists' ideas on the relationship among investment, money, business cycles, economic development, and division of labor are formalized. In particular, technology and saving fundamentalisms are criticized using dynamic general equilibrium models.

All of the Smith–Young models suggest that as soon as the right tool of the trade for formalizing classical development economics is at the command of economists, the spirit of classical mainstream economics can be resurrected in a modern body of inframarginal analysis, and development economics can then be brought back to the core of modern mainstream economics.

In chapters 5, 6, 11, and 13, general equilibrium models with economies of scale and economies of variety of goods (Dixit–Stiglitz, 1977, Ethier, 1982, Krugman, 1979, 1980, Krugman–Venables, 1995, 1996, Murphy–Shleifer–Vishny, 1989, Fujita–Krugman, 1995, Romer, 1987, 1990) are used to formalize the high-development economics of Rosenstein-Rodan (1943), Fleming (1955), Nurkse (1952), Scitovsky (1954), Myrdal (1957), and Hirschman (1958). These models show that as economists have gained a command of the technical substance of general equilibrium models with economies of scale, many development problems, such as the network effects of industrial linkage, circular causation, and interdependent decisions in different sectors, industrialization, dual structure, and urbanization can be much better investigated using general equilibrium analysis. These models show that not only is the degree of industrialization dependent on the degree of urbanization, but the latter is also determined by the former. Also, the number of goods, the network size of industrial linkage, productivity, and the extent of the market are interdependent. Some of the models show that each player's decision in choosing her trade network is dependent on the size of the network of trade and industrial linkage, while the network size is determined by all players' participation decisions.

The Romer models (1987, 1990) and other dynamic equilibrium models of economic development in chapter 13 formalize Young's conjecture about the spontaneous evolution of the number of producer goods, which Young (1928) called the "qualitative aspect of division of labor," and the interdependence between the emergence of new goods and the evolution of the extent of the market. All of the models of high-development economics show that the very function of the market is to network self-interested decision-makers in order to utilize the gains from economic development, though the function might be imperfect.

All of the formal general equilibrium models focus on the classical question of economic development (namely, why one county is wealthier than others or how scarcity can be reduced by the division of labor) rather than on the neoclassical question of what the resource allocation is in a market for a given degree of scarcity. In many of the new development models, symmetry is assumed, so that resource allocation is too trivial to be interesting at all: the quantities of all goods consumed and produced are the same in a model with *ex ante* identical

individuals and symmetric tastes and production and transaction conditions. But very interesting stories of economic development, such as the evolution of division of labor and the related extent of the market, structural changes, and industrialization, can be told by the models. Asymmetries are introduced in chapters 6, 8, 11, 17, and 18 to tell stories about urbanization, the emergence of dual structure, cities, money, business cycles, and the institution of the firm from the evolution of division of labor.

1.4 THE SCIENTIFIC APPROACH TO DEVELOPMENT ECONOMICS

All of the new models of economic development and transaction costs share a common feature: they are based on a *scientific approach to development economics*. This approach divides economic analysis between four levels in a hierarchical structure. At the bottom level of the hierarchy, the mathematical concepts of functions and sets are used to describe the environment of economic development. For instance, utility functions are used to describe individuals' preferences, and production functions and production sets are used to describe production conditions. The notions of budget constraint and related ownership structure and pricing rules, or more general game rules in game models, are used to describe the institutional environment.

At the second level of the hierarchy, mathematical programming is used to describe individuals' self-interested decisions. The results of the analysis at this level are referred to as the comparative statics of a decision in a static model, or the dynamics and comparative dynamics of a decision in a dynamic model. Such results explain individuals' self-interested decisions by prices and the development environment, which encompasses preferences, production conditions, and institutional arrangements.

At the third level of the hierarchy, more sophisticated mathematical tools are used to describe the outcome of interactions between self-interested decisions. The results of the analysis at this level are called comparative statics of general equilibrium in a static model, and the dynamics and comparative dynamics of general equilibrium in a dynamic model. Such results explain how the outcomes of interactions between self-interested decisions and related development performance change in response to changes in the economic environment. Development economists pay particular attention to those comparative statics or dynamics that predict changes in equilibrium aggregate productivity. In this text, the equilibrium models that formalize classical development economics are used to predict evolution in division of labor and related structural changes.

All analysis at the three levels just described is referred to as *positive analysis of economic development*. When development economists conduct positive analysis, they do not ask what is good or bad, or what should be done to change matters, for they are not then concerned with value judgments. What they are trying to do is to use *thought experiments* to figure out what is going to happen under certain conditions and what is the mechanism for economic development. The following process is typical of such thought experiments. Beginning with some assumptions about intangible preferences and behaviors, economists use rigorous mathematics to establish connections between the intangible and tangible phenomena. One example of such a tangible phenomenon is the structural change whereby the income share of the industrial sector increases with per capita income. They can thus infer intangible relationships from the tangible. If the observed phenomena are consistent with their predictions based on the established connection, then their assumptions about the intangible are accepted as working hypotheses, which can be used to explain development phenomena. If the thought experiment generates predictions concerning tangible phenomena that are incompatible with observations, the hypothesis underlying the thought experiment is then rejected.

Some conjectures can never be falsified. For example, consider the statement: "An increase in inequality of income distribution will decrease the welfare of a country." Here, the inequality can be measured by the Gini coefficient or the variance of income distribution. Most economists accept the Pareto rankable measurement of welfare (see the definition of Pareto optimum in chapter 3). But if economic development generates changes that are not Pareto rankable, for instance, increases of some individuals' utilities are at the cost of others' utilities, then it is nearly impossible to find a measure of a country's welfare that is accepted by all economists. This is not only because utility is intangible and cannot be directly measured and compared between individuals, but also because economists cannot find a universally accepted functional form or set of weights to specify a country's welfare as a function of all individuals' utilities. Without a well-defined measurement of the country's welfare, there is no way to test or falsify the above statement.

On the other hand, the following statement can be falsified. "Deterioration of a country's terms of trade is associated with a decrease in per capita income in this country." Data on a country's terms of trade and per capita income can be collected. If the average price of all goods exported in terms of the average price of all goods imported decreases, while per capita real income increases, then the statement is falsified. P. Sen (1998) uses data to falsify this statement. He has also found that deterioration of the terms of trade and dramatic increases in trade volume and in total factor productivity may concur. In chapters 3 and 6, we shall use inframarginal analysis of general equilibrium models to show that the concurrent phenomena may take place if positive productivity gains from an enlarged network of division of labor caused by improvements in transportation conditions outweigh the negative effects of deteriorated terms of trade. This general equilibrium view about the relationship between economic development and the terms of trade can be intuitively illuminated by the following fact. The terms of trade of the computer sector have deteriorated dramatically in the past two decades, while productivity progress in this sector far outweighs the deterioration of terms of trade. Hence, an increase in the income share and productivity of this sector and the deterioration of its terms of trade concur.

Falsification of a hypothesis does not invalidate the chain of mathematical logic linking the assumption and the prediction in the hypothesis, provided of course that the process of deduction is mathematically correct. Hence, rejection of the hypothesis may be attributable to unrealistic assumptions, or it may be attributable to a problem with the analytical framework itself. Thus, by safeguarding against incorrect logic in the thought experiment that generates a hypothesis, mathematics can help us to narrow down the list of possible explanations for the empirical rejection of that hypothesis. This enables us to focus our attention on the assumptions and the analytical framework.

