ECONOMIC AND BUSINESS HISTORY 2024-2025

Text 1 – Oded Galor (2022) *The journey of Humanity. The origins of wealth and inequality*, Dutton, Pinguin House (selected pages).

Text 2 – Simon Kuznets. The Modern Economic Growth: rate, structure and spread. New Haven: Yale University Press, 1966, chapter 10).

Text 3 – Tawney Lecture 2009 – Robert Allen, 2009, Why was the Industrial Revolution British? https://ehs.org.uk/multimedia/tawney-lecture-2009-why-was-the-industrial-revolution-british/

Text 4 – Alfred D. Chandler Jr. (1981), "The United States: seedbed of managerial capitalism". In Alfred D. Chandler Jr., Herman Deams (editors), *Managerial hierarchies: comparative perspectives on the rise of the modern industrial enterprise*. Cambridge: Harvard University Press, pp. 9-40.

Text 1

Oded Galor, *The journey of Humanity. The origins of wealth and inequality*, (selected pages)

1. Introduction

Imagine that some residents in Jerusalem 2,000 years ago, were to step into a time machine and travel to the Ottoman-ruled Jerusalem of 1800. They would undoubtedly be impressed by the magnificent new city wall, the considerable population growth, and the adoption of new innovations. But although nineteenth-century Jerusalem was quite different from its Roman predecessor, our time travellers would adjust with relative ease to their new surroundings. Admittedly, they would adapt their behaviour to the new cultural norms, but they would be able to maintain the trades they had practised at the dawn of the first century and sustain themselves easily enough, since the knowledge and skills acquired in ancient Jerusalem would still be pertinent at the turn of the nineteenth century. They would also find themselves vulnerable to similar perils, illnesses, and natural hazards as those endured in the Roman period, and their life expectancies would hardly alter.

Envision, however, the experience of our time travellers if they were whisked away in our time machine again, just another two hundred years ahead, to early-twenty-first-century Jerusalem. They would be utterly astounded. Their skills would now be obsolete, formal education would be a prerequisite for most occupations, and technologies that might seem like witchcraft would be daily necessities. Furthermore, as numerous fatal diseases of the past would have been eradicated, their life expectancy would instantly double, requiring an entirely different mindset and longer-term approach to life.

The gulf between these eras makes it difficult to conceive the world we left behind not so long ago. As the seventeenth-century English philosopher Thomas Hobbes put it bluntly, human life was nasty, brutish, and short. At the time, a quarter of new-borns died of cold, hunger and assorted illnesses before reaching their first

birthday, women often perished during childbirth, and life expectancy rarely exceeded forty. It was a place where women, men and children devoted long hours to ferrying water to their homes, washed infrequently, and spent the winter months in smoke-filled homes. A time in which most people lived in far-flung rural villages, rarely ventured from their birthplace, survived on paltry and monotonous diets, and could neither read nor write. A dismal era when an economic crisis did not simply demand belt-tightening, but rather led to mass starvation and death. Many of the daily hurdles that concern individuals in the present-day pale in comparison to the hardships and tragedies faced by our not-so- distant forebears.

It has long been the prevailing wisdom that living standards have risen incrementally over the entire course of human history. This is a distortion. While the evolution of technology has indeed been a largely gradual process, accelerating over time, it has not resulted in a corresponding improvement in living conditions. The astounding ascent in the quality of life in the past centuries has in fact been the product of an abrupt transformation. […]

Since the dawn of the nineteenth century, a split second compared to the span of human existence, life expectancy has more than doubled, and per capita incomes have soared twenty-fold in the most developed regions of the world, and fourteen-fold on Planet Earth as a whole (Fig. 1). This continuing improvement has been so radical, in fact, that we often lose sight of just how exceptional this period is in relation to the rest of our history. What explains this Mystery of Growth – the scarcely conceivable transformation in the quality of life of the last few centuries, in terms of health, wealth and education, which dwarf any other changes in these dimensions since the emergence of Homo sapiens?

In 1798, the English scholar Thomas Malthus offered a plausible theory for the mechanism that had caused living standards to remain stagnant, effectively trapping societies in poverty, since time immemorial. He argued that whenever societies managed to bring about a food surplus through technological innovation, the resulting boost in living standards could only ever be temporary as it would lead inevitably to a corresponding rise in birth rates and a reduction in mortality rates. It was just a matter of time, therefore, before the ensuing population growth would deplete the food surpluses, and thus living conditions would revert to subsistence levels, leaving societies as poor as they had been before the innovation.

Indeed, during the period known as the Malthusian epoch – which is to say, the entirety of human history up until the recent dramatic leap forward – the fruits of technological advancements were channelled primarily towards larger and denser populations and had only a glacial impact on their long- term prosperity. Populations grew while living conditions stagnated and remained near subsistence. Variations between regions in terms of the sophistication of their technology and the productivity of their land were reflected in differing population densities, but the effects they had on living conditions were largely transitory. Ironically, however, just as Malthus completed his treatise and pronounced that this 'poverty trap' would endure indefinitely, the mechanism that he had identified suddenly subsided and the metamorphosis from stagnation to growth took place.

How did the human species break out of this poverty trap? What were the underlying causes of the extent of this epoch of stagnation? Might the forces that governed both the protracted economic ice age and our escape from it foster our understanding of why current living conditions are so unequal across the globe?

Fuelled by the conviction, and the evidence, that in order to understand the causes of the vast inequality in the wealth of nations we would have to identify the principal driving forces behind the process of development as a whole […] this book explores and identifies the forces that have governed the development process. It demonstrates how these forces operated relentlessly, if invisibly, throughout the course of human history, and its long economic ice age, gathering pace until, at last, technological advancements in the course of the Industrial Revolution accelerated beyond a tipping point, where rudimentary education became essential for the ability of individuals to adapt to the changing technological environment. Fertility rates started to decline and the growth in living standards was liberated from the counterbalancing effects of population growth, ushering in long-term prosperity that continues to soar in the present day. At the centre of this exploration is the question of the sustainability of our species on Planet Earth. Today, the impact of the growth process on environmental degradation and climate change raises significant concerns as to how our species might live sustainably and avert the catastrophic demographic outcomes of the past.

The journey of humanity provides a hopeful outlook: the tipping point that the world has recently reached, resulting in a persistent decline in fertility rates and the

acceleration of ‘human capital’ formation and technological innovation, could enable humanity to mitigate these detrimental effects and will be central for the sustainability of our species in the long run.

Intriguingly, when prosperity skyrocketed in recent centuries, it did so only in some parts of the world, triggering a second major transformation unique to our species: the emergence of immense inequality across societies. One might suppose that this phenomenon occurred primarily because the escape from the epoch of stagnation has occurred at different times across the globe. Western European countries and some of their offshoots in North America and Oceania experienced the remarkable leap in living conditions as early as the nineteenth century, while this ascent was delayed in most regions of Asia, Africa and Latin America until the latter half of the twentieth century (Fig. 2).

[…] Uncovering the deep-rooted factors behind this global disparity leads us to reverse the course of our journey and to take major sequential steps far back in history, ultimately reverting to the place where it all began – the exodus of Homo sapiens from Africa tens of thousands of years ago.

2. The Malthusian regime

Like other species, over most of their existence, humans were caught in a trap of hardship and privation, near the subsistence level.

Despite some regional differences, income per capita and wages for unskilled labourers in different civilisations fluctuated within only a very narrow band for thousands of years. In particular, estimates suggest that wages for a workday were the equivalent of seven kilograms of wheat grains in Babylon and five kilograms in the Assyrian Empire more than three thousand years ago, eleven to fifteen kilograms in Athens more than two thousand years ago, and four kilograms in Egypt under the Roman Empire. In fact, even on the eve of their Industrial Revolution, wages in Western European countries remained in this narrow range: ten kilograms of wheat in Amsterdam, five in Paris, and three to four in Madrid, Naples and assorted cities in Italy and Spain.

Moreover, skeletal remains across various tribes and civilisations over the past 20,000 years indicate that despite some regional and temporary differences, life expectancy (at birth) oscillated within a very narrow band. Remains uncovered in

Mesolithic sites in North Africa and the Fertile Crescent suggest that life expectancy was nearly thirty years. During the subsequent Agricultural Revolution it did not change significantly in most regions, though it dropped in some. In particular, skeletons exhumed from burial sites dating from the early stages of the Neolithic Revolution, 4,000 to 10,000 years ago, suggest that life expectancy was about thirty to thirty-five at Çatalhöyük (Turkey) and Nea Nikomedeia (Greece), twenty at Khirokitia (Cyprus), and thirty near the towns of Karataş (Turkey) and Lerna (Greece). Two and a half thousand years ago, life expectancy reached about forty years in Athens and Corinth, but headstones from the Roman Empire indicate yet again an age at death in the range of twenty to thirty. More recent evidence points to fluctuations in life expectancy in the range of thirty to forty years in England from the mid-sixteenth to nineteenth centuries, and comparable values were recorded in pre-industrial France, Sweden and Finland.

For nearly 300,000 years after the emergence of Homo sapiens, per capita incomes were scarcely higher than the minimum necessary for survival, plagues and famines were abundant, a quarter of babies did not reach their first birthday, women commonly perished during childbirth, and life expectancy rarely exceeded forty years.

[In 1798], Malthus published An Essay on the Principle of Population, in which he […] advanced the gloomy thesis that in the long run humanity could never prosper because any gains it made would ultimately be depleted by population growth […]

In retrospect, Malthus's description of the world as it existed in the past was entirely accurate. It was his pessimistic predictions about the future of humanity that turned out to be utterly mistaken.

Imagine a village in the pre-industrial age where the inhabitants devise a more efficient method to grow wheat using iron ploughs, considerably increasing their ability to produce bread. At first, the villagers' diets would improve and, trading some of the surplus, their living conditions would rise. The abundance of food might even enable them to reduce their work and enjoy some leisure. But critically, Malthus argued, this surplus would allow them to sustain more surviving children, and accordingly the village's population would grow over time. And since the land available for wheat cultivation within the village is necessarily limited, this population growth would gradually lead to a reduction in each villager's bread ration. Living standards would begin to drop after the initial rise and would only stop falling once

the ratio of loaves per villager returned to its original level. Painfully, their technological progress would lead to a larger but not a richer population in the long run.

This trap has had all living beings in its clutches. Consider a pack of wolves on an island. Global cooling causes sea levels to drop and uncovers a land bridge to another island, which is home to a peaceful population of rabbits. The wolves gain new hunting grounds, the availability of additional prey boosts their living standard, and more cubs survive to reach maturity, leading to an explosion of the wolf population. However, as more wolves must share a limited amount of rabbits, the wolves' living standard gradually reverts to the pre-cooling level, while the wolf population stabilises at a larger size. Access to more resources does not make the wolves better off in the long run.

The Malthusian hypothesis is based on two fundamental building blocks. The first is that a rise in resources (agricultural yields, fishing hauls, and hunting and gathering bounties) leads populations to have more surviving offspring, driven by the biological, cultural and religious predisposition to reproduce, and the decline in child mortality that accompanies better nourishment. The second building block is that population growth engenders a decline in living conditions whenever living space is limited. According to Malthus, the size of any population will adapt to the available resources via two mechanisms: the positive check – a rise in mortality rates due to the increased frequency of famine, disease and war over resources in societies whose populations have outgrown their food production; and the preventative check – a drop in birth rates during periods of scarcity through delayed marriage and the use of contraception.

Did technological advancements in the pre-industrial era lead to larger but not richer populations as implied by the Malthusian thesis? The evidence is clear that technological sophistication and population size were indeed positively associated in this era, but the existence of this relationship does not in itself indicate an impact of technology on population. In fact, technological advancements during this period were partly the result of larger populations because sizeable societies produced both more potential inventors and greater demand for their inventions. Besides, it may be that other independent factors – cultural, institutional or environmental – contributed to the growth of both technology and population, thus accounting for the positive

correlation between the two. In other words, this correlation cannot in itself be taken as evidence of Malthusian forces.

Fortunately, the Neolithic Revolution provides us with an intriguing way to test the validity of the Malthusian thesis. […] We can therefore infer a region's level of technological advancement from our knowledge of when it underwent the Neolithic Revolution (or from the number of domesticable species of plants and animals in the region). Put another way, at any single point in time, regions that had undergone the Neolithic Revolution earlier would be expected to have higher levels of technological sophistication. Thus, all other factors being equal, if a region that underwent the Neolithic Revolution earlier is also larger or richer, we can confidently conclude that this has been caused by its level of technological advancement. Using this approach, we can indeed observe the Malthusian mechanism at work prior to the industrial era. In 1500 cE, for instance, higher technological level, as inferred from an earlier onset of the Neolithic Revolution, did indeed lead to greater population density, whereas the impact on per capita income was negligible (Fig. 4).

Separate evidence, meanwhile, shows that fertile soil also contributed to higher population density but not to higher living standards. And examining even earlier eras through the same lens reveals an impressively consistent pattern – technological advancements and higher land productivity led primarily to larger but not richer populations, implying that prior to the Industrial Revolution, people across the world enjoyed largely similar standards of living.

3. The wheels of change

What, then, propelled humanity out of the gravitational forces of the Malthusian equilibrium? How did the world wrench itself out of this economic black hole?

In search of the catalyst of the transition from stagnation to growth, one may argue that the Industrial Revolution is the force that gave the world an abrupt external shock that jolted it into the modern phase of growth. However, evidence from the eighteenth and nineteenth centuries when the Industrial Revolution occurred suggests that there was no 'jolt' at any point during this period. While the transition

was rapid when compared with the timespan of human history, the productivity gains experienced during this period increased gradually. Indeed, when the Industrial Revolution first transpired, since technological change was incremental, populations spiked but average incomes increased only very modestly, just as would be predicted by the Malthusian theory. Yet, at a certain point, nearly a century later, the Malthusian equilibrium quite mysteriously vanished and tremendous growth ensued. The conceptual framework I devised in the past few decades to address this conundrum was inspired by insights from the mathematical field of bifurcation theory, which demonstrate how, beyond a certain threshold, minor alterations in a single factor may generate a sudden and dramatic transformation in the behaviour of complex dynamical systems (as is the case when heat crosses a threshold and transforms water from liquid to gas). In particular, this research has focused on identifying the cogs that were whirring invisibly beneath the surface, wheels of change that were turning relentlessly throughout the epoch of the Malthusian equilibrium but which ultimately broke its hold and led to the emergence of modern growth – much like the rising temperatures in the kettle.

