

The Mystery of Economic Growth
by Elhanan Helpman
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A Review by:

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The growth of nations is one of the most important topics of our times. Economic growth not only poses an intellectual puzzle that occupies economists' thinking and politicians' agendas but also affects the lives of billions of people around the world. In *The Mystery of Economic Growth*, Elhanan Helpman tells us the tale of economic growth in a vivid and intellectually stimulating way. He organizes the tale around four themes: the importance of physical and human capital accumulation and how this accumulation interacts with technological change; the importance of knowledge accumulation and how knowledge shapes total factor productivity; the importance of global linkages between countries and how this interdependence affects the dissemination of knowledge; and finally the importance of institutions and how institutions provide incentives for accumulation of factors, creation of knowledge, and adoption to new economic environments. His main point is that economic growth is largely driven by institutions that promote innovation and adoption to technical change. Therefore, solving the mystery of economic growth depends on understanding the work of institutions.

There has been extensive academic research on the causes and the consequences of

economic growth in the last 20 years. Helpman has been an active and influential participant of this research wave. He provides a systematic, non-technical, and objective review of this vast research, putting it in a historical context and highlighting the conclusions. Given the size of this literature this is an enormous task. Helpman does an excellent job in synthesizing the literature and provides us with an analysis that is short yet very thorough and comprehensive.

The Mystery of Economic Growth is the book to read if you want to learn about what we know about “economic growth” and what the remaining mysteries are. The book deserves to be read by a wide range of economists, policy makers and researchers who are interested in this subject. It is a *must* reading for undergraduate and graduate students who would like to do research in the field of economic growth and international development.

In my review, I will try to present a brief summary of each chapter, emphasizing the lessons learned and highlighting the unresolved questions. Each chapter is set up in the following way: first the questions are laid out, then the theory designed to answer these questions is reviewed and finally, the theory is confronted with the data. The readers will gain a lot more from reading the book since every chapter has many interesting and insightful details.

Chapter 1, “Background” reviews the stylized facts using very illustrative figures. These figures reveal that income per capita differences across countries are substantial. For example, as of 1996 U.S. income per capita was 18 times higher than that of Pakistan and 46 times higher than that of Mozambique. If we do a comparison over time, we see that Pakistan’s income per capita in 1996 is equal to that of the U.S. in 1870. Helpman argues that this type of long lags suggest that it will take many years before poor countries catch up with the current standard of living in the rich countries. Next, Helpman introduces data on growth rates and shows how the small differences in growth rates can cause dramatic differences in living standards. For example, a country that grows 1 percent per year doubles its living standards in every 70 years, whereas a country that grows 3 percent per year does

so in only 23 years! He presents data that shows the disparities in growth rates in the post World War II period. Growth rates have been uneven and therefore the income differences between poor and rich countries have increased, leading to a “twin-peak distribution” of the world income. He argues that in spite of the unevenness, the last 100 years were a time of remarkable growth. Figure 1.5 plots the growth rates for the world average since 1500s. The main point of this figure is that during the last 100 years income per capita on average has grown at a much higher rate compared to the previous centuries.

Chapter 2, “Accumulation” starts with two questions: 1) What are the mechanisms that drive the large improvements in the standard of living documented in Chapter 1? 2) Why did such mechanisms work to the benefit of some countries but not so much for others? In the rest of the book, Helpman tells us the answers for these questions offered by the last 20 years of economic growth research. Chapter 2 focuses on the accumulation of factors of production. Helpman argues that macroeconomists have emphasized the accumulation of factors—physical and human capital—as major forces behind the growth process precisely because this type of accumulation responds to economic incentives. Next, he describes the Solow model that is based on this principle. In this model, economic growth comes from capital accumulation and it is only temporary. The diminishing marginal productivity of capital per worker implies that in the long run all countries converge to the same level of income. They also have the same growth rate, which depends on the rate of technological progress. The rate of technological progress is assumed to be exogenous and thus does not respond to incentives.

