# Engines of Growth and Inequality in the Wealth of Nations

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**Abstract**

This article examines the contributions of Philippe Aghion, Peter Howitt, and Joel Mokyr, recognized by the Nobel Prize committee "for having explained innovation-driven economic growth," in the context of the development process as a whole. Aghion and Howitt established the centrality of creative destruction in the growth process of advanced economies, identifying the displacement of existing technologies by superseding ones as a key mechanism in sustaining economic growth. Mokyr highlighted the role of a tightening link between theoretical knowledge and practical application during the Scientific Revolution and the Enlightenment in fostering technological progress in Western Europe on the eve of the Industrial Revolution. These frontier-centered perspectives transformed our understanding of the causes and consequences of innovation-driven growth in advanced economies operating near the technological frontier. Yet, beyond this context, the central challenge to the growth process has depended less on the creation of new technologies than on the emergence of fundamental conditions conducive to skill formation, fertility decline, and societal adaptation, which have shaped the timing of the transition to modern growth, the pace of economic growth thereafter, and the contemporary inequality in the wealth of nations. A comprehensive account of sustained growth and contemporary inequality across societies therefore requires anchoring the growth process in its broader historical arc.

*Keywords:* Growth, Innovation, Inequality, Unified Growth Theory, Human Capital, Demographic Transition

*JEL Classification Codes:* O10, O40, Z10

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** Prepared for the *Scandinavian Journal of Economics*.

*** The author is grateful to Quamrul Ashraf and Felipe Valencia and the Editors for valuable comments and discussions. ChatGPT was used for language editing.

## 1. Introduction

Over the past 150 years, developed economies have experienced sustained growth in living standards. Output per capita has risen persistently, and advances in productivity have emerged as a defining characteristic of the development process at the technological frontier. The forces underlying this process have preoccupied scholars for centuries and since the advent of modern growth theory have inspired research aimed at uncovering the mechanisms that enable economies to generate persistent improvements in productivity and lasting gains in the standard of living.

The neoclassical growth model provided an important framework for exploring the forces that sustain long-run improvements in living standards. In his seminal contribution, Robert Solow established that while capital accumulation contributes to a transitory increase in output per capita, technological progress is essential for sustaining long-run gains in living standards.[1] As capital accumulates, diminishing returns erode the contribution of investment to output growth, and in the absence of technological progress, growth in income per capita slows and ultimately comes to a halt. Lasting gains in living standards therefore require continuous technological progress.

Yet, by treating technological progress as exogenous, the neoclassical growth framework was not well positioned to uncover the deeper determinants of sustained growth. Building on these foundations, a subsequent line of research, advanced by Paul Romer, illuminated the sources of technological progress and traced them to the purposeful creation of novel ideas through research and development.[2] This conceptual shift transformed the treatment of technological progress in growth theory from an external driving force to an outcome of economic choice, placing the incentives to innovate at the center of the growth process. In particular, the expected return to innovation, and its effect on the allocation of resources between production and knowledge creation, was proposed as a major engine of long-run growth.

The Schumpeterian growth framework pioneered by Philippe Aghion and Peter Howitt placed creative destruction at the center of the theory of innovation-driven growth, deepening the understanding of the forces underlying sustained economic growth.[3] In their framework, long-run growth is propelled by a sequence of innovations through which new technologies displace

[1] Solow (1956).
[2] Romer (1990), Grossman and Helpman (1991), and Jones (1995).
[3] Aghion and Howitt (1992, 1998, 2008).

existing ones, permitting sustained aggregate productivity growth along with entry, exit, and the reallocation of resources. This approach generated implications that have received empirical support in studies of firm dynamics, productivity growth, and technological change. It highlighted the role of market structure, along with the incentive to innovate, in shaping innovation and in governing firm entry and exit through creative destruction.