What are those mysterious wheels of change that operated persistently during the Malthusian epoch and ultimately triggered the dramatic metamorphosis in living standards in the past two centuries?

One of these wheels of change was population size. At the eve of the Neolithic Revolution, in the year 10,000 BCE, an estimated 2.4 million human beings roamed the Earth. Yet, by the year 1 cE, as the Roman Empire and the Mayan civilisation approached their height, the world's population had multiplied seventy-eight-fold, and soared to 188 million. A millennium later, when the Vikings raided the coasts of Northern Europe and the Chinese first used gunpowder in combat, humanity stood at 295 million individuals. World population had risen to nearly half a billion by the year 1500, at the time when Columbus was in the midst of his expeditions to the Americas, and at the turn of the nineteenth century, in the early phases of industrialisation, the human population nearly crossed the one billion mark (Fig. 6).

The relationship between population size and technological change is a reciprocal one – just as technological advancements during the Malthusian epoch enabled populations to densify and grow 400-fold within a 12,000- year period, so had the size of these human populations contributed to an acceleration in the pace of

innovation. As noted above, larger populations were more likely to generate both a greater demand for new goods, tools and practices, as well as exceptional individuals capable of inventing them. Moreover, sizeable societies benefited from more extensive specialisation and expertise, and greater exchange of ideas through trade, further accelerating the spread and penetration of new technologies. As we have seen, this self-reinforcing, positive feedback loop emerged at the very dawn of the human species and it has been operating ever since.

This impact of population size on the technological level is apparent across cultures and regions throughout the historical record. Regions that experienced an earlier onset of the Neolithic Revolution, such as the Fertile Crescent, gave rise to the largest prehistoric settlements and enjoyed a persistent technological head start […] Larger populations were not only more conducive to technological development, but they also prevented the kind of technological decline that is a common feature of smaller communities, such as that experienced by the Polar Inuit of north-west Greenland in the 1820s. This society was hit by an epidemic that decimated its adult population, who were the store for the tribe's priceless technological knowledge, such as for kayak construction. In its aftermath, the young survivors could not restore this lost technological know-how, since even the possessions of the old were buried with them, and experienced an extreme technological regression, which drastically eroded their hunting and fishing capabilities. Their population began to dwindle and would surely have continued to wane had they not eventually encountered another Inuit community, who reintroduced them to this lost knowledge a few decades later. Acute technological regression among isolated communities had been experienced by other small communities, such as Aboriginal Tasmanian tribes after the loss of their land bridge with Australia. In contrast, technological regression is much rarer in larger populations which tend to have trading links with other groups, spread their knowledge across society, and enjoy regular infusions of new inventions.

As will become apparent, this reinforcing cycle – technological development sustaining larger populations, while larger populations reinforce technological development – which has operated throughout most of our existence, gradually but continuously intensified until ultimately the rate of innovations reached a critical threshold. This was one of the sparks for the phase transition that hoisted humanity out of the epoch of stagnation.

Population size operated in tandem with another wheel of change – population composition. […] During the Malthusian epoch, it is reasonable to suppose that cultural traits that were complementary to the technological environment would have generated higher income, and thus a larger number of surviving offspring, leading therefore to a gradual increase in the prevalence of these traits in the population. And because these traits would in turn reinforce that pace of technological change, they would have contributed to the pace of the development process from stagnation towards growth. As we will see, among the most growth-enhancing of these cultural traits would have been norms, attitudes and customs associated with placing a high value on education, having a 'future-oriented' mindset and embracing what we might call an 'entrepreneurial spirit'.

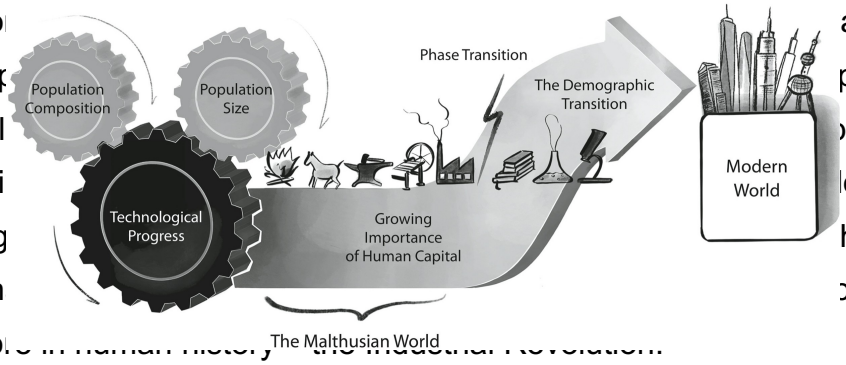
This process is epitomised by the evolution of the cultural inclination for parental investment in 'human capital' – factors that influence worker productivity, such as education, training and skill, along with health and longevity. Consider a human population caught in the Malthusian equilibrium that consists of two large clans: the Quanty and the Qualy. The Quanty clan adheres to the cultural norm, 'be fruitful and multiply' (Genesis 9:1), bringing as many children as possible into the world and investing its limited resources in raising them. In contrast, the Qualy clan pursues an alternative custom: its members choose to have fewer children but they invest a considerable part of their time and resources in factors that influence their children's productivity and earning capacity. Which of the clans, the Qualy or the Quanty, will have more descendants and thus dominate the overall population in the long run?

Suppose that Quanty households bear on average four children each, of whom only two reach adulthood and find a reproductive partner. Meanwhile, Qualy households bear on average only two children each, because their budget does not allow them to invest in the education and health of additional offspring, and yet, thanks to the investment that they do make, both children not only reach adulthood and find a reproductive partner but they also find jobs in commercial and skill-intensive occupations, such as blacksmiths, traders and carpenters. At this stage,

neither the fraction of Quanty nor Qualy is expanding over time and the composition of the population remains stable. But now suppose the society in which they live is one where technological development boosts the demand for the services of blacksmiths, carpenters and other trades who can manufacture tools and more efficient machines. This increase in earning capacity would place the Qualy clan at a distinct evolutionary advantage. Within a generation or two, its families are likely to enjoy higher incomes and amass greater resources. Their offspring will then be able to afford to bear on average, say, three children, educate all three of them, raise them to adulthood, and marry them off. In contrast, the uneducated offspring of the Quanty clan will not be affected by this technological development, their incomes will remain unchanged, and thus, on average, still only two children from each Quanty household will be likely to reach adulthood.

This mechanism suggests that in societies where technological innovation offers economic opportunity and thus where reproductive success is enhanced by the investment in human capital that allows one to seize it, a positive feedback loop will lead the Qualy clan to dominate the population in the long run: the increasing dominance of Qualy families will foster technological progress, while technological progress will increase the share of Qualy families in the population.

These, then, were the wheels of change that have been whirring beneath the surface fo ations sustained larger po pulation to their ecological oted populations fostered i logies and gain increasing hese wheels of change th on a scale never seen befo



4. Wealth and Inequality

In the past decade, scores of boats overloaded with migrants from Africa have sunk just off the coast of Libya and thousands of passengers have lost their lives. In 2015 alone, more than a million people crossed the Mediterranean in similar crafts, and over the course of this ongoing humanitarian crisis many thousands more from Africa, the Middle East and Latin America have died attempting to reach European and US borders. This desperate mass exodus, in which people not only endanger their lives but leave behind their families and homeland, and pay considerable sums they can scarcely afford to human traffickers, is primarily a result of the immense inequality in living standards across world regions […] At the surface of this global inequality is the fact that income per capita in developed nations is significantly higher than that in developing countries (Fig. 14), resulting in a much higher expenditure on education, health care, nutrition and housing.

But why do the citizens of some countries earn significantly more than the residents of others? This earning gap partly reflects differences in 'labour productivity': each hour of work in some world regions produces goods or services of greater value than an equivalent hour of work elsewhere. Agricultural labour productivity, for instance, varies enormously across countries. In the United States agricultural productivity per worker in 2018 is nearly 147 times higher than in Ethiopia, 90 times higher than in Uganda, 77 times higher than in Kenya, 46 times higher than in India, 48 times higher than in Bolivia, 22 times higher than in China and 6 times higher than in Brazil. But again, why do American farmers reap a far bigger harvest than the farmers of sub-Saharan Africa, South East Asia and most of South America?

The answer should come as no surprise: these differences are primarily a reflection of the technologies for cultivation and harvesting that are used in each country, as well as the skills, education and training of farmers. American farmers use tractors, trucks and combine harvesters, for example, while farmers in sub-Saharan Africa are more likely to rely on wooden ploughs often pulled by oxen. Moreover, American farmers are better trained and can use genetically modified

seeds, advanced fertilisers and refrigerated transportation, which may not be feasible or profitable in the developing world.

Nonetheless, this chain of proximate causes does not shed light on the roots of the disparity. It simply directs us to a more fundamental question: Why does the production process in certain countries benefit from more skilled workers and more sophisticated technologies?

Previous attempts to understand economic growth, like that of Nobel Prize-winning economist Robert Solow, focused on the importance of the accumulation of physical capital – straw baskets, rakes, tractors and other machines – to economic growth.

Suppose that a couple harvests enough wheat to bake a few dozen loaves of bread a week. They use some of these loaves to feed their family and sell the remainder at the village market. Once they have saved enough, they purchase a plough, increasing their stock of physical capital, their harvests and ultimately the number of loaves of bread they can bake per week. As long as the couple does not have additional children, this accumulation of capital (the addition of a plough) will help them increase their per capita income. The impact of this physical capital accumulation, however, is constrained by the law of diminishing marginal productivity: as the amount of land and time available to them is limited, then if that first plough boosts the couple's output by five loaves of bread a week, a second plough might only contribute three more loaves, while the fifth plough may hardly boost productivity at all.

The important corollary of this analysis is that only perpetual improvements in the efficiency of the plough will deliver long-term income growth for these villagers. Furthermore, the acquisition of a new plough would spur faster growth on a poor farm than it would on a more advanced farm of equal size, because this would likely be the first on the poor farm, whereas it might be the third or the fourth on the rich one. Thus, a relatively poor farm should grow more quickly than a more advanced one, and over time the income gap between the poor and the rich farms should narrow.

Solow's growth model suggests therefore that economic growth cannot be sustained indefinitely in the absence of technological and scientific progress. Moreover, it predicts that, with time, income disparities between countries that differ only in their initial levels of per capita income and capital stocks should diminish.

Imagine a marathon race in which the further runners get from the starting point the harder each additional step becomes. If one group of runners starts the race a few minutes earlier than a second, equally talented group of runners, the first group will keep ahead of the latecomers, but the gap between the two will be narrowing with every stride they take. Analogously, in the context of countries that differ only in their initial levels of per capita income and capital stock, those poorer economies that started the race later should gradually converge with those richer economies that started the race earlier, and thus the income gaps across these nations should eventually decline.

Yet, as Figure 15 shows, the economies of the developed and developing nations have not converged. Quite the contrary, in fact: the gaps in living standards between regions have largely expanded over the past two centuries.

What prompted this great divergence between some countries? And what are the forces that have prevented some poorer nations from catching up with richer ones?

In the second half of the twentieth century, policymakers advanced programs with the aim of raising the living standards of developing countries based on the insight that technological progress and the accumulation of physical and human capital stimulate economic growth. However, inequality across nations persists to such an extent as to suggest that these policies have had a limited impact. Too narrow a focus on observable factors on the surface – the manifested disparities – rather than on the underlying causes that created them has prevented the design of policies that would help poorer nations overcome the less visible, but more persistent, obstacles they face. These forces could have created a barrier that

inhibited investments, education and the adoption of new technologies, contributing to uneven development across the globe. It is these underlying causes and obstacles that we will need to identify if we wish to decipher the Mystery of Inequality and foster global prosperity.

5. The Power of Culture

Cultural traits – the shared values, norms, beliefs and preferences that prevail in a society and are transmitted across the generations – have often made a significant impact on a society's development process. In particular, aspects of culture that dispose populations towards or away from the maintenance of strong family ties, interpersonal trust, individualism, future orientation and investment in human capital have considerable long-term economic implications.[6]

The boundary between cultural and personal traits may often appear fuzzy. Some people might invest heavily in the education of their young because of the values of their social, ethnic or religious group, while others may be driven by personal traits, reflective of their life experiences, upbringing and family background. Nonetheless, one's values, beliefs and preferences are rarely independent of one's social and cultural context. And when variations in these norms correlate clearly with ethnic, religious or social groupings, it is plausible that they are, to a large extent, a manifestation of cultural rather than individual differences. In other words, it is the cultural component that is pertinent for the understanding of inequality across groups.

So how have cultural traits emerged and persisted and how have they affected the evolution of societies in the course of human history?[…] Like biological mutations, the initial appearance of a cultural change may be 'random', but its survival or extinction is not accidental. The norm of literacy and book-learning might never have appeared in either the Jewish or Protestant communities without the decree of the Jewish sages and the preaching of Luther; but it is nearly certain it would never have taken root in the way that it did were it not for the advantages – in this case commercial and economic – bestowed on those who embraced it, advantages that the early advocates of Bible study neither envisioned nor invoked.

Different societies in different places at different times have inevitably developed different norms in order to adapt to the particular ecologies they inhabit. Over time and across civilisations, thinkers and leaders have proposed countless initiatives to reform norms, values and beliefs. Yet it is mostly when either geographical and climatic characteristics, the disease environment, or technological, commercial and social conditions have reinforced the benefits of these novel cultural traits that they have persisted and generated significant cultural change.