In the second part of the chapter, Helpman asks how well this model performs in characterizing the real world. The main implication of the Solow model, that poor countries grow faster and will eventually catch up with the rich countries, fails to be present in the data. Some researchers argue that this type of “absolute convergence” is not a prediction of the Solow model. Instead, we should be searching for “conditional convergence”. Countries differ in their savings rates and population growth rates, and these differences lead

to differences in their income levels in the long run. By controlling for (or conditioning on) these determinants of the long run income levels, Barro and Sala-i-Martin (1992) and Mankiw, Romer, Weil (1992) find evidence of “conditional convergence”, that is rich countries and poor countries converge to different income levels. The following question still remains: What are the forces behind this divergence across rich and poor countries? This question is tackled in the following chapters, but for now Helpman concludes that the lack of convergence implies that accumulation cannot be the driving force behind growth. If it were all countries should have converged by now. In particular, after 1980s we observe huge international capital flows but we don’t see any further convergence.¹ Overall, Helpman claims that the Solow model is not an adequate setup to analyze the real world. Some researchers suggest that one way to solve the problems of the Solow model is to incorporate human capital accumulation.² Helpman does not agree with this view, and argues why in the next chapter.

Chapter 3, “Productivity” starts with the definitions of various concepts of productivity. Then it describes growth accounting, a methodology that decomposes the growth of output into two components: growth of factors of production and growth of total factor productivity (TFP). Various researchers show that the contribution of TFP to total output growth varies between 50 percent to 80 percent, depending on the adjustments for the quality of labor. Thus TFP growth is responsible for a large part of output growth. Helpman underlines the fact that the methodology of growth accounting does not unveil the *causes* of economic growth. He argues that high productivity induces capital accumulation. Thus, a significant part of the growth in inputs can be attributed to the growth in TFP.³ This is an extremely important point, especially in the case of small open economies the entire investment might be driven by TFP and hence the entire output growth can be regarded

¹One reason for this is the fact that these international flows are in the opposite direction relative to the benchmark predicted by the Solow model.

²See Mankiw, Romer, Weil (1992); Lucas (1990).

³See Blomstrom, Lipsey and Zejan (1996).

as the growth in TFP.⁴ Helpman argues that this relationship between investment and TFP biases the standard Mankiw, Romer, Weil type OLS estimates of investment upward. He concludes that TFP plays a major role in accounting for the observed cross-country variation in income levels and growth rates. Hence we need to understand what drives the differences in TFP. The next chapter examines one possible answer to this question.

Chapter 4, “Innovation” starts with the key observation that despite wars and other sources of volatility the average growth rate of the world GDP has been rising over time. The rate of the growth of the U.S. economy has been rising since 1800. These facts cannot be reconciled with the Solow model which implies a constant rate of technological progress and hence a constant rate of growth in the long-run. Helpman argues that these observations, combined with the problems of the Solow model mentioned before, lead to the development of endogenous growth theory. The revolution was led by Paul Romer and Robert Lucas. Both of them shifted the focus from factor accumulation to knowledge creation. Romer (1986) and Lucas (1988) claim that externalities that result from knowledge creation can generate increasing returns to scale which offset the decreasing returns to scale from factor accumulation and hence lead to sustained growth in the long run. According to Helpman alternative treatments of knowledge and/or human capital have dramatically different implications and the exact meanings of the different concepts have not yet been sufficiently clarified.⁵

Next, Helpman reviews the empirical literature. Researchers find repeatedly the pos-

⁴In Kalemli-Ozcan et al. (2005), we show that a simple neoclassical model, in which TFP varies across states and over time and where capital freely moves across state borders, can characterize the capital flows within the U.S. In this framework capital flows to states that experience a relative increase in TFP. We examine empirically if the level of net capital flows between states following relative movements in TFP corresponds to the predictions of the model. Our empirical results imply large flows of capital between states; for example, we find that a state with annual per capita output growth 1 percent higher than the average state over 10 years would attract capital in the amount of \$9,900 per capita over those 10 years.