This text will review emerging empirical research that tests new development economics against observations. For instance, North (1958) provides empirical evidence for a positive correlation between the employment share of the transaction sector and economic development. Barro (1997), Easton and Walker (1997), Frye and Shleifer (1997), Gallup and Sachs (1998), and Sachs and Warner (1995a, 1997) provide empirical evidence for the positive effects of transaction conditions on economic development. Yang, Wang, and Wills (1992) provide empirical evidence for a positive correlation between the evolution of division of labor, improvements in transaction conditions, and economic development.

As Albert Einstein suggested, however, "It is quite wrong to try founding a theory on observable magnitudes alone. . . . It is the theory which decides what we can observe" (quoted in Heisenberg, 1971, p. 31). The new development economics covered in this text might challenge many conventional interpretations of empirical observations and may develop new concepts that lead to unconventional observations.

At the fourth level of the hierarchical structure of development economics, economists raise questions that involve value judgments, such as, "Is the outcome of interactions between self-interested decisions (equilibrium) in a competitive market based on the private ownership

system good for society as a whole?" The analysis at this level is referred to as *welfare* or *normative analysis of economic development*.

The following examples explain why the scientific approach to analyzing economic development is useful. First, we consider a striking feature of ideas of state-planned economic development which is inconsistent with the scientific approach.

In the 1950s, normative analysis of economic development received a great deal of attention from development economists when a sound theoretical foundation for the positive analysis of general equilibrium mechanism of economic development was yet to be established. Many indices were suggested to measure the effects of development on welfare (see Sen, 1988), and many policy prescriptions were made to pursue what was believed to be the best for society in the absence of sound positive analysis. This was partly because development economists were not familiar with the technical substance of inframarginal analysis and general equilibrium models. Also, it was based on the assumption that economists, or the governments for which some economists work, are benevolent central planners who can make value judgments on behalf of individual citizens. Even if the assumption is valid, this approach is naive, since it ignores complicated trade-offs between many variables associated with the indices in raising utility and complicated interactions between conflicting self-interested decisions that somehow trade-off the utility of one person against another's utility.

Hence, in this text, we do not follow this approach. Instead, we follow a scientific approach. That is, we first make assumptions about the environment for economic development, then use mathematics to figure out the general equilibrium development mechanism and establish a connection between intangible behaviors and tangible development phenomena. Then we test the hypothesis generated by thought experiments against observations. We can thus recommend to decision-makers those equilibrium mechanisms that are compatible with empirical observations as working hypotheses. In chapters 3 and 4, we will show that with localized increasing returns and network effects of division of labor the equilibrium network size of division of labor that emerges in the decentralized market is Pareto optimal. The very function of the market is to coordinate self-interested decisions to fully utilize the network effects of division of labor net of transaction costs. In chapters 5, 6, 11, and 13 we will investigate the coordination difficulty of the efficient network of industrial linkage which may occur when global economies of scale exist in a neoclassical framework with a dichotomy between pure consumers and firms, though the market can utilize most of the network effects of industrialization and urbanization.

Part III will focus on the endogenous transaction costs caused by interest conflicts and opportunism and their effects on economic development. We will establish the connection between intangible endogenous transaction costs and utility on the one hand, and tangible per capita income and trade volume on the other. Hence, we can use a sophisticated way to infer intangible endogenous transaction costs and distortions and their effects on economic development from tangible development phenomena. Since economic transition and reforms are considered as a subfield of development economics (Roland, 2000), we will apply the theories covered in this text to economic transition in chapter 19.

The scientific approach to development economics is based on the extensive application of mathematics. This application can facilitate the division of labor between different generations of economists and students or between specialized fields of economics by raising communication efficiency in debating, teaching, and research. From the point of view of classical development economics, Marshall's insights into the development implications of division of labor are far superior to his marginal analysis of demand and supply. But the former is not in modern mainstream economics, while the latter is part of the core of modern mainstream economics, because the former is not but the latter is formalized within a mathematical framework. This illustrates the implications of mathematical formalism for the formation of mainstream economics.

In addition, as Debreu (1991) indicates, mathematics not only provides better tools of the trade for economics, but also may affect economists' framework for thinking in a profound way. The history of the theory of labor surplus and the literature of high-development economics illustrates his point.

According to Lewis (1988) and Ranis (1988), Lewis's original motivation for developing the theory of labor surplus was to explore the development mechanism that generates evolution in division of labor. According to this idea, the dual structure is between self-sufficient production of goods and commercialized and specialized production of goods, rather than between the agricultural and industrial sectors. But Lewis could not find the right tool to formalize his original idea. We know today that this right tool is the inframarginal analysis of decision-making in choosing the level of specialization. As Krugman (1995) points out, proponents of the labor surplus model could not even play with a tractable general equilibrium model with increasing returns. In the 1950s and 1960s, most development economists could only barely manage general equilibrium models with constant returns to scale. They were not familiar with inframarginal analysis of this kind of model either. Hence, Lewis, Fei, and Renis used marginal analysis of the model with constant returns to scale to formalize their ideas. As a result, their final models are far away from classical development economics and from their own original thinking. The *ad hoc* assumption of disequilibrium in the labor market and exogenous technical progress or capital accumulation in the industrial sector becomes the driving force of economic development in their models. We shall show in chapters 3, 4, and 6 that their original ideas can be appropriately formalized using inframarginal analysis of the Ricardian and Smithian models with endogenous specialization.

Krugman (1995) indicates that high-development economics about circular causation, coordination problems of the network of industrial linkages, and economies of scale was more interesting than the model of labor surplus. But economists could not manage general equilibrium models with economies of scale to formalize high-development economics in the 1950s. Krugman attributes the success of the labor surplus model compared to high-development economics to the latter's low level of analytical formalism. In this text, we will show that many ideas of high-development economics can be formalized using general equilibrium models with increasing returns. Stories based on the models are much more interesting than those based on labor surplus models.

This history of development economics demonstrates that some insightful ideas may not be included in mainstream development economics if they are not appropriately formalized within a mathematical framework. A limited capacity in managing mathematical formalism was very often a bottleneck in development economics. Since the application of mathematics in the research of economic development is a gradual evolutionary process, usually the most simple and thereby very unrealistic mathematical models are developed before more sophisticated and realistic ones. Hence, it is common that very ingenious ideas are too complicated to be formalized by any mathematical models that can economists' command, while tractable models are too simple and naive. Therefore the following two extremes are inappropriate: One is to worship mathematical formalism and ignore nonmathematical insights into economic development. The other is to totally ignore the implications of mathematical formalism.

As development economics becomes part of the core of modern mainstream economics, it becomes universally applicable. This implies, on the one hand, that it is applicable not only to less-developed countries, but also to developed countries. On the other hand, the economic mechanisms that drove economic development in Britain, western Europe, and the US in the eighteenth and nineteenth centuries are, to a great extent, the same as those driving the economic development of east Asia and other currently developing countries. Poverty in sixteenth- and seventeenth-century Britain, in eighteenth-century France, and in nineteenth-century Japan was, to a great extent, the same as that in currently less-developed countries. Chapters 3 to

6 and 19 will use inframarginal analysis of evolution of division of labor to investigate the advantages and disadvantages of the latecomer to industrialization and their evolution over different development stages. The relationship between income distribution, endogenous transaction costs, and economic development will be examined in chapters 3 to 6 and 9. The general equilibrium analysis yields some predictions that are substantially different from the economics of underdevelopment which was quite popular in the 1950s and 1960s.

