

# **Growth Economics and Policies**

**A Fifty-Year Verdict  
and a Look Ahead**

***Shahid Yusuf***



THE  
**GROWTH**  
DIALOGUE



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## About the Author

**Shahid Yusuf** is Chief Economist, the Growth Dialogue. Dr. Yusuf brings many decades of economic development experience to the Dialogue, having been intensively involved with the growth policies of many of the most successful East Asian economies during key periods of their histories. Dr. Yusuf has written extensively on development issues, with a special focus on East Asia and has also published widely in various academic journals. He has authored or edited 24 books on industrial and urban development, innovation systems, and tertiary education. His five most recent books are: *Development Economics through the Decades* (2009); *Tiger Economies under Threat* (co-authored with Kaoru Nabeshima, 2009); *Two Dragonheads: Contrasting Development Paths for Beijing and Shanghai* (co-authored with Kaoru Nabeshima, 2010); *Changing the Industrial Geography in Asia: The Impact of China and India* (co-authored with Kaoru Nabeshima, 2010); and *China Urbanizes* (co-edited with Tony Saich, 2008). Dr. Yusuf holds a PhD in Economics from Harvard University and a BA in Economics from Cambridge University. He joined the World Bank in 1974 as a Young Professional and while at the Bank spent more than 35 years tackling issues confronting developing countries. During his tenure at the World Bank, Dr. Yusuf was the team leader for the World Bank-Japan project on East Asia's Future Economy from 2000–09. He was the Director of the *World Development Report 1999/2000: Entering the 21st Century*. Prior to that, he was Economic Adviser to the Senior Vice President and Chief Economist (1997–98), Lead Economist for the East Africa Department (1995–97), and Lead Economist for the China and Mongolia Department (1989–1993). Dr. Yusuf lives in Washington, DC and consults with the World Bank and with other organizations.





## Abstract

A scientific and industrial revolution accelerated growth rates in a handful of Western countries starting in the nineteenth century. By the early twentieth century, growth rates had begun rising in Asian, Latin American, and Eastern European economies as well. With the end of WWII and the subsequent decolonization, rapid growth spread to late-starting developing nations. As a result of this history, a growth ideology has become firmly entrenched. Initially it was buttressed by the contest between capitalist and socialist systems during the Cold War era. Since the 1980s, the quest for growth has been reinforced by globalization, by the “war on poverty” as championed by the international financial institutions, and by a wealth of theorizing and empirical research. The latter effort has singled out productivity as the primary source of long-term growth and advances in technology, broadly defined, as the driver of productivity. Now, policy makers are demanding more from growth than a mere increase in GDP, even as the potential contribution of industrialization is diminishing. Growth economics is struggling to expand the toolkit and enlarge the menu of practical policy options. Capital investment embodying advances in technology remains crucial, albeit difficult to manipulate. Investment in high-quality human capital promises large dividends via innovation and efficiency gains, but raising the quality of education and the volume of commercial innovation by dint of policy is a struggle. Institutional reforms that harness the full power of market forces, tempered by regulation, continue to offer somewhat elusive hope. Growth economics remains a vital subdiscipline and the concepts of sustainability, inclusiveness, and greening are challenging researchers. But with the refinement of theory and practice proceeding at a homeopathic pace, relevance is at risk. There is an urgent need for disruptive innovation to give new direction to theorizing and policy.



# Growth Economics and Policies: A Fifty-Year Verdict and a Look Ahead

*Shahid Yusuf*

Our forefathers struggled to maintain living standards from one generation to the next. Only the privileged or lucky few saw their incomes rise steadily year after year. Constructing a time series for worldwide per capita incomes going far back in time is a stretch. However, Angus Maddison (2008) did undertake this herculean task and we are fortunate to have his educated guesstimates extending back to the dawn of the Common Era. At the time when the Roman and Han Empires were in full flower, per capita GDP of a population numbering about 226 million was US\$467 in 1990 dollars. A thousand years later, the world's population had risen by a few tens of millions (to 267 million) but per capita incomes were almost unchanged. By 1500, incomes had crept to US\$567 for a population numbering 378 million and after another 300 years, with numbers having more than doubled, per capita GDP had inched up by only US\$100. China and India, the two largest economies at the beginning of the nineteenth century, had per capita incomes close to the world average while people in Western Europe enjoyed incomes of over US\$1,200. It is around this time that the Great Divergence begins to emerge, with the industrial revolution ushering in "modern economic growth" in some West European countries and later the United States. By the mid-nineteenth century, the tempo of growth was quickened by the embrace of industrialization by Western countries, continuing advances in scientific knowledge and a broad spectrum of technologies, and institutional changes. On the eve of the Great War, Western Europe and its "offshoots" had far outpaced the rest of the world with per capita incomes of US\$3,500 and US\$5,200 respectively as against US\$658 in Asia (excluding Japan). The unending economic growth we now take for granted<sup>1</sup> surfaced in the latter half of the nineteenth century and although economic progress was interrupted by cyclical downswings,<sup>2</sup> it was around this time that Europe and the Americas

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<sup>1</sup> Classical economics (that of Smith, Malthus, Marx, Mill, and Ricardo) concluded that growth, if it occurred, would be temporary, with economies tending to revert to a stationary/steady state if perturbed.

<sup>2</sup> The National Bureau of Economic Research has tracked business cycles in the United States dating back to 1854 (see <http://www.nber.org/cycles.html>). Many downswings were severe and painful but they came to be viewed as the inevitable lot of capitalist economic systems. Such tolerance is much less in evidence in the post-WWII period.

decisively broke with the relative economic stagnation of past centuries and established new benchmarks. Between 1870 and 1939, the United States and the United Kingdom averaged unprecedented growth rates of 3.3 percent and 1.9 percent respectively. Several European countries achieved comparable rates of growth and late in the nineteenth century, Argentina and Brazil were also beginning to catch up.<sup>3</sup>

Starting in the early 1950s, something even more remarkable happened. Not only did the United States and the United Kingdom maintain their earlier momentum,<sup>4</sup> but also, within a decade, economic growth had emerged as a key objective of the vast majority of nations. With Germany leading the way in Europe and Japan in East Asia, economies recovering from the devastation caused by war accelerated to growth rates of 5 percent and higher in the 1950s and these were joined by a number of newly independent colonies in the 1960s.<sup>5</sup> Very soon, an extended past during which growth was slow if it occurred at all became a distant memory and a “new normal” took root. It could hardly be otherwise in the light of the vertiginous growth of per capita incomes worldwide: incomes that had grown just 18 percent between 1500 and 1820 increased by 750 percent from the beginning of the nineteenth century to the start of the twenty-first century.<sup>6</sup> The impact of accelerating economic growth on poverty in the face of a spiraling global population has been nothing short of dramatic: between 1981 and 2008, the number of people living on less than US\$1.25 a day declined from 1.94 billion to 1.29 billion and the decline continued through 2010, with the reduction being greatest in Asia because of the performance of the Chinese and Indian economies.<sup>7</sup>

As the global economy recovers from the financial crisis of 2007–08 and struggles with the smoldering eurozone crisis, two questions are uppermost for policy makers: (i) whether and how industrialized and industrializing countries might be able to restore the robust performance of the 1993–2007 period (minus the bubbles),<sup>8</sup> and (ii) the contribution that growth economics could make to the

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<sup>3</sup> Maddison (2010).

<sup>4</sup> In fact, the mobilization of resources for the war effort was tonic for economies recovering from lasting effects of the Great Depression and subsequent, somewhat ill-considered, fiscal actions (in the United States) to narrow public sector deficits.

<sup>5</sup> One of the earliest accounts of the recovery of the European economies is by Kindelberger (1967).

<sup>6</sup> See Ventura (2005). According to Zilibotti (2007), the population weighted growth rate in the second half of the twentieth century alone was 2.9 percent per year. This growth has been paralleled by a lengthening (and an international convergence) of life expectancy and, at least in the advanced countries, an increase in the fraction of individual lifetimes devoted to learning, together with a decline in the fraction devoted to working.

<sup>7</sup> World Bank (2012).

<sup>8</sup> This period is viewed as a second golden age (the 1960s was the first), even though it was punctuated by the East Asian economic crisis of 1997–98, which severely imperiled some of the highest fliers, and by the dot-com bust of 2000–01, which punctured visions of a high-growth, low-inflation “new economy” propelled by IT-based innovations.

policy agenda. Most developing and middle-income countries continue to envisage growth rates averaging 6–8 percent. They are convinced that the extraordinary performance of a handful of countries<sup>9</sup> during the past quarter century can be replicated by the many in the decades ahead.<sup>10</sup>

The purpose of this paper is to study how thinking on growth has evolved since the 1950s<sup>11</sup> through the interplay of international politics, country-level experience, and theorizing almost exclusively conducted in Western countries. The paper reflects on how this body of thinking has diffused through a variety of channels and influenced policies in virtually all developing countries. Finally, the paper considers whether—following the financial crisis and the unsettled circumstances in the first decade of the twenty-first century—economic research based on the experience of a few countries, over a limited period of time, can provide relevant and effective policy guidance.

The paper is divided into three parts. Part 1 examines the experience of the early postwar decades and the worldwide spread of a “growth ideology” that marked a shift from the prewar beliefs and experiences of the majority of nations. Part 2 discusses economic theory and empirical findings underlying the new growth ideology from the 1960s onwards. Part 3 reflects on the policy prescriptions to be garnered from growth economics. It also briefly examines how thinking on development is responding to the financial crisis, worries about an income trap in middle-income countries, notes a resurgent interest in industrial policies, and asks questions regarding the future contribution of innovation to growth and its greening.

## 1. Industrialization and Growth: The New Normal

Western Europe and North America were long the center of economic growth. However, Jeffrey Williamson (2011) notes that economic change was accelerating in a number of countries on the periphery starting in the last quarter of the nineteenth century. Russia, Japan, Mexico, Argentina, and Chile all began building industrial capacity at a pace exceeding that of countries at the core; industrial growth in these countries averaged between 4 and 6 percent as against the 3.5 percent average of the United States, the United Kingdom, and Germany. After 1920, these early developers from the periphery were joined by several

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<sup>9</sup> The Commission on Growth and Development (2010) identified 13 countries that averaged growth rates of 7 percent or more per year between 1960 and 2002.