⁵For example if in Lucas’ models human capital is not only embodied in individuals but also in society then it is not different than Romer’s stock of knowledge.

itive effect of education on economic growth.⁶ However the evidence on the existence of externalities from investment in education, which are required for human-capital driven sustained long-run economic growth is mixed. Acemoglu and Angrist (2001) do not find any evidence, while Cohen and Soto (2001) and Moretti (2002) find evidence of such externalities. Helpman concludes that the lack of decisive evidence in favor of externalities from educational investment is only temporary and current evidence is not definitive, but, when we look at the evidence for externalities in the accumulation of knowledge, the picture is clearer. As shown by Griliches (1992) and others, the social rate of return to R&D is higher than the private rate of return, which is a clear indicator of externalities. This evidence justifies the second wave of the new growth theory, which has emphasized innovation as a source of the productivity growth. In Romer (1990), innovators have incentive to innovate since they have copyrights of the “blue prints”, which secures monopoly profits. At the same time they create knowledge that is not embodied in the “blue prints” and can be used by everybody. As a result countries that devote higher resources to R&D have higher productivity growth. Jaffe and Trajtenberg (2002) find evidence in favor of this model, showing that patent citation is an important channel of technology diffusion and the transmission of R&D spillovers. Grossman and Helpman (1991a, b) and Aghion and Howitt (1992) have developed alternative theoretical frameworks where products are not equally substitutable and they improve along quality ladders and growth is a result of quality improvement over time. Helpman then reviews the empirical literature that finds evidence in favor of these models.

Finally, Helpman discusses the problems of endogenous growth models. The innovation-driven endogenous growth models are criticized because they imply that large countries grow faster, a prediction that is not supported in the data. The inherent link between market size and the incentive to innovate in these models—more people, more Einsteins—causes

⁶See Goldin and Katz (2001), Young (1995).

scale effects. Kremer (1993) presents historical evidence that population size and economic growth are positively correlated, meaning that scale effects exist in historical data. However Jones (1995b) and others strongly argue that scale effects are not present in post World War II data. Helpman reviews the models developed by Jones (1995b), and Segerstorm (1998) that try to eliminate these effects. Helpman argues that one can magnify or dampen scale effects but cannot get rid of them completely.⁷

Chapter 5, “Interdependence” is an excellent chapter which puts economic growth at the heart of the globalization process. Helpman reasserts his point from the previous chapters on the importance of productivity growth for a full understanding of economic growth. He then adds, “..a satisfactory understanding of economic growth also requires an appreciation of how countries interact with each other, because countries’ income levels are interdependent.” Elhanan Helpman and Gene Grossman are among the leading researchers in the area of interdependence. They have numerous papers on how trade and diffusion of knowledge can help countries to be connected. Thus this chapter has lots of details, yet is still extremely well-written. Helpman argues that the two waves of globalization are the two periods of rapid economic growth. The first wave of globalization (1870–1913) is characterized by an unprecedented increase in trade, investment and migration. Similarly the second wave of globalization, which is occurred in the post-World War II era, is also driven by trade and investment. During these two waves of globalization, countries that took part in the globalization process have witnessed high growth rates. The main point of this chapter is to argue that international integration has sizeable effects on economic growth.

Using insights from trade theory, Helpman explains how in an open economy countries can escape from the curse of diminishing returns because trade allows countries to special-

⁷Helpman also discusses the general purpose technologies (GPT) in the final part of the chapter. These are different from small incremental innovations that have been discussed so far. GPT refer to things like steam engine, electricity, computers, big inventions that changed our lives for better forever.

ize, which in turn affects the return to capital. Researchers argue that this is why small countries, such as East Asian countries, can grow fast.⁸ Helpman emphasizes that this effect does not apply to large countries because by increasing production of one product large countries can depress the price of that particular product in the world markets. Acemoglu and Ventura (2002) argue that in general these terms-of-trade movements are an important mechanism for the international transmission of growth effects. However, Helpman claims that the estimates of Acemoglu and Ventura (1 percent faster growth means 0.6 percent deterioration in terms-of-trade) should be interpreted as a cross-country average, as trade theory suggests that the effects of accumulation on terms-of-trade vary with the characteristics of the growing country. Helpman thinks that knowledge flows and spillovers are as important as terms-of-trade in linking income levels and growth rates across countries. Trade, R&D spillovers and TFP interact with each other in different ways. This point is one of the main themes of the book. Trade increases market size, reduces the duplication of R&D, increases knowledge spillovers, and increases specialization, all of which will increase R&D and hence TFP. On the other hand trade increases competition and causes factor prices to change, which leads to a decline in TFP. In addition, trade does not necessarily imply convergence of income levels. If the R&D spillovers are international in scope, there will be convergence and if they are national in scope, there will be divergence.⁹ Helpman reviews the empirical literature on international knowledge spillovers. It seems that the evidence is positive, i.e., less-developed countries do benefit from foreign stock of knowledge; however, the output gain in industrial countries is larger. As a result, Helpman concludes that investment in innovation in developed countries leads to divergence of income levels between poor and rich.¹⁰

Next, Helpman discusses some historical examples where international trade played a

⁸See Ventura (1997), Young (1992).