Many new development phenomena caused by globalization and the information revolution are the very features of economic development in the developed world. The questions at the end of this chapter give several examples of new features that can be analyzed by the new development economics. We can not only figure out the mechanism that enables the poor to catch up to the wealthy, but also predict some of the megatrends of future economic development. Examples of the megatrends given in the questions are the increasing income share of the resource cost in handling noise in information transmission, and the higher risk of coordination failure in an increasingly more integrated and larger network of division of labor and exchanges. This trend causes increases in frustration and mental pressure, which might enlarge the market for counseling and psychoservices in the new century.

Since this text resurrects the spirit of classical development economics in a modern body of analytical formalism, its spirit is older and its body is younger than neoclassical development economics. The new development economics is, we hope, particularly powerful in analyzing the new development phenomena of networking and globalization.

Key Terms and Review

- Classical development economics vs. neoclassical development economics
- The scientific approach to development economics
- Positive, normative, and empirical analyses of economic development
- Why is general equilibrium analysis essential for understanding the mechanisms for economic development?
- Marginal analysis vs. inframarginal analysis of economic development
- Why is inframarginal analysis essential for formalizing classical development economics?

Further Reading

Classical development economics: Turgot (1766), Groenewegen (1977), Lewis (1988), Sen (1988), Petty (1671, 1683), Marshall (1890), Smith (1776), Meier and Seers (1984), Robbins (1968), North and Thomas (1970); *Neoclassical development economics*: Sen (1983), Arndt (1989), Bliss (1989), Bhagwati (1984), Lewis (1955, 1984), Livingstone (1983), Meier and Seers (1984), Adelman (1961), Meier (1994), Stern (1989), Rosenstein-Rodan (1943), Fleming (1955), Nurkse (1952), Scitovsky (1954), Fei and Renis (1964), Myrdal (1957), Hirschman (1958), Chenery (1979), Kuznets (1966), Kaldor (1957); *Criticisms of neoclassical development economics*: Stiglitz (1989), Bhagwati (1984), Stigler (1976), Kornai (1991, 1992), Young (1928), Krueger (1995, 1997), Behrman and Srinivasan (1995), World Bank (1991, 1996, 1997), Cheung (1970), Coase (1960); *Economics of property rights and transaction costs*: Coase (1937, 1946, 1960), Cheung (1970, 1983), Barzel (1982, 1985, 1997), Buchanan (1975), Milgrom and Roberts (1992), Hart (1995), Bolton and Scharfstein (1998), Gibbons (1998), Holmstrom and Roberts (1998), Yang and Wills (1990), Maskin and Xu (1999); *The new school of economic history*: North (1981, 1990, 1994), McNeill (1974), Mokyr (1990, 1993), Landes (1998), Rosenberg and Birdzell (1986), MacFarlane (1988), Braudel (1984), Fairbank (1992), Weber (1927, 1961, 1968), Baechler (1976), Chandler (1990), Pipe (1999); *General*

equilibrium models with economies of scale: Murphy, Shleifer, and Vishny (1989), Krugman (1991, 1995), Fujita and Krugman (1995), Krugman and Venables (1995); *Literature of endogenous growth*: Judd (1985), Lucas (1993), Romer (1987, 1990, 1993), Grossman and Helpman (1995), Barro and Sala-i-Martin (1995), Aghion and Howitt (1998); *Literature of endogenous specialization*: Young (1928), Stigler (1951, 1976), Houthakker (1956), Rosen (1978, 1983), Becker (1981), Yang and S. Ng (1998); *Constitutional economics*: Buchanan (1989, 1991).

QUESTIONS

Classical development economics

1 Following Marshall, Young (1928) described the technical progress associated with division of labor as a development in which a production process becomes fragmented and disintegrates into specialized tasks while new machinery is introduced to perform these tasks. In his comment on Knight (1921), he stated clearly that: "You [Knight] miss the point, I fear, of Marshall's 'external economies.' They are the economies (in general) of greater specialization and div. of labor" (quoted in Blitch, 1983, p. 362). See also Blitch (1995) for a detailed account of Young's perspectives on external economies. Compare this defense of Marshall to Young's criticism of Marshall's notion of external economies of scale, and discuss the connection and differences between economies of division of labor and economies of scale.

2 Use the following examples to criticize technology fundamentalism and saving and investment fundamentalism. China's telecommunications market is monopolized by the state telecommunications company. Hence, despite very advanced technology and equipment, which are superior even to those in many developed countries, the prices of telecommunications services are 2 to 600 times those in the US. Due to weak protection and enforcement of intellectual property, many Chinese software companies are unable to survive, despite a large population size that might be associated with a very large market for Chinese software.

3 Automobile manufacturing technology is now available to the Chinese as it was to Ford in 1903 (when the Ford Motor Company was established). Currently, per capita income in China is not lower than it was in the US in 1908 (when the Ford Model T came onto the market). But why couldn't a Chinese counterpart to the Ford Motor Company appear in the twentieth century? You may assume that Mr. Ford is now in China, at the age of 16. The following conditions indicate that he cannot set up his company, and cannot make a fortune from his Model T. Use this example to illustrate whether the policy prescriptions of classical development economics are relevant to the currently developing country.

a) Mr. Ford was a country boy when he moved to Detroit, Michigan in 1879. If the young Ford were now in rural China and wanted to move to a city, he would not be able to get permanent residential registration in a Chinese city. Without this registration, he would have to pay a much higher rent for housing, and would even be unable to get housing at all in some large Chinese cities. Also, an automobile manufacturing company would be fined severely by the government if it hired him. Hence, his chances of learning automobile manufacturing skills would be very slim. Suppose that Mr. Ford had already set up his Ford Motor Company in a Chinese city. He would have to bribe the government officers for urban residential registration of his employees from rural areas.

