A Culture of Growth: The Origins of the Modern Economy
by Joel Mokyr

There is no doubt that the last two centuries, or slightly more – from the start of the First Industrial Revolution – have been unique in human economic history. The beginning of 19th century marks the advent of modern economic growth – “the Great Enrichment”. Referring to that at the very beginning of his book, Mokyr points out “We know what happened, and we know more or less how and where it happened. What remains very much a mystery is why” (p. 3). According to the author, the following 403 pages of the book are about providing an answer.

According to Mokyr, the answer must address two riddles. The first one is about institutions, because, contrary to Daron Acemoglu and James A. Robinson (2012), he does not believe that better markets, based on the protection of private property and contractual rights, more cooperative behaviour of economic agents, and efficient allocation of resources themselves account for modern economic growth. The stance taken is that growth whose engine is accumulation of production factors and efficiencies, due to trade and division of labour, labelled as Smithian growth, is not sustainable. When all production factors are allocated and when all inefficiencies are eliminated, e.g. with no more room for additional division of labour or restructuring, the engine of Smithian growth runs out of steam. Modern economic growth is Schumpeterian – creative destructions, innovations, and above all, technological progress – in Mokyr’s words, continuous improvement of “useful knowledge, both scientific and technological”. That leads to the second riddle – about the motivation for these improvements, especially taking into account that knowledge is, to a great extent, a public good.

Furthermore, institutions, considered in line with the widely accepted North’s definition, create incentives or rather constraints in relationship between people, but science (propositional knowledge), which produces useful knowledge and technology (prescriptive knowledge), is based on the relationship between people and the physical environment, with nature, rather than with other people. In Mokyr’s words “ultimately the relations with physical world around us in the end determines the growth of useful knowledge and eventually that of technology-driven growth. Technology is above all consequences of human willingness to investigate, manipulate...
and exploit natural phenomena and regularities…” (pp. 14-15). Obviously, institutions provide incentives for scientists in their relationship with themselves and other people, but not incentives regarding the content of their research.

Mokry’s answer to both those riddles is simple: culture. The book’s proposition is crystal clear: the explosion of technological progress in the West was made possible by cultural change. What is not crystal clear is the very concept of culture. Being aware that culture means different things to different people, Mokry, in Part I of the book (Evolution, Culture, and Economic History) explicitly specifies what culture means for him “culture is a set of beliefs, values and preferences, capable of affecting behavior, that are socially (not genetically) transmitted and that are shared by some subset of society” (p. 8). So, the ingredients are: (1) beliefs, effectively containing knowledge, both codifiable and tacit, including (positive) statements about the physical and metaphysical environment; (2) values, as normative statements about the social environment; and (3) preferences, as normative statements about individual matters, such as consumption and personal affairs.

Mokry’s definition of culture is clear, unambiguous, and analytically rich, as it implies that culture is decomposable, i.e. that it consists of separate elements – traits. Comparing them to genes, it could be concluded that the same traits are shared by people from the same cultures, but that is very unlikely that two people share exactly the same combination of cultural elements. Obviously, cultural identical twins are less probable than the genetic ones.

There are two issues regarding this definition of culture. The first one is whether the notion of culture should include behaviour itself. Mokry believes that it is analytically useful to separate behaviour, i.e. actions (which may be driven by a combination of culture and other causes), from the culture that guides and constrains actions. He even suggested the analogy, using evolutionary terms, which treats culture as genotypic and actions as phenotypic. The second issue is about distinguishing between the notions of “culture” and “institutions”. Mokry, who has already pointed out beforehand in the book that there are different outcomes of the two, with institutions having no effects on the individual’s attitude toward the physical environment, adds additional insight: culture is something “entirely of the mind” and is to an extent a matter of choice; in short, it is endogenous to individuals. Contrary to this, institutions are exogenous, as they are socially determined constraints to human actions to other humans. It is a pity that Mokry does not consider moral norms, something that can be in the middle, between culture and institutions, as he considers them. On the one hand, moral norms are internal norms of individuals; they are endogenous, i.e. not imposed, meaning that they are a segment of culture, most probably within the “values” trait from Mokry’s definition. On the other hand, moral norms are constraints to individuals in their relationships with the other people, effectively performing the job of institutions. Drawing the line between culture and institutions is obviously a difficult and thankless job, and the relationship between the two is rather complicated.