<sup>10</sup> Hope springs eternal; however, Acemoglu (2012, p. 5) points out that the gap between countries in the 90<sup>th</sup> percentile and the 10<sup>th</sup> percentile as well as those in the 75<sup>th</sup> and the 25<sup>th</sup> percentile has widened. The ratio between the 90<sup>th</sup> and the 10<sup>th</sup> percentile was less than 9 early in the twentieth century and over 30 towards the end of the century.

<sup>11</sup> Seminal papers on growth by Roy Harrod and Evsey Domar were written in 1939 and 1946, respectively. These were in the Keynesian vein and compared the stability of growth paths.

Southern European countries such as Italy and Greece, by Brazil and Peru, by Poland and Turkey, and by colonial Korea; Taiwan, China; and Manchuria. Countries enjoying political autonomy followed the lead of the pioneers and industrialized faster with some of the colonized East Asian nations close behind.

Starting in the 1950s, with postwar recovery and decolonization in full swing, industrialization moved into higher gear. Williamson (2011) estimates that industrial growth in the periphery rose to 7.9 percent between 1950 and 1975. “Industrialization in the poor periphery was ubiquitous. In every region, many others joined the previous, precocious industrial leaders. In short, the rate of industrial catching-up surged in the post war quarter century and it also spread from the emerging leaders to regional followers” (Williamson 2011, pp. 11–12). Many factors contributed to this surge. For example, the transport revolution and cheap energy lowered costs, which stimulated trade and helped diffuse industrial production to the periphery. In addition, changing terms of trade favoring manufactures encouraged local production, and greater readiness to use tariff and exchange rate policies to protect domestic production boosted import-substituting industrialization.<sup>12</sup> Perhaps most significant was the germination of a growth ideology among national elites, who had become increasingly aware of enhanced economic opportunities and eager to secure material prosperity comparable to what they saw in the West. In the grip of this new fervor, developing countries began planning for rapid growth. They took their cues from the leading Western economies and also drew lessons from “compressed development”<sup>13</sup> achieved by the former Soviet Union, Japan, and China. These three relatively late-starting countries were rebuilding their economies with remarkable speed and reentering an arc of development predating WWII. Developing countries could benefit—as Alexander Gerschenkron (1962) showed—from the advantages of backwardness by introducing institutional innovations that could ease or unlock key constraints. There were huge productivity gains to be realized from adopting new and codified agricultural and industrial technologies and from the transfer of resources from the rural sector to industry and services in urban centers.<sup>14</sup>

The nascent growth ideology of national elites was powerfully reinforced by the ideologies of the great powers that defined the political economy of international development throughout the more than three-decade-long Cold

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<sup>12</sup> The use of tariff protection to promote domestic industrialization mirrored the policies adopted by the United States and Germany in the nineteenth and the first half of the twentieth centuries. Chang (2002) observes that the United States was the most protectionist nation from the time of the Civil War until the eve of WWII.

<sup>13</sup> This is a term used by Whitaker and others (2008) to describe development in East Asia bringing out the role of the state and of links with global value chains.

<sup>14</sup> Gerschenkron’s ideas are echoed in Justin Lin’s analysis of the emerging economies—and China in particular—over the past 30 years (Lin, 2011). See also Mathews (2006) on the potential advantages enjoyed by latecomers.

War.<sup>15</sup> Michael Latham (2003, p. 9) observes “though American visions of the true and only heaven differed from Soviet visions of the ‘end of history’, both models stressed the ability of enlightened elites to accelerate an inevitable, universal movement through historical stages and posited that technological diffusion would engender a new consciousness and a new society.” Both sides worked tirelessly using every instrument and channel they could mobilize to create, through the agency of local technocratic elites, a new economic order in their often-contested spheres of influence. America and its allies attempted to promote modernization and material prosperity within a capitalist framework, sometimes with the trappings of democracy,<sup>16</sup> whereas the countries of the communist bloc pursued broadly similar international policy objectives within a Leninist framework. And both sides used virtually identical means to achieve desired geopolitical and economic outcomes: foreign aid, power projection and arm twisting, technical assistance, training programs, arming of militaries, soft power, and, not infrequently, proxy wars to prop up favored regimes (some of which persisted for years, making life nastier and more brutish for millions).<sup>17</sup> Econometrically sharpened hindsight shows that aid in pursuit of geopolitical objectives contributed little to investment, growth, or poverty reduction.<sup>18</sup> However, it cemented alliances with ruling elites<sup>19</sup> and trained the focus on modernization and development and through technology transfers hard as well as soft, kept growth at the center of policy attention and the preferred yardstick for measuring economic progress.

Post war thinking was influenced by the efficacy of state economic control during WWII and the embracing of Keynesian policies following the Great Depression to help smooth business cycle fluctuations or at least reduce their amplitude. These policies reinforced other trends and measures contributing to the acceleration in growth rates. However, they also slowly gave rise to a perception that the business cycle had been largely tamed (some argued by a deepening of market institutions and increasing market/price flexibility). The belief was that policy makers had the tools to sustain economic activity at high

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<sup>15</sup> The term was coined by George Orwell and first used in 1947 by Bernard Baruch to describe the tensions that erupted between the Soviet Union and the Western powers shortly after the end of WWII.

<sup>16</sup> America supported European integration starting in the 1950s because it believed that this would raise growth rates, strengthen democracy, and neutralize communist influence.

<sup>17</sup> Hironaka (2005) describes some of these never-ending wars in postcolonial states.

<sup>18</sup> A large literature on the relationship between aid and growth comes to at best inconclusive findings. Aid (including military assistance) did not cause growth and may on balance have supported predatory elites who through their rent seeking activities were (and are) a brake on growth. See Doucouliagos and Paldam (2006, 2009); Easterly (2006); Roodman (2007). Nevertheless, the more than US\$16 billion of aid provided to the Republic of Korea by the United States and its allies contributed to technology transfer, as well as to the stabilization and development of that country, and helped ward off the threat from the Democratic People’s Republic of Korea.

<sup>19</sup> In the process, aid seems to have increased inequality in recipient countries. See Herzer and Nunnenkamp (2012).

levels or, in other words, to minimize the threat of prolonged downturns that eroded past gains. As result of these policies and beliefs, the role of the state, already greatly enlarged during the course of the long war, was steadily augmented, and the state acquired the responsibility to strive after and maintain rapid growth. The emergence of a large and initially economically successful Communist Bloc (and active economic proselytizing by the countries of the Bloc) contributed to a widespread belief in the augmented role of the state. Fiscal policy, including direct public sector intervention, was seen as a way to promote private initiative and industrialization. State-guided capitalism received a strong endorsement from the performance of the Republic of Korea; Taiwan, China; Singapore; Malaysia; and Thailand and it provided other developing economies with both inspiration and a proven model at least through the early 1990s.<sup>20</sup> The performance of the Chinese economy, once market oriented reforms were introduced in the early 1980s, further underscored the advantages of market institutions tempered by state control and an outward orientation to harness the power of globalization.

The growth expectations that took root during the halcyon 1960s proved to be remarkably durable. Europe endured a long spell of stagnation during the 1970s and growth was slow also in the United States through the early 1980s. Latin America, after an initial surge, lost ground starting in the 1980s and suffered from “lost decades.” China was hobbled first by the havoc caused by the Great Leap in 1958–60 and, after a short spell of recovery in the first half of the 1960s, by more than 10 years of disruption resulting from the Cultural Revolution that Mao choreographed in 1966. By the mid 1970s, Africa had entered a long economic twilight that persisted for over two decades, and India remained on the treadmill of the “Hindu growth rate” until the onset of reforms in the early 1990s.<sup>21</sup> Only the “tiger economies” in East Asia defied gravity and exploited international market opportunities to grow their economies at high speed with the help of investment in industry and buoyant exports.

The gloom lifted in the 1990s, arguably because of four main developments: (i) accelerating globalization assisted by the lowering of trade barriers;<sup>22</sup> (ii) the stripping away of capital controls and declining transport costs; (iii) the tonic effects of general purpose technologies (GPTs)<sup>23</sup> that released a flood of innovations; and (iv) the spread of regulatory reforms to weed out market

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<sup>20</sup> State guided capitalism in the Republic of Korea and Taiwan, China was the subject of two well-known publications by Wade (1990) and Amsden (1989). A sampling of the voluminous literature on industrial policy is summarized in Yusuf (2011).

<sup>21</sup> In the Indian case, the first steps towards deregulation in the 1980s had already begun raising growth rates, but the release from the prolonged stagnation took place in the 1990s.

<sup>22</sup> The landmark Uruguay Round of trade negotiations was successfully concluded in 1994.

<sup>23</sup> Semiconductors (and microprocessors), which are key components of information and communication technologies, and the Internet are two GPTs that have served as the drivers of innovation since the mid-1980s. See Bresnahan and Trajtenberg (1995); Jorgenson, Ho, and Stiroh (2011).



distortions that stifled competition,<sup>24</sup> caused inefficiency, and promoted rent seeking. The neoliberal argument for enlarging the role of markets and reining in the activities of the state<sup>25</sup> received a boost first from the collapse of the former Soviet Union and the discrediting of the socialist planned approach to development, and then, more convincingly, from the surge in global economic activity.

Could the growth ideology have become so all-pervasive absent the parallel rise of growth economics? This is difficult to answer because growth and development have become inextricably linked and growth is widely accepted as the touchstone of performance. However, it is fair to say that the rise and teaching of neoclassical growth economics in leading Western universities from the mid-1950s did much to build the analytic and empirical scaffolding to support the idea that a steady-state growth path<sup>26</sup> was theoretically feasible and was being demonstrated in practice by a number of countries. After a slow start, growth modeling exploded in the 1960s as economists became more accustomed to using mathematics and began elaborating the “science of growth” in conscious imitation of the methodologies of the hard sciences.<sup>27</sup> As national income data accumulated, especially on the United States, theoretical models were put to the test and the growth industry was born providing much-needed intellectual underpinnings for the growth ideology and a few conceptual tools for policy makers wanting to translate political promises into tangible economic results. Sections 2 and 3 of this paper discuss how economics accounts for growth, but before getting to that it is worth listing a number of other reasons for the popularity of the growth ideology and why it has survived and will continue to survive setbacks and disappointments.