The rationing of houses and a state-monopolized land distribution system mean that he would have a very difficult time providing housing for his employees.

b) Mr. Ford could successfully sell his Model T in the 1910s because of his dealer franchise network, which created a high level of division of labor between production and distribution and between franchisees at different localities. But in China, any private wholesale and retail network cannot operate without a license issued by a government committee, which is usually headed by the government officer who monopolizes the local wholesale and retail network. The interest conflict between any private wholesale and retail network and the state monopoly in that wholesale and retail network implies that Mr. Ford would have a very slim chance of approval for his dealer franchise network from the government committee. In the US at the beginning of the twentieth century, more than a hundred start-ups of motor vehicle manufacturing companies created a competitive environment that nurtured Mr. Ford's success. There is no such free entry into automobile manufacturing in China. China has an approval system for setting up firms. In other words, the automatic registration system which has been institutionalized in the Western world since the nineteenth century is not available in China. In addition, in China there is a list of sectors in which domestic private firms are not allowed to operate. This list includes banking, automobile manufacturing, telecommunications, railroad, and freeway construction. Hence, Mr. Ford would be unable to set up his company at all if he were an entrepreneur in China in the 1990s.

c) State opportunism and a predatory government policy in China engender a government monopoly in the capital market, imposing arbitrary fees and expropriatory taxes on private firms. This implies that even if Mr. Ford got the chance to set up his Ford Motor Company, he might be unable to get adequate capital and to make a profit. The state-monopolized banking system implies that personal checks and many other mediates of exchanges are not available to many ordinary Chinese. This substantially limits the market for Ford's cars.

d) Ford's lobbying campaign to promote a better infrastructure under a democratic system utilizes "externality" associated with infrastructure. But the state monopoly on constructing infrastructure in China and restriction on free association generate a lot of rent-seeking activities and opportunistic behavior. Mr. Ford would not have much of a chance to promote a motor-related infrastructure in China.

e) In China, local government monopoly in many sectors fragments the Chinese market. Local governments' monopolistic distribution systems carry out a protection policy that restricts the sale of goods produced by those firms that are not under local government control. Mr. Ford would have a hard time penetrating the fragmented local markets.

4 Some economists treat the study of specialization and division of labor as a subfield of economics. Comment on this view in connection to Houthakker's assertion (1956, p. 182) that "there is hardly any part of economics that would not be advanced by a further analysis of specialization." Use some examples to discuss his points.

5 Smith and Turgot used the general equilibrium view of division of labor and economic development to criticize the mercantilists' partial equilibrium view on the relationship between trade and development. According to this mercantilists'

view, a great trade surplus would contribute to a country's wealth. Hence, the government should manipulate the terms of trade by using tariff and other trade policies. According to Smith's general equilibrium view, as domestic division of labor within a country or international division of labor between countries increases, wealth will be increased. Since demand and supply are two sides of division of labor, worries on trade deficit and shortages of foreign exchange are groundless, provided the gains from division of labor and trade are not outweighed by transaction costs. The policy based on this view of development is intended to reduce the barriers of trade and transaction costs and let the invisible hand play its role in coordinating division of labor. Use this example to discuss why the notion of division of labor is a general equilibrium concept, and why Young (1928) considered marginal analysis of demand and supply that is separated from the analysis of decisions in choosing levels of specialization as a partial view.

The new school of economic history

6 Compare the British experience of successful development in the seventeenth to nineteenth centuries with the following facts. In some less-developed countries, government behavior is predatory and expropriatory. Government officers use the coercive power of the government apparatus and their taxing power to steal citizens' property. A typical example is the Duvalier government's behavior in Haiti during the 1950s and 1960s. According to the World Bank (1997, p. 149), the economic pillars of Haiti's predatory state were expropriation, extortion, tax inflation, and corruption. Significant resources were devoted to protecting Duvalier himself – 30 percent of total government expenditures during the first half of the 1960s. Agriculture, particularly coffee, was heavily taxed. Some sources estimate that Duvalier transferred more than US$7 million a year out of Haiti for personal purposes. Large-scale bribing also took place, through deals with foreign investors on projects that often never materialized. Extortion under the veil of "voluntary" donations was institutionalized under some political movements. According to Summers (1992), in a sub-Saharan African country, the government pursued a patronage recruitment policy for government employment and favoritism in issuing trade licenses. Then it purposely distorted exchange rates and prices in favor of the relatives' trade businesses. In China during the 1960s and 1970s, the government used its monopoly in the banking sector, in the distribution network, in the urban real estate sector, and in other important sectors to pursue tangible and intangible rents. The approval system for setting up private firms, the strict licensing system for setting up firms for foreign trade, and the monopolized job assignment system were used by the government to discriminate against private businesses. A procurement system that compelled peasants to sell underpriced agricultural goods to government agents, and the residential registration system, which restricted rural residents' mobility, were used to pursue the interests of urban residents, including the government elite, at the expense of rural residents (see Yang, Wang, and Wills, 1992). In this process, industrialization and economic development became hostages to state opportunism.

7 North (1958, 1981, p. 166) observes that "productivity increase as a result of declining transaction costs had been going on since at least 1600, when the Dutch flute [a specialized merchant cargo ship] was used in the Baltic trade and subsequently adopted on other routes. The declining transaction costs – a result of reduced piracy,

increases in size of ships, growing trade, and reduced turnaround time – led to substantial productivity growth beginning 150 years (at least) before the Industrial Revolution; and they, more than technological change, were responsible for productivity increases." Compare this view of technical progress to technology and investment fundamentalism, which claims that investment in research and development is the main engine of economic development.

8 Comment on Landes' (1998, p. 31) discussion on the institutional conditions for economic development: "It has been suggested that this end to danger from without launched Europe on the path of growth and development. Others would argue that freedom from aggression is a necessary but not sufficient condition. Growth and development call for enterprise, and enterprise is not to be taken for granted. Besides, medieval Europe did not lack for impediments to such initiatives. . . . Linked to the opposition between Greek democracy and oriental despotism was that between private property and ruler-owns-all. Indeed, that was the salient characteristic of despotism, that the ruler who was viewed as a god or as partaking of the divine, thus different from and far above his subjects, could do as he pleased with their lives and things, which they held at his pleasure. And what was true for the ruler was true for his henchmen. The martial aristocracy typically had a monopoly of weapons, and ordinary folk were careful not to offend them, arouse their cupidity, or even attract their attention; to look them in the eye was an act of impudence that invited severest punishment."

9 Use the following documentation of the differences between China and Europe to explain the differences in their development performances in the seventeenth to nineteenth centuries. Landes (1998, pp. 34–6): "The concept of property rights went back to biblical times and was transmitted and transformed by Christian teaching. The Hebrew hostility to autocracy, even their own, was formed in Egypt and the desert." "Despotisms abounded in Europe, too, but they were mitigated by law, by territorial partition, and within states, by the division of power between the center (crown) and local seigneurial authority. Fragmentation gave rise to competition, and competition favored good care of good subjects. Treat them badly, and they might go elsewhere. Ecumenical empires did not fear flight, especially when, like China, they defined themselves as the center of the universe. There was no other place to go." Fairbank (1992): "Oriental societies, organized under centralized monolithic governments in which the bureaucracy was dominant in almost all aspects of large-scale activity – administrative, military, religious, and economic – so that no sanction for private enterprise ever became established . . ." Imperial governments carried out the industrial policy of limiting commerce and promoting agriculture. Fairbank (1992, p. 179): "The merchant was kept in check by the official as an ally whose activities could be used and milked in the interest of either the officials personally or of the state. As Etienne Balazs pointed out, commercial transactions were always subject to the superintendence and taxation of the officials. Government monopolies of staple articles, like salt and iron in ancient times, or like tea, silk, tobacco, salt, and matches more recently, expressed the overriding economic prerogatives of the state. No merchant class had been allowed to rise independently and encroach upon these prerogatives. This was ensured in practice by the official disregard for private property. This meant that official patronage and support were necessary to protect any big commercial undertaking. The result was a close community of interest between the merchant and the official. . . . In short, capitalism

failed to prosper in China because the merchant was never able to become established outside the control of the landlord gentry and their representatives in the bureaucracy. In feudal Europe the merchant class developed in the towns. Since the landed ruling class were settled in their manors upon the land, the European towns could grow up outside the feudal system instead of being integrated in it."