This becomes obvious in the next step of the analysis in the book – the direction of causality between culture and institutions. On the one hand, as Mokry points out, the causality goes from culture to institutions, as he accepts insight of Douglass
C. North (2005), that beliefs and preferences are the “scaffolds” of institutions, acknowledging also the insight of Acemoglu and Robinson (2012), that institution can serve the interest of the minority to extract rents. On the other hand, Mokyr acknowledges insight (Alberto Alesina and Paola Giuliano 2015) that institutions can affect cultural beliefs in many ways and through many mechanisms. Several chapters later Mokyr vividly demonstrates this causality direction, providing insights about the specific institutions that enabled, if not produced, the cultural evolution that made the Industrial Revolution possible.

More methodological issues are sorted out in subsequent chapters of Part I of the book. It starts with a consideration of the relationship between nature and technology, somewhat surprisingly reduced to spelling out that the cultural belief in progress and especially economic progress has three components: (i) positive, the belief that material progress is possible; (ii) normative, the belief that material progress is desirable, that accumulation of wealth is not something sinful or vain; and (iii) perspective, that once conditions (i) and (ii) are fulfilled, a concrete agenda of policy measures and institutional change should be formulated. Although, according to Mokyr, these three cultural elements have roots that go back to early European history, certainly to the Late Middle Ages, prior to 1750 they did not produce anything similar to the industrial revolution or sustainable growth based on technological progress. Why? Back to square one!

Some hints about the direction of the answer are given in the following chapter about cultural evolution. Borrowing notions from evolutionary biology for understanding cultural change, the points are evident: (a) variation, meaning that culture contains great variations of traits, as the consequence of past innovation, often unintended, due the adaptation; (b) inheritability, meaning that culture is passed between individuals, either vertically from generation to generation, or horizontally between separate individuals; (c) superfecundity, meaning that there are too many cultural features for an individual to absorb, so one has to choose, and successful cultural choices are replicated much faster. Cultural evolution is about the choices of individuals. It is not surprising that Mokyr is certain that cultural change is dominantly about persuasion. Nonetheless, he emphasises that culture is resistant to change, because it is linked to cultural capital, the investment that people have made in their current beliefs, since a cultural change would decrease returns on these beliefs and “cultural rents” would be eliminated. Obviously, standard industrial organisation insight about incumbents, rents, and barrier to entry can be applied to cultural evolution.

The engine of cultural evolution are biases, and the engine works through social learning and persuasion. Much of the social learning occurs vertically, but persuasion primarily works horizontally, between peers. Hence, cultural evolution is choice-based and the choices that enable diffusion of new ideas are made according to various types of biases, i.e. cultural innovations. Mokyr identifies several cultural biases: (1) content-based bias, as people accept cultural innovations because of their inherent qualities and content; (2) direct bias, because of strong cultural authorities (e.g. priests); (3) consistency and confirmation bias, because consistency with their other beliefs; (4) model based bias, because rolemodels’ beliefs are worth imitating;
(5) rhetorical bias, because charismatic and persuasive individuals with cultural innovations can convince others of their views; (6) frequency dependence bias, because it is important for individuals what the majority of people around them believe, since conformism is resilient, creating room for a virtuous circle, if the innovation is initially successful in taking root; (7) rationalisation bias, because individuals tend to internalise existing social norms and socially mandated rules (institutions), and associate themselves with the values that these institutions are based on; (8) coercion bias, rather self-explanatory, especially highly authoritarian and coercive societies; and (9) salient events bias, the case when highly traumatic events have a discontinuous effect on culture through a powerful framing effect – the Holocaust is perhaps the most striking example, but the Great Depression is also relevant when considering the culture of free market versus the culture of government intervention. The rather extensive list demonstrates plurality and richness of the ways that cultural evolution occurs.

With methodological issues sorted out in Part I of the book, the hunt starts for the explanation of “the Great Enrichment”, i.e. for the answer to the question why. It starts in Part II (Cultural Entrepreneurs and Economic Change, 1500-1700), focusing on the agents of cultural change in Early Modern Europe. The agents of this change were cultural entrepreneurs, those few (“Cortesian army”) who “not only choose a set of cultural traits for themselves from a given menu, but also add to the menus available to the others” (p. 59). The notion akin to the one of the “moral entrepreneur” (Avner Grief 2009)¹, or the “ideological entrepreneur” (North 1981). In other words, “exceptional and unusual specimen who are the sources of evolutionary change” (p. 60). However, this does not apply to every change, as Mokyr is very specific “my interest here is in the attitudes of people towards their natural environment and their willingness to comprehend and manipulate it for their needs” (p. 61). Taking this into account, the choice of Francis Bacon and Isaac Newton as the leading cultural entrepreneurs of Early Modern Europe is hardly surprising.