Humans have developed traditions and norms that regulate, for example, diet, property rights, social cohesion, family structure and gender role. Individuals within these societies often consider these traditions to be based on timeless and essential truths, commonly adhering to and perpetuating them as such, without necessarily knowing their original purposes or understanding the adaptive reasons for their existence. This psychological tendency to adhere to existing cultural norms without challenging their foundations has conferred a survival advantage. Societies with hardly any scientific knowledge of human biology, group consciousness or the ecological factors that affect their habitats have been able to thrive in complex and precarious environments, behaving as if they did possess such knowledge, thanks to accumulated wisdom of generations of trial and error, passed on in the form of ancient traditions, timeless beliefs and universal rules […]

But then a dramatic transformation occurred in one region of the world that galvanised growth-enhancing traits, leading to ‘a culture of growth’ […] [F]orward-looking philosophers started to gain the upper hand over their rivals. Thus wrote Immanuel Kant in his 1784 essay ‘What is Enlightenment?’: The Enlightenment called on human beings to trust themselves and have the resolution to reject antiquated cultural traditions. It encouraged the development of a more sceptical, empirical and flexible approach towards the world, in the hope of creating a new culture founded not on a faith in the traditions of the past but on the belief that a better world could be built through scientific, technological and institutional progress. This outlook, suited as it was to rapid adaptation to a changing environment, has

been described recently by the economic historian Joel Mokyr as ‘a culture of growth’.

As the pace of technological and social change dramatically increased, individuals and societies who were in a position to adopt this ethos thrived. This was a radical paradigm shift from previous periods when the pace of progress was slower and so the ethos of the Enlightenment was often less advantageous than reverence for the wisdom of the ancients and adherence to tradition.

Yet, it is in the nature and purpose of culture to preserve and persist, not to reject the past and celebrate change, and this inherent tension meant that for most societies, a rapid transformation was either challenging or infeasible. The impact of cultural inertia on economic development can be seen in the different trajectories of northern and southern Italy. Since 1871, Italy has been a unitary republic, governed by a single set of political, legal and economic institutions. In contrast to Korea, there is no international border separating Italy’s northern region from its southern one. Yet, the two parts of Italy differ considerably: in much of the south, income per capita is only two- thirds of the level in the affluent north.

In 1958 the American political scientist Edward Banfield advanced an influential thesis that attributed southern Italy’s lower level of prosperity to stronger family ties in the region. He argued that more intense family ties diminished trust outside of one’s kinship group, weakened cooperation in pursuit of a common public goal, and thereby reduced the level of economic prosperity in the region. In line with his thesis, recent evidence suggests that kinship ties do indeed differ significantly across Italian regions, as they do more generally across countries. Likewise, tighter nuclear family bonds do tend to adversely affect levels of social trust, political participation, the status of women in the workforce and geographic mobility. And since, as the Nobel Prize–winning American economist Kenneth Arrow noted, business deals often rely on trust while its absence harms trade, lower levels of trust outside of the family setting might have diminished the level of economic development in southern Italy compared to the north.

But how did these differences in trust levels and family ties emerge in the first place? Nearly thirty years after Banfield's study, the American public policy researcher Robert Putnam released an equally influential book that offered an explanation for these puzzling variations. A thousand years ago, southern Italy was governed by Norman kings who imposed a feudal economic order, whereas northern cities that enjoyed relative freedom after casting off the yoke of the Holy Roman Empire developed more democratic institutions. Historically, therefore, citizens in northern Italy had played an active role in political affairs, contributed to communal activities, and had greater levels of trust in their peers, whereas those in the south had grown accustomed to having limited voice in the hierarchical political system. According to Putnam, for that reason northern Italy nurtured a culture conducive to democracy, while swathes of southern Italy retained institutions reminiscent of the old feudal order and were dominated by the Mafia.

Putnam argued that democracy is critically nourished by social capital – cultural traits that foster trust and civic engagement in politics. Indeed, modern-day inhabitants of Italian cities that achieved independence relatively early in the Middle Ages exhibit higher levels of democratic and civil commitment, greater trust, and higher levels of economic prosperity. Social capital has also contributed to greater openness to the instruments of contemporary finance and thus to economic prosperity. Residents of northern Italy, which is characterised by higher levels of social capital, reflected in higher voter turnout and blood donation rates, for example, have a greater tendency to hold their wealth in banks, accept credit, invest in stocks and obtain loans. Intriguingly, social capital has a long-term, persistent impact: Italians who migrate to other parts of Italy are still influenced by the cultural heritage of their ancestral regions.

The Italian divide illustrates the powerful influence of cultural attributes associated with social capital. It indicates that they persist over centuries, thereby bringing the effect of institutional changes from the ancient past to bear on social and political developments in the present. The fingerprints of the long-term historical impact of culture are visible in other regions, too. The Habsburg Empire governed a vast expanse of Central and Eastern Europe from the mid-fifteenth to early twentieth centuries and was known for the efficiency of its institutions. Parts of Eastern Europe

once ruled by the Habsburgs still enjoy greater trust in governing institutions and lower levels of corruption than adjacent regions (even within the same country) that were formerly ruled by the Ottoman or the Holy Roman Empires.

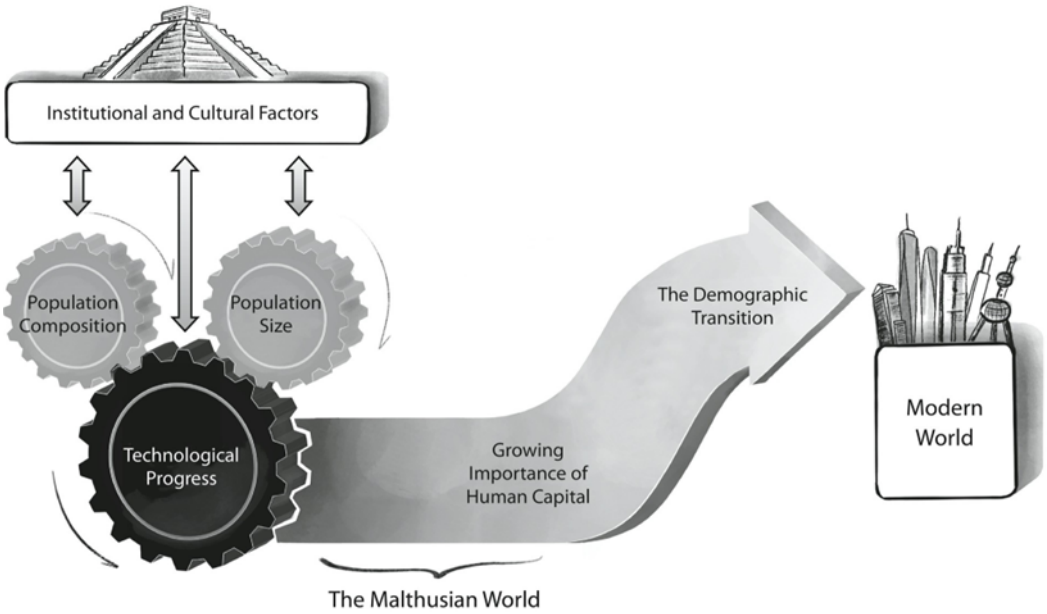
The enduring legacy of the slave trade in Africa provides a particularly sobering example of the persistence of social capital – or the lack of it. Slavery existed in parts of Africa before the fifteenth century, but with the advent of the transatlantic trade in enslaved Africans, abductions and inter- ethnic conflicts greatly increased in West Africa as local chiefs responded to the immense demand from European slave traders. These traumatising practices fomented a precautionary distrust of Europeans and strangers but also of neighbours and relatives. Indeed, based on a survey conducted by the Afrobarometer across sub-Saharan African countries, there appears to be a substantial gap in levels of interpersonal trust between areas affected by the slave trade and those that were spared, more than a century after that trade came to an end.

In summary, cultural traits emerge from myriad factors, predominantly as an adaptive response to our habitat. Adjustments in that environment, whether in the form of new institutions, technology, the arrival of new crops, trade or migration, have had a major impact on the emergence and endurance of new cultural traits. When a shift in cultural characteristics has led to economic

success, that change seems to have taken place more quickly. But since on the whole cultures evolve more slowly than technology, especially in the past few centuries, it is likely that in some societies cultural traits have been and may still be a barrier to development […]

Over the course of human history, individuals across most societies have treated technological, scientific and philosophical changes with suspicion, safeguarding their governing institutions and existing power structures […] However, a few centuries ago, societies in Western Europe did experience a cultural shift, one that accelerated the speed of the great cogs of human history, and helped bring about the modern era of sustained economic growth. They arrived at the conviction

that scientific, technological and institutional development held the keys to a better world. In other words, they believed that developments of this sort were progress.



[…]Yet, a major puzzle remains unresolved: why did the cultures and institutions that were particularly conducive to technological development emerge in certain societies and not others?

6. Geographical Roots of Cultural Traits

At some junctures in human history, the location of cultural and institutional transformations may appear rather arbitrary; one can imagine a counterfactual history in which North Korea became a capitalist powerhouse while South Korea sank into communist poverty. However, in most circumstances, deep-rooted factors underpinned the emergence of cultural norms and institutional structures. These were geography and human diversity.

A future-oriented mindset, or long-term orientation, is one of the most important cultural traits for economic prosperity. It affects our propensity to save, acquire education, and advance or adopt novel technologies – and according to work by Dutch social psychologist Geert Hofstede it differs significantly between countries. In light of the contribution of this trait to human and physical capital formation,

technological advancement and economic growth, scholars consider it to be a fundamental determinant of the wealth of nations.

The origin of this cultural trait might be traced to the geographical environment in which it evolved. Consider a society during the Malthusian epoch whose members are contemplating two possible strategies for the use of their land. The consumption strategy is to exploit the entire land for gathering, fishing and hunting, so as to satisfy the daily consumption needs of the group. This strategy guarantees a modest, yet relatively stable, year-round food supply. The investment strategy, by contrast, is to forgo some of current consumption by planting crops on part of the territory. This strategy requires some degree of long-term orientation since it involves sacrificing short-term consumption for the sake of consumption in the future.

Over the course of history, the investment strategy would have been more profitable in regions where crops generated a higher yield, and so in these places one would expect a larger portion of the available territory to be devoted to cultivation. Societies located in these fruitful regions have indeed enjoyed higher levels of income and, in the Malthusian era, higher reproductive success. This would have vindicated their strategy, reinforcing their favourable attitude towards long-term orientation, which will have been transmitted intergenerationally and become more prevalent in those societies. Thus, variation in crop yield could be the origin of the different levels of future-oriented behaviour observed in different regions of the world.

It is certainly the case that crop returns are distributed unevenly within and between continents. In particular, in the pre-1500 period, the dominating crops in Europe (barley) and Asia (rice) yielded almost twice as many potential daily calories (per acre) as the corresponding crop in sub- Saharan Africa (peas), while requiring only two-thirds of the cultivation period from planting to harvesting. Empirical evidence suggests that, within each continent, countries whose populations originated in areas with higher potential return on crop cultivation do tend to be more long-term-oriented, even taking into account other geographical, cultural and historical factors. Moreover, analysis based on polls conducted by the European Social Survey (2002–14) and the World Values Survey (1981–2014) suggests that

people who come from regions with higher potential return to crop cultivation are predisposed to be more future-oriented.

As ever, these findings might be driven by reverse causality. This correlation could reflect the fact that societies with greater long-term orientation are the ones that choose to cultivate crops that require longer- term investment. However, the correlation is with potential caloric return, which is inferred entirely from agroclimatic characteristics, rather than with the actual crops that were grown in a region; the fact that such characteristics are (largely) unaffected by human choice implies that reverse causality is not at play. At the same time, the fact that the potential crop yield is (unsurprisingly) highly correlated with the actual one suggests that crop yield is indeed the mechanism that triggered the evolution of this cultural trait.

Yield is not the only aspect of crops that translates geographic conditions into cultural traits. The type of cultivation they require can also do so. Evidence from Chinese regions suggests that the suitability of land for the cultivation of rice – which requires large-scale and therefore shared irrigation systems – has contributed to more collectivist, interdependent culture, whereas land that is suitable for the cultivation of wheat, which requires a lower degree of cooperation, has contributed to the emergence of more individualistic cultures. Likewise, comparison between countries suggests that land suited to more labour-intensive crops is also associated with the emergence of more collectivist cultures.

[…]

Geographical characteristics are therefore some of the ultimate forces that set the evolution of culture, institutions and productivity in motion. They are among the deep-rooted factors affecting the great cogs that drive the journey of humanity, hastening the emergence of growth in some places and delaying it in others. In conjunction with cultural and institutional characteristics, they have contributed to the timing and the location of the technological outburst of the Industrial Revolution and ultimately to the onset of the Demographic Transition. They reveal some of the roots of the disparity in the wealth of nations today and so provide the clues to how we might address it.