10 Analyze the driving force of the evolution of capitalist institutions with connection to the following historical facts. Weber (1968, pp. 1212–64): Trade and cities are the progenitors of modern capitalism. Towns precede princes. Occidental cities had the following unique features. Cities emerged before the nation states. They had fortifications, markets, their own courts of law, and in part, autonomous law, association structure, partial autonomy (privileges, corporate rights). In Asia, cities were princely fortresses. In the Occident, "urban landed property was always alienable without restriction, inheritable, unencumbered with feudal obligations or obligated only to fixed rental payments . . . In Asia and in the ancient world, this distinctive treatment of urban land settlement cannot be observed with similar regularity." Magical caste was absent in Occidental cities. The city as an institutionalized association and a "territorial corporation" protected properties from the sovereign. It provided, under merchant governance, freedom for serfs, religious minorities, and new ideas. According to McNeill (1974), the lack of an overarching sovereign under feudalism led to horizontal contractual relations. Strong monarchies in England and France consolidated after the rise of towns (also, certainly, in German lands). The rise of the limited state implies that monarchs were too weak to snuff out dissent, opposition, and countervailing pressures. The increasing consolidation of states (England, France, Prussia, Hapsburg Spain) was generally not enough to undermine internal pluralism, corporate intermediaries, etc. Hence, state consolidation generally expanded internal markets. "As a general rule, a measure of expansion in foreign trade preceded the laborious unification of the internal market." An expanding internal market supported the commercialization of agriculture (specialization within agriculture). Hoffman and Norberg (1994, p. 305) comment, "In sum, all of the monarchs of early modern Europe had to confront powerful obstacles to their will; none raised revenue without negotiation, consultation, and sometimes bribery." "Absolutist regimes despite their pretentions were not able to borrow or tax at will. Only governments with strong representative institutions could extract huge revenues and borrow large sums. Taxation and despotism were in the end incompatible." "In the end, liberty was a necessary precondition for the emergence of a strong state, a state of wealth and power" (p. 310).

11 Discuss the institutional conditions for economic development using the following documentation of the differences between Britain and France. Letters from England by Voltaire (in exile in England, 1726–9) already revealed the differences between England and France. Letter 9, "On the Government": "A man is by no means exempt from paying certain taxes here simply because is a noble or because is a priest. All taxes are fixed by the House of Commons which, though only second in rank [to the House of Lords], is first in prestige. The Lords and the Bishops may well reject the Bill from the Commons for taxation, but they may not change anything in it; they must either pass or reject it out of hand. When the Bill is confirmed by the Lords and approved by the King, then everybody pays. Everyone gives, not according to his rank (which is absurd) but according to his income. There is no arbitrary tax or capitation, but a real tax on landed property." Letter 10, "On Commerce": "In France, [the Marquis] loftily despises a business man, and the business man so

often hears people speak disparagingly of his profession that he is foolish enough to blush." According to Mokyr (1990, pp. 234–50), the differences between Britain's patent laws and the French government prize system for invention, and between people-made Common Law and government-made civil laws explain the differences in development performance between Britain and France in the eighteenth century. Landes (1998) also notes more limited private rights to land in France than in Britain in the seventeenth century.

12 A forthcoming manuscript by North and Weingast on the comparison between North American and Latin American growth over the last three centuries suggests that state opportunism (predatory and expropriatory taxation and authoritarian regimes) in Latin America explains the great difference in the development performance between North America and Latin America. Comment on their view.

13 Use Landes' (1998, p. 222) following discussion to assess technology and saving fundamentalism of economic development in connection with Young's view on the relationship between technological progress, the extent of the market, and division of labor. "The contribution of high consumption to technological progress struck contemporaries, and more of them as the British advance grew. Without taking a course in Keynesian economics, French merchants understood that mechanization made for high wages, that high wages made for increased demand for manufactures, and that effective demand made for increased prosperity. 'Thus, by the working of a system that seems paradoxical, the English have grown rich by consuming' [Daniel Defoe, 1728]. Paradoxical indeed: such dispendious habits ran against the old wisdom that counseled thrift and abstemiousness, habits congenial to French peasants compelled to avarice. One result was a manufacture that aimed at a large national and international market and focused on standardized goods of moderate price – just the kind that lent themselves to machine production. 'The English,' wrote Charles marquis de Biencourt, 'have the wit to make things for the people, rather than for the rich,' which gave them a large and steady custom."

14 According to North and Weingast (1989), the Constitutional Monarch and parliamentary democracy that emerged from the British Glorious Revolution in 1688 provided a credible government commitment to a constitutional order. This significantly reduced the government's predatory behavior. Hence, endogenous transaction costs caused by rent-seeking and opportunism were reduced and long-term political stability could be secured. North argues (1981, pp. 158–68) that "Toynbee wrote, 'The essence of the industrial revolution is the substitution of competition for the medieval regulations which had previously controlled the production and distribution of wealth.' It is true that the decline in mercantilist restrictions including repeal or reform of the Statute of Artificers, poor laws, acts of settlement, usury laws, navigation acts, [corn laws], and so forth is part of the story. Particularly significant to the development of more efficient markets, however, is the better specification and enforcement of property rights over goods and services; and in many cases much more was involved than simply removing restrictions on the mobility of capital and labor – important as those changes were. Private and parliamentary enclosures in agriculture, the Statute of Monopolies establishing a patent law, and the immense development of a body of common law to better specify and enforce contracts also are part of the story." According to Mokyr (1993, p. 47), "Many of the obsolete laws and regulations that encumbered progress (for example by mandating precise technological practices in detail) were revoked. In 1809 Parliament revoked a sixteenth

century law prohibiting the use of gig mills in the wool-finishing trade, and five years later it did away with one of the pillars of regulation, the Statutes of Artificers and Apprentices." As he notes (Mokyr, 1990, p. 268; 1993), secured rights to residual returns of firms reduced transaction costs in setting up firms and encouraged specialized entrepreneurial activities, and secured rights to intellectual property directly improved transaction conditions for technological progress and encouraged specialized invention of new technology. When patent laws were not enough to protect entrepreneurial ideas and rights to inventions, the institution of the firm was used to protect intellectual rights via residual rights of the firm and trade secrets. A stable and nonpredatory tax system and the government's laissez faire policy encouraged business activities and the evolution of division of labor. The liberation of civil society with respect to the State and the separation of Crown's coffer from the Bank of England enriched the creativity of society and restrained rent-seeking. Free association (i.e., setting up private firms needed no approval or license from the government) improved transaction conditions for the evolution of the institution of the firm. Hence, transaction costs were significantly reduced, the level of division of labor in inventing and other activities increased, and new producer goods and related new technology emerged. Is the development experience of Britain in the seventeenth and eighteenth centuries relevant to currently developing countries? Why did neoclassical development economists not pay enough attention in the 1950s to this successful development experience?

Neoclassical development economics

15 Some development economists argue that mainstream economics on the function of the market is not applicable to developing countries because of the nonexistence of many markets in less-developed countries. Lio (1998; see ch. 10 below) shows that if inframarginal analysis is used to formalize classical development economics, the equilibrium number of active markets and degree of marketization can be endogenously determined by the equilibrium level of division of labor and trading efficiency. Use this example to discuss the relationship between classical development economics and neoclassical development economics.