### **Growth as a Belief System**

The growth “ideology” has permeated the discourse on development and proven compelling for good and bad performers alike for several reasons. First, the growth rate for the global economy between 1950 and 1999 averaged 4 percent per year, well in excess of pre-1850 levels. Moreover, there is the demonstration effect generated by highly successful performers, however small they might be—and Singapore; Hong Kong SAR, China; Taiwan, China; and the Republic of

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<sup>24</sup> This was a time when concerns about state failure were making deep inroads into thinking in the United States, spurred by the ideas emanating from the Chicago School and the activities of increasingly influential neoliberal and libertarian think tanks (Backhouse 2010).

<sup>25</sup> This was enshrined in the “Washington Consensus,” first tabled by John Williamson in 1989.

<sup>26</sup> An early collection of essays by Nobel Prize winner Edmund Phelps (1967) offered a foretaste of the esoterica to come. Another example is Chakravarty (1969), lavishly praised in a Foreword by Paul Samuelson, who urged countries to stay “indefinitely near the turnpike (path)” when embarked “on a sufficiently long journey” (p. xii) See also the work of Bardhan (1970) and Arrow and Kurz (1970).

<sup>27</sup> The calculus of variations and optimal control theory became a favorite tool of some instructors teaching courses in development economics in leading American universities.

Korea were small economies in the 1970s and 1980s. These resource-poor countries on the periphery showed that steady progress from the lowest rung to near the top of the income ladder was possible in as little as four decades through technological catching-up and the patient building of human and physical capital largely from internal resources. Growth was achieved not through the virtuosity of policy but through macroeconomic and political stability, successful efforts at resource mobilization, learning and absorbing technologies from abroad, and the exploiting of market opportunities opened up by globalization. The early and later “tigers” served as a beacon of hope for the majority of economies that have struggled with low or negative growth rates. Had the tigers not materialized, it is doubtful that the growth ideology could have acquired such a loyal following. No amount of modeling can substitute for 7 percent rates of growth sustained for three decades.

Second, perhaps one can claim with little exaggeration (witness the concerns expressed in the United States circa 2012) that in democracies and autocracies alike, political legitimacy of governments has come to hinge on the delivery of good economic results over the medium term. If incomes stagnate and become more unequal or employment is hard to come by, democracies will show governments the door. The Arab Spring uprisings have demonstrated that populations can eventually become restive even in tightly policed autocracies. Rightly or wrongly, the notion that governments must deliver growth (or steady gains in welfare that in time come to be widely shared<sup>28</sup>) has acquired worldwide currency<sup>29</sup>—and politicians have had a large hand in embedding it more firmly through the promises they make as they seek office. Rightly or wrongly, it is becoming conventional wisdom that some degree of international convergence of consumption standards is a viable objective, given the relative performance of developed and developing countries during the past decade.<sup>30</sup>

Third, a number of developments over the past 50 years have rendered growth more urgent and made it harder to think of a world without growth. Population increase is a critical concern for a number of countries and, even as it slows, they will still have to convert a youth bulge into a youth dividend. Slow growth will have enormous economic and consequences (already apparent in the Middle East and South Asia) not only for countries saddled with high rates of unemployment but also for others if mass unemployment leads to an upsurge in international migrations. A related factor is the promises many governments—

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<sup>28</sup> Worsening inequality can be politically corrosive and a threat to democratic and capitalist institutions. However, in many countries, advanced and others, inequality continues rising inexorably. See the discussion below.

<sup>29</sup> GDP growth as measure of welfare gain is frequently challenged but has yet to be dethroned by an equally compact, easy to compute, and compelling indicator. See Stiglitz, Sen, and Fitoussi (2010).

<sup>30</sup> Rodrik (2011) doubts that such convergence will easily materialize except in the case of a few countries.

and the international community—have made (and will continue to make) to reduce if not eliminate poverty and more guardedly, inequality. The evidence suggests that countries (such as China) that have successfully tackled poverty have relied upon high rates of growth, which generate jobs, finance social safety nets, and enable governments to provide the poor with services that will equip them with capabilities.<sup>31</sup> The commitment to reduce poverty, staunchly backed by international financial institutions (IFIs) and nongovernmental organizations (NGOs), is supported by vast, international, bureaucratic machinery; but to deliver results, foreign assistance alone will not do. Countries saddled with large poverty burdens must grow. A return to nineteenth century rates of growth would be intolerable. Hence out of necessity, all parties must hold tight to the growth ideology and hope for the best.

Increasing resource and energy scarcities, climate change, and environmental degradation demand an urgent greening of growth. Although debate continues on the advantages of early and precautionary action, the weight of evidence points increasingly to net growth benefits of green policies and green technologies.<sup>32</sup> The evidence also suggests that 2–3 degrees of warming is becoming unavoidable, a development that will entail costly mitigating efforts in the future, in particular to increase the resilience of cities. In anticipation of a harsher environment, countries need to build their resource bases, because it is the wealthier countries that are far better able to weather shocks and to repair the damage. These three developments increase the pressure on governments to assign priority to growth because there can be no doubt that each will require large investments of capital and advances in technological capabilities—all associated with success at growing GDP.

Fourth—and there are other factors I will not list—industrialized and industrializing countries are ageing and faced with a shrinkage of the workforce a decade or two into the future. A number of economies are weighed down with large debts and even larger contingent liabilities, which will be difficult to pay down or accommodate without fairly robust growth.<sup>33</sup> Therefore, for fiscal and welfare reason at the very least, a resumption of “adequate” growth rates in these countries is vital if they are to maintain or improve on their current living standards. Stagnating economies will face enormous difficulties. In fact, there is no alternative but to aim for the highest rates of growth a country can potentially achieve.

The above sketches the emergence and 60-year dominance of the growth ideology. But while average growth rates are handily above the levels reached prior to the mid-nineteenth century for many countries, sustaining growth rates

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<sup>31</sup> The capabilities approach is associated with Amartya Sen (1985) and his co-authors—for example, Martha Nussbaum. See <http://www.iep.utm.edu/sen-cap/>; <http://plato.stanford.edu/entries/capability-approach/>; <http://ndpr.nd.edu/news/26146-creating-capabilities-the-human-development-approach-2/>.

<sup>32</sup> See Hallegatte and others (2012).

<sup>33</sup> Unless of course, the long-term healthcare, pension, and social benefits can be pared or revoked.

of 7 percent or more has proven difficult and this confronts growth economics with a severe challenge: to convincingly explain sustained growth accelerations<sup>34</sup> and with the benefit of such analyses arrive at policy recommendations tailored to individual country circumstances that will enable others to replicate what thus far has been the lot of a favored few. Economists have responded to the social and political demand for policy measures—and the need to build professional reputations by constructing sophisticated models and testing myriad hypotheses. However, as indicated below, analytic complexity and empirical rigor, while admirable, have yielded meager results by way of policies that are both specific to country needs and effective. As Arrow (1962) observed, “the math has taken on a life of its own,” and the furious productivity of growth economists has still to yield convincing evidence of its policy relevance.

## 2. Growth: Supply Push and Demand Pulled

The literature on growth is forbiddingly large and the expanding international army of researchers guarantees an endless stream of additions. The two volumes of the *Handbook of Economic Growth* provide a sense of the scope and richness of the research.<sup>35</sup> These were published in 2005 and much new material has appeared since then. Capturing the many-sidedness of this literature in a few pages is impossible. However, mercifully, the central threads and stylized facts are few and they have changed little over time—and there is nothing to suggest that the next 10,000 papers will add or subtract much from what we already know.

Growth can be viewed from two angles and because this is economics, they are supply and demand. In a contribution to the debate on capital theory that raged between the two Cambridge schools,<sup>36</sup> Paul Samuelson (1966, p. 444) ringingly announced that “until the laws of thermodynamics are repealed, I will continue to relate outputs to inputs—i.e. to believe in production functions.” And factor inputs have remained the drivers of growth in the supply side version of growth economics. Demand provides a complementary perspective. Whether or not supply materializes is a function of demand for outputs. If demand is weak, as it is in recessions, investment diminishes, production slackens, workers are not hired, and some of those employed are laid off. The unemployed cut back their consumption, which further sours the expectations of

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<sup>34</sup> Empirically tracked by Hausmann, Pritchett, and Rodrik (2005).

<sup>35</sup> See Aghion and Durlauf (2005). These are volumes 1A and 1B. Volume 2 is to come.

<sup>36</sup> The controversy swirled around the aggregation of goods and services into a factor of production to be plugged into a production function yielding a marginal product that determines the distribution of income. The controversy was captained by Joan Robinson and Paul Samuelson from Cambridge University, United Kingdom and Cambridge University, United States, respectively. See Harcourt (1972) and, more recently, Cohen and Harcourt (2003).

investors. In the absence of reflationary, state-initiated macro policies (as Keynesians advocate), this leads to a tightening vicious spiral. Economic growth slows with potentially long-lasting consequences. Market fundamentalists, unlike Keynesians,<sup>37</sup> are of the view that business cycles caused by market forces leave trend rates of growth mostly unchanged. They suggest that so long as markets are left to do their work (that is, the state stays on the sidelines), the demand side of growth can be ignored. But not all agree that demand management is irrelevant from the standpoint of long-run growth or that a “night watchman” state should be the twenty-first century ideal.