Figures quoted in the text

Figure 1. The Mystery of Growth

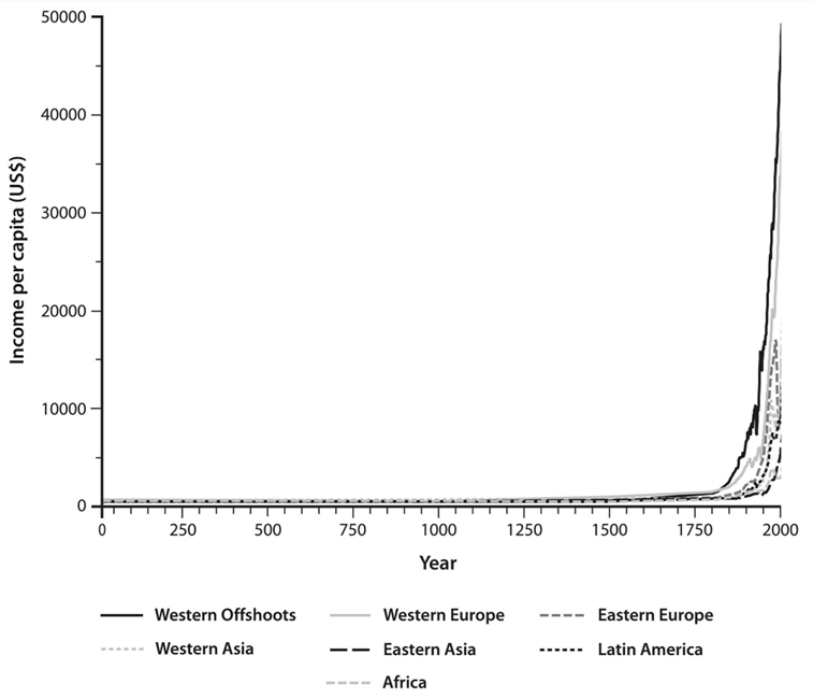


Figure 2. The Mystery of Inequality

The divergence in per capita income across world regions in the past two centuries

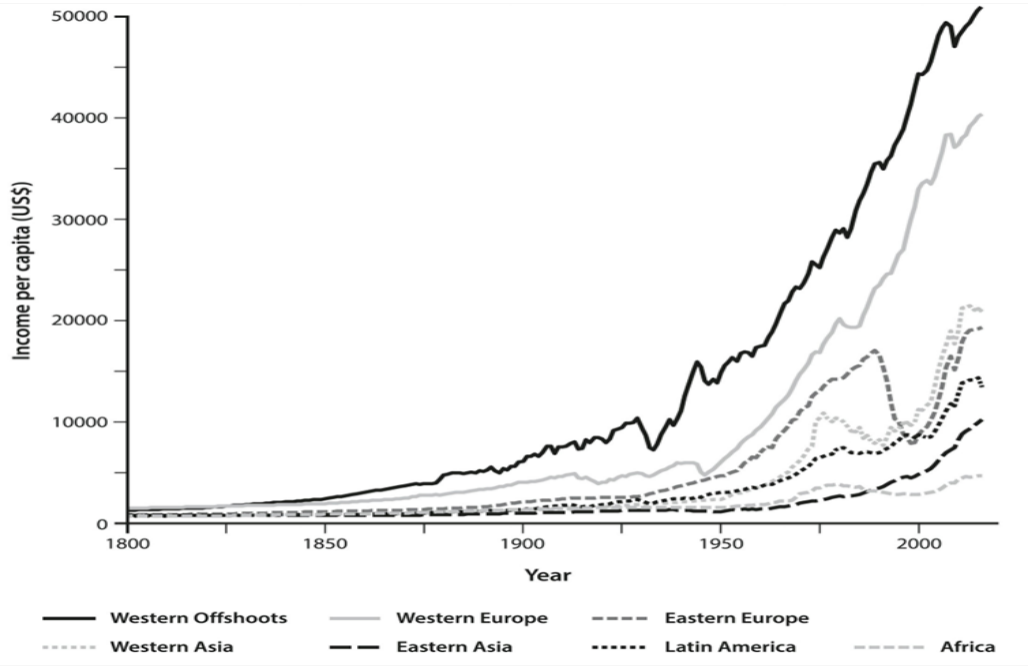


Figure 4. Effects of Technology Level on Population Density and Per Capita Income across Countries in the Year 1500

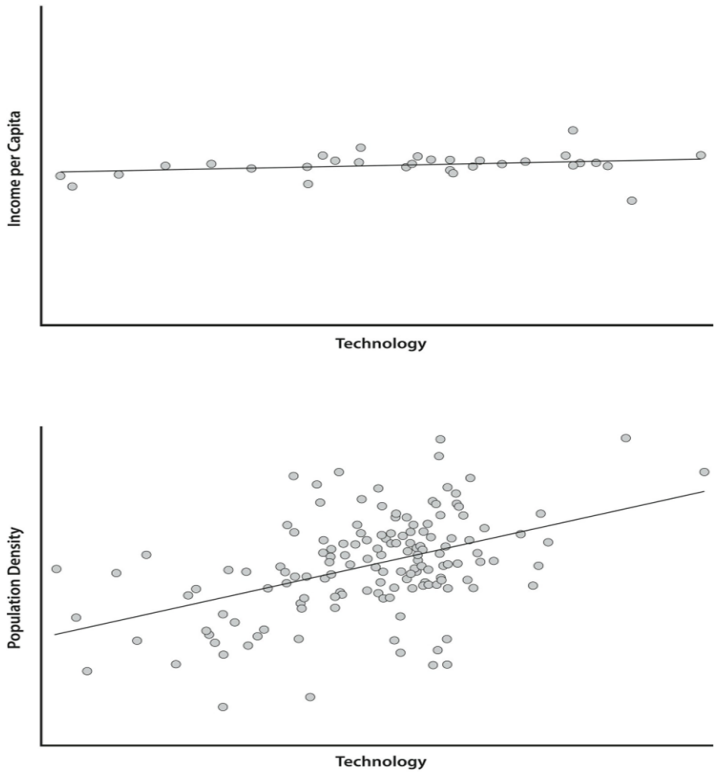


Figure 6. Human Population Growth during the Malthusian Epoch

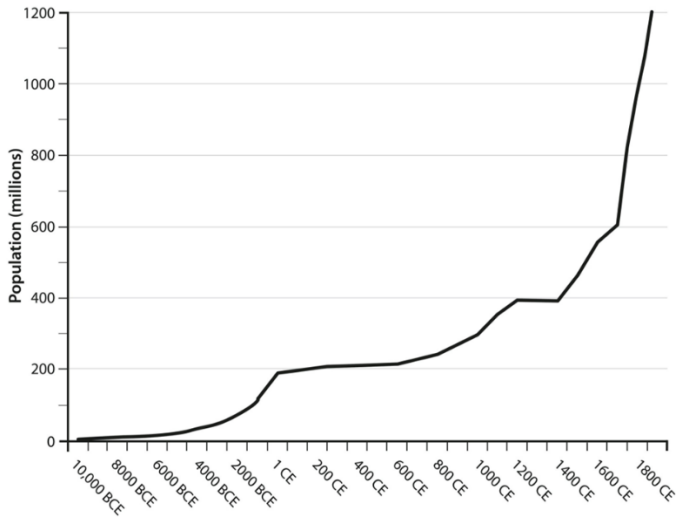


Figure 10. Evolution of Life Expectancy (at birth) across the Globe, 1613–2013[2]

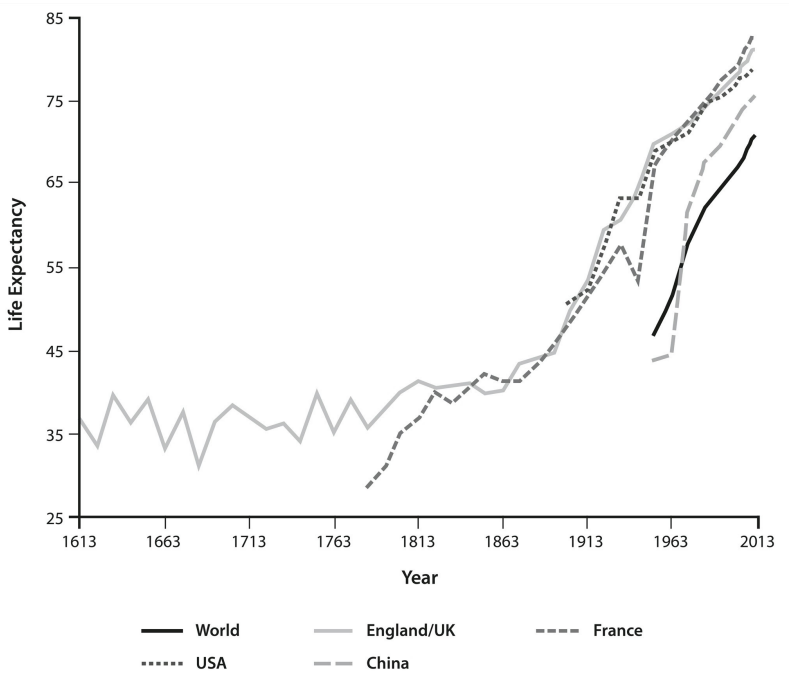


Figure 14. Income Per Capita in US Dollars, 2017[3]

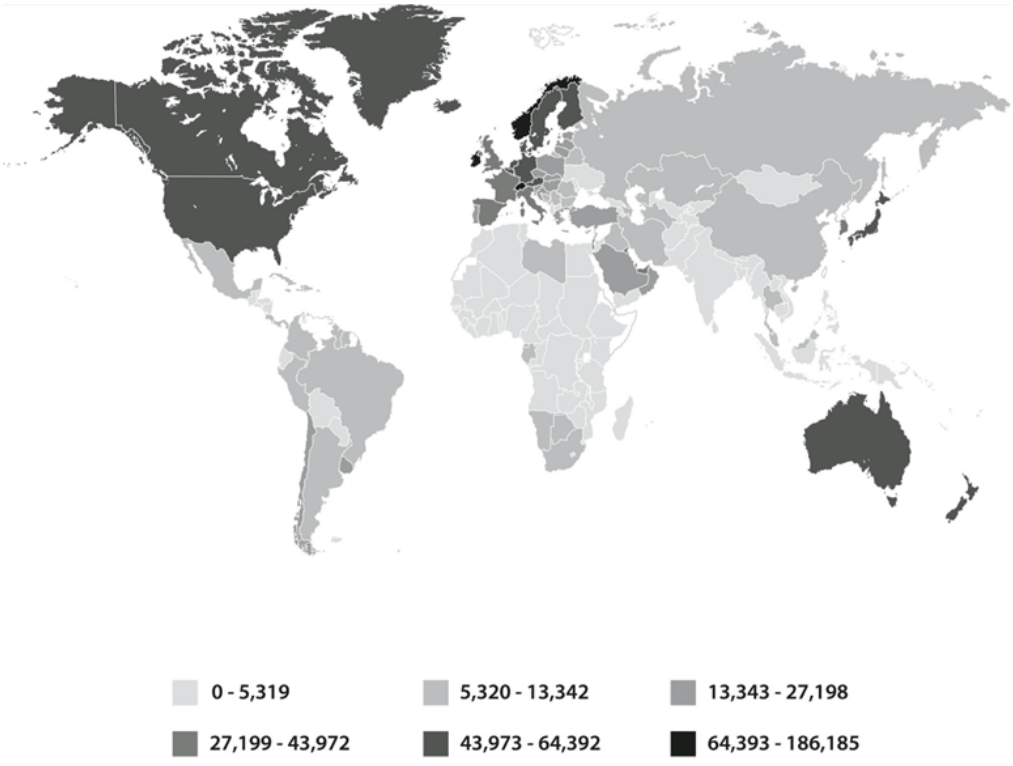
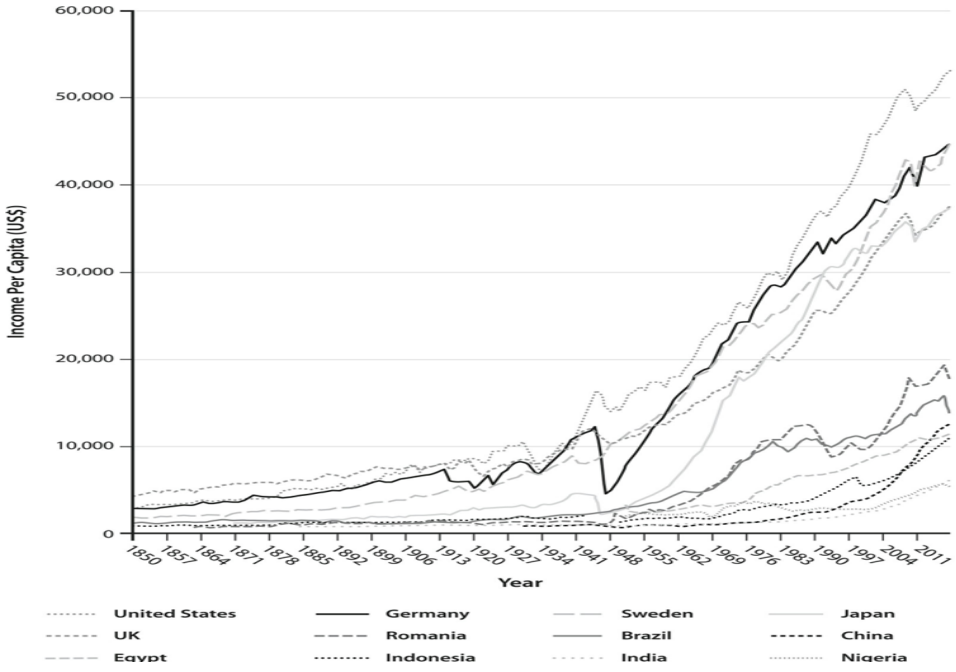


Figure 15. Evolution of Per Capita Income across Countries,1850-2016



Text 2

Kuznets, Simon, *The Modern Economic Growth: rate, structure and spread. A postscript*

Design of the study

The study summarized in the preceding chapters was designed on one guiding assumption: modern economic growth, once identified, would prove to be a significant, orderly, and distinctive body of long-term economic experience. It would be significant in having dominated long-term economic change in a number of societies and in having affected most of mankind. It would be orderly in that several of its observable and revealing characteristics would be common to the nation states identified as developed; in that these common characteristics would be interrelated, in terms of analytically plausible associations among various aspects, of economic and social behavior; and in that its spread internationally would display some reasonable sequence. It would be distinctive in that the combination of common characteristics, and perhaps the sequence of spread would differ significantly from previous experience – so that modern economic growth could be studied as distinct and separate from that in premodern times. The implication that a common source of growth, a common group of typical factors, determined such significantly widespread, systematically related, and distinctive growth trends, led to the concepts of the economic epoch and the epochal innovation, and to the use of the term "modern economic growth" to describe the current epoch of spreading application of science to processes of production and social organization the topics with which we began the discussion in Chapter 1.