16 Some development economists suggest using many direct measures of welfare to assess the development performance of a country. Use the scientific approach to assess this method in connection with the following discussion. India's per capita GNP is higher but life expectancy is lower than in China. Which country's people have higher utility? This is a question that has no well-defined, unique answer. According to one index of the living standard which is a weighted average of per capita GNP, house affordability, pollution, traffic congestion, the crime rate, and other variables that affect welfare, Japan has the highest welfare and the US is ranked number seven, behind Australia. But many Americans who have experience of Japan would not agree with this ranking. In other words, there are a lot of possible substitutions (trade-offs) between each pair of development indices. Only an individual knows her own utility maximization problem which efficiently trades off one against the others among these indices. Such a utility maximization problem is intangible to the government decision-maker. The trade-off between an individual's utility and that of others' is even more complicated. Not only is the government planner unable to figure it out, but even if she can, it is impossible for her to balance them in a

benevolent way. Olsen (1996) and Dowrick and Nguyen (1989) use the net flow of migrants between the two countries to identify per capita utility difference between them. Analyze under what conditions this approach to assessing development performance is more reliable than the neoclassical approach discussed above.

17 The infant industry argument claims that protectionist tariffs are essential for industrialization of a less-developed country because of economies of scale, learning by doing, and the network effect of industrial linkage. But some economists argue that the infant industry argument boils down to the argument of an imperfect capital market. In the absence of a developed capital market, protectionist tariffs are essential for industrialization. Comment on these views in connection with Hume's (1748, "Of Money," pp. 34–5) following the classical view on investment. "There seems to be a happy concurrence of causes in human affairs, which checks the growth of trade and riches, and hinders them from being confined entirely to one people; as might naturally at first be dreaded from the advantages of an established commerce. Where one nation has gotten the start of another in trade, it is very difficult for the latter to regain the ground it has lost; because of the superior industry and skill of the former, and the greater stocks of which its merchants are possessed, and which enable them to trade on so much smaller profits. But these advantages are compensated in some measure, by the low price of labor in every nation which has not an extensive commerce, and does not much abound in gold and silver. Manufactures therefore gradually shift their places, leaving those countries and provinces which they have already enriched, and flying to others, whither they are allured and are again banished by the same cause."

18 Dodzin and Vamvakidis (1999) have found empirical evidence for a positive correlation between the degree of openness and the income share of the industrial sector in developing agricultural economies. Use this evidence to assess the theory of the infant industry, which claims that protectionist tariffs are essential for industrialization of an agricultural society.

19 Recent equilibrium models of saving and credit (see chapter 16 below) show that the rationale for saving, investment, and interpersonal loans is based on the gains from the intertemporal trade of goods. Saving and investment cannot take place if transaction costs (moral hazard, adverse selection, and other types of transaction costs) outweigh the gains from intertemporal trade. Use this general equilibrium view to analyze worries about the shortage of investments in developing countries and capital flight from less-developed countries.

20 An ingredient of failed development policies prevailing in the 1950s was reliance on state-owned enterprises for industrialization. This policy failure was generated by ignorance of the function of private residual rights of firms, which has been explored by the new theory of the firm and transaction costs discussed in chapters 8 and 9 below. A comprehensive government investment program based on Harrod–Domar's investment fundamentalism and input–output analysis is evidence for the ignorance of the function of the market in coordinating division of labor, which is investigated in chapters 4, 7, and 8 below. A discriminatory development policy that promotes industrialization at the cost of rural residents' welfare was due to state opportunism that took economic development hostage in pursuing the interests of the elite at the cost of the powerless. Analyze the mechanism of political economy for this policy prescription in connection with Krueger's related analysis of rent-seeking (1995, 1997).

21 Krueger (1995, p. 2511) indicates that the pessimism of many neoclassical development economists over the contribution of trade to economic development is based on the argument of elasticity, which implies that the income share of demand for primary goods from less-developed countries declines due to an income elasticity of less than 1. Krueger argues that protectionist tariffs based on this pessimism are a self-fulfilling prophecy. The model in chapter 4, below, shows that regardless of the income elasticity of demand for any good, as the transaction cost coefficient for a traded good increases, the general equilibrium jumps from a structure with trade and high aggregate productivity to autarky with low aggregate productivity. Use this result to analyze why the elasticity argument is not a general equilibrium view of development, and why it might be misleading.

22 Why did neoclassical development economics pay no attention to the difference between the successful development experience of Britain and the relatively unsuccessful development experience of France in the eighteenth century? (See Mokyr, 1990, pp. 234–50 and 1993 for comparison of the two.) Many policy prescriptions suggested by neoclassical development economics are similar to mercantilism, which was rejected by the successful development experience of Britain in the eighteenth century and by classical development economics as represented by Smith. Why was the mercantilists' mistake repeated in the 1950s and 1960s?

23 In the 1950s, many development economists worried about the capability of developing countries in obtaining foreign exchange and investment. If the developing country concerned was a large one (such as India or China), they worried that the world market could not absorb goods exported from this country. Why are the worries groundless from a general equilibrium view?

24 In the 1950s, the governments in Soviet Union, China, and India set up many specific development targets, such as increases in per capita income, life expectancy, literacy, medical aid, public utilities, output levels of steel, machine tools, and grain; per capita consumption of cloth, education, housing, and investment; increases in nutrition levels, and decreases in infant mortality (see, for instance, Behrman and Srinivasan, 1995). Early development economics generally followed this central planning idea of economic development. Some indices to measure economic development, such as the indices of inequality of income distribution, of illiteracy, of infant mortality, and of life expectancy, were developed in accordance with this idea. Is such thinking about economic development consistent with scientific analysis?

25 Some neoclassical development economists claim that many markets are absent in less-developed countries, so that distortion in the latter is greater than in developed countries. But according to the economics of property rights and endogenous externality (see ch. 10 below), the trade-off between economies of division of labor and transaction costs implies that better transaction conditions in developed countries may generate more transactions and more aggregate distortion in society as a whole. Use this example to discuss why we need inframarginal analysis of the general equilibrium network of division of labor to investigate the development mechanism.

26 Some development economists argue that the experience of capitalist economic development in eighteenth- and nineteenth-century western Europe is not sufficient for successful economic development. They point to Egypt, India, Indonesia, and Latin America as examples of unsuccessful capitalist economic development. Use the differences in institutions between these countries and Britain to assess this argument. For instance, the longtime political monopoly of the ruling party in

Egypt generates state opportunism, while India's state-planned industrialization encourages rent-seeking and other opportunism.

The applicability of development economics to developed countries

27 According to Buchanan (1991), state opportunism is not only an obstacle for economic development in developing countries, but also a burden of economic development in developed countries. He argues that the game between constitutionalists, who are concerned with constitutional rules based on a collective decision that pursues long-term social welfare, and rent-seekers who pursue the short-term interests of a particular group at the cost of long-term social welfare under given democratic rules, dictates the evolution of constitutional rules, which determine policy-making. An individual may play dual roles as a constitutionalist and a rent-seeker. Use the debates on trade policies, the education systems and the healthcare system in a democratic developed country (the US or Britain) to analyze the effect on economic development in that country of the "super game" in forming constitutional rules and in policy-making.