While the Schumpeterian framework underlined the economic incentives and market processes that governed innovation, R&D, and their growth implications, Joel Mokyr highlighted the intellectual and institutional preconditions that made technological progress systematic and self-sustaining on the eve of the Industrial Revolution in Western Europe.[4] He argued that sustained technological progress emerged when the link between propositional knowledge (understanding of natural regularities) and prescriptive knowledge (practical know-how) tightened over the course of the Scientific Revolution and the Enlightenment. He further maintained that this process unfolded through intellectual networks, skilled artisans, and institutional arrangements that enabled useful knowledge to accumulate, diffuse, and shape production more systematically.

This frontier-centered perspective provides a powerful account of innovation-driven growth and the forces that sustain technological progress in economies engaged in R&D. Yet, beyond the set of advanced economies at the technological frontier, the central challenge to the growth process has rested less on the creation of new technologies than on the emergence of fundamental conditions conducive to skill formation, fertility decline, and societal adaptation, which have shaped the course of economic development, the transition to modern growth, the pace of economic growth thereafter, and the contemporary inequality in the wealth of nations. Accordingly, anchoring the growth process in its broader historical arc is essential for a comprehensive account of sustained economic growth and pronounced inequality across societies.

## 2. Origins of Modern Technological Progress

### 2.1 Innovation-Driven Growth

The analytical framework developed by Aghion and Howitt transformed the analysis of innovation-driven growth by placing creative destruction, and the displacement of existing

[4] Mokyr (1990, 2002, 2009, 2016).

technologies by superseding ones, at the core of the growth process. Rather than portraying technological progress as a uniform enlargement of the stock of applicable knowledge, it depicts innovation as a disruptive force that unsettles existing production structures while generating novel ones. In particular, it highlights the coexistence of turbulence at the microeconomic level with sustained aggregate progress.

### 2.1.1 Theoretical Framework

At the center of the Aghion and Howitt analytical framework is the proposition that long-run growth is driven by a sequence of quality-improving innovations through which newer, more productive technologies displace older, less efficient methods of production. Competitive innovative effort in an R&D sector is directed toward risky attempts to develop technologies capable of superseding the technological frontier. Successful innovators acquire a temporary technological edge until a subsequent innovation displaces them and renders their technology obsolete. Long-run growth is therefore governed by the frequency and magnitude of quality-improving innovations.

Innovation in this framework arises from deliberate and inherently risky economic activity motivated by the prospect of temporary technological leadership and the monopoly rents it confers. Yet, the competitive process that makes innovation profitable also renders this leadership transient, as each successful innovation is destined for eventual displacement. Thus, unlike earlier endogenous growth models, the Schumpeterian framework brings to the forefront the distributional consequences of innovation, particularly the disruptive effects on incumbent firms and traditional sectors.

### 2.1.2 Determinants of Innovative Effort

In the Aghion and Howitt framework, research and development activity arises when the expected net gains from innovation are sufficient to induce firms to innovate. These expected gains depend on the probability of successful innovation, the anticipated duration of technological leadership, the intensity of competition, and the institutional environment governing innovation.

Earlier ovation-driven growth models suggest that stronger product-market competition would tend to weaken innovation incentives by lowering the monopoly rents associated with successful

innovation. In contrast, the Schumpeterian framework highlights the conflicting effects of competition on innovation in an environment governed by creative destruction. On the one hand, lower competition preserves larger post-innovation rents and thereby strengthens the payoff to successful innovation. On the other hand, greater competition can intensify the incentive to innovate by increasing the gain from escaping close rivals and securing temporary technological leadership. This escape-competition effect is especially pronounced among firms near the technological frontier, where successful innovation is more likely to yield a profitable leadership position, whereas firms that lag further behind may innovate less when competition intensifies.[5] Innovation is therefore predicted to be most pronounced at intermediate levels of competition, where firms face sufficient pressure to innovate yet still expect substantial gains from successful innovation. Accordingly, the relationship between competition and innovation is predicted to exhibit an inverted-U relationship.

### 2.1.3 Market Failures

The Schumpeterian framework highlights two opposing forces that drive a wedge between private and social incentives to innovate. Innovations generate knowledge spillovers, enabling future innovators to stand on the shoulders of their predecessors. As innovators cannot fully appropriate these broader social gains, private research effort can fall short of the social optimum. Conversely, firms may engage in excessive innovation motivated by the aspiration to displace their rivals and capture their market share. Recognizing this tension has important implications for the design of R&D policies.

