



Middle-income growth traps



Pierre-Richard Agénor^{a,b,*}, Otaviano Canuto^c

^a School of Social Sciences, University of Manchester, United Kingdom

^b Centre for Growth and Business Cycle Research, United Kingdom

^c World Bank, United States

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ABSTRACT

This paper studies the existence of middle-income growth traps in a two-period overlapping generations model of economic growth with two types of labor and endogenous occupational choices. It also distinguishes between “basic” and “advanced” infrastructure, with the latter promoting design activities, and accounts for a knowledge network externality associated with product diversification. Multiple steady-state equilibria may emerge, one of them taking the form of a low-growth trap characterized by low productivity growth and a misallocation of talent—defined as a relatively low share of high-ability workers in design activities. Improved access to advanced infrastructure may help to escape from that trap. The implications of other public policies, including the protection of property rights and labor market reforms, are also discussed.

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1. Introduction

Since the 1950s, rapid growth has allowed a significant number of countries to achieve middle-income status. However, very few have made the additional leap needed to become high-income economies. Rather, many have gotten stuck in what has been called a middle-income trap—or more appropriately perhaps, an imitation trap, as discussed later—characterized by a sharp deceleration in growth.¹ Thus, unlike a typical poverty trap, which describes a stagnation or “locked-in” equilibrium that is often due to a lack or limited availability of a key production input or public good—insufficient supply of private capital due to low savings and low income to begin with, coordination failures, inadequate public infrastructure, insufficiently developed credit and capital markets, poor access to public health or education services, weak institutions, and so on—in a low-income environment, a middle-income trap typically occurs *after* a country has been growing rapidly for a sustained period of time, has improved substantially the standards of living of its population, and for reasons that are not generally related to those that explain why a poor country may be stuck in a bad, path-dependent equilibrium.²

For instance, most countries in Latin America and the Middle East reached middle-income status during the 1960s and 1970s, and have remained there ever since. According to the World Bank (2012), of 101 economies classified as middle-income in 1960, only 13 had become high income by 2008: Equatorial Guinea; Greece; Hong Kong, China; Ireland; Israel; Japan; Mauritius; Portugal; Puerto Rico; South Korea; Singapore; Spain; and Taiwan, China. In Asia, Malaysia and Thailand

* Corresponding author.

E-mail address: pierre-richard.agenor@Manchester.ac.uk (P.-R. Agénor).

¹ The term “middle-income trap” was apparently first used by Gill et al. (2007); see also the Growth Report of the Commission on Growth and Development (2008). “Middle income economies” are defined in accordance with the World Bank’s classifications by income group, as given in <http://data.worldbank.org/about/country-classifications>.

² For recent contributions to, and discussion of, the literature on poverty traps, see Azariadis (2006), Azariadis and Stachurski (2005), Mayer-Foulkes (2005), Agénor and Aizenman (2010), Bénassy and Brezis (2013), Wang and Wang (2014), and Agénor (2015).

provide good examples of the growth slowdown that characterizes a middle-income trap. Despite the financial crisis of 1997–1998, they ended the century with productivity levels that stood significantly closer to those recorded in advanced countries. However, the pattern of labor-intensive production and exports in these countries has remained broadly unchanged for the past two decades. At the same time, they have faced growing competition from low-cost producers, first China and India, and more recently Vietnam and Cambodia. Growth has slowed significantly as a result. Moving up the value chain and resuming rapid growth by breaking into fast-growing markets for knowledge and innovation-based products and services has remained elusive—not only for Malaysia and Thailand but also for a number of other middle-income countries (UNIDO, 2009).

In a more formal analysis, Eichengreen et al. (2012, 2013) found that growth slowdowns typically occur at per capita incomes of about \$15,000 at 2005 constant international PPP prices.³ At that point, the growth rate of GDP per capita slows by an average of 3.5 percentage points.⁴ They also found, using regression and standard growth accounting techniques, that growth slowdowns are essentially *productivity* growth slowdowns—with a drop in TFP growth representing about 85 percent, or 3 percentage points, of the absolute reduction in the growth rate of GDP per capita—and that the peak probability of a growth slowdown occurs when manufacturing accounts for about 23 percent of total employment in the economy.