A few important points regarding cultural entrepreneurs. The first one is that there must be a market for ideas, i.e. competition between different ideas and rather free entry for new ideas. Hence, one could infer, it is not the absolute value of an idea that is important, but the relative one – to what extent one idea is superior to others. This leads to the second point: it is the institutions of the market for ideas that are important, because it is exactly these institutions that provide competitive pressure and evaluation of the ideas in the market. The third one is that the most successful cultural entrepreneurs stand on the shoulders of those who came before them; progress takes a painful step-by-step path.

Nonetheless, not all successful cultural entrepreneurs brought progress. Mokyr points out to the entrepreneur of that kind: Islamic philosopher Al Ghazali, from the

¹ Mokyr quotes Grief’s description of the destiny of moral entrepreneurs, implying that the destiny of the cultural ones is similar: “Moral entrepreneurs are individuals with new moral visions who seek to gain followers. When they fail, they enter the history books, if at all, as anarchists, rebels, false prophets, cult leaders, and heretics. When they win, they write the history books” (p. 59, Footnote 1). Also, George Bernard Shaw’s Maxims for Revolutionists is quoted: “The reasonable man adapts himself to the world: the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man” (p. 60).
late 11th and early 12th century, whose influence on thought in the Muslim world led to the rise of mysticism and occasionalist thinking. Mokyr considers him a key figure in the decline of Islamic science, which had flourished in the first centuries of Islam, pointing that it was due to his influence and that of his followers, i.e. their entrepreneurial success, that the “Arabs never became a nation of Galileos, Keplers, and Newtons” (p. 66).

The first of the two leading European cultural entrepreneur, Francis Bacon, was not shy and pointed out directly “the true and legitimate goal of science is to endow human life with new discoveries and resources” (p. 71). Quite appropriate for someone who was later dubbed the “Philosopher of Industrial Science”. His cultural (r)evolution was to a great extent methodological, as his legacy was inductive, concrete and materialistic science based on data and experiments, sharply rejecting what the age called “hypothesis”, and according to Mokyr, in modern terminology would be considered as speculation. Taking into account that Bacon’s breakthrough was in the methodology of science, it is a bit surprising that at the end of the chapter, Mokyr writes that “Bacon’s heritage was nothing less than the cultural acceptance of the growth of useful knowledge as a critical ingredient of economic growth” (p. 98). Not only was evidence for support of this statement not provided, but the insights sound like the findings of 20th century economic growth theories.

Isaac Newton’s work, according to Mokyr, was the final nail in the coffin of the “ancients” in their struggle with the “moderns” on the issue of whether modern culture could measure up to the achievements of classical civilisation. The breakthrough that provided that very nail was that in Newton’s work the emphasis was on mathematics and instrumentality, not on explaining the “deep” cause of things. Physics was finally thoroughly separated from metaphysics. Instead of a great theory explaining everything, Newton “aimed for more modest goal... to provide a mathematical description of observed phenomena. The implication was that once nature was intelligible, it could be manipulated, controlled, applied to human needs” (p. 104). An additional implication was that, from Newton on, “natural philosophy” gradually disconnected from philosophy and became science – the one that would generously contribute to the growth of useful knowledge. Obviously, Newton shoulders are “more equal” then shoulder of other giants.

Part III of the book (Innovation, Competition and Pluralism in Europe, 1500-1700) starts rather unexpectedly with consideration of the relationship between human capital and religion, as a case of cultural choice in action. The rationale for including such a chapter in the book is not convincing. There is no doubt that human capital can be an important contribution to economic growth. There is also no doubt that religion, especially some confessional features, can make a difference regarding the general level of human capital. However, Mokyr himself points out that “what counts disproportionately is the culture of an educated elite” (p. 119). It is a puzzling choice to include this chapter in the book, as its incremental product is close to zero.

Nonetheless, the subsequent chapter is very productive, giving first, if not the answers, then clues about the question from the beginning of the book: why? First, early modern Europe was open and willing to absorb and exploit foreign ideas. The voyages of discovery of that time (cynics would say voyages of conquest) opened the
floodgates of information about alien societies, e.g. new products and technologies, something that was out of the question for Tokugawa Japan, for example. Mokyr is positive: “Europe’s leadership in the Science Revolution occurred because Europeans found themselves at the confluence of Islamic, Indian and Chinese useful knowledge” (p. 148). Be that as it may, but the question is why was it not other way around? Why did the synthesis occur in Europe?