### 2.1.4 Empirical Implications and Supporting Evidence

The Schumpeterian framework and the subsequent literature it inspired generate several empirical implications. First, economies and sectors that allocate greater resources to R&D would be expected to experience faster productivity growth. Second, the impact of competition on innovation would exhibit an inverted-U-shaped pattern. Third, the pro-innovation effect of competition would be stronger among firms operating near the technological frontier, where successful innovation is more likely to yield technological leadership. Fourth, innovation-driven growth would be expected to coincide with incumbent displacement, entrant expansion, and the

[5] Acemoglu et al. (2006) and Vandenbussche (2006).

reallocation of resources toward more productive firms. Fifth, innovation-enhancing institutions and policies would be more conducive to growth near the frontier, whereas imitation-enhancing institutions and policies would be better suited to foster growth farther from the frontier.

A growing empirical literature is broadly consistent with the main implications of the Schumpeterian framework and the subsequent literature it inspired. Innovative activity is associated with productivity growth across sectors and countries. Firm and industry studies suggest a non-linear association between competition and innovation, along with an important role for entry, exit, and incumbent displacement in the growth process,[6] while cross-country analyses indicate that innovation-enhancing institutions are more conducive to growth near the technological frontier.[7]

## 2.2 Triggers of Innovations in Western Europe on the Eve of Industrialization

Joel Mokyr explored the conditions that fostered sustained innovation in Western Europe on the eve of the Industrial Revolution, placing emphasis on the sources of Britain's early technological lead. Rather than viewing technological advancements as outcomes of isolated episodes of ingenuity, he highlighted the role of the Scientific Revolution and the Enlightenment in fostering a systematic and self-sustaining interaction between useful knowledge, technical capabilities, and openness to disruptive change. His contributions illuminated the forces that transformed episodic invention into persistent technological progress, underpinning the increasing flow of innovations during the Industrial Revolution.

### 2.2.1 Science, Useful Knowledge, and the Pace of Innovations

Mokyr advanced the hypothesis that persistent technological progress in Western Europe was fostered by the tightening link between propositional and prescriptive knowledge on the eve of the Industrial Revolution. In his conceptual framework, propositional knowledge refers to knowledge of regularities in nature, whereas prescriptive knowledge encompasses the practical techniques, methods, and expertise used in production. Accordingly, technological progress became self-

[6] Aghion et al. (2005) and Bartelsman and Doms (2000).
[7] Aghion et al. (2014).

reinforcing when gains in propositional knowledge guided improvements in technique, while practical experimentation fed back into deeper understanding.

In Mokyr's account, the Scientific Revolution promoted systematic observation, measurement, controlled experimentation, and reproducibility, enhancing the reliability and transmissibility of useful knowledge. As propositional and prescriptive knowledge became more tightly connected, technological change became less random and more amenable to sustained improvement. This tightening link fostered an environment in which useful knowledge could expand, circulate, and continuously shape production, rather than remain confined to episodic technological advancements.[8]

### 2.2.2 Artisans, Networks, and the Diffusion of Useful Knowledge

The diffusion of useful knowledge and its conversion into technology relied on networks linking scholars, engineers, artisans, and entrepreneurs, through which knowledge was translated from the theoretical realm into production.[9] Skilled mechanics, instrument makers, and other practitioners capable of interpreting, modifying, and scaling new techniques played an important role in turning abstract designs and scientific knowledge into operational and commercially viable technologies. These agents did not merely implement existing ideas; they adapted, refined, and extended them, underscoring that the diffusion and productive application of useful knowledge were closely tied to the distribution of technical competence within society, particularly among those able to bridge theory and practice.

### 2.2.3 Institutions and the Openness to Disruptive Change

Institutional and political conditions in Western Europe on the eve of the Industrial Revolution shaped the extent to which innovation could emerge and spread. Technological change generated distributional consequences, producing winners and losers and often provoking resistance from established interest groups. In particular, the diffusion of new technologies was hindered when incumbent groups had the capacity to block or delay technological implementation in order to protect their existing rents.