A common explanation of growth slowdowns is based on a Lewis-type development process. In that perspective, factors and advantages that generate high growth during an initial phase of rapid development—low-cost labor and imitation of foreign technology—disappear when middle- and upper-middle-income levels are reached, thereby requiring new sources of growth to maintain sustained increases in per capita income. Indeed, during a first phase, low-income countries can compete in international markets by producing labor-intensive, low-cost products using technologies imported from abroad. These countries can achieve large productivity gains initially through a reallocation of labor from low-productivity agriculture to high-productivity manufacturing. However, once these countries reach middle-income levels, the pool of underemployed rural workers shrinks and wages begin to rise, thereby eroding competitiveness. Productivity growth from sectoral reallocation and technology catch-up are eventually exhausted, while rising wages make labor-intensive exports less competitive on world markets—precisely at the time when other low-income countries get themselves engaged in a phase of rapid growth. Put differently, *persistent* growth slowdowns coincide with the point in the growth process where it is no longer possible to boost productivity by shifting additional workers from agriculture to industry and where the gains from importing foreign technology diminish.⁵ This process is well supported by the evidence on productivity slowdowns provided by Eichengreen et al. (2012), as indicated earlier. It is also consistent with the results in Perez-Sebastian (2007), where imitation is the main source of productivity growth in early stages of development, whereas broad-based innovation—defined as the application of new ideas, technologies, or processes to productive activities—becomes the main engine of growth as the economy approaches the world technology frontier. The implication is that to avoid falling into a middle-income trap (with continued reliance on imitation of foreign technology), countries must address its root structural cause early on and find new ways to boost productivity. Observers have argued that the main sources of higher productivity are a shift to high-value services and the promotion of home-grown innovation, possibly through government subsidies to “priority” sectors.

This paper takes a similar perspective on the cause of a middle-income trap but extends it in a different direction. Although it fundamentally agrees on productivity slowdowns as being a source of these traps, it differs from the existing literature in terms of the reasons why productivity growth may be constrained, and what type of public policies can be implemented to promote a broad-based innovation strategy. We emphasize interactions between three determinants of productivity growth: individual decisions to acquire skills, access to different types of public infrastructure, and *knowledge network externalities*—which we define as a situation where a higher share of workers with advanced levels of education has a positive impact on their performance, that is, their ability to take advantage of existing knowledge.⁶ As far as we know, this paper is the first to bring these interactions to the fore and analyze their implications for the existence of multiple equilibria in an endogenous growth framework.⁷

We conduct our analysis in the context of an overlapping generations (OLG) model in which we distinguish between two types of labor skills, basic and advanced. In contrast to most of the literature, we focus on embodied human capital; advanced skills are defined as specialized knowledge that can be acquired by devoting a given amount of time to higher

³ The authors define a growth slowdown based on three conditions: The first requires that prior to the slowdown the seven-year average growth rate is 3.5 percent per annum or greater. The second identifies a growth slowdown with a decline in the seven-year average growth rate by at least 2 percentage points. The third condition limits slowdowns to cases in which per capita GDP is greater than \$10,000 in 2005 prices—thereby ruling out episodes related to countries that have not yet successfully developed. Note that Eichengreen et al. (2013) also found evidence of a second mode at \$11,000 in 2005 prices in the distribution of growth slowdowns.

⁴ However, the authors also note that there is considerable dispersion in the income levels at which growth slowdowns occur.

⁵ A related consideration is that by specializing initially in low-skilled intensive activities, low-income countries may have diminished incentives to invest in education—hence reducing the rate of accumulation of human capital needed to promote broad-based innovation.

⁶ Indirect evidence of the importance of (local) knowledge networks is provided by Weinberg (2011), who found that per capita GDP in developing countries is positively related to the number of important scientists born in and staying in a country. For a general discussion of the role of domestic and cross-country knowledge networks in promoting innovation capacity, see UNIDO (2012, Chapter 4.5).

⁷ The theory of leapfrogging (or lack thereof) developed by Acemoglu et al. (2006), which emphasizes the selection of high-skill managers to promote innovation, could provide an alternative conceptual basis for middle-income traps.

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