### **The Reign of Capital followed by Total Factor Productivity**

In the beginning, when the Harrod-Domar model was the workhorse of growth economics, only capital and labor mattered. These were the two basic factors whose entry into the production function caused growth, depending on a combination determined by technological relationships. In a Harrod-Domar world, if the supply of labor was elastic, then growth was paced by the supply of capital. Countries mobilizing a large volume of capital through domestic savings, supplemented by investible resources from abroad, could grow faster. This relationship helped to explain the performance of the communist countries that sacrificed consumption in order to build productive capacity. The dominance of capital lasted until the middle of the 1950s, when papers by Trevor Swan (1956) and more famously by Solow (1956, 1957), revolutionized thinking on the sources of growth. These papers showed that as much as 70 percent of the growth in the United States could not be traced to factor inputs but instead was caused by a residual, including technology and other intangibles.<sup>38</sup> By singling out technological change as a key factor, Solow (and others such as Abramovitz<sup>39</sup>) highlighted the role that knowledge had come to play since the dawn of the Industrial Revolution. Prior to that, “even the best and the brightest mechanics, farmers and chemists—to pick three examples—knew relatively little about the fields of knowledge they sought to apply. The pre-1750 world ... made many path-breaking inventions. But it was a world of engineering without mechanics, iron making without metallurgy, farming without soil science, mining without geology, water-power without hydraulics, dye making without organic chemistry and medical practice without microbiology and immunology. Not

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<sup>37</sup> Sometimes the two opposing groups are divided into the “freshwater” school of market fundamentalists and believers in real business cycles (such as Robert Lucas from Chicago and Thomas Sargent, formerly from Minnesota) and the “saltwater” school of neo- and post-Keynesian theory (including most notably, Paul Krugman and Larry Summers), many from the East coast and some from the West coast. See <http://seekingalpha.com/article/306991-paul-krugman-and-the-saltwater-economists-predictions>.

<sup>38</sup> Kuznets (1966) recognized the importance of capital saving innovations and investment in education and the development of skills.

<sup>39</sup> For Abramovitz (1993), technology accounted for only a part of the coefficient of ignorance or the residual.

enough was known to generate sustained growth based on technological change (Mokyr 2005, p. 1,119).

Solow's findings were subsequently validated by others, and triggered theoretical and empirical research to track down the "quarks" that inhabit the residual—or total factor productivity (TFP) as it has come to be known.<sup>40</sup> This quest is now in its sixth decade and although a multitude of suspects have been identified, a theory that convincingly accounts for the residual/TFP, lays bare its dynamics, and points unequivocally to effective policies has proven elusive. Researchers attempting to explain the differences in performance among countries have marshaled scores of so-called fundamental variables including geography, entrepreneurship, financial deepening, religion, ethnic fractionalization, and natural resources.<sup>41</sup> But after examining the explanatory robustness of the leading candidate growth theories, Durlauf, Kourtellos, and Tan (2008, p. 344)<sup>42</sup> are forced to conclude that there is a lack of "strong evidence that any of the new growth theories are robust direct determinants of growth when we account for model uncertainty.... [However,] variation in growth rates across countries are more robustly explained by differences in macroeconomic policies and unknown heterogeneity associated with regional groupings."

Recent attempts at estimating TFP for a large number of countries range from a quarter of growth to over two-thirds, with the average falling somewhere in the 50 percent range.<sup>43</sup> Over the longer term, the consensus is that growth of GDP and divergences in per capita GDP will be closely tied to individual country performance with regard to productivity. Moreover, Solow's initial intuition that the explanation for the residual was to be found in technology grounded in the accretion of knowledge has come to be widely accepted. Technological change and innovation (some embodied in new equipment) are seen as the mainsprings of productivity growth. Underlying these is a learning and innovation system that produces human capital and determines its quality; helps to absorb technology and refines it through incremental innovations; generates ideas, some of which are translated into commercial innovations; and through the agency of greater technical, vocational, managerial, and organizational skills, brings about gains in efficiency. Physical capital is still very much in the picture by creating productive capacity and serving as a vehicle for research and technology transfer. In addition, since 1995, information technology (IT) capital has acquired

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<sup>40</sup> Earlier work by Denison (1962), Jorgenson and Griliches (1967), and Maddison (1987) suggested ways of decomposing the residual, including through human capital inputs.

<sup>41</sup> One compact source of cross-country growth analysis is Barro (1997).

<sup>42</sup> See also the detailed weighing of approaches to modeling growth and econometrically tracing its causes in Durlauf, Johnson, and Temple (2005). Kenny and Williams (2001) also observe that the empirical evidence does not enable one to select among competing explanatory factors.

<sup>43</sup> Among a legion of TFP enumerators, see Bosworth and Collins (2003), Crafts (2010), Jorgenson and Vu (2010), and Allen (2012).

a substantial role, especially in the United States and Europe.<sup>44</sup> IT is complemented by technology that is at the heart of what Baumol (2002) describes as the “capitalist growth machine.” As Parente and Prescott (2000), Comin and Hobijn (2010), Allen (2012), and many others note, the main reason why some countries are so far down on the income scale and convergence is so halting is because these economies have difficulty borrowing technologies from more advanced countries and tailoring it for their own purposes.

A number of reasons have been put forward to explain why frontier technologies have been slow to diffuse. Bad institutions that place limits on absorptive capacity, regulatory constraints, vested interests, and poor governance must take some of the blame. They have discouraged technology adoption through their affects on the business climate and entrepreneurship. The poor quality of human capital and associated deficiencies in technological capacity has thrown up additional hurdles. But the nature of technologies closer to the frontier may also slow diffusion. These technologies tend to be capital intensive because they were developed in countries where labor is relatively expensive and skills are abundant. They are less cost effective in countries where labor costs are low relative to those of capital. Lower- and middle-income countries, all in East Asia, that have managed to narrow technology gaps in two or three decades have done so through rapid deepening of capital. This was made possible by intensive resource mobilization and the provision of capital at low rates of interest to industry through state-controlled financial channels. This process, which mimics the approach adopted by Germany and Italy during their catch-up stage in the late nineteenth century, has been backstopped by investment in learning and innovation systems that have built up the technical, research, and soft skills to absorb and effectively utilize advanced methods of production.

A country such as China offers a good illustration of how technology gaps can be narrowed and productivity raised. China has invested massively in state-of-the-art production equipment, financed by equally massive domestic savings channeled to enterprises through state-owned banks at state-controlled rates of interest that substantially depress the cost of capital.<sup>45</sup> At the same time, China has successfully enlarged its pool of skills, thus facilitating absorption of technology from overseas. This brings us back to the refinements and advances in growth theory, as expounded in work by Paul Romer<sup>46</sup> that modeled endogenous growth and explicitly accounted for the role of knowledge.

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<sup>44</sup> Jorgenson, Ho and Stiroh (2005) note that a decline in IT prices have induced firms to substitute IT for non IT capital and since 1995, Jorgenson and Vu estimate (2010) that IT capital’s contribution worldwide rose from less than a quarter to more than a third of the total contribution of capital.

<sup>45</sup> Financial repression is a notable accompaniment of capital-intensive development in several of the East Asian economies.

<sup>46</sup> Romer (1986, 1994).

## From Solow to Endogenous Growth

The Solow model, by clarifying the relationship between capital accumulation and growth, helped to partially dislodge the orthodoxy that saw capital as the key to growth and focused growth-augmenting policies exclusively on measures to raise the rate of investment. For example, in Rostow's analysis (1960), a takeoff into sustained growth was explicitly a function of a prior increase in capital investment from 5–6 percent to 15 percent or more.<sup>47</sup> Solow showed that increasing capital accumulation eventually runs into diminishing returns<sup>48</sup> as an economy shifts from extensive to intensive growth, but in avoiding the problem the model assumed exogenous technological change that limited its explanatory power. This deficiency was remedied by explicitly incorporating (endogenizing) knowledge into the growth model. Endogenous growth theory assumes that learning by doing<sup>49</sup> and investment in education creates knowledge and knowledge spillovers. Thus, externalities reverse the diminishing returns to capital, allowing growth to be sustained. In other words, the continuous production of knowledge through a variety of avenues staves off what would otherwise be an inevitable onset of diminishing returns that would negate the deepening of capital.<sup>50</sup> It is arguable whether endogenous growth theory constitutes a significant advance, however, as Solow (2007, p. 6) remarks, "the most valuable contribution of endogenous growth theory has not been the theory itself, but rather the stimulus it has provided to thinking about the actual production of human capital and useful technological knowledge."

The literature is replete with an immensity of small variations and minor extensions, including the role played by institutions (whether viewed as rules or as organizations with specific governance mechanisms),<sup>51</sup> but the action revolves

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<sup>47</sup> Rostow's rules of thumb were appealing to American policy makers because they distributed countries along a continuum of stages and imposed a semblance of order on a complex and at times chaotic world situation. This in turn simplified the decision rules for foreign assistance and put a ceiling on how much foreign assistance would be needed to realize America's development objectives for the international community. See Haefele (2003, p. 87).

<sup>48</sup> This became spectacularly evident in the case of the former Soviet Union, which by 1975 was investing 38 percent of GDP but saw its growth taper through the 1970s to almost zero in the 1980s. See Allen (2011, p. 134).

<sup>49</sup> The endogenizing of technological change as a profit-making activity in its own right was foreshadowed by Arrow in a landmark 1962 paper where he used capital investment as the vehicle through which learning/technological change occurs endogenously rather than being introduced exogenously. See also Solow (1997). But Solow (2007, p. 5) wonders whether endogenizing was as much of a breakthrough as it is touted to be, because to endogenize the growth rate of a variable requires a linear differential equation: "the plausibility of the model depends upon the robustness of that assumption: it amounts to the firm assumption that the growth rate of output (or some determinant of output) is independent of the level of the output itself."

<sup>50</sup> Aghion and Howitt (2009) nicely elucidate the workings of all and sundry models of growth and track the twists and turns in the development of theory. See also Howitt (2004).

<sup>51</sup> According to some researchers, institutions (represented by a proxy for which data can be found) are the keys to growth. Institutions such as property rights and intellectual property surely matter,



around capital and TFP and ways of parsing TFP. The contribution of TFP appears to be rising, according to a recent study by Arezki and Cherif (2010) of 94 countries covering the period 1970–2000. The question that refuses to go away is whether all the fuss over TFP is increasing the stock of effective policy instruments and institutions, and helping us understand why growth is so persistently uneven and all too often unresponsive to the moving of conventional policy levers. Policy instruments and institutions are discussed in the next section.