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[8] A complementary perspective emphasizes the role of bourgeois dignity and liberty (McCloskey, 2010).
[9] De la Croix et al. (2018).

In Mokyr's perspective, sustained technological progress depended not only on the generation and application of knowledge, but also on an openness to potentially disruptive change. Institutions that constrained the power of incumbents and permitted the broader diffusion of new technologies played an important role in sustaining the innovation process. In Mokyr's account, Britain's edge in the process of industrialization rested on the accumulation of useful knowledge and technical skills, as well as on institutional arrangements that constrained the ability of interest groups to impede technological progress.

## 3. Beyond Frontier-Centered Perspectives

The contributions of Aghion, Howitt, and Mokyr constitute a landmark in our understanding of innovation-driven growth. They illuminate the forces that sustain technological progress in advanced economies, as well as the intellectual and institutional developments that made systematic innovation possible in Western Europe on the eve of the Industrial Revolution. Indeed, within the modern growth regime, innovation has been a central engine of growth, alongside demographic forces, human capital formation, and institutional, cultural, and societal characteristics.

Innovation-driven growth and its historical underpinning in Western Europe on the eve of the Industrial Revolution are predominantly applicable to technologically advanced economies in which systematic innovative activity and R&D are among the core elements of the growth process. However, for developing economies, the central challenge in fostering economic growth has been the cultivation of an environment conducive to human capital formation, fertility decline, and societal adaptation, rather than frontier innovation.

Relatedly, the framework of innovation-driven growth is most suitable to environments in which the transition from the epoch of stagnation that characterized most of human existence has taken place and economies operate within the modern growth regime. It highlights the role of innovation incentives, technological rivalry, and creative destruction in propagating and sustaining growth once growth has emerged. In this respect, innovation-driven growth is particularly informative about the roots of the variation in growth processes within the modern growth regime (i.e., variation along the intensive margin), capturing differences in growth trajectories among advanced economies.

Empirical evidence suggests that forces underlying variation in the emergence of the modern growth regime (i.e., variation along the extensive margin), forces that lie outside the core innovation-driven growth framework, are critical for the understanding of the growth processes of both developed and developing economies. Indeed, major technological advances in the pre-industrial era failed to generate sustained economic growth because the gains they generated were largely offset by population growth, a pattern that underscores the central role of demographic forces, human capital formation, and structural transformation in the transition from stagnation to sustained growth.

Fundamental conditions conducive to skill formation, fertility decline, and societal adaptation have shaped the transition to modern growth, the pace of economic growth thereafter, and the contemporary inequality in the wealth of nations. The historical trajectory of human societies is therefore indispensable for deciphering the forces that governed the development process in its entirety, the hurdles faced by developing economies in their attempts to achieve sustained growth, and the roots of inequality across societies.

## 4. Roots of Growth and Seeds of Inequality in the Wealth of Nations[10]

The emergence of sustained economic growth constituted one of the most profound transformations in the course of human history. In the wake of millennia of stagnation in living standards across societies, the past two centuries witnessed a metamorphosis, reflected in an extraordinary fourteen-fold rise in per capita income worldwide (Figure 1).

[10] This section draws heavily on Galor (2025).

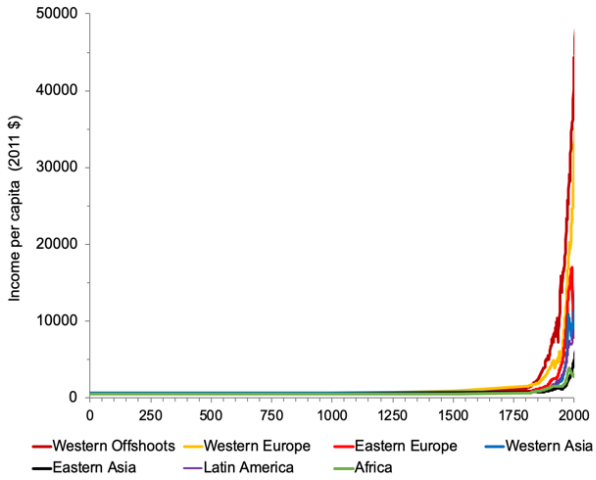


**Figure 1.** The Emergence of Sustained Growth

The pronounced rise in income per capita across world regions over the past two centuries, following millennia of stagnation.[11]