28 Naisbitt (1990) predicts several megatrends: franchising will be a major business form in the US in the twenty-first century, the income share of counseling and psychoservices will increase, and individuals will be increasingly less specialized. Discuss the possibilities for using new development economics to predict such megatrends and modernization phenomena in developed countries.

29 One of Bill Gates' 12 rules for the digital revolution is to read all of one's email (*Time Magazine*, March 22, 1999, p. 72). This is certainly not an optimum economic decision because of the trade-off between information gains and resource cost in acquiring information. Several Smithian models in this text predict that the income share of information cost increases as information technology improves and negative network effect increases more rapidly than the positive network effect of division of labor and information exchange as the network expands. This implies that increasingly more resources are used for screening and deleting useless information or jargon messages. More importantly, society's capacity to handle and absorb information increases as what each member knows, as a proportion of the total information that the society knows, decreases. Hence, the simple slogan "information era" may mislead people to think that the more information that one knows, the better. A new development feature in the US in the twenty-first century might be that it becomes increasingly difficult to make decisions to achieve an efficient trade-off between the positive and negative network effects of information exchange. Comment on this view in connection with the dramatic and rapid negative network effects of the computer virus on modern economic life.

30 A striking development phenomenon in developed countries, documented in Lio (1996), is the concurrent increase in market leisure time and working time, and decrease in self-sufficient working time. This phenomenon implies that as individuals are more specialized in their professional jobs, they increase the purchase of services that used to be self-provided. This tendency is associated with increasing income from the market. According to the *Franchise Annual 1999*, this will make the sector that offers time-saving services to the two-income family the fastest growing sector in the next 30 years. Explain why the Lio model predicts the concurrent development phenomena as a consequence of the expansion of the network of division of labor.

31 An interesting development phenomenon in developed countries is documented by a survey in *The Economist* (Sept. 5–11, 1998, pp. 4–7). The survey found that the probability that a motorist gets in a traffic jam is higher in the US cities which are upgrading their transportation infrastructure the fastest. North (1958, 1986) also finds empirical evidence for this phenomenon, that income share of transaction costs increases as transaction conditions are improved. This implies that as communication technology is improved and productivity of the computer sector increases, the income share of expenditure on computers and communications increases rather than decreases. This implies that increasingly more time and resources will be consumed in handling jargon and in searching and screening. Use classical ideas on network effects of division of labor to analyze this modern development phenomenon.

32 A development phenomenon noted by Naisbitt (1990) is the rapid development of franchise networks in the US and other developed economies. He claims: "Franchising is the single most successful marketing concept ever." According to the International Franchise Association (1997), "More than 550,000 franchise businesses dot the American landscape, generating more than $800 billion in sales, with a new franchise business opening somewhere in the US every 8 minutes each business day." Among three types of franchise – a products franchise, a brand name franchise, and a business format franchise – the last one grows much faster than the other two. In 1999, 4,177 business format franchises in the US are listed in *Franchise Annual*. Most of them were franchised after 1960. One of them has 20,000 to 22,000 units. It seems that classical development economics can explain this phenomenon very well. Most business format franchises (the fast food franchise networks McDonald's and Kentucky Fried Chicken are two of them) involve the division of labor between thinking and doing. The franchiser specializes in providing know-how (intangible intellectual property, which is very commonly associated with an operation manual and training programs). The franchisee specializes in providing tangible goods or services, buying intangible know-how from the franchiser. Sometimes, a franchise network involves deep division of labor between the sector providing roundabout production equipment and the sector providing final services. For instance, the know-how (McDonald's "bible") provided by the McDonald's franchiser includes the purchase of very specialized cooking equipment that can utilize a high level of division of labor between the roundabout sector and the final sector to improve productivity. Also, the know-how provided by the Precision Tune franchiser includes the purchase of very specialized equipment for testing and fixing car engines. If Smith applied his theory to analyze the franchise, he might say something as follows. The high level of division of labor within a particular franchise network generates high productivity on the one hand, and high transaction costs of tangible and intangible properties on the other. The common opportunism in the network is that the franchisee no longer wants to pay a franchise fee once she has acquired the necessary know-how. The franchise contract uses a hostage mechanism to restrict such opportunism. The typical franchise contract has a special clause allowing the franchiser to unilaterally terminate the contract if the franchisee does not pay the franchise fee, which might be 9 percent of the sales revenue of the franchise. Within a certain period of time after the termination, the franchisee is not allowed to compete with the franchiser in a specified territory and in specified activities. This hostage mechanism significantly reduces the transaction costs caused by infringement

upon the intellectual property rights of the franchiser, so that productivity gains from a larger network of division of labor become more likely to outweigh transaction costs. From this point of view, the boom of franchise networks in the developed countries is the evolution of division of labor between the production of intellectual property and of tangible services. This new development phenomenon has the same economic mechanism as that for Smith's pin factory. This boom of franchise networks is associated with the recently popular business practices of downsizing, disintegration, outsourcing, contracting out, and focusing on core competencies, which are considered puzzling, since their concurrence to performance progress is incompatible with the neoclassical concept of economies of scale. In chapter 8 of this text, we will use a Smithian model to explain concurrent increases in productivity and division of labor and the decrease in the average size of firms.

33 Up to 1999, more than a thousand new business practices in Internet commerce (e-commerce) have been granted patents. One of them pays reviewers for clicking on Internet messages. This generous pricing policy makes money from a rapid expansion of network connections which repays the company in a roundabout way. The variety of possible pricing structures of a business network increases more than proportionally as the network of transactions expands, since the number of pricing structures is n^m where m is the number of traded goods and n is the number of goods directly priced in this network. Marginal cost pricing does not work for choosing the efficient one from many pricing structures since decision variables and prices discontinuously jump between different pricing and network configurations. Use this example to illustrate why inframarginal analysis is essential for understanding many of the new development phenomena in the networking and globalization era.

Notes

1 According to Lewis (1988), "The theory of economic development established itself in Britain in the century and a half running from about 1650 to Adam Smith's *The Wealth of Nations* (1776)." Hagen (1980, p. 72) also claims that "Adam Smith was a growth theorist." Sen (1988, p. 10) indicates that "Petty is regarded, with justice, as one of the founders of modern economics and specifically a pioneer of quantitative economics. He was certainly also a founder of development economics. Indeed, in the early contributions to economics, development economics can hardly be separated out from the rest of economics, since so much of economics was, in fact, concerned with problems of economic development. This applies not only to Petty's writings, but also to those of the other pioneers of modern economics, including Gregory King, François Quesnay, Antoine Lavoisier, Joseph Louis Lagrange, and even Adam Smith. *An Inquiry into the Nature and Causes of the Wealth of Nations* was, in fact, also an inquiry into the basic issues of development economics."

2 Petty (1671, I, pp. 260–1) noted that specialization contributes to skillful clothmaking and pointed out that the Dutch could convey goods cheaply because each of their ships was specialized for a specific function. In another place, Petty gave a more striking example of the division of labor in the manufacture of a watch. Turgot (1751, pp. 242–3) linked the development of division of labor with concurrent increases in inequality of income distribution and in living standards for even the humblest member of society.