## Introducing Demand

Much of the attention of growth theory has been on the supply side, with demand attracting sporadic attention during business downturns, as has been the case since 2008. Such is the trajectory of international growth after WWII that a prolonged shortfall in demand was not perceived as a significant problem until recently. This explains the surprise and alarm<sup>52</sup> that greeted both the severity of the financial crisis (unexpected by the legion of believers in the efficiency and stability of Western financial markets and disinclined to harbor bearish sentiments) and the Great Recession that followed. During the extended period of calm prior to 2008,<sup>53</sup> the majority of macroeconomists were content to track the movements of the economy using variants of dynamic stochastic general equilibrium (DSGE) models that incorporated consumption smoothing and rational expectations, which papered over the differences between the Keynesian<sup>54</sup> and new classical models.

From the perspective of growth economics, this neglect of demand management (including the demand generated by net exports) and the risk of crises are hard to explain, given crises' frequency (though mainly in developing countries). A literature going back several decades has established that poor demand management—by injecting macroeconomic volatility,<sup>55</sup> inflationary pressures, or adverse expectations—has been responsible for depressing investment and growth in many countries.<sup>56</sup> One reason why the East Asian tiger

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but how and how much they impinge on TFP is difficult to determine. As policy instruments, institutional variables are tricky to define and manipulate and the returns can accrue non-linearly over a long period of time.

<sup>52</sup> And the initial silence and the subsequent defensive response to Queen Elizabeth's question: "Why did no one see the crisis coming?" <http://www.ft.com/intl/cms/s/0/1c1d5a9e-bb29-11dd-bc6c-0000779fd18c.html#axzz1rNHjoBif>.

<sup>53</sup> Between the mid-1980s and 2007, there was a relative lull in financial crises and defaults, which, according to Reinhart and Rogoff (2008), set the stage for the "big one."

<sup>54</sup> New Keynesian models assume (difficult to measure) sticky prices.

<sup>55</sup> Burnside and Tabova (2009) find that a country's average growth rate is correlated with its exposure to risk factors and the greater its exposure to shocks, the lower its average growth. In other words, riskier countries depress domestic investment and attract less capital from abroad.

<sup>56</sup> See Sirimaneetham and Temple (2009) for a reexamination of the evidence using a new index of instability and for references to a large earlier literature.

economies performed at such a high level is because, for the most part, they were able to create stable macroeconomic environments conducive to investment and to risk taking. A second reason of equal importance was the emphasis that East Asian economies placed on trade (and foreign direct investment) policies aimed at maximizing the growth impetus from exports. Thus, growth was supported both in the form of demand and through gains in productivity, technology transfer, and the encouragement that an open trading environment offered to foreign investors. It was the relative neglect of such policies at the very time when globalization was widening opportunities for growth through trade that stifled growth in many developing economies and enabled the East Asians to pluck the low-hanging fruit.

The experience of Japan also shows how poor macroeconomic management can undermine efforts at accumulating knowledge and inducing innovation. Japan is home to some of the most innovative multinational corporations, spends in excess of 3 percent of GDP on research and development (R&D), is second only to the United States in the number of patents it registers each year, and is not short of science and technology skills. Nevertheless, following the bursting of the real estate bubble in 1989 and the ensuing financial crisis, Japan's growth slowed to a crawl, with TFP growing by just 0.6 percent per year between 1990 and 2003.<sup>57</sup> In other words, investment in knowledge to augment science, technology, and innovation (ST&I) activities cannot boost growth if demand is persistently weak. Moreover, experience suggests that the private sector is quick to pare R&D spending when the economy enters a downturn and the immediate future demand for innovation weakens. The more astute companies are careful not to cut their research activities, as they provide the ideas and products for future growth, but the majority does in fact take the axe to R&D. Following the 2007–08 financial crisis, companies reacted by curtailing expenditures on research, as did some governments beset with fiscal problems—the result of past macroeconomic mismanagement.

As Keynes<sup>58</sup> observed, deficient demand tilts the odds against the entrepreneur and can stifle innovation and eat into the growth of productivity. Amazingly, after so much research on macroeconomic policy, the financial crisis and the problems of the eurozone have uncovered a singular lack of consensus regarding the efficacy of demand management and how it can be most effectively conducted, once monetary policy is reduced to near impotence when

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<sup>57</sup> Jorgenson and Motohashi (2005).

<sup>58</sup> "If effective demand is deficient ... the individual enterpriser who seeks to bring these resources into action is operating with the odds loaded against him. The game of hazard, which he plays, is furnished with many zeros, so that the players as a whole will lose if they have the energy and hope to deal all the cards. Hitherto the increment of the world's wealth has fallen short of the aggregate of positive individual savings; and the difference has been made up by the losses of those whose courage and initiative have not been supplemented by exceptional skill or unusual good fortune. But if effective demand is adequate, average skill and average good fortune will be enough" (Keynes 1936).

interest rates are at the zero bound. In the United States, for example, the leading economists are unable to agree as to whether the multiplier effect of fiscal spending by the Federal government is greater or less than one. The reason appears to be that the new classical “freshwater” school never embraced a role for fiscal policy as a stimulus. Instead, it assumed that monetary and exchange rate policies would be sufficient and its members are virulently opposed to government intervention of the sort associated with fiscal activism. What we see playing out on the macroeconomic front is not a debating of policy options grounded in rigorous empirical analysis but a contest between two belief systems unable to convincingly establish a position with reference to preceding research. Perhaps most disconcerting is that the debate is being conducted exclusively among participants drawn from a handful of schools (with strong ideological leanings) in North America and Western Europe. Other countries and other academics have a stake in the outcome of the debate and future directions of macroeconomic policies but their contribution is barely visible. On demand management as on the supply related aspects of growth, a few Western universities continue to call the shots by training and indoctrinating the majority of those who worldwide conduct influential research and advise policy makers. The epicenter of growth economics remains highly localized, and more than 60 years after the birth of growth economics, Western ideas, fashions, and methodologies continue to determine what is researched, how it is researched, and what gets translated into policies.

### **Indices of Performance**

In this context there remains one additional substrand of the demand-side approach that deserves consideration because it figures so prominently in the assessment of growth prospects and the making of policies. This strand comprises the numerous indices of competitiveness, business climate, corruption, innovation, logistics, and entrepreneurship. These are just a few of the indicators that seek to gauge a country’s attractiveness for investors, its potential for innovation, and its production competitiveness relative to other countries.<sup>59</sup> Because of their apparent simplicity and due to intensive marketing, these indicators have emerged as the yardsticks with which countries measure performance and they provide some of the more monitorable policy handles. Macroeconomic stability and demand management through monetary, fiscal, and exchange rate policies are the key determinants of investment, consumption, and exports. However, some research confirms that the “investment climate” (the competitiveness of the economy as measured by a number of indicators) and innovative capacity (also measured from several different angles) affect investment decisions and innovativeness, and that these feed through into growth via capital accumulation and gains in productivity. Undoubtedly, the

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<sup>59</sup> See, for instance, World Bank (2004); WEF (2012).

various elements that enter into these indices matter. How much each counts, and which ones should be singled out to yield the maximum productivity gains, is unlikely to be settled because there are far too many indices. Many are built up through subjective assessments, and it is difficult to say which combination of factors, in conjunction with a host of other determinants, will be appropriate for a specific country.

Inevitably, as with most things, one size does not fit all. The safe conclusion is that conventional demand management dominates all other types of management. Insufficient demand, demand volatility, excess demand, and the distortions, bubbles, and crises they can cause, are likely to negatively affect growth prospects.

The first step to a good business climate and a competitive economy is macroeconomic stability. Looking at the fragile state of many Western economies following the official start of recovery, the importance of demand management is self-evident but not apparently to a sizable segment of the economics profession and to the policy makers whose ear they have. Brad DeLong (2012, p. 2) captures the Keynesian mood well when he remarks: “For 62 years, from 1945–2007, with some sharp but temporary and regionalized interruptions, entrepreneurs and enterprises could bet that the demand would be there if they created the supply. This played a significant role in setting the stage for the two fastest generations of global economic growth the world has ever seen. Now the stage has been emptied.” Clearly Keynesians are on the defensive. The case for reflationary fiscal policies to restore growth is receiving a frosty political reception and the case for restoring long-term growth, once recovery is well and truly launched in Western countries, is not being made in a manner that convinces the politician or the median voter.

In middle-income countries that must drive global growth if the advanced countries do not, the situation is satisfactory in the short term but much less so over the longer haul.<sup>60</sup> Countries such as Brazil, the Russian Federation, South Africa, India, Malaysia, the Arab Republic of Egypt, Indonesia, and China are by no means primed for sustained growth of the kind the high flyers enjoyed in the 1980s and the 1990s. Future growth in these countries is vulnerable to a number of factors, including dysfunctional domestic governance and political turbulence, low rates of saving and investment (in certain cases), an unwelcoming business climate, major sectoral imbalances and inefficiencies, limited or declining manufacturing capabilities, and weak innovation systems. In addition, all of these countries would be affected by the inability of their Western trading partners to return to earlier growth paths, or, worse, by a reversal of trade liberalization.

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<sup>60</sup> Some of these countries worry about becoming caught in a middle-income trap and being unable to upgrade industry and close technology gaps because of human and research capital constraints.

Increasing income inequality, especially in advanced English-speaking countries and many middle- and low-income ones, including some in East Asia, is adding to the uncertainty regarding future growth prospects. The Kuznets curve has proven unreliable. Kuznets (1955) forecast a period of increasing income inequality as labor migrated from rural to higher-paying urban jobs in developing countries (and income from land declined), followed by a return to greater equality once societies urbanized, industrialized, raised average levels of education, and introduced equalizing tax and transfer programs.<sup>61</sup> In fact, inequality declined in Western countries until about 1980, but has been rising since.<sup>62</sup> In continental European countries, the Nordic countries, and Japan, inequality was flat and is now increasing slowly. In developing countries, inequality first declined and leveled off and in many it is now on the rise—including in the East Asian economies, which demonstrated, with the help of land reforms and rapid industrialization,<sup>63</sup> that countries could achieve high rates of income growth and maintain income inequality. Income inequality is edging upward in the United States, Singapore, China, Japan, some of Europe, and remains high in South America and Sub-Saharan Africa. Conventional wisdom would suggest that growth could suffer if political tensions arise and boil over, affecting policy making and investor risk perception. However, research reported in the *Oxford Handbook of Economic Inequality*<sup>64</sup> does not point to a clear relationship running from inequality to economic performance. A meta-analysis by de Dominicis, de Groot, and Florax (2006) adds some valuable detail, which shows that the influence of inequality on growth is stronger in less-developed countries and when the duration of a spell of growth is shorter—the long-term impact is different from the impact in the short run. Although past experience partially allays fears regarding growth, recent trends in inequality and levels reached are nevertheless disquieting and these could prove to be problematic if growth is weak because of the lingering aftermath of the Great Recession. Inequality could become politically unacceptable in democracies if economic performance remains sluggish, and could unleash demands and policy actions that further curb growth, at least over the medium term.