In order to specify the scope of our empirical observations, we identified as modern economic growth the secular trends in "developed" countries over a sufficiently long period (say five decades) and as far back as possible to the date at which the shift from premodern trends began (the earliest, in England, in the late eighteenth century). Furthermore, "developed" countries, with some exceptions, were identified as politically independent nations having the highest per capita products

and, in fact, accounting for between a seventh and a quarter of world population. The underlying rationale is that such levels of per capita product could have been attained only through decades of the high growth rates that typify modern economic growth, and that, consequently, the high per capita product countries must have managed to engage in that growth process. By identifying modern economic growth with sustained high rates of increase in per capita product we have implicitly stated that such high rates are a common characteristic of modern economic growth. The circularity of this sequence –evident in the definitional steps of any inquiry – would be empty only if we had found that the high rate of growth of per capita product was the *single* common characteristic – for then we would find only what we put in. In fact, and this is the substance of much of the discussion in the preceding chapters, we find a variety of associated characteristics which suggest not only the important consequences of the high rate of growth of per capita product but also the mechanism by which this rate was realized, sustained, or impeded.

But before turning to these associated characteristics, we should note the three kinds of countries – with high per capita product – that were excluded from the group of "developed" countries as defined above; exceptions that limit the scope of the empirical observations. The first was any nation below a minimum size (usually less than a million population). Such nations were excluded on the ground that although they are politically sovereign, they may be too much within the orbit of larger countries to manifest independent economic growth. The second was any nation, usually small, whose high per capita product was due to some exceptional natural resource endowment, such as oil. Such nations were excluded on the ground that the high per capita product had little to do with antecedent growth rates that transform an economy and society over a long period. Finally, we excluded, except for casual references, the Communist countries, on the ground that the whole cast of their economic and social institutions has been too different and their beginnings too recent to warrant inclusion for the purpose of testing for common and associated characteristics of modern economic growth.

Each of these exclusions reflects problems in generalization and analysis that go beyond the specific criteria employed: the economic growth of a politically independent nation with a much larger population than a million, and indeed of any size, may not be independent; natural resource endowments may substantially affect

modern economic growth anywhere, favorably by raising per capita product or adversely by keeping it low (as may have been the case in Japan); and we can point to several non-Communist developed countries whose social and political institutions were rather distinctive and different in the past. But if we were to limit the universe of developed countries to those most similar in size, natural resource endowment, and social institutions, we might be reduced to studying one country; and even if there were several units from which to derive general characteristics, the generalizations might be of little value precisely because the diversity in significant conditions had been reduced too much.

For the resulting group of developed countries – mostly in western, northern, and central Europe; the European offshoots overseas such as the United States, Canada, and Australia; and Japan – we emphasized quantitative characteristics of economic growth. This emphasis has limited our analysis for two reasons. First, for some of these countries (e.g. the Netherlands, Switzerland, Belgium, and even France) long-term economic records are relatively poor; and second, some important aspects of modern growth, e.g. the accumulation of useful knowledge and the rate of technological change, do not lend themselves to quantitative measurement – at least at present. Nevertheless, it seemed important to stress testable, quantitative data on major aspects of what is essentially a process of quantitative change – even though the quantities are, as always, attached to qualitatively different, and significantly distinct, aspects of economic activity and categories of its results.

In listing the common characteristics of modern economic growth revealed by the long-term records for the developed countries, we shall be selective rather than complete. Rather than present a complete summary of what is already a summary discussion, in the preceding chapters, of more detailed evidence presented elsewhere, we felt that it would be more useful to select a few major characteristics, particularly those that seem to have widest general implications. They are listed below in the general order followed in Chapters 2-9, from the aggregative aspects of modern economic growth, to the structural, and then the international.

Characteristics of modern economic growth

1. The high rates of increase in per capita product (ranging from less than 15 to about 30 percent per decade) characteristic of modern economic growth have been

accompanied, in most developed countries, by substantial rates of population growth – ranging about 10 per cent per decade and much higher than in the premodern centuries. This has meant rates of increase in aggregate product ranging from over 20 to close to 50 per cent per decade, an enormous rise in total output within the developed countries, and a multiplicity of consequences of substantial population growth, ranging from pressures on natural resources to relative size of successive generations, and to wide differentials in rates of natural increase among various economic and social groups. The findings on the rate, structure, and mechanism of modern economic growth, derived from past records, are primarily for countries with a substantial rate of increase in population; and the relation of the latter to these findings must be recognized and hopefully distinguished – if the conclusions are to be applied to other countries where the pattern of population growth may be quite different.

2. A rate of 15 per cent per decade (which means quadrupling in a century) produced a rise in per capita product that was too high to be explained, except in small part, by rises in inputs per head. Input of man-hours per head could have increased only slightly, if at all, since the working day and week typical of the presently developed countries before their modernization were long, and the proportion of total labor force to total population was subject to age-sex limitations. Input of capital per head of total population could and did rise much more than man-hours per head, but its contribution to the rise of output was limited by the moderate weight of incomes from capital in total income. The scanty available data suggest that increase in inputs per head of man-hours and material capital combined accounted for less than a fifth of the secular rise in production per capita, and for a decreasing fraction in recent decades. Modern economic growth is distinguished by the fact that the rate of rise in per capita product was due primarily to improvements in quality, not quantity of inputs – essentially to greater efficiency or output per simple unit of input, traceable to increases in useful knowledge and better institutional arrangements for its utilization.

3. The high rate of growth of efficiency, referred to under point 2, has been pervasive, characterizing all major production sectors of the developed economies. If the rise in output per unit of input in agriculture was lower than that in industry, it was still so large compared with premodern levels that one can speak of an agricultural as

well as of an industrial revolution. The rise in the capacity and efficiency of transportation and communication has been even more striking. And if our measures suggest that product per unit in the services proper (trade, personal, government) have risen less than that in commodity production and transportation, this may be a reflection in part of the difficulty of measuring output in such services and the possible understatement in these measures. The pervasive effect of technological and organizational changes on efficiency in all sectors is significant because it implies that all components of the economy and society were affected and under pressure to alter their institutional arrangements, and because, in combination with other factors to be noted below, these trends in efficiency serve to explain the rapid shift in the structure not only of product but also of productive factors, particularly labor.

4. Trends in the sectorial origin of aggregate output, which generally accompanied modern economic growth, include the following: a decline in the share of agriculture and related industries; rises in the shares of manufacturing and public utilities; shifts within manufacturing from less to more durable products, and to a limited extent from consumer to producer goods; increases in the shares of some service groups (personal, professional, government) and declines in the shares of others (domestic service). These are all well known, and their main feature is recognized in the term "industrialization", often used as a synonym for modern economic growth; but it is the effect of the combination of these shifts in industrial origin of aggregate output with the trends in efficiency within the various sectors, noted under point 3, that must be stressed here. This combination produced marked shifts in the sectorial allocation of the labor force: a somewhat greater decline in the share of agriculture and related industries, a somewhat lesser rise in the share of industry, and a distinct rise in the share of services (whose share in output showed rather mixed trends). These shifts in the industrial attachment of labor (there were also shifts in the allocation of capital among industries, but we know less about them) are important for they mean changes in conditions of life and work of the population, affecting the use of income and other links in the mechanism of economic growth.

5. The trends in the industrial distribution of aggregate output, noted above, reflect changes in the structure of final demand, which in turn may be due either to the rise in per capita product (with different income elasticity of demand) or to

technological changes which do not affect all categories of final goods at the same rate. Furthermore, the trends for individual countries also reflect changes in export and import opportunities, in turn due to shifts in transportation costs, inclusion of new countries in the network of world trade, differential impacts of technological change on comparative advantages, and so on. The important point to be noted here is that a high rate of growth in per capita product implies a rapid shift in the structure of final demand – whether due to persistent income elasticity or to technological changes; and that the factors that induce a high rate of growth of per capita product usually make for a greater rate of expansion of foreign trade and of changes in the international division of labor (except, of course, under Communist autarky). Thus modern economic growth is characterized by rapid shifts in the industrial structure of product, and consequently by rapid shifts in shares of labor attached to various sectors in the country – much more rapid shifts than appear to be true of the premodern centuries.

6. A similarly rapid shift occurred in the distribution of aggregate product and allocation of the labor force (and probably capital) among economic units classified by size and type-ranging from the small own-account individual firms to the large impersonal corporations and government. The movement away from agriculture – the sector that dominated pre-modern economies – meant a marked reduction in the share of small own-account enterprises in aggregate output and of individual entrepreneurs and own-account workers in the labor force. And these inter-sectorial shifts were accompanied by growth in the scale of firms and changes in the type of organization within sectors such as manufacturing or trade – from the small unincorporated firm to the large corporate unit. With the rapid shifts in industrial structure and rapid change in technology there were also rapid shifts in allocation of product among types and sizes of producing firms, and consequently in the allocation of the labor force – by the size of the enterprises to which it was attached, by status as between entrepreneur own-account and employee – with a marked rise in the share attached to larger enterprises and in the share of employees in the labor force. In general, such rapid shifts occurred in most allocations directly related to and connected with industrial structure – e.g. among employees, from blue- to white-collar jobs, or from less to more skilled occupations. Obviously high inter-industry,

inter-status, and inter-occupational mobility of the labor force is a characteristic of modern economic growth.

7. The marked and rapid changes in the structure of product and particularly in the industry, status, and occupation structures of the labor force, are important aspects of modern economic growth because they call for and imply a capacity for rapid institutional adjustments and for inter- and intra-generational mobility of the population (and of capital). The differential impacts of technological changes and higher per capita product on structure of final demand and on the international division of labor set up a chain reaction in which the responses of the population as members of the labor force became important links in the changes of institutional patterns of life that in turn affected economic growth. The rates of structural shift involved were too high to be accommodated by differences in rates of natural increase among various groups in the population and labor force – just as the rate of growth of per capita product was too high to be accounted for by increases in inputs per capita.

Furthermore, the demographic growth differentials were not necessarily associated positively with differentials in economic growth opportunities revealed by the shifts referred to above. Nonagricultural population did not have a higher rate of natural increase than agricultural; nor did employees compared with own-account workers, or whitecollar workers compared with blue-collar; the association was, if anything, inverse. Consequently considerable migration in space and occupational shift within or between generations were required to adjust the labor supply to the changing demands of shifting industrial and type of firm structure; and this extensive mobility, of which urbanization was one important facet, affected conditions of life and consumption, the mechanism of fitting people into their roles in the economy, and the institutions of transmission of skill from one generation to the next, and even influenced the views that people were likely to have of their roles and obligations in the economy and society. To the extent that rapid shifts in the economic position of various population and labor force groups may have been productive of friction, government played a greater role, and a national consensus that would limit such friction and preserve political unity assumed increasing importance.

8. While a rapid shift characterized the industrial and type of firm structure of national product and the closely related allocations of labor force and population, in

some aspects of economic structure the trends associated with modern economic growth were far less pronounced. This seems particularly true of what might be called the distributional aspects. If we could establish an unequivocal distribution of income by factor shares between capital and labor (which calls for allocation of such a "mixed" category as entrepreneurial income) it would probably indicate trends that were fairly limited – which, given the higher rate of growth of material capital than of labor, would mean a marked decline in the rate of return on capital compared with the return on labor (without allowance for greater investment in the latter). The trends in the size distribution of income were not marked either, at least relative to the order of change observed in industrial distributions of product and inputs. To be sure, in the more recent decades, the size distributions of income in the developed countries have tended toward a narrowing of inequality toward smaller shares of upper income groups and larger shares of the lower groups. But these shifts have been relatively moderate; and it is rather significant that despite the impressive and sustained increase in per capita product that has characterized modern economic growth, the "poor" are still with us – although the standard by which this category is measured has also been rising in absolute terms.

Yet in one respect this impression of limited long-term changes in the size distribution of income may be misleading – at least in comparing modern economic growth with pre-modern times. The rate of intergroup mobility, of shifts in identity of the population units in the upper and lower groups of the size distribution of income, may have been far higher in the modern economic growth epoch than in the earlier centuries. With the rapid inter-industry and inter-occupational shifts, and with the new industries and occupations representing the major sources of higher incomes, the entrepreneurial innovators connected with these industries and occupations were not likely to be those attached to the older established ones.

9. Another aspect of economic structure in which the trend has been moderate is the allocation of product by use, particularly between capital formation and consumption. To be sure, the gross capital formation proportions (to national domestic product) rose from about 10 to about 20 per cent and the net probably from 5 per cent or less to between 10 and 15 per cent. But despite the enormous rise in reproducible capital stock per capita or per worker, consumption still accounted for the overwhelming proportion of gross and net national product. And while there were

marked trends within capital formation (from inventories and construction to producers' equipment) and within consumption (with an increase in the share of government consumption and shifts within household consumption from foods and clothing to consumers' durables and personal, recreation, health, and education services), the needs of modern economic growth for material capital were moderate, accounting for a relatively modest fraction of total output, which rose only a few percentage points over the long period. This slight change is consistent and connected with other trends characterizing modern economic growth, specifically the high rate of growth in efficiency and the rapid shifts in industrial and occupational structure. Because of these shifts in structure, the proportion of consumption to total output remained high – an effect partly of urbanization, partly of technological changes creating demand for new consumer goods, and partly of greater need for quasi-capital types of consumer expenditures (education, health, etc.). And because of the modest capital formation proportions, combined with a high rate of technological change, the proportion of growth in capital input per capita to growth in product per capita remained low.

10. The international aspects of economic growth are characterized by three, prominent trends. First, the technological revolution in transportation and communication facilitated contact among various parts of the world, particularly between the developed countries and others – in terms of effective ease, for the first time in the history of human societies; beginning in the late nineteenth century conditions were thus radically different from those in the pre-modern centuries. Second, modern economic growth spread sequentially from its pioneer beginnings in eighteenth century England to various follower countries, with the timing of entry continuing into the recent decades of the twentieth century and presumably into the future. Third, until the entry of Japan in the late nineteenth century, followed by the U.S.S.R. in the 1930s, modern economic growth was concentrated in European countries and their offshoots overseas, whose per capita incomes were well above average, even before industrialization, and certainly much higher than the incomes of the countries in Asia and Africa. These three features of economic modernization, added to the high rates of aggregate growth and the shifts in the internal economic structure already referred to above, led to a variety of associated trends in the

international aspects of the modern growth process observed among the developed countries and in their relation to the underdeveloped parts of the world.