⁹For an extensive analysis see Grossman and Helpman (1991b).

¹⁰See Coe and Helpman (1995).

direct role in the growth of nations, such as Europe versus China.¹¹ Then he reviews the empirical evidence, in particular the work of Frankel and Romer (1999), that indicates a positive effect of trade on growth. In the last part of the chapter, Helpman reviews the literature on trade policies and growth and underlines that this issue requires further investigation. The empirical evidence suggests during the first wave of globalization, protection is good for growth, but, in post-World War II era it seems that protection is bad for growth.¹² In addition, current studies that look at the relation between trade policy and growth have lots of problems, one being the endogeneity of the trade policy.¹³ Helpman concludes that protectionist policies are probably bad but one still needs to be cautious and needs to investigate the structural features of the economy when trying to analyze the link between trade policies and growth.

Chapter 6, “Inequality” starts with two important questions: 1) Does the distribution of income within a country affect its growth rate? 2) Does economic growth affect the distribution of income? Helpman argues that both of these questions have tentative answers. The famous *Kuznets curve* depicts an inverted U-shape relationship between income per capita and income inequality. However the literature finds little evidence of such a pattern.¹⁴ He then reviews the work of Bourguignon and Morrisson (2002), who find that inequality between countries has increased since 1820. Inequality within countries, on the other hand, declined at the beginning of the twentieth century and then increased slightly after World War II. Helpman concludes that worldwide trends do not give us a clear relationship between inequality and growth. Helpman also reviews the empirical evidence on inequality and growth, where the results are mixed.¹⁵ He argues that inequality must slow growth but research in this area failed to identify the mechanisms through which this happens.

¹¹See Pomeranz (2000).

¹²See O’Rourke (2000).

¹³See Rodriguez and Rodrik (2000).

¹⁴See Deininger and Squire (1996).

¹⁵See Alesina and Rodrik (1994), Persson and Tabellini (1994).

Helpman claims that it is better to examine the relationship between inequality and growth in specific contexts. One major source of inequality since the 1970s is the rising college wage premium as documented by various researchers for most of the OECD countries.¹⁶ There have been two leading explanations: Integration of less-developed countries into the world trade; and the direction of the technical change.¹⁷ Helpman argues that the evidence so far is more in support of the technology explanation, though the results are still debated and we don't have a good empirical evaluation of the size of this effect.¹⁸

In the last part of this chapter, Helpman reviews the literature about the debate on the effects of growth on the poor. The data shows that the poverty rates and the fraction of people who lives under the poverty levels declined over time. For sure, the fast growth of China and India has contributed a lot to poverty reduction. Helpman asks whether this is a general pattern or something specific to these countries. He reviews the empirical literature and concludes that on average growth has raised the income of the poor around the world.¹⁹ He concludes though that there are still unanswered questions. In particular, what are the mechanisms that link growth to income distribution, and which of them are more important? And which economic and political institutions are important for these mechanisms? He examines some of these questions in the last chapter.

Chapter 7, "Institutions and Politics" is a superb chapter. The research that is discussed in this chapter is rather at its early stages. Helpman gives an excellent review of the existing studies and lays out research questions for future work in this area. He makes the sharp conclusion that institutions are the key to the growth process, which is the main point of the book.

He starts by asking the main question again: Why do TFP levels differ so much and why do they grow at different rates in different countries? We know from the earlier chapters

¹⁶See Katz and Autor (1999).

¹⁷See Krugman (1995), Leamer (2000).

¹⁸See Berman, Bound, and Machin (1998); Borjas, Freeman, and Katz (1997); Acemoglu (1998).