The search for policy recipes to achieve or restore rapid growth, and to distribute the gains more equitably, is urgent, as countries wrestle with

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<sup>61</sup> Acemoglu and Robinson (2002) explain the shape of the Kuznets curve in Western European countries as follows: by increasing inequality, capitalist industrialization either brings about a change in the political regime or forces the ruling political elites to redistribute income in the interests of stability.

<sup>62</sup> Goldin and Katz (2009); Atkinson, Picketty and Saez (2011); Acemoglu (2012). The increasing equality is explained by the spread of education resulting from the shifts in the distribution of political power, mediated by democratic institutions and change in ideological beliefs.

<sup>63</sup> Acemoglu and Robinson (2002) maintain that the land reforms in East Asia fundamentally altered the relationship between growth and inequality.

<sup>64</sup> Salverda, Nolan, and Smeeding (2009).

unemployment, expectations and contingent liabilities. However, arithmetic<sup>65</sup> suggests that serious economic and environmental strains could ensue if a few of the largest countries, such as China, converged towards the living standards of the West and the majority of the others start to narrow technology and income gaps. The tax that such growth would impose on global public goods, and the resource depletion it would entail, would imperil the growth project that has been the centerpiece of development for so many decades. Even a substantial greening of growth, were it to occur in the next two to three decades, might be too little and too late. Does growth economics have a convincing riposte for the doom mongers? What are the stylized policy recommendations of continuing significance that have come out of 60 years of research and its application? The next section discusses these questions.

### 3. Policies for Growth: A Small Pot of Gold

Long immersion in the literature on growth leaves one with the feeling that pearls never stop pouring in: so much is being written on such a staggering multitude of topics. There is a sense that a lot of incremental innovation is afoot wherever economics is being taught or practiced—and not just in a few Western hotspots. But then one stops to remember the last 1,000 papers read and the 4 million regressions<sup>66</sup> scrutinized. That is when the sense of moving in circles becomes apparent and the impossible task of summarizing a few stylized policies begins to seem manageable.

#### King Capital

Although the spotlight might have shifted to TFP, capital is the driver of growth for most low- and lower-middle-income countries<sup>67</sup> far from the technological frontier, with low capital labor ratios and still on the extensive margin of development. For these countries, the first order of business is to put in place the infrastructure that undergirds development and to build the productive capacity. Capital investment does this and it also serves as the avenue through which technology is transferred from more advanced to developing countries. China is the foremost exemplar of this approach. It telescoped decades of development into years by pulling out the stops on capital investment and in the process transferring technology at a much faster pace than would ordinarily have been possible. How can a country raise investment to upwards of 25 percent of GDP?

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<sup>65</sup> See Cohen (2012); Sachs (2008).

<sup>66</sup> Only Sala-i-Martin (1997a, b) has confessed to having run 4 million regressions ([www.nber.org/papers/w6252.pdf](http://www.nber.org/papers/w6252.pdf)), later reduced to 2 million ([www.jstor.org/stable/2950909](http://www.jstor.org/stable/2950909)).

<sup>67</sup> The United States could also use a sizable dose of capital investment to restore its ailing infrastructure and perhaps even partially reverse the hollowing of its manufacturing activities. In 2009, U.S. gross investment was a paltry 15 percent.

Only a few have managed this through a combination of resource mobilization through the fiscal system and public sector entities; by harnessing publicly owned and controlled banks; by exerting financial repression, which depresses interest rates over long periods; through state capitalism in combination with industrial policy vigorously implemented through fiscal and organizational incentives; and with the help of an exchange rate policy that undervalues the domestic currency relative to that of major trading partners. This is a tall order, beyond the capacity of most countries, and some of the incentives utilized in the past are now disallowed by the World Trade Organization (WTO). In fact, even countries that once achieved high rates of investment, such as Malaysia, have fallen far below earlier levels. Other countries such as Brazil and South Africa have been unable to approach East Asian levels in spite of introducing generous fiscal incentives for investment and a deepening of the financial sector to mobilize and allocate savings.

Improving the business climate can in principle increase investment, but it is difficult to identify countries that have moved to a high growth path by working on the indicators that affect transaction costs. In the 1980s and a part of the 1990s, low rates of saving and investment in Latin American and Sub-Saharan countries was blamed on macroeconomic mismanagement. However, better macro-management has increased investment modestly if at all. Between 1995 and 2009, gross investment was unchanged in Latin America and rose from an average of 18 percent to an average of 21 percent in Sub-Saharan Africa. Low levels of private investment in productive capacity and limited investment in physical infrastructure constrain growth, both directly and by dampening the gains in TFP from embodied technological progress and learning.

Horizontal and matrix-based approaches (as distinct from the earlier vertical ones) to industrial policy that were pushed aside by market fundamentalism in the 1990s are back in favor,<sup>68</sup> as countries struggle to raise the level of investment and orient it more towards the productive sectors rather than housing or real estate. The jury is still out on whether such policies or others will make a tangible difference in primarily market-based economies operating with reference to WTO rules.

### **Human Capital the Knowledge Producer**

Endogenous growth theory and the research on human capital has brought out the vital role of education and ST&I skills. They serve both as drivers of (inclusive) growth in themselves and as complements to increasingly more sophisticated capital/IT equipment based on technologies introduced in the advanced countries. Research by Hanushek and others<sup>69</sup> has demonstrated that the quality of human capital (based on standardized tests) counts for more than

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<sup>68</sup> See Van Reenen (2012), Aiginger (2007, 2011), and Aiginger and Sieber (2006).

<sup>69</sup> Hanushek and Woessman (2008, 2012); Pritchett and Viarengo (2008).

quantity, especially in the race to narrow technological gaps and to raise factor productivity by improving management, soft skills, allocative efficiency, and policy implementation. Learning from countries that are high on the quality ladder has become a growth industry in its own right, even as some of these countries (for example, Singapore and Finland) begin to worry about the emphasis on rote learning and on the inability to instill sufficient creativity and problem-solving skills. It is clear from Western experience that greater spending on education does not by itself suffice, once it is over some threshold of adequacy. Teacher qualifications, incentives, status, and autonomy can make a difference but each success story has tight and unreplicable cultural correlates. Human capital has emerged as an axis of growth economics, and many of the answers countries are seeking must be found in the swampland of education “science,” itself full of interesting papers and dead ends.

### **Innovation Systems**

Human capital development and the learning economy it represents is inseparable from the ST&I system that uses human capital to generate ideas and commercial innovations facilitated by legal and regulatory institutions to move the TFP needle. The architecture of innovation systems in the leading economies has been exhaustively mapped to the following conditions: the role of the government, universities, and the financial system (including venture capital providers); legal institutions supporting intellectual property and the trading of ideas; industrial composition; the entrepreneurial dynamics of the business community, both domestic and foreign; and the contribution of a competitive market environment. A series of OECD reports<sup>70</sup> elucidates country experiences and offer policy advice. Lundvall (2007) provides a historical perspective and Martin (2012) nicely summarizes the state of the field and notes the challenge of coordinating the actions of several participants in the innovation game. The *idea- and innovation-generating machine* must function smoothly to extract the maximum TFP from capital investment and the accumulation of human capital. This is very much in the spirit of endogenous growth theory, but it should be noted that endogenous growth policies and innovation activities are not really separable. They are carried out more or less in tandem, given the fast-moving nature of the technological environment. A universal roadmap exists only as a broad sketch. With the U.S. and Finnish innovation systems showing signs of strain, two of the global icons are tottering on their pedestals.

### **Demand Management**

Demand management is linked to economic openness and the role of trade in creating opportunities for firms (especially in small countries). Through demand management, firms can realize economies of scale and connect with international value chains. This creates avenues for technology transfer and subjects domestic

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<sup>70</sup> See [http://www.oecd.org/document/62/0,3746,en\\_2649\\_34273\\_38848318\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/62/0,3746,en_2649_34273_38848318_1_1_1_1,00.html).



firms to competitive pressures. Whether or not trade enhances productivity through these channels remains undecided. Bernard and his co-authors<sup>71</sup> show that the firms that enter export markets are already the productive ones. Others find that trade does cause productivity to rise.<sup>72</sup> As with macroeconomic policy, the answer seems to boil down to a matter of belief, because there are an equal number of papers arguing both sides of the case. I tend to go with the ayes. But this expression of belief only begs the larger question: How does a country become a successful exporter? If one takes China as a model, then the answer appears to lie in making massive investments in physical and human capital to build manufacturing capability; creating an innovation system to enhance absorptivity; exploiting foreign direct investment to increase access to technology; maximizing fiscal, financial, and exchange incentives; and applying pressure from the party organization to achieve state-mandated export targets.

## 4. Concluding Remarks

The economics profession has been hard hit by the inability to warn of the recent financial crisis and to contribute coherent policy directions to aid recovery and to restore growth. After a few months of soul searching and the occasional mea culpa, the response, inevitably, is denial, and a return to business as usual.<sup>73</sup> Perhaps it cannot be otherwise. For its part, growth economics seems resigned to circling around the coefficient of ignorance and stirring in new variables, even though the policy value added from these efforts is perilously close to zero.