The answer is in the European institutions at that time, i.e. about free entry into the market for ideas. As contestability became common, the outcomes were determined by evidence, irrespective of the origin of the new entry. This is quite a convincing answer, but then we come to the next question: why were barriers to entry into the market for ideas in Europe low compared to other parts of the world, for example India or China?

The answer to this question is in Europe’s political fragmentation, which was a necessary condition for barriers to entry into the market for ideas to go down and for innovation to defeat conservatism. The first argument in favour of this finding is that fragmentation destroys barriers to entry because ideas and people who have them can travel from one jurisdiction to another, effectively moving to the jurisdiction with the lowest barrier to entry. The second is that, since in politically fragmented Europe states were often at war with each other, rulers, eager for military victory, had every incentive to attract people with new ideas, with useful knowledge that can be used for advancing military technology. Being frequently at war with each other did not prevent European decision-makers from learning from the enemy and providing mechanisms for technology transfers from the adversary, especially in cases of its superiority. Vanity regarding this kind of technology transfer was not an issue.

Nonetheless, the fragmentation was not enough for the Europe’s Scientific Revolution. The political fragmentation was coupled of with “an intellectual and cultural unity, an integrated market for ideas, that allowed Europe to benefit from the obvious economics of scale associated with intellectual activity” (p. 170). This unique combination explains the changes that made possible the surge in useful knowledge and technological progress that made the Industrial Revolution possible.

It was the transnational Republic of Letters, the Respublica Literaria, a “virtual community” of Europe’s intellectual elite of that time, which provided the intellectual and culture unity that led to political fragmentation being sufficient condition for the Scientific Revolution. The main rules governing the Republic of Letters were “freedom of entry, contestability, that is, the right to challenge any form of knowledge, transnationality, and a commitment to placing new knowledge in the public domain” (p. 189). It was irrelevant whether the members of the Republic of Letters agreed on a given topical issue, e.g. in astronomy or medicine – what was important was that they generally agreed on the rules according to which such disputes would be addressed. It is not surprising that the key words describing the scientific thinking of the early new Europe were “doubt and scepticism – about the clas—
sics, about the structure of the universe... eventually even about the immortality of the soul” (p. 192). Again, it is about institutions, this time the specific institutions of the European scientific community, and the market for ideas.

Mokyr fully endorses the Hayekian approach that institutions are man-made, but unintended consequences of human actions, emphasising that the observed institutions did not occur by any conscious design – there was no blueprint of any kind. They were unintended consequences of scholars trying to build a reputation among their peers “in order to gain various advantages, including much-hoped-for financial security, freedom, and time to do undisturbed research through patronage positions” (p. 183). These were individuals pursuing their own unitality maximisation, unintentionally created an institutional set-up with substantial and remarkable positive spill-over effects. So, it was a typical bottom-up pattern of origin of institutions, as opposed to the top-down approach (Acemoglu, Simon Johnson, and Robinson 2005).

Basically, Part III of the book ends with the answer to the question why from page one of the book. Mokyr points out “the key to Europe’s success was fortunate condition that combined political fragmentation with cultural unity” (p. 215). Political fragmentation was exogenous and cultural unity was an unintended consequence of the actions of Europe’s intellectual elite. A crucial prerequisite for cultural unity were the institutions of free market for ideas, primarily free entry of new ideas and contestability.

With crescendo at the end of Part III of the book, a reader is somewhat sceptical about the contribution of Part IV of the book (Prelude to the Enlightenment); the first chapter of this part confirms that scepticism. It is completely dedicated to the question why the Industrial Revolution occurred in Britain. The surge of useful knowledge was all European; the Republic of Letters was transnational, so from the culture prospective, it could have happened anywhere in Europe. Was Britain somehow unique? Mokyr believes so, because of the historical importance of – Puritanism. But the evidence he provides is hardly sufficient for the reader to accept his suggestion. Mokyr dismisses speculation that labour saving technology stimulated by high wages was the driving force behind the British Industrial Revolution, as suggested by Robert C. Allen (2009). Rightly so! Nonetheless, he does not acknowledge that political and economic institutions in Britain at the time were significantly different from other European countries, due to the effects of the Glorious Revolution (Acemoglu and Robinson 2012). And it was the character of these institutions, rather than Puritans or high wages, that provided incentives for the Industrial Revolution.