11. The international flows of men, goods, and capital were at high rates from the second quarter of the nineteenth century to World War I. The migration streams were particularly important for the overseas offshoots of Europe – in North America, Oceania, and several Latin American countries (such as Argentina and Uruguay) – however useful they may have been to the countries of origin as a safety valve in the periods of population pressure on land and early transition to industrialization. These differences between countries of origin and destination of international migration – in relatively free response to economic push and pull – resulted in much higher rates of aggregate growth in the young and "empty" countries overseas as well as other differences in characteristics of economic growth between the old and young countries.

12. Because of the rapid growth of the volume of goods in foreign trade between the 1820s and World War I, the proportions of foreign trade to aggregate product rose significantly during this scant century – both in the older developed countries and in the steadily increasing number of underdeveloped countries drawn into the network of world trade. The only group that did not show marked rises in foreign trade proportions was the young countries overseas – Canada, Australia, the United States (and possibly others) – although even in these the declines date from the time when they were probably small trading outposts of their European mother country, with relatively high proportions. Thus, up to 1913 a law of an "increasing" rather than a "declining" share of foreign trade in aggregate product seemed to operate.

13. Paralleling the expansion of foreign trade and reflecting the spreading ties of the older developed countries with their offshoots and colonial areas overseas and the use of capital loans for political purposes, foreign capital investment flows also grew rapidly from the second quarter of the nineteenth century to World War I. Quantitatively the volumes were limited, and as proportions of total domestic capital formation they were substantial only in the smaller developed countries that were closely related to some one major developed world creditor country (e.g. Canada and Argentina in relation to Great Britain). But granted the limited volumes and the

political element in their channeling, the international flows of capital funds grew proportionately and were at their peak on the eve of World War I.

14. With World War I came a radical change in international flows of men, goods, and capital – an effect not evident in aggregate rates of growth or in trends in internal structure of developed economies. The two world wars, the major worldwide depression of the 1930s (which reflected the failure to adjust to the aftermath of World War I), and the emergence of Communist regimes hostile to the economically developed countries could not but cause this adverse change in the international flows. The effect on international migration was particularly marked, and it has never recovered to levels at all approaching the pre-World War I proportions. Almost as striking was the effect on economically oriented international flows of capital funds, excluding politically motivated grants and donations. And, despite continued major improvements in transportation and communication, even proportions of foreign trade to aggregate output are barely back to the levels attained on the eve of World War I; and they certainly do not show rises similar to the upward trend in the nineteenth and early twentieth centuries.

15. The expansion in the volumes and proportions of international flows of men, goods, and capital before World War I was presumably due to the same factors and forces that were responsible for the high rates of aggregate growth and the rapid shifts in internal structure characteristic of modern economic growth; and in that sense all these aspects of economic growth are interconnected. But it is a moot, if highly intriguing, question whether the world wars of the twentieth century and the deep world fissure resulting from the emergence of Communist states are also consequences of the same forces and are thus highly likely, if not inevitable, consequences of modern economic growth. However the question is answered, the relevant trends in modern economic growth are clearly the results of its sequential spread, the high level of aggregate growth, and the rapid shifts in internal structure. The sequential spread, rather than simultaneous emergence, meant inequalities in the rate of aggregate growth even among the countries that eventually became developed, let alone between all of these and the underdeveloped areas of the world. The high rates of aggregate growth meant that the absolute differences in growth rates even among developed countries were wide, and therefore cumulated rapidly into marked shifts in relative economic and political power among nations – a

situation usually provocative of international strain and conflict. The rapid shift within developed countries among population groups in their roles and shares in the economy may have been productive of internal strains; and in combination with the weakening of family, religious, and local ties, may have led to increasingly vigorous nationalism as the basis for the necessary consensus, and may thus have produced a climate favorable to international conflict. In all these respects, the spread of modern economic growth to a number of large developed countries constituted a necessary, if not sufficient, condition for world wars and for the increasing strain of backwardness which forced the powerful central governments to take a more active part in the initiation of economic modernization.

The summary statements above stress the characteristics of modern economic growth that were common to the developed countries as defined here for purposes of measurement and analysis; the relations, largely among these countries but also between them and others, in the spread of modern economic growth; and the connections among the common characteristics and between them and the international aspects of spread.

That we found several common characteristics is not surprising, since the permissive source of modern economic growth was the major additions to the world stock of useful knowledge – a source potentially available to all countries – and its usefulness is with reference to material means to satisfy human wants that are common to much of mankind. The material achievements of modern technology underlying economic growth in the current epoch are, after all, relevant to human wants that, broadly conceived, date back for centuries. The dreams of our forebears, whether of the effortless abundance in a long lost Eden or of greater power suggested by the Icarus legend, are akin to ours; and the specific ways of realizing such dreams are revealed to us by modern technology, whose products – whether an abundance of food, motor cars, or television sets – appeal to most people who come into contact with them.

Nor are the associations among these common characteristics of modern economic growth unexpected. For if some of them relate to production and others to consumption, it is man who is both the producer and the consumer; and the conditions under which he functions in one capacity will determine in large part his

function in the other. Furthermore, greater basic knowledge and technological capacity will not only produce more goods at lower cost but also reduce mortality – so that until the birth rates decline, a rise in product per capita and a higher rate of population growth will go hand in hand. And there may be an obvious connection between increased productive power and greater diversification of demand. Thus, the common characteristics are interrelated because they stem from a common cause, because they reflect different aspects of activity and response of the same group of people, or because, given some persistent structure of human wants, aggregate levels and structures of components are causally connected.

The association between the aggregative and internal structure characteristics of modern economic growth, on the one hand, and the character of its spread and the effects on international relations on the other, again stems from a common source. The increased power of technology applies to international transport and communication; it carries across national boundaries the consequences of the rapid shifts in internal structure of developed nations; it contributes to the sequential spread because the institutional changes required to provide the proper auspices for economic modernization are so radical that simultaneous emergence in many countries is difficult. Even if one rejects the validity of a fixed set of economic development prerequisites, one may still argue that conditions for the shift from preindustrial to modern economic growth were not so minor as to be common to many nations at any given time – especially if one considers the historical distance of most of the world from the small European subcontinent in which economic modernization emerged and from its overseas offshoots to which this process spread first.

One can thus find a good deal of "order," of community and association among the aggregative, structural, and international characteristics of modern economic growth. However, since the statements above may seem to claim too much, it is only appropriate, in concluding this summary postscript, to discuss the qualifications and the questions that they raise.

Text 3

Allen, Robert C., *Why was the Industrial Revolution British?*

Follow the link to the 2009 Tawney Lecture at the Economic History Society website:

https://ehs.org.uk/multimedia/tawney-lecture-2009-why-was-the-industrial-revolution-british/

Text 4

Alfred D. Chandler, Jr., *The United States: Seedbed of Managerial Capitalism*

Major sectors of technologically advanced market economies have come to be dominated by big business. The managers of modern business enterprises are responsible for coordinating the day-to-day flow of goods through the processes of production and distribution and for allocating resources essential to future production and distribution. The market continues to generate the demand for goods, and the managers make their decisions on the basis of their estimates of market demand. The visible hand of managerial direction has replaced the invisible hand of market mechanisms, however, in coordinating flows and allocating resources in major modern industries.[1] The purpose of this essay and the three that follow is to describe and attempt to explain why, when, and how this fundamental transformation in the organization of the world's leading market economies occurred. The first step toward achieving that goal is to elaborate on the nature of modern business enterprise and modern capitalism, using concepts and terms briefly defined in the introduction.

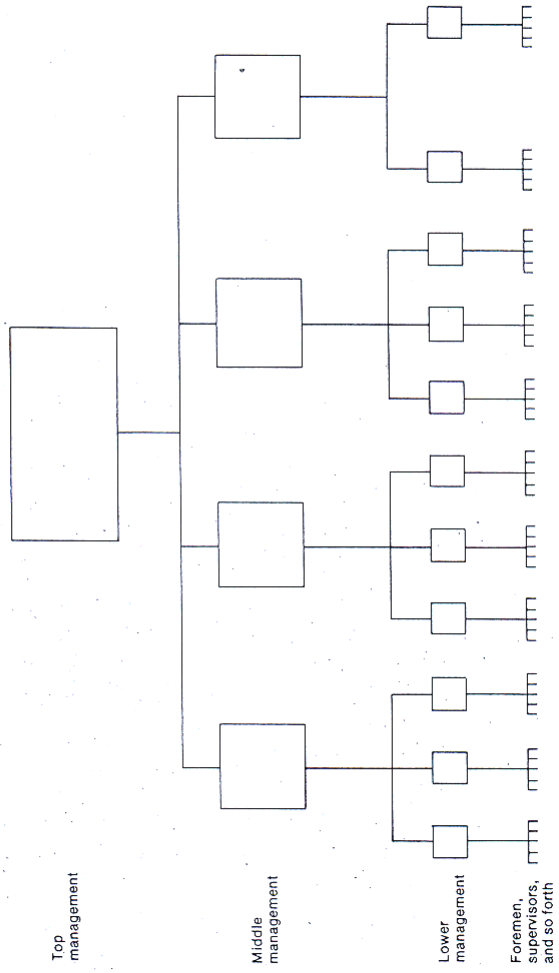
Managerial enterprise and managerial capitalism

The modern business enterprise is defined by two major characteristics (see figure 1.1). First, it contains many distinct operating units, each with its own administrative offices, its own full-time salaried manager, and its own set of books and accounts that can be audited separately from those of the larger enterprise. Theoretically, each could operate as an independent business enterprise. The traditional firm was a single-unit enterprise, with an individual or a small number of owners operating a shop, store, factory, bank, or transportation line out of a single office. Normally, this type of firm undertook to fulfil only a single economic function, produced or sold a single line of products, and operated in one geographic area.

[1] Many of the statements in this brief chapter should be qualified. For a more complete discussion of broad generalizations and for the documentation that supports them, see Alfred D. Chandler Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass., 1977).

Before the rise of the modern firm, the activities of these small, personally owned and managed enterprises were coordinated and monitored primarily by market and price mechanisms. The modern multiunit enterprise, in contrast, has come to operate in different locations, often carrying out a number of economic activities and producing or selling several lines of goods and services. The operation of its units and the transactions among them have been internalized within the firm. The activities of these units have come to be monitored and coordinated by the decisions of salaried managers rather than by market mechanisms.

Figure 1.1. The basic hierarchical structure of the modern business enterprise (each box represents an office)



Source: Alfred D. Chandler, Jr., *The Visible Hand* (Harvard University Press, 1977), p. 2.

The second salient characteristic of the modern business enterprise is therefore that it employs a hierarchy of middle- and top-salaried managers who supervise the work of the units under its control and who form an entirely new class of businessmen. As late as 1840, there were no middle managers in the United States and very few in Europe; that is, almost no salaried managers supervised the work of other managers and, in turn, reported to senior executives who were themselves salaried managers. Nearly all the top-level managers were owners, either partners or major stockholders in their enterprises.

This two-part definition of the modern business enterprise suggests the basic hypothesis about its initial appearance and continuing growth: that it began and expanded by internalizing activities and transactions previously carried out by a number of separate businesses. It emerged at the point when the businesses, or units, could be operated more profitably through a centralized managerial hierarchy than by means of decentralized market mechanisms. Administrative coordination by a managerial hierarchy gave enlarged enterprise several advantages. Routinizing the transactions among units lowered their costs, and the integration of units for production, purchasing, and distribution reduced the costs of information about markets and supplies. More important, the ability to schedule the flow of raw material and finished goods more closely and to standardize processes involved made possible for firms to use the resources of the individual units – their personnel, machines, and other facilities – more intensively; this ability thus cut the costs of production and distribution. (Scheduling and standardization made possible what can be termed economies of speed, a basic element in what economists normally call the economies of size or scale.) In addition, administrative coordination allowed product specifications and market services to be adjusted more rapidly to customer needs; in this way a steadier flow of goods was permitted and customer satisfaction increased. Such coordination also ensured a steadier flow of cash to the firm and therefore lowered the costs of credit. It became profitable in any economy, however, only after the development of technology and the growth of the market increased the economic activity to a speed and volume sufficient to make existing mechanisms of coordination by market forces cumbersome.

Once a managerial hierarchy had successfully increased profits by coordinating operations, it became in itself a source of power, permanence, and continued growth. The managers' basic objective was to keep their organization profitably employed; they did so by increasing the speed and volume of their activities and by internalizing more units or processes. As enterprises grew, and as the number of executives increased, managers became more specialized and more professional. They generally had much the same type of training, often attending the same group of schools. They joined the same professional societies and read the same journals. As their roles came to require more narrowly specialized expertise, they became increasingly independent of the owners of the enterprises. Salaried managers' specialized knowledge and their firms' ability to generate the funds necessary for continued expansion meant that they soon controlled the destiny of the enterprises by which they were employed.

By altering control within individual firms, the coming of the large, multiunit enterprise changed the nature of capitalism. If capitalism is defined as an economic system in which the means of production and distribution are operated by privately rather than publicly owned enterprise and in which decisions within individual enterprises are motivated by consumer demand rather than by a central plan, then varying types of capitalism can be identified by examining the relationships between those who make the decisions about the firm's operations and those who own its means of production and distribution. In traditional, personal capitalism, the owners and the decision makers were the same; owners made both the short-term decisions about current output and transactions and the longer-term decisions about investments in facilities for the future. In the large, multiunit enterprise, however, salaried middle managers, who have little or no share in its ownership, have come to be responsible for coordinating the flow of goods and supervising the operating units; owners rarely concern themselves with the work of middle management.

At the highest level, however, owners continued – often for extended periods of time – to have a say in critical policy decisions about products, services, volume of output, rate of return, and the allocation of resources. When the growth of the enterprise was financed from retained earnings – that is, when it was self-financed – the founding entrepreneurs and members of their families continued to own the controlling shares, and they or their representatives continued to be part of top-level

management. When the enterprise relied largely on outside financing for its establishment and initial growth, bankers and other financiers participated in top-level management decisions. The first type of modern business enterprise can then be labelled the entrepreneurial or family firm (it was, naturally, enterpreneurial in the first generation and family-dominated thereafter); the second type can be called the financially dominated firm. An economy or sector in which entrepreneurial or family firms predominate can, furthermore, be considered an instance of family capitalism; one in which financially dominated firms are most common, an instance of financial capitalism.