There is no denying the scale of the economic research conducted over the past half century, but growth economics is struggling to provide detailed and meaningful answers to policy concerns. If TFP is indeed the driver of growth, its measurement is becoming something of an art,<sup>74</sup> appreciated by practitioners (there are scores of estimates, no two alike) but contributing little to the content and precision of policies for raising TFP. There is no consensus on how growth that is evenly shared might be accelerated in advanced countries and sustained by middle-income ones fearing the onset of sclerosis. In the absence of fresh ideas, the professional and public debate mindlessly regurgitates well-worn nostrums on investment in education and science and technology; on stimulating innovation; and on creating an institutionally well-stocked, regulation-lite,

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<sup>71</sup> Bernard (2006). Iacovone and Javorcik (2012) added also find that potential exporters upgrade quality prior to entering the export market.

<sup>72</sup> See Lopez (2005).

<sup>73</sup> Specialization, ideological predispositions, and an absence of alternative models makes people return to the same coalface. Dislodging neoclassical/neo-Keynesian macroeconomics will require the mother of all disruptive theories.

<sup>74</sup> A survey of the econometrics of TFP by Van Beveren (2012) indicates how many tools and tests the modeler can now marshal to enhance the joys of estimation.

market friendly, enabling business environment. The one apparent innovation is the greening of several of the latest offerings on growth.

Since the early 1970s, leading economists have periodically warned that their profession would be marginalized by the trend towards technical specialization, mathematical modeling, and a focus on the testing of narrow hypotheses using increasingly more abstruse econometrics. These warnings have gone unheeded. As a consequence, in the face of a crying need for rapid and effective policy action on many fronts, growth economics is not forthcoming with convincing analysis, plus the kind of fine-grained policy suggestions informed by political realities, that determine whether and how policies are implemented and the nature of outcomes. Policy makers often have short time horizons, are looking for practical proposals, and must constantly weigh the political and distributional implications of economic policies. Therefore, they have little time for recommendations to “strengthen institutions,” or move from the periphery to the “core of the product space,” or invest more in R&D, or improve the quality of education, or, most dishearteningly, raise TFP. These are all suitable grist for articles and blogs. But after 60 years, growth economics should be able to offer more varied, politically informed, specific, and operationally relevant fare, and policy makers and others who ultimately finance the uncountable regressions deserve better. Maybe in the next 60 years they will receive their due.

## References

- Abramovitz, Moses. 1993. “The Search for the Sources of Growth: Areas of Ignorance, Old and New.” *Journal of Economic History* 53(2): 217–43.
- Acemoglu, Daron. 2012. “The World Our Grandchildren will Inherit: The Rights Revolution and Beyond.” NBER Working Paper No. 17994. National Bureau of Economic Research, Cambridge, MA.
- Acemoglu, Daron, and James A. Robinson. 2002. “The Political Economy of the Kuznets Curve.” *Review of Development Economics* 6(2): 183–203.
- Aghion, Philippe, and Peter Howitt. 2009. *The Economics of Growth*. Cambridge MA: MIT Press.
- Aghion, Philippe, and Steven Durlauf, eds. 2005. *Handbook of Economic Growth Volume*, Vol 1A and 1B. New York: North-Holland.
- Aiginger, Karl. 2007. “Industrial Policy: Past Diversity and Future. Introduction to the Special Issue on the Future of Industrial Policy.” *Journal of Industry, Competition and Trade* 7(3&4): 143–46.
- — —. 2011. “The Inefficiency of Industrial and Innovation Policy in France.” VoxEU.org, October 3. <http://www.voxeu.org/index.php?q=node/7054>.
- Aiginger, Karl, and Sussane Sieber. 2006. “The Matrix Approach to Industrial Policy.” *International Review of Applied Economics* 20(5): 573–603.

- Allen, Robert C. 2011. *Global Economic History*. New York: Oxford University Press.
- — —. 2012. "Technology and the Great Divergence: Global Economic Development since 1820." *Explorations in Economic History* 49(1): 1–16.
- Amsden, Alice H. 1989. *Asia's Next Giant*. New York: Oxford University Press.
- Arezki, Rabah, and Reda Cherif. 2010. "Development Accounting and the Rise of TFP." IMF Working Papers 10/101. International Monetary Fund, Washington, DC.
- Arrow, Kenneth J. 1962. "The Economic Implications of Learning by Doing." *The Review of Economic Studies* 29(3): 155–73.
- Arrow, Kenneth J., and Mordecai Kurz. 1970. *Public Investment, the Rate of Return and Optimal Fiscal Policy*. Baltimore, MD: Johns Hopkins Press.
- Atkinson, Anthony B., Thomas Piketty, and Emmanuel Saez. 2011. "Top Incomes in the Long Run of History." *Journal of Economic Literature* 49(1): 3–71.
- Backhouse, Roger E. 2010. *The Puzzle of Modern Economics*. Cambridge, UK: Cambridge University Press.
- Bardhan, Pranab K. 1970. *Economic Growth, Development and Foreign Trade*. New York: Wiley Interscience.
- Barro, Robert J. 1997. *Determinants of Economic Growth*. Cambridge, MA: MIT Press.
- Baumol, William A. 2002. *The Free Market Innovation Machine*. Princeton, NJ: Princeton University Press.
- Bernard, Andrew. 2006. "Firms in International Trade." *NBER Reporter*. Cambridge, MA: National Bureau of Economic Research.
- Bosworth, Barry, and Susan M. Collins. 2003. "The Empirics of Growth: An Update." Unpublished paper. Brookings Institution, Washington, DC. [http://www.brookings.edu/papers/2003/0922globaleconomics\\_bosworth.aspx](http://www.brookings.edu/papers/2003/0922globaleconomics_bosworth.aspx).
- Bresnahan Timothy, and Manuel Trajtenberg. 1995. "General Purpose Technologies 'Engines of Growth'." NBER Working Paper No. 4148. National Bureau of Economic Research, Cambridge, MA.
- Burnside, Craig, and Alexandra Tabova. 2009. "Risk, Volatility and the Global Cross-Section of Growth Rates." NBER Working Paper No. 15225. National Bureau of Economic Research, Cambridge, MA.
- Caselli, Francesco, 2005, "Accounting for Income Differences Across Countries." In *Handbook of Economic Growth*, Volume 1A, Philippe Aghion and Steven Durlauf, eds., pp. 679–741. New York: North-Holland.
- Chakravarty, Sukhamoy. 1969. *Capital and Development Planning*. Cambridge, MA: MIT Press.
- Chang, Ha-Joon. 2002. *Kicking Away the Ladder*. London: Anthem Press.

- Cohen, Daniel. 2012. *The Prosperity of Vice*. Cambridge, MA: MIT Press.
- Cohen, Avi J., and G. C. Harcourt. 2003. "Retrospectives: Whatever Happened to the Cambridge Capital Theory Controversies?" *Journal of Economic Perspectives* 17(1): 199–214.
- Comin, Diego A., and Bart Hobijn. 2010. "Technology Diffusion and Postwar Growth." NBER Working Paper No. 16378. National Bureau of Economic Research, Cambridge, MA.
- Commission on Growth and Development. 2010. *The Growth Report*. Washington, DC.
- Crafts, Nicholas. 2010. "The Contribution of the New Technology to Economic Growth: Lessons from Economic History." Unpublished paper. University of Warwick, UK.
- De Dominicis, Laura, H.L.F. de Groot, and R.J.G.M. Florax. 2006. "Growth and Inequality: A Meta-Analysis." Tinbergen Institute Discussion Paper TI 2006-064/3. Tinbergen Institute, Rotterdam, The Netherlands.
- DeLong, J. Bradford. 2012. "The Shadow of Depression." *Project Syndicate*. March 29. <http://www.project-syndicate.org/commentary/the-shadow-of-depression>.
- Denison, Edward F. 1962. *The Sources of Economic Growth in the United States and the Alternatives Before Us*. New York: Committee for Economic Development.
- Domar, Evsey. 1946. "Capital Expansion, Rate of Growth and Employment." *Econometrica* 14(2): 137–47.
- Doucouliagos, H., and M. Paldam. 2006. "Aid Effectiveness on Accumulation: A Meta-Study". *Kyklos* 59(2): 227–54.
- Doucouliagos, H., and M. Paldam. 2009. "The Aid Effectiveness Literature: The Sad Results of 40 Years of Research." *Journal of Economic Surveys* 23: 433–61.
- Durlauf, Steven A., Andros Kourtellos, and Chih Ming Tan. 2008. "Are any Growth Theories Robust." *Economic Journal* 118(1): 329–46.
- Durlauf, Steven, N. Paul, A. Johnson, and Jonathan R.W. Temple. 2005. "Growth Econometrics." In *Handbook of Economic Growth, Volume 1A*, Philippe Aghion and Steven Durlauf, eds., pp. 679–741. New York: North-Holland.
- Doucouliagos, Hristos, and Martin Paldam. 2006. "Aid Effectiveness on Accumulation: A Meta Study." *Kyklos* 59(2): 227–54.
- Easterly, William. 2006. *The White Man's Burden*. New York: Penguin Press.
- Gerschenkron, Alexander. 1962. *Economic Backwardness in Historical Perspective*. Cambridge, MA: Belknap Press, Harvard.
- Goldin, Claudia, and Lawrence F. Katz. 2009. "The Future of Inequality." *The Milken Institute Review*. 3<sup>rd</sup> Quarter.