3 According to North (1981, pp. 158–68) and Groenewegen (1977), Britain's domestic liberal policy regime and France's liberal reforms under Turgot preceded Smith's advocacy for the role of the invisible hand which was followed by Britain's liberal international trade regime.

4 Economists agree to disagree about the theory of economic history. Hence, the hypotheses on development history reviewed in this chapter are only a sample of many competing ones.

5 According to La Porta, Lopez-de-Silanes, Shleifer, and Vishny (forthcoming), common law, which emerges spontaneously from litigation rather than being made by government, is more conducive than civil (continental) law, which is government created, to economic development. However, since major west European countries have increasingly imitated the constitutional judiciary (judicial review) in the US, the constitutional orders of common law and the continental system have been converging.

6 See Beasley (1995) for a detailed analysis of the economic, political, and social reforms of the Meiji period.

7 The era of nineteenth-century free trade is usually dated from 1846, when Britain unilaterally liberalized by repealing the Corn Laws. In fact, liberalization had begun earlier, with the abolition of export duties in 1842 and the reduction of import duties in 1842 and 1845. The next decisive step was the Cobden–Chevalier Treaty of 1860, which liberalized British–French trade. The new German Reich was established by Bismarck on free trade principles and low tariffs in 1879. It is often suggested that this free trade era ended in 1879 with a renewed wave of protectionism, starting with Bismarck's acceptance of the famous tariff on bread and iron, which raised import duties on agriculture and steel. Higher tariffs soon followed in France and Italy. In fact, even with these tariff increases, average tariff rates remained low until the First World War, and nontariff barriers (for example, quotas and exchange controls) were virtually non-existent. According to data assembled by Capie (1983, table 1.3, p. 8), average tariff revenues as a percentage of total imports stayed below 10 percent in France, Germany, and the United Kingdom; between 10 and 20 percent in Italy; between 20 and 30 percent in the United States; and between 20 and 40 percent in Russia.

8 See Eichengreen and Flandreau (1994, p. 9). The countries on the gold or silver standards in 1908 included, in Europe: the United Kingdom, France, Belgium, Switzerland, Italy, Germany, the Netherlands, Portugal, and Romania; in North America: the United States and Canada; in Central America: Mexico, Nicaragua, Guatemala, Honduras, Salvador, and Costa Rica; in South America: Peru, Chile, Brazil, Venezuela, and Argentina; in Asia and the Middle East: the Ottoman Empire, Egypt, and Persia. The national currencies were convertible into gold in all cases except the following: Italy, Austria, Spain, Portugal, Nicaragua, Guatemala, Peru, Chile, Brazil, and Venezuela. The Italian and Australian currencies were stable though not convertible.

9 See Thorp (1984) for very insightful essays on the country-by-country experience.

10 Just as Baechler (1976) considers the rivalry between sovereignties as the driving force of the evolution of capitalist institutions in the seventeenth to nineteenth centuries, Krueger (1995) considers the rivalry between governments in the international arena as the driving force for the return to liberalization reforms in the late twentieth century.

11 The changing *zeitgeist* is captured by Keynes in his remarkable lecture "National Self-Sufficiency," delivered in Ireland in 1933, when the world was in the depths of the Great Depression (Keynes, 1933). In the lecture, Keynes rejects the commitment to free trade and the international harmonization of institutions, declaring the late nineteenth-century experience a massive, and apparently inevitable, failure. In Keynes' view, the international system led to war by stoking competition among the leading powers: "The protection of a country's existing foreign interests, the capture of new markets, the progress of economic imperialism – these are a scarcely avoidable part of a scheme of things which aims at the maximum geographical diffusion of capital wherever its seat of ownership" (Keynes, 1933, p. 236). For this reason, countries are best linked by ideas and culture, not economic and financial entanglements. Keynes writes: "I sympathise, therefore, with those who would minimise, rather than with those who would maximise, economic entanglements between nations. Ideas, knowledge, art, hospitality, travel – these are the things which should of their nature be international. But let goods be homespun whenever it is reasonably and conveniently possible; and, above all, let finance be primarily national" (Keynes, 1933, p. 236).

12 In comparison to communism and fascism, the welfare state was a much more successful response to the Great Depression.

13 Zaleski (1980) documents Soviet planners' mimicry of Western production patterns. Lenin's works, for instance (1939), indicate that he was very familiar with the features of industrialization in a developed capitalist economy.

14 Sachs and Warner (1995a) document the surge of protectionism at the end of the nineteenth century. Chapter 3 in this text uses the Ricardian model to explain the phenomenon; the inframarginal analysis has simultaneously endogenized trade regime and the equilibrium level of market integration.

15 For instance, Arndt (1989), Bliss (1989), Bhagwati (1984), Hirschman (1958), Lewis (1984), Livingstone (1983), Meier and Seers (1984), Sen (1983), and Stern (1989) consider development economics as a field which applies economics to less-developed countries.

16 In the 1950s the governments in the Soviet Union, China, and India set many specific development targets, such as increases in per capita income, life expectancy, literacy, medical aid, accessibility of public utilities, output levels of steel, machine tools and grain, per capita consumption of cloth, education, housing, investment, and nutrition levels; see, for instance, Behrman and Srinivasan (1995).

17 The optimum solution to a decision problem is a corner solution if some decision variables take on their upper or lower bound values. The optimum solution is an interior solution if all decision variables do not take on the bound values.

18 Marshall assumed concavity (diminishing marginal utility), which implies but is not implied by quasi-concavity of a utility function.

19 Though neoclassical marginal analysis is used by many economists to criticize the state-planned development strategies proposed by early neoclassical development economics, our text will show that inframarginal analysis can provide a much more powerful analytical vehicle.

20 Coase (1946, p.173) noted "a consumer does not only have to decide whether to consume additional units of a product; he has also to decide whether it is worth his while to consume the product at all rather than spend his money in some other direction." He applies this inframarginal analysis to criticize marginal cost pricing rule (1946) and Pigou's marginal analysis of externality (Pigou, 1940 and Coase, 1960). Buchanan and Stubblebine (1962) coined the term "inframarginal analysis." Koopman (1957) and Arrow, Enthoven, Hurwicz, and Uzawa (1958) are among those economists who initiated formal inframarginal analysis in economics. Becker (1981) and Rosen (1977) are among those economists who initiated formal inframarginal analysis of specialization and division of labor. The application of inframarginal analysis to a decision problem can be found in Kendrick (1978), Little and Mirrless (1980), Becker (1981), and Rosen (1983). Its application to the theory of incomplete contracts can be found in Grossman and Hart (1986) and Hart (1995). The application of inframarginal analysis to general equilibrium models can be found in Yang and Wills (1990), Yang and Borland (1991), Dixit (1987, 1989), Yang and Shi (1992), Yang and Ng (1993), and in chapters in this text. Yang and S. Ng (1998) provide a recent survey of inframarginal analysis of division of labor.

21 Recent development economics texts, for instance Ray (1998) and Meier (1995), cover part of the literature on endogenous transaction costs, such as Stiglitz's models of moral hazard and tenancy. But they do not cover the literature of endogenous externality, commitment game models, the economics of property rights and transaction cost, and the new school of economic history.