Family and financial capitalism proved to be transitional stages in the evolution of the modern business enterprise and of modern capitalism. No family or financial institution was large enough to staff the managerial hierarchies required to administer modern multiunit enterprises. Because the salaried managers developed specialized knowledge and because their enterprises were able to generate the funds necessary for expansion, they ultimately took over the top-level decision making from the owners or financiers or their representatives. Unless the latter themselves became full-time professional managers, they soon participated in top-level management decisions only as members of boards of directors. At monthly or, more often, quarterly meetings, they had to make decisions on matters on which managers had been working every day, using information provided primarily by the managers. They rarely had the time, the information, or the depth of experience to propose alternatives; they could veto proposals, but they could do little else. If they disliked the managers' actions, they might hire others, but they could not manage the firm themselves. Family members, as a result, soon came to view their enterprise, as did other stockholders, from the point of view of rentiers; that is, their interest in the enterprise was no longer in its management but rather in the income derived from its profits. Firms in which representatives of the founding families or of financial interests no longer make top-level management decisions – where such decisions are made by salaried managers who own little of the companies' stock – can be labeled managerial enterprises; the economies or sectors where such firms dominated became parts of a new system of managerial capitalism. When types of capitalism are thus defined in terms of the relationships between owners and administrators of the means of production and distribution, it is clear that all advanced market

economies have moved from traditional, personal capitalism toward managerial capitalism since the middle of the nineteenth century. The rapidity of the change has differed among sectors and nations, but managerial capitalism now dominates the central producing and distributing sectors of every major market economy.

The rise of the modern enterprise in the United States

Before the coming of the railroad and the telegraph and the widespread availability of coal as a source of energy and heat, business activity in the United States economy was not extensive enough to create a need for multiunit enterprises or for a class of salaried managers. As long as goods were produced and moved by traditional methods and sources of energy – such as wood, wind and water, man and beast – the daily output of a production unit and the number of transactions carried out each day by a distribution unit could easily be supervised by the owners assisted by one or two managers. Using century-old business methods, traditional, small, owner-managed enterprises had little difficulty in carrying out production and distribution in the United States. Although the expansion of the United States economy in the early nineteenth century brought a rapid growth in the number of firms and spread the activities over a wide geographic area, it did not result in any increase in the size of firms. As business enterprises became more numerous, they became more specialized; most produced and distributed only a single line of goods, such as cotton, grain, hardware, or dry goods and carried out a single function, such as wholesaling, retailing, manufacturing, banking, or providing insurance. The activities of hundreds of thousands of these small businesses were coordinated almost entirely by the invisible hand of market mechanisms.

The coming of the railroad and the telegraph and the simultaneous availability of large quantities of coal quickly brought the modern enterprise to the United States – first in transportation and communications, then in distribution, and finally in production. The new technologies made possible much greater speed and volume in the production and movement of goods and necessitated the creation of managerial hierarchies to supervise, monitor, and coordinate the new processes of production and distribution. In transportation and communications, the managers of the railroad, telegraph, and steamship companies began to coordinate the movement of goods from one commercial center to another. In distribution, new mass-marketing

enterprises, which relied on new means of transportation and communication, administered the flow of goods from processors or producers to retailers or ultimate consumers. In manufacturing, the new mass producers came to coordinate the flow from the extraction of raw material through production to distribution to retailers or final consumers. In sectors dominated by the new, large enterprises, the top-level managers of a few modern multiunit companies made the decisions that had previously been made by the owners of thousands of small firms.

Transportation and communications

The first modern business enterprises in the United States, the large railroad and telegraph companies, appeared in the 1850s. Because there were many more railroads than telegraph companies (by 1866 one company, Western Union, all but held a monopoly of telegraphic transmission), because scheduling, moving, and pricing wide varieties and large volumes of freight traffic was more complex than the transmission of messages by electricity, and finally because the railroads were much more costly to construct and operate than telegraph lines, the railroads became the nation's first big business. Unlike canals and turnpikes, railroads required centralized operating control, since trains moved at much greater speed than horse-drawn vehicles or boats. They did so on a single track, whereas roads and canals were wide enough to permit two-way traffic. The absolute necessity to centralize the scheduling of the movement of traffic meant that the railroads were the first common carriers to build and maintain their own rights-of-way. Up to that time, transportation firms had operated their carriages, wagons, or boats on the rights-of-way owned and maintained by other, often public, enterprises.

Managerial hierarchies first appeared in the nation's economy when the railroads began to operate more miles of track than could be personally managed by a single superintendent and his assistants. The basic operating unit of the new, large railroads was a geographic division that normally operated from 50 to 100 miles of track. The divisions, in turn, were divided into offices, each of which was responsible for a single function – the movement of trains, the flow of passenger and freight traffic, the maintenance of locomotives and rolling stock, or the construction and upkeep of the right-of-way. Once two or three such geographic divisions had been established – that is, after the railroad had become a multiunit enterprise – the work

of the managers in charge of the functional departments within each division had to be carefully monitored and coordinated. Middle managers housed in the railroad's central office took on this responsibility; they supervised the activities of the lower-level managers in the divisions and reported to the full-time top-level managers – the general superintendent, the president, and, often, the chairman of the board of directors.

The effective operation of the larger railroad network required external cooperation among managerial hierarchies, as well as the perfection of their operation within the enterprise. In the years immediately before and after the Civil War, middle- and top-level managers devised ways to move freight cars efficiently and without interruption over several different companies' lines. They standardized the width of track, or the gauge, equipment such as couplers and signals, and organizational procedures, such as the through bill of lading, interroad billing, and the operation of the car accountant's office (which kept track of the location of "foreign" cars carried on its road and of its own cars on other roads). This kind of technological and organizational standardization was planned and carried out by the quasi-professional association of managers. Such groups as the Society of Railroad Accounting Officers and the American Society of Railroad Superintendents helped make possible the movement of loaded cars from any part of the country to any other without a single transshipment – that is, without having to unload or reload from the cars of one line to another's. Before the coming of the railroad, freight moving from Philadelphia to Chicago had to be unloaded and reloaded as many as nine times. Once these cooperative techniques were perfected, railroad companies quickly took over, that is, internalized, most of the activities that had been undertaken by express companies, freight forwarders, and other specialized transportation enterprises, enterprises that had come into being in order to provide more certain delivery of goods to distant destinations on schedule.

Comparable cooperation among managerial hierarchies to control competition among railroads for the newly increased through traffic was, however, much less successful. To prevent what the managers considered ruinous competition and so to ensure a continuous flow of through traffic over their tracks, the railroads formed formal federations such as the Southern Railway and Steamship Association and the Eastern Trunk Line Association in the 1870s. These cartels allocated first traffic and

then profits among competing roads. Even though they set up embryonic managerial hierarchies to enforce their policies, they nonetheless failed to maintain rates and to enforce traffic quotas both because the constant pressure of high fixed costs led companies to cheat on the pool by reducing rates to shippers through secret rebates and because these agreements could not be enforced as contracts in courts of law.

By the early 1880s, managers had decided, and representatives of investors on their boards had agreed, that the only way to ensure a continuous flow of traffic at profitable rates was to enlarge their enterprises by constructing new lines or buying existing ones to form giant "self-sustaining" systems; these networks provided their companies with their own tracks into the major commercial cities and raw material producing areas in the regions in which they operated. By the mid-1890s, most of these systems had been built; thirty large railroad companies, administering lines 1,500 to 10,000 miles long, owned and operated two thirds of the railroad mileage in the United States.[2] Most areas of the country, however, were served by two or more systems. In order to obtain the massive financing they needed to build these systems, top-level managers had developed close ties with Eastern investment bankers with access to European sources of capital. These bankers increasingly replaced local and individual investors on the boards of the new systems.

The operation of these railroad systems required the creation of two or even three layers of middle management. In a company that had grown from 500 to 5,000 miles of track, several operating divisions were grouped together into geographically organized multiunit subenterprises; each was under a general manager, with his own set of functional executives. (The organization of these giant systems was strikingly similar to that of autonomous product and geographic divisions of the multidivisional industrial enterprise in the twentieth century.) The general managers reported to a corporate office made up of vice presidents with oversight of functional activities, the president, and the chairman of the board. The top-level management group concentrated on the road's strategies for growth and on allocating resources to achieve them. Because railroad building required unprecedented amounts of capital, top-level managers had to share strategic decisions with representatives of the investment banks, who provided the necessary funds.

[2] Listed in Chandler, *Visible Hand*, table 3.

Other transportation and communications enterprises followed the example of the railroads. Top-level managers allocated resources in consultation with financiers, and middle managers monitored the activities of operating units and coordinated flows among them. By 1900, nearly all the few United States steamship companies (largely coastal and river lines) had become parts of the major railroad systems. In the area of urban transportation, the expensive new electrical technology meant that middle managers of the one or two large companies providing this service in the leading cities supervised day-to-day operations, while top-level managers shared decisions about allocating funds with representatives of municipal authorities, as well as with investors. The new utility companies that provided the towns and cities with electricity were operated in much the same manner. Communications differed from transportation only in that monopoly rather than oligopoly was the norm. Both Western Union and American Telephone and Telegraph became dominant because their managers obtained control of the complex scheduling required to handle high-volume, long-distance, or through traffic.

By the beginning of the twentieth century, then, the nation's transportation and communications were operated by large, modern, multiunit enterprises administered by salaried professional managers. Although the financiers on their boards took no part in the middle managers' tasks of coordinating and monitoring the operations of individual units, they participated with top-level managers in allocating resources. These sectors thus became the best-known examples of financial capitalism in the United States. Even so, the financiers had little more than veto power, except during times of system building, since they rarely had the time, information, or experience to propose alternatives of allocating resources.

Distribution

As the modern transportation and communications infrastructure began to take form, a revolution occurred in commerce. In the 1840s, traditional merchants marketed and distributed goods in much the same fashion as their counterparts had done for the previous five hundred years. In the United States, merchants were more specialized and were more likely to trade on a commission basis than those of fourteenth century Florence or Venice, but they used the same kind of partnerships, the same kinds of contracts, and the same double-entry methods of bookkeeping.

Yet barely a generation after the railroad and telegraph networks began to spread across the land, all the basic forms of modern marketing had appeared. In the 1850s, commodity dealers who bought directly from farmers and sold directly to processors quickly replaced factors and other types of commission merchants in marketing agricultural crops. The new dealers relied on the telegraph to transact business and on the railroads to deliver on a precise schedule. In the same decade, full-line, full-service wholesalers who bought directly from manufacturers and sold directly to retailers replaced commission merchants in marketing and distributing manufactured consumer goods. By the 1880s, the wholesalers were already beginning to give way, in their turn, to the new mass retailers the department stores that sold directly to the consumer in the growing urban centers, the mail-order houses that sold to rural areas, and the first chain stores, which concentrated on retail trade in towns and smaller cities.

Each of these new types of distributors were similarly organized. Each had extensive buying and selling organizations. Commodity dealers had buyers in the farming regions and at commodity exchanges; wholesalers and mass retailers set up purchasing offices in the commercial and manufacturing centers of the United States and Europe. Each had a buying office for each major product line the enterprise handled. The buyers set price, quantity, and physical specifications (size, weight, and quality) of goods to be purchased; they also scheduled the shipments to the company's sales organizations, often working with the latter in writing advertising copy and setting up displays. In all cases, profit came from volume, rather than mark-up. The criterion for evaluating the degree of success achieved through administrative coordination was "stock-turn", that is, how many times stock turned over within a specified period of time. The greater the stock-turn, the more intensive the use of existing facilities and personnel and, therefore, the lower the unit cost of distribution.

Thus the visible hand of management came to coordinate the flow of goods from producers to retailers or consumers in a more efficient and profitable manner than had been achieved by market mechanisms. The nature of the necessary scheduling set limits to effective coordination and, therefore, to the extent of vertical integration of different economic functions. Distributing firms had little to gain by moving into manufacturing. Coordinating flows into and through the processes of

production required very different types of coordinating procedures and skills, and distributors undertook to manufacture only when goods could not otherwise be obtained at the quality, quantity, and price desired. Once a stable source was assured, they nearly always sold out their interest in the manufacturing plant, or retained only a passive concern with that facility. In contrast, mass retailers had little difficulty in internalizing wholesaling transactions and coordinating flows directly from the manufacturer to the consumer. They quickly began to take over business from the wholesalers, whose share of the total distribution of goods declined from the 1880s on. Mass retailers grew, therefore, not by moving into manufacturing but by adding new lines of products for which they might use their existing purchasing organization and their coordinating skills.

The success of this kind of administrative coordination was dramatic. Wholesalers and the small retailers who purchased from them turned increasingly to politics in an attempt to obtain state and federal regulation to protect themselves from the mass retailers. Even though the latter's prices were low enough to generate protest, the profits they reaped from administrative coordination quickly placed their families – the Wanamakers, the Fields, the Filenes, the Kresges, the Strauses of Macy's, the Rosenwalds of Sears, Roebuck, the Hartfords of ABcP, and others – among the wealthiest in the land. Because the cash flow generated by this kind of high volume, administratively coordinated distribution was so large and the necessary capital investment so small, these enterprises continued to be owned and controlled by their founders and their families, and family members normally continued to have a major say in top-level management decisions. The distribution sector of the United States economy therefore remained a bastion of family capitalism longer than other sectors.