¹⁹See Dollar and Kraay (2002).

that part of the reason is the accumulation of the factors of production and investment in R&D. But substantial differences still remain even after accounting for these. Since the time of Adam Smith many economists and economic historians have argued that for accumulation of knowledge and capital, institutions that protect property rights should be in place. Institutions and policies have a direct effect on countries' ability to accumulate, innovate, and adopt to new environments as a result of technological change.

Helpman starts with reviewing the early literature on institutions. Historians such as North (1981, 1990) have studied the effects of institutions on economic growth throughout the history. According to North, institutions are the rules of the game and organizations are the players. Grief (1993), who analyzed a particular private institution formed by the Maghribi traders that operated in the Mediterranean in the eleventh century, prefers a broader definition. He defines institutions to be a system of rules, beliefs and organizations and he emphasizes context-specific analysis of institutions. Helpman argues that since we don't have historical data to calculate TFP growth, we cannot quantitatively assess the contribution of the early institutional developments on growth. Helpman continues with a discussion of the work by La Porta et al. (1998) who show that the quality of the current laws, investor protection, and enforcement depends on the origin of the legal system of the country. They are strongest in common-law countries and weakest in French civil-law countries and in between for Scandinavian and German law countries. Glaeser and Shleifer (2002) study the evolution of these different legal origins. They find that civil law relies on professional judges and legal codes, whereas common law relies on broader principles. Thus, France which had a weak central government in the twelfth and thirteenth centuries adopted a civil law system and England which was relatively peaceful at the time and had a strong central control, adopted common law. The legal systems were then transferred to developing countries through colonization and shaped their institutions.

Helpman then discusses the counter argument formulated by Acemoglu, Johnson, and Robinson (2001, 2002). These authors argue that local conditions are more important than

the identity of your colonizer and your legal origin. They argue whether the European colonialists could safely settle in a particular location is the determining factor. If the European settlement was discouraged by diseases, as in Africa, or where the surplus extraction was beneficial via an urbanized and prosperous population, as in Latin America, the Europeans set up worse institutions. Thus, they argue that historical mortality rates of European settlers are good instruments for today's institutions. Helpman claims that the evidence provided by Acemoglu, Johnson and Robinson is very strong, and controlling for legal and colonial origin do not change the robustness of their result. Sachs (2001), on the other hand, claims that geography is central to economic development and has a direct effect on economic growth. Helpman argues that the debate between geography versus institutions is not so much about whether geography affects development, rather, it is about whether it affects development through the formation of institutions only as Acemoglu, Johnson and Robinson argue. To counter "geography is destiny" type arguments, Acemoglu, Johnson and Robinson (2002) document a "reversal of fortune", that is, the countries that were rich around 1500 had become poor by 1995 and vice versa.

In the last part of this chapter, Helpman reviews the political economy literature: the interaction between economic and political interests, and the effect of this interaction on economic growth. Reviewing the literature on democracies versus autocracies and special interest groups,²⁰ Helpman argues that we don't have a theory of how interest groups affect growth and how political institutions are linked to growth, nor do we have reliable empirical evidence on these links. However, progress is being made. For example, Persson and Tabellini (2003) found that the age of democratic regimes and their constitutional type affect labor productivity via the policy formation process. Acemoglu and Johnson (2003) try to separate contracting institutions from the property right institutions and show that the latter is more important. Helpman argues that although this is very important step

²⁰See Przeworski et al. (2000); Acemoglu and Robinson (2003); Grossman and Helpman (1994b); Olson (1965, 1982); Persson and Tabellini (2003).

in discovering the effects of separate institutional channels the results still need further robustness checks.

Helpman closes by arguing that institutions are more fundamental determinants of growth than accumulation or investment in R&D, but studies on the effects of institutions on growth are fairly recent so conclusions from the last chapter of the book are still tentative. Further research is needed to identify the channels through which institutions affect growth and the ways the various institutions interact. He argues that this is an enormous task but with the new data sets and models we are equipped for the job!

“The Mystery of Economic Growth” is an excellent book for those who are interested in economic growth. It is short, relatively non-technical, but still provides an extensive coverage of the topic. Helpman tells an exciting story focusing on the most important research in the last 20 years with lots of insightful discussions. I enjoyed reading the book and I learned from it. I would recommend it to anyone who has the basic tools for economics since those will appreciate Helpman’s insights and gain a lot from the book. For those, Helpman’s book is Growth 101.

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