This transformation, however, unfolded unevenly across world regions, giving rise to the striking divergence in the wealth of nations over the past two centuries (Figure 2). Western Europe and some of its offshoots witnessed the onset of this unprecedented rise in living standards in the nineteenth century, whereas much of the world began this transition only in the second half of the twentieth century, contributing to large disparities in income per capita across world regions.

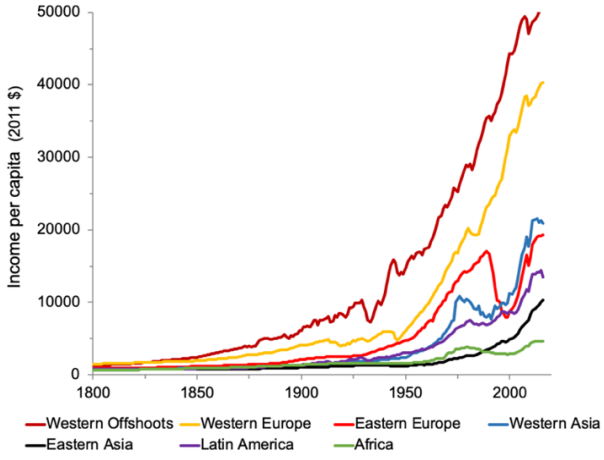


**Figure 2. Divergence in the Wealth of Nations**

The widening gaps in per capita income across world regions over the past two centuries.

[11] Figures 1 and 2 are based on extrapolations from the Maddison Project Database, 2010, 2013, and 2018 editions (Bolt and van Zanden, 2014 and Inklaar et al., 2018).

What accounts for this remarkable transformation in living standards over the past few centuries following the economic ice age that characterized most of human existence? What underlies the striking divergence in the wealth of nations over the past two centuries? Why has the transition to modern growth remained so elusive for much of the developing world?

The astonishing advance in human prosperity and the emergence of inequality across nations have reflected predominantly cross-societal variation in the onset and timing of the transition from stagnation to growth, rather than variation in growth processes within the modern growth regime. Initial conditions and their impact on the historical trajectories of human societies shaped the timing of this transition and played a central role in the differential spike in human prosperity and the widening disparities across nations.

Resolving these fundamentally challenging questions therefore requires a unified framework that captures the entire historical arc of development. Such a framework would need to account for the forces that governed the Malthusian epoch, the conditions that permitted the transition to sustained growth, and the deep-rooted factors behind the differential timing of the transition from stagnation to growth across the globe and their impact on the divergence in the wealth of nations. This perspective would broaden the scope of inquiry beyond innovation-driven growth, while preserving the central role of innovation at the frontier within the modern growth regime.

## 4.1 A Unified Perspective on the Development Process

Unified Growth Theory offers such a perspective.[12] It provides an integrated analytical framework for the understanding of this intricate development process over the entire course of human existence. The theory identifies the universal "wheels of change" that have governed this process, tracing the forces that confined humanity to a prolonged era of subsistence-oriented existence, yet ultimately set in motion the transition from stagnation to sustained growth and the associated divergence in the wealth of nations.

The theory captures in a unified analytical framework the joint evolution of technology, population size, societal adaptation, and income per capita over the course of human history. It encompasses the main phases that have characterized the development process: the Malthusian epoch, the escape

[12] Galor (2011), Galor and Weil (2000), Galor and Moav (2002), and Galor and Mountford (2008). See the survey of Galor (2025) for related contributions.

from the Malthusian trap, the emergence of human capital as a central engine of growth, the onset of the demographic transition, the emergence of sustained economic growth, and the divergence in the wealth of nations over the past few centuries.