- Haefele, Mark, H. 2003. "Walt Rostow's Stages of Economic Growth: Ideas and Action." In D.C. Engerman, N. Gilman, M. H. Haefele, and M. E. Latham, eds., *Staging Growth*. Amherst: University of Massachusetts Press.
- Hallegatte, Stephane, G. Heal, M. Fay, and D. Treguer. 2012. "From Growth to Green Growth: A Framework." NBER Working Paper No.17841. National Bureau of Economic Research, Cambridge, MA
- Hanushek, Erik A., and Ludger Woessmann. 2008. "The Role of Cognitive Skills in Economic Development." *Journal of Economic Literature* 46(3): 607–68.
- — —. 2012. "The Economic Benefits of Educational Reform in the European Union." *CESifo Economic Studies* 58(1): 73–109.
- Harcourt, Geoffrey C. 1972. *Some Cambridge Controversies in the Theory of Capital*. Cambridge, UK: Cambridge University Press.
- Harrod, Roy F. 1939. "An Essay in Dynamic Theory." *Economic Journal* 49(1): 14–33.
- Hausmann, Ricardo, Lant Pritchett, and Dani Rodrik. 2005. "Growth Accelerations." NBER Working Paper No. 10566. National Bureau of Economic Research, Cambridge, MA.
- Herzer, Dierk, and Peter Nunnenkamp. 2012. "The Effect of Foreign Aid on Income inequality: Evidence from Panel Co-integration." Working Paper No. 1762. Kiel Institute for the World Economy.
- Hironaka, Ann. 2005. *Neverending Wars*. Cambridge, MA: Harvard University Press.
- Howitt, Peter. 2004. "Endogenous Growth, Productivity and Economic Policy: A Progress Report." *International Productivity Monitor* 8 (Spring): 3–13.
- Iacovone, Leonardo, and Beata Javorcik. 2012. "Getting Ready: Preparation for Exporting." CEPR Discussion Paper No. 8926. The Center for Economic and Policy Research, London.
- INSEAD. 2011. *Global Innovation Index 2011*. Paris. [www.insead.edu](http://www.insead.edu).
- Jorgenson, Dale W., and Kazu Motohashi. 2005. "Information Technology and the Japanese Economy." NBER Working Paper No. 11801. National Bureau of Economic Research, Cambridge, MA.
- Jorgenson, Dale W., and K. Vu. 2010. "Potential Growth of the World Economy." *German Economic Review* 8(2): 125–45.
- Jorgenson, Dale W., and Zvi Griliches. 1967. "The Explanation of Productivity Change." *The Review of Economic Studies* 34(3).
- Jorgenson, Dale W., Mun S. Ho, and Kevin J. Stiroh. 2011. "Understanding the Information Age." In *Productivity*, Vol 3. Cambridge, MA: MIT Press.
- Kenny, Charles, and David Williams. 2001. "What Do We Know About Economic Growth? Or Why Don't We Know Very Much?" *World Development* 29(1).

- Keynes, John M. 1936. *The General Theory of Employment, Interest and Money*. New York: Harcourt and Co.
- Kindelberger, Charles P. 1967. *Europe's Postwar Growth: The Role of Labor Supply*. Cambridge, MA: Harvard University Press.
- Kuznets, Simon. 1955. "Economic Growth and Income Inequality." *American Economic Review* 45(1): 1–28.
- — —. 1966. *Modern Economic Growth: Rate Structure and Spread*. New Haven: Yale University Press.
- Lacovone, Leonardo, and Beata S. Javorcik. 2012. "Getting Ready: Preparation for Exporting." CEPR Discussion Paper No. 8926. The Center for Economic and Policy Research, London.
- Latham, Michael E. 2003. "Introduction." In D.C. Engerman, N. Gilman, M. H. Haefele, and M. E. Latham, eds., *Staging Growth*. Amherst: University of Massachusetts Press.
- Lin, Justin Yifu. 2011. "From Flying Geese to Leading Dragons." World Bank Policy Research Working Paper No. 5702. World Bank, Washington, DC.
- Lopez, Ricardo A. 2005. "Trade and Growth: Reconciling the Macroeconomic and Microeconomic Evidence." *Journal of Economic Surveys* 19(4): 623–48.
- Lundvall, Bengt-Ake. 2007. "Innovation System Research: Where It Came From and Where It Might Go." GLOBELICS Working Paper Series No. 2007-01. Global Network for Economics of Learning, Innovation, and Competence Building Systems (GLOBELICS), Aalborg University, Denmark.
- Maddison, Angus. 1987. "Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment." *Journal of Economic Literature* 25(2): 649–98.
- Maddison, Angus. 2005. *Growth and Interaction in the World Economy*. Washington, DC: The AEI Press.
- — —. 2008. "The West and the Rest and the World Economy: 1000–2030." *World Economics* 9(4): 75–99.
- — —. 2010. *The World Economy*. Paris: OECD.
- Martin, Ben R. 2012. "Innovations Studies: Challenging the Boundaries." Unpublished paper. Science and Technology Policy Research (SPRU), University of Sussex, UK.
- Mathews, John A. 2006. "The Intellectual Roots of Latecomer Industrial Development." *Journal of Technology and Globalization* 1(3-4): 433–50.
- Mokyr, Joel. 2005. "Log Term Economic Growth and the History of Technology." In *Handbook of Economic Growth, Volume 1A*, Philippe Aghion and Steven Durlauf, eds., pp. 679–741. New York: North-Holland.
- Parente, Stephen L., and Edward C. Prescott. 2000. *Barriers to Riches*. Cambridge, MA: MIT Press.

- Phelps, Edmund S. 1967. *Golden Rules of Economic Growth*. Amsterdam: North Holland.
- Pritchett, Lant, and Martina Viarengo. 2008. "Producing Superstars for the Economic Mundial." Unpublished paper. JFK School, Harvard University, Cambridge MA.
- Reinhart, Carmen, and Kenneth S. Rogoff. 2008. "This Time is Different: A Panoramic View of Eight Centuries of Financial Crises." NBER Working Paper No. 13882. National Bureau of Economic Research, Cambridge, MA.
- Rodrik, Dani. 2011. "The Future of Economic Convergence." Unpublished paper. Harvard University.
- Roodman, David. 2007. "The Anarchy of Numbers: Aid, Development, and Cross-Country Empires." *World Bank Economic Review* 21(2): 255–77.
- Romer, Paul M. 1986. "Increasing Returns and Long-Run Growth." *Journal of Political Economy* 94(5): 1002–37.
- — —. 1994. "The Origins of Endogenous Growth." *The Journal of Economic Perspectives* 8(1): 3–22.
- Rostow, Walt W. 1960. *The Stages of Economic Growth: A Non Communist Manifesto*. Cambridge, UK: Cambridge University Press.
- Sachs, Jeffrey. 2008. *Commonwealth*. New York: Penguin Press.
- Sala-I-Martin, Xavier X. 1997a. "I Just Ran Four Million Regressions." NBER Working Paper No. 6252. National Bureau of Economic Research, Cambridge, MA. [www.nber.org/papers/w6252.pdf](http://www.nber.org/papers/w6252.pdf).
- — —. 1997b. "I Just Ran Two Million Regressions." *The American Economic Review* 87(2): 178–83. [www.jstor.org/stable/2950909](http://www.jstor.org/stable/2950909).
- Salverda, Wiemar, Brian Nolan, and Tim Smeeding, eds. 2009. *The Oxford Handbook of Economic Inequality*. New York: Oxford University Press.
- Samuelson, Paul A. 1966. "Rejoinder: Agreements, Disagreements, Doubts, and the Case of Induced Harrod-Neutral Technical Change." *Review of Economics and Statistics* 48(4): 444–48.
- Sen, Amartya K. 1985. *Commodities and Capabilities*. Oxford: Oxford University Press.
- Sirimaneetham, Vatcharin, and Jonathan Temple. 2009. "Macroeconomic Stability and the Distribution of Growth Rates." *World Bank Economic Review* 23(3): 443–79.
- Solow, Robert M. 1956. "A Contribution to the Theory of Economic Growth." *Quarterly Journal of Economics* 70(1): 65–94.
- — —. 1957. "Technical Change and Aggregate Production Function." *Review of Economic Statistics* 47: 312–20.
- — —. 1997. *Learning from Learning by Doing*. Stanford, CA: Stanford University Press.

- — —. 2007. "The Last 50 Years of Growth Theory and the Next 10." *Oxford Review of Economic Policy* 23(1): 3–14.
- Stiglitz, Joseph E., Amartya Sen, and Jean-Paul Fitoussi. 2010. *Mis-measuring Our Lives*. New York: The New Press.
- Swan, Trevor W. 1956. "Economic Growth and Capital Accumulation." *Economic Record* 32(2): 334–61.
- Van Beveren, Ilke. 2012. "Total Factor Productivity Estimation: A Practical Review." *Journal of Economic Surveys* 26(1): 98–128.
- Van Reenen, John. 2012. "Industrial Policy Works for Smaller Firms." VoxEU.org, February 17. <http://www.voxeu.org/index.php?q=node/7633>.
- Ventura, Jaume. 2005. "A Global View of Economic Growth." In *Handbook of Economic Growth, Volume 1A*, Philippe Aghion and Steven Durlauf, eds., pp. 679–741. New York: North-Holland.
- Wade, Robert. 1990. *Governing the Market*. Princeton, NJ: Princeton University Press.
- Whittaker, D. Hugh, Tianbiao Zhu, Timothy J. Sturgeon, Mon Han Tsai, and Toshie Okita. 2008. "Compressed Development." MIT IPC Working Paper 08-005. MIT, Cambridge, MA.
- Williamson, Jeffrey G. 2011. "Industrial Catching-up in the Poor Periphery 1870–1975." Discussion Paper No. 8335. CEPR, London.
- World Bank. 2004. *World Development Report 2005: A Better Investment Climate for Everyone*. Washington, DC: World Bank.
- — —. 2012. "An Update to the World Bank Estimate of Consumption Poverty in the Developing World." World Bank, Washington, DC.
- World Economic Forum. 2012. *Global Competitiveness Report 2011–2012*. Geneva.
- Yusuf, Shahid. 2011. *East Asian Experience with Industrial Policy and its Implications for South Africa*. Washington, DC: World Bank.
- Zilibotti, Fabrizio. 2007. "Economic Possibilities for Our Grandchildren 75 Years After: A Global Perspective." Working Paper No. 344. Institute for Empirical Research in Economics, University of Zurich, Zurich.









**A** scientific and industrial revolution initiated accelerated growth rates in a handful of Western countries starting in the nineteenth century. By the early twentieth century, accelerated growth had spread to economies in Asia, Latin America, and Eastern Europe. With the end of WWII and the subsequent decolonization, rapid growth came to late-starting developing nations as well. As a result of this history, a growth ideology has become firmly entrenched. Policy makers are now demanding more from growth than a mere increase in GDP, even as the potential contribution of industrialization is diminishing. Growth economics is struggling to expand the toolkit and enlarge the menu of practical policy options. But with the refinement of theory and practice proceeding at a homeopathic pace, relevance is at risk. There is an urgent need for disruptive innovation to give new direction to theorizing and policy.

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