Production

The revolution in production was longer in coming than that in distribution primarily because far more technological development was required. The innovations in distribution were almost wholly organizational responses to the opportunities offered by fundamental technological changes in transportation and communications. In production, the railroads and the telegraph encouraged technological innovations that increased output by making it possible for materials to pass through

manufacturing plants more rapidly and with greater regularity, a process that was helped further by the new availability of coal as a source of power. Equally important, these new developments permitted several processes of production to be incorporated into a single factory or works. ("Works" can be defined as several factories at a single site.) Three basic mass-production techniques – large-batch and continuous-process production methods and those involving the making of machinery by fabricating and assembling standardized interchangeable parts – were quickly perfected. Large-batch and continuous-process methods first appeared in the refining and distilling industries. Because the materials were liquid and semiliquid and the processes were chemical, careful plant design and more intensive use of energy permitted a sharp increase in the volume of material processed and the speed with which it could pass through the refineries – that is, the "throughput" was increased. Within a decade of the discovery of oil at Titusville, Pennsylvania, in 1859, for example, petroleum was refined without ever being touched by human hands; labor was needed only for packing the product into barrels. At the same time, the more intensive use of coal-fired, superheated steam and high-pressure cracking processes further increased the yield for each unit of capital and labor and thus decreased the unit cost of production. Comparable developments took place in processing sugar, whiskey, beer, and cotton and linseed oils and in the production of acids, bleaches, and paints. Somewhat later, in the late 1870s and early 1880s, continuous-process machinery was developed for turning agricultural products into cigarettes, flour, breakfast cereals, and canned goods and for mass-producing matches, soap, and photographic film.

Mass production came somewhat more slowly in the metalmaking and metalworking industries. Here both the technology and the organization of production were more complex. The first spectacular breakthroughs in metal making came in iron and steel production during the late 1860s and early 1870s, when energy was used more intensively, plant design was improved, and new machinery was developed in works that integrated at a single site the basic processes of production – the blast furnaces that produced pig iron, the Bessemer and open-hearth convertors that made steel in massive batches, and the rolling and finishing mills that produced rails, beams, and other final products. In the metalworking enterprises, where mass production involved the assembly of interchangeable parts, managers

paid even closer attention to improving machinery and plant design and, above all, to the organization of the work force in order to ensure an even, steady flow of materials through the many fabricating and assembling processes in each manufacturing establishment. It was no accident, therefore, that the modern machine-tool industry was developed primarily for the metalworking industries and that modern "scientific" or systematic factory management was first devised there. New types of machines and new types of organization were necessary if metalworking factories were to produce goods in volume.

The new methods of mass production, however, did not in themselves lead to the creation of large, multiunit business enterprises. Monitoring and coordinating the processes internalized within a single establishment required the services of only a small number of salaried managers. The new mass producers became modern enterprises only when they integrated forward by creating their own extensive organizations for sales and distribution. They rarely adopted this strategy of growth, furthermore, unless existing marketers – specialized manufacturers' agents, as well as the new mass marketers – were unable to sell and distribute their output as quickly as it could be produced by the new techniques.

[…]

Expanding the managerial enterprise

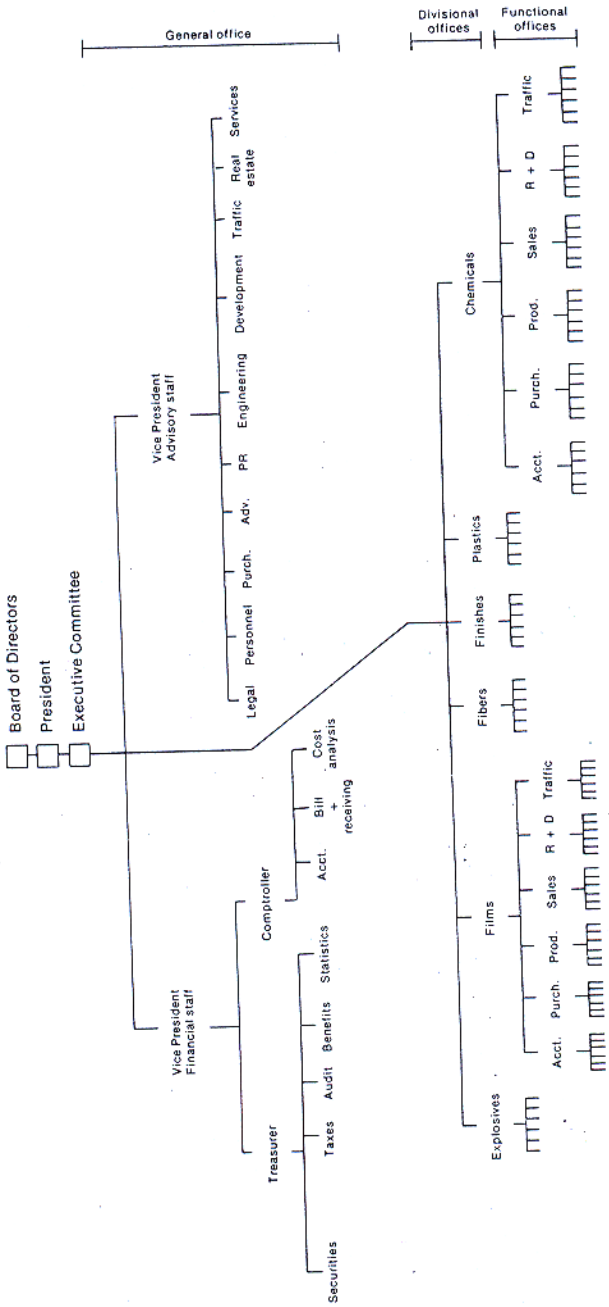
[…]

After World War I, the large, integrated enterprises adopted an explicit strategy of diversifying beyond a full line into new products for new markets; they searched for products that made use of their technological, marketing, and managerial techniques and skills rather than those that used only existing purchasing, production, and marketing facilities. The strategy of diversification quickly caused administrative difficulties, however. Managerial hierarchies that had been created to coordinate, monitor, and allocate resources for one line of products had great difficulty in administering the processing of several sets of products for new and different markets. Middle managers were unable to handle the very different coordinating requirements of the several lines. Top managers were overwhelmed by the need to supervise and to allocate resources to many businesses that often varied greatly. The response was the invention of the multidivisional structure (see figure 1.2). In

this type of organization the general managers of the several autonomous operating divisions become responsible for coordinating the flow of goods and supervising the operating units that produced and distributed one major product line to one major market; a general office and top-level executives with no operating responsibilities, assisted by a large general staff, concentrated on allocating resources to the various product divisions.

[…]

Figure 1.2. The multidivisional structure: manufacturing



Source: Alfred D. Chandler, Jr., *The Visible Hand* (Harvard University Press, 1977), p. 458.

The rise of the managerial enterprise in Europe

A comparable transformation has taken place in other advanced market economies, but more slowly and more recently. The modern multiunit industrial enterprise first appeared in Europe about the same time – in the late nineteenth century as it did in the United States; equally important, it was clustered in only a few industries. With the exception of textiles in Great Britain, these were capital intensive, energy-absorbing industries with an increasing need for professional managers. The manufacturers in these industries, however, made less extensive use of mass-production techniques, particularly the manufacture of machinery through assembling interchangeable parts, than those in the United States. Because coordination of the flow of goods was less complex, middle management was leaner than in United States firms. Even more important, owners continued to manage enterprises at the highest level. In Europe, entrepreneurs, their families, and representatives of banks and other large investors continued to make critical policy decisions about coordination of production and allocation of resources. As a result, the managerial class remained much smaller than in the United States and fewer signs of professionalism, such as schools, associations, and journals, appeared. Because the managerial enterprise and the class that managed it first flourished there, the United States experience often provided models and precedents for their evolution in other parts of the world.

Even the briefest look at the development of modern business enterprise in Europe, however, suggests a history quite different from that of the United States. In continental Europe, the central government played a much larger role in designing, building, and operating the transportation and communications infrastructure; even in laissez-faire Britain, the post office came to operate the telephone and telegraph. As a result, administrative techniques and personnel may have been transferred directly to business from government bureaucracies in a way that could not have been possible in the United States, where no large government offices existed before the beginning of the twentieth century. Like their counterparts in the United States, the Europeans created department stores and chains for mass distribution in urban markets, but more direct channels to rural and small town markets, the full-line, full-service wholesalers and then the mail order houses, came more slowly. Intricate and

elongated networks of middlemen seem to have remained in operation longer in Europe than they did in the United States. The most important difference, however, was that mass production was less often integrated with mass distribution in Europe. The most dynamic form of modern enterprise, the integrated industrial firm, therefore had less chance to grow, to diversify, and to extend its operations to other countries. Such enterprises did appear, but those that developed in Europe were fewer in number and usually smaller than their counterparts in the United States.

One possible reason why the United States turned out to be the seedbed of managerial capitalism was the size and nature of its domestic market. In the second half of the nineteenth century, that market was the largest and, more important, the fastest growing in the world. In 1880, national income and population were one and a half times the size of those of Great Britain; they were twice as large by 1900 and three times as large by 1920. As Simon Kuznets's data indicate, the rate of growth of the population and national product was consistently much higher in the United States than in other technologically advanced nations France, Germany, and Great Britain during the years between the Civil War and World War I.[3]

In Europe, mass markets developed more slowly. The relative oversupply of labor and the resulting low wages reduced potential consumer demand; income distribution may have been more skewed than in the United States; class and regional tastes were more strongly differentiated. For these reasons, the first large integrated enterprises in Europe were concentrated in primary metals, shipbuilding, heavy machinery, and chemicals, rather than in food, petroleum, and light standardized machinery, as in the United States. An important exception was the large, integrated food and brewing enterprises in Great Britain. Otherwise, most large British companies made goods for producers rather than for consumers. Even the dominant British textile firms produced thread or cloth to be processed, rather than finished goods. The products of the first large enterprises in Europe were therefore mainly nonstandardized or semifinished goods that went to a relatively small number of industrial firms; in the United States, in contrast, standardized finished products went directly from producers to millions of homes, offices, and farms. In addition, European firms provided most of the materials needed for building the transportation

[3] Simon Kuznets, *Economic Growth of Nations* (Cambridge, Mass., 1971), pp. 45-47.

systems and establishing the basic industries in nations that were just beginning to industrialize; they also equipped the growing armies and navies of the rest of the world.

The smaller, slower-growing consumer markets in Europe reduced both manufacturers' interest in adopting new mass production techniques and their incentives to build large marketing and purchasing organizations. In Great Britain and France, producers of consumer goods continued to rely on middlemen to handle their more traditional wares, such as food, apparel, and appliances for home use – products that were, in turn, produced in a traditional craft fashion. Where large, multiunit enterprises did appear, they remained small enough to be managed at the top level by a small number of owners. As a result, family capitalism continued to flourish. In Germany, where the integration of production with distribution was more common, smaller markets and cash flows reduced the opportunity to rely on internal financing and thereby increased the dependence on the large banks for outside financing. Managers continued to make top-level decisions in consultation with financiers, and financial capitalism thus continued to hold sway.

Cultural and social factors, particularly as expressed through legal differences, also appear to have played a role in delaying the coming of the large managerial enterprise and, with it, managerial capitalism. In the United States, individualistic values and the fear of concentrated economic power that might curtail equality of economic opportunity were reflected in the passage of the Interstate Commerce Act of 1887, which regulated the railroads, and the Shoran Antitrust Act three years later, which outlawed trusts and cartels. Ironically, this legislation hastened the growth of the large, centrally administered enterprises. Because it was the only nation that did not permit agreements among railroads to maintain rates by assigning traffic and profits, the railroad companies in the United States built their enormous self-sustaining systems of transportation, most of which were larger than any privately owned European railroad company. In Europe, family firms joined federations, which took the legal form of holding companies in Great Britain and cartels in Germany and France, in order to be sure of continuing profits for their small, single-function enterprises. Only a few of these firms employed middle or top-level managers. Instead, owners or their representatives made decisions about price, output, and coordination at weekly or monthly conferences. Even in the most sophisticated

cartels and holding companies – those with staffs of salaried managers to handle day-to-day administration – basic policies were determined by vote of the constituent companies' representatives on a central board. In the United States, such federations were illegal. The Sherman Antitrust Act itself and the courts' interpretations of the law exerted powerful pressure, of a sort that did not exist elsewhere, to force family firms to consolidate their operations into a single, centralized enterprise administered by a hierarchy of salaried managers.

Class distinctions in Europe may also have made a difference in the way managerial capitalism evolved. Families identified themselves more closely with the firm that provided them with the income to maintain their status than did families in the United States. Even in large enterprises that integrated production with distribution and that took on middle managers to coordinate the flow of goods, family members continued to dominate top-level management. Often they chose not to expand the enterprise if it meant losing personal control; they continued to prefer negotiating within cartels to creating or expanding managerial hierarchies.

Since World War II, restraints on the growth of the firm have diminished, and the spread of managerial enterprise has accelerated in Western Europe. Greatly increased demand for goods during and after the war encouraged the adoption of new mass-production technology. Mass markets grew as national output rose rapidly, as income was distributed more equitably, and, above all, as full employment brought higher wages. The establishment of the European Economic Community further enlarged these markets. Laws passed in the 1950s and 1960s against monopolies and restrictive business practices discouraged the continuance of holding companies and cartels of family firms. At the same time, large enterprises with salaried middle managers have grown in size and increased in numbers; they have developed mainly in the same industries as in the United States those in which administrative coordination is the most profitable. These firms have adopted administrative structures and procedures similar to those used by large United States firms. With the spread of the modern managerial business enterprise in Europe, all the paraphernalia of professional management have appeared – associations, journals, and training programs.

These comparisons of the development of modern multiunit enterprises at home and abroad are tentative and introductory. Large amounts of data are still to be

collected and analyzed before a clear picture can emerge of growth patterns of the European enterprise, their procedures for internal organization, and the actual operation of the federations of firms in the form of cartels and holding companies. Existing information, however, does indicate that managerial enterprise, and, with it, managerial capitalism, is becoming the dominant form of organization and the dominant system of production and distribution in the central sectors of modern, technologically advanced economies. Clear differences nevertheless remain in the ways in which the flow of goods through the economy are coordinated and resources allocated for future production and distribution. Only by comparing the evolution of large-scale, multiunit enterprises in different economies can organizational imperatives be identified and the impact of the cultural attitudes and values, ideologies, political systems, and social structures that affect these imperatives be understood.