The theory delineates the principal economic forces behind the transition from stagnation to sustained economic growth and underscores their critical role in the contemporary growth processes of developing as well as developed economies. In particular, it identifies the role of these forces in shaping the growth process and the recent divergence in income per capita across world regions.

While the innovation-driven growth perspective is particularly well suited for understanding the conditions that sustain growth among economies engaged in systematic R&D and operating near the technological frontier, Unified Growth Theory is intended to illuminate the growth process in its entirety and the distinct phases that shape development trajectories across societies. This perspective brings into focus forces that lie outside the core innovation-driven framework. In particular, it highlights the demographic structure, human-capital base, and societal adaptation that govern the transition to modern growth and its subsequent trajectory, as well as historically rooted factors that shaped the differential timing of this transition across the globe and their implications for the divergence in the wealth of nations.

The development process is woven with remarkable historical episodes. It is easy to drift in this ocean of details, buffeted by the waves and unaware of the deeper currents underneath. Unified Growth Theory seeks to uncover these currents that turn the wheels of change over the course of human history, illuminating the long arc of human development and the roots of growth and inequality in the wealth of nations.

## 4.2 The Development Process Through a Unified Lens

For most of human existence, the development process unfolded under Malthusian constraints. Technological advances and territorial expansion increased fertility and lowered mortality, channeling gains in productive capacity predominantly into population growth rather than toward sustained improvements in income per capita. Cross-societal differences in technological

capability and land productivity were therefore reflected predominantly in variations in population density, while their effects on living standards remained transitory.[13]

The self-reinforcing interaction between technological progress, population growth, and societal adaptation has governed the process of development over the entire course of human history. Technological advances permitted larger populations to be sustained while intensifying the adaptation of societies to these innovations, whereas population growth and societal adaptation expanded both the base of prospective inventors and the demand for new technologies, further stimulating their creation and diffusion.[14] Over the Malthusian epoch, this self-reinforcing process generated steady advancement across civilizations, as technological capabilities expanded, populations grew, and societies adapted.

Yet one vital aspect of the human condition remained largely unchanged: living standards. Over most of human existence, technological progress did not generate durable improvements in the quality of life. Indeed, as the seventeenth-century English philosopher Thomas Hobbes memorably observed, life was "nasty, brutish, and short." Advances in technology and territorial expansion were channeled predominantly into population growth, dispersing the gains from progress across a growing population. While innovations produced temporary improvements in economic well-being, these gains were eventually offset by population growth, causing living conditions to revert toward the subsistence level. Fertile land, coupled with state capacity, as experienced at times in ancient China, Egypt, Greece, Persia, and Rome, fostered technological advances that temporarily improved living standards. Yet these gains did not endure.

While the transition from stagnation to growth may appear dramatic and sudden—and indeed it was—the underlying forces driving this change were set in motion at the dawn of humanity, gradually gathering momentum over the course of history. Ultimately, as the self-reinforcing interaction among these wheels of change intensified, the pace of technological progress crossed a critical threshold and generated a phase transition. Accelerated technological change generated demand for a new resource: workers equipped with the skills and knowledge required to operate

[13] A broad body of evidence, surveyed in Galor (2022, 2025), suggests that Malthusian dynamics (Malthus, 1798) and the phenomenon of Malthusian stagnation (Ashraf and Galor, 2011) are empirically supported. This evidence includes cross-country analyses, long-run time-series evidence, quantitative studies of pre-industrial European societies, and within-country studies of pre-industrial economies.

[14] Boserup (1965), Simon (1977), Kremer (1993), and Galor (2022).

in an increasingly dynamic technological environment. This mechanism first operated during industrialization in Western Europe, where rapid technological change contributed to the expansion of mass education. Decades later, it unfolded in developing economies, where the changing technological environment, driven predominantly by the adoption of frontier technologies, raised the demand for human capital and triggered its rapid expansion.[15]

As a widening set of occupations in manufacturing, commerce, and services required literacy, numeracy, and technical competence, parents faced stronger incentives to invest in the education of their children, inducing a progressive shift in the allocation of resources toward child quality. Consequently, technological progress began to outpace population growth, contributing to a modest rise in income per capita despite continued population expansion. Eventually, however, the further intensification of the demand for human capital induced parents to reduce fertility so as to permit greater investment in each child's education, setting in motion the fertility decline that characterized the demographic transition in developed economies and, with a considerable delay, in developing economies, where similar forces emerged at later stages of the development process.[16]

The rise in the returns to human capital, and its effect on the fertility decline, was reinforced by the increase in life expectancy and the decline in child labor. Furthermore, technology-skill complementarity contributed to the narrowing of the gender wage gap, raising the opportunity cost of child-rearing and reinforcing the movement toward smaller family sizes. These combined forces operated in both developed and developing economies, although in different time periods, triggering the demographic transition and severing the positive association between economic growth and birth rates that had prevailed over most of human existence.

The reduction in fertility lifted a major constraint on the development process. It permitted technological progress to unfold free from the counterbalancing effects of population growth, enabling further human capital formation and an unparalleled wave of innovation. The fertility

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[15] Evidence from the early and later stages of industrialization, surveyed in Galor (2022, 2025), is indicative of technology-skill complementarity in the early phases of industrialization, suggesting that educated individuals enjoyed a comparative advantage in coping with rapidly changing technological environments.

[16] As surveyed by Galor (2022, 2025), evidence from a wide range of countries, including the United States, Germany, France, Ireland, China, England, and Nigeria, supports the existence of the quantity-quality trade-off during these historical periods. Cross-country analyses further substantiate the role of technological acceleration in this process.

decline, the emergence of a workforce increasingly equipped to operate and adapt in a rapidly changing technological environment, and the acceleration of technological progress catalyzed the *phase transition* that liberated humanity from the enduring grip of the Malthusian trap. These forces generated sustained growth in income per capita in developed economies, while propelling the development process in developing economies.[17]

Yet, this transformation unfolded unevenly across the globe, giving rise to pronounced inequality across societies over the past two centuries. The wheels of change have governed the development process throughout human history across all world regions. However, the pace of interaction between technological progress and the size and composition of the population has varied significantly across societies, reflecting differences in their initial conditions. Institutional, cultural, geographical, and societal characteristics, as well as the legacy of colonialism, influenced the strength of the feedback between population and technology, the contribution of human capital to technological progress, and the responsiveness of human capital formation and fertility decline to the rising demand for skills. These forces shaped the timing and intensity of the transition to modern growth across societies, contributing to the emergence of significant disparities in the wealth of nations.[18]

## 5. Concluding Remarks

The advent of the neoclassical growth model and innovation-driven endogenous growth models marked an important milestone in our understanding of the mechanisms through which technological progress sustains economic growth within the modern growth regime. These frameworks highlighted the contribution of innovation, technological rivalry, and creative destruction to the growth process among economies in close proximity to the technological frontier, once their demographic structure, skill base, adaptive capacity and institutional environment permitted innovation-driven growth to operate at scale.

[17] The pivotal role of the fertility decline in shaping subsequent growth processes and comparative development is underscored by Cervellati and Sunde (2015) and Madsen et al. (2020).

[18] Galor (2010, 2011) explores the impact of society-specific characteristics on the trajectory of societies from stagnation to growth, permitting the theory to account for cross-societal variation in institutional, cultural, geographical, and societal characteristics. A broad empirical literature provides support for these channels (e.g., Galor and Mountford, 2008; Acemoglu and Robinson, 2012; Spolaore and Wacziarg, 2013; Ashraf and Galor, 2013; Galor and Özak, 2016).

Yet, across most societies, the emergence and intensity of modern growth were governed less by frontier innovation itself than by the conditions that enabled skill formation, fertility decline, and societal adaptation. These forces shaped the course of economic development, governing the timing of the transition to modern growth, the pace of growth thereafter, and the divergence in the wealth of nations over the past two centuries. From this vantage point, innovation-driven growth captures the experience of advanced societies at the technological frontier, while the unified perspective on the long arc of development underscores the interplay between demographic forces, human capital formation, and technological progress in generating and sustaining economic growth, and accounting for divergent development trajectories across societies.

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