Mokyr’s reluctance to take the institutional path in explaining the British Industrial revolution is somewhat puzzling because in his very book he has no second thoughts about the relevance of institutions. “Technological progress in practice depends on well-defined property rights, as well as, contract enforcement, since it typically involves investments of some kind, as well as contracts with suppliers, workers and customers” (p. 122). Within the framework of endogenous growth theory, this statement can be rephrased that investment in R&D, a crucial factor of technological progress, depends on the incentives created by appropriate institutions. Therefore, Puritans are hardly part of the picture, according to Mokyr’s contribution in the other part of the book.
More interesting question is how essential formal scientific knowledge was to the emergence of modern economic growth. In Mokyr’s words “Could high-skilled artisans by themselves have brought about the Industrial Revolution?” (p. 273). His counterfactual analysis provides a clear answer to this question: had technological progress consisted purely of disseminating and incremental improving best-practice existing artisan procedures, and hoping for learning-by-doing, unconnected to what happened at a higher intellectual level, the process would have run into diminishing returns and fizzled out. Mokyr gives a hint that everything would ended with some technical progress in the textile industry, where technical problems were less complex than in the chemical industry or power engineering. One might add that the Second Industrial Revolution would have been unthinkable without scientific knowledge.

The last part of the book (Part V: Cultural Change in the East and West) focuses to the question why China did not have an Industrial Revolution, with the implicit aim of answering the question why Europe was so special. Mokyr nails the question by quoting Joseph Needham (1969) “Why did the Chinese society in the eighth century A. D. favour science as compared with Western society, and that of the eighteenth century A. D. inhibit it?” (p. 288). After many pages of Chinese history, not all of which are relevant to the question, Mokyr provides the expected answer: “China did not have very competitive market for ideas, and incumbents were able to erect high barrier to entry to potential entrants who wanted to contest the status quo and become cultural entrepreneurs” (p. 310). In addition to that – or perhaps as the method of erecting barrier to entry by incumbents – science in China remained in many ways activity controlled and regulated by the state administration.

Now the question is why. Although Mokyr timidly suggests that mobility of cultural entrepreneurs across jurisdictions was rarely an option in China, he does not spell out the magical word for his consideration in early chapters of the book – fragmentation. Precisely because of the fact that China was big and not politically fragmented, there was no way to evade barriers to entry, on the one hand, and there were no incentives for the political elite to remove the barriers, on the other. This is precisely the mechanism that Hoffman (2015) uses to explain the backwardness of China’s military technology compared to Europe.

The other reason mentioned by Mokyr is that Chinese cultural attitudes towards Western knowledge reinforced their reluctance to learn from them. The hostility of Chinese elites to “barbarie” foreign cultural elements is well documented. Furthermore, Mokyr points out that to in order to make Western learning more acceptable, Chinese scholars had to convince the officials that most of it was of Chinese origin. This demonstrates that arrogance was not monopolised by Europeans, but their arrogance was not xenophobic. Europeans sailed across the seas much more than anyone else; they fully embraced contacts with the natives, including Cortés & Pizarro style murdering and plundering, but they also accepted and further developed the knowledge of the natives, such as the potato growing technology of the Incas. Accordingly, it was Europeans who benefited from Chinese knowledge; it was Europeans who increased their knowledge in contact with the Chinese, not the other way around. One way or the other, the excursion to China in the final part of the book brought quite a modest incremental product.
At the very end of the book (Epilogue) Mokyr raises two interesting questions. The first one is whether the European path was a necessary condition for explosive economic growth and the modern, technological advanced economy; in other words, could a different civilisation provide the same outcome in different way? Mokyr speculation is that we may never know, since all non-European civilisations were all exposed to European culture, and “their trajectories were irreversibly perturbed” (p. 340).

The other question is whether a completely different set of institutions, instead of a decentralised community of competitive scientists and investors, could have produced the Great Enrichment. For example, a central administration with civil servants, supported and sustained by a benign and progress minded bureaucracy. Mokyr is straightforward: “the economic logic would probably judge such a scenario as unlikely” (p. 341). Sapienti sat!

With this book Mokyr provides a splendid conceptual framework for considering the fundamental causes of economic growth. Introducing culture to the deliberation definitely adds value to these considerations. The question is to what extent this approach undermines the institutional explanation of long-term economic growth, something that has been a dominant paradigm for the past decade or more, probably since the publication of Acemoglu, Johnson, and Robinson (2005). In other words, are culture and institutions substitutes in terms of the explanation of the fundamental course of economic growth?

Mokyr’s book provides evidence that they are not substitutes, but rather that they are complementary. It is institutions that entirely explains Smithian growth, the one based on investments, division of labour, and elimination of the inefficiencies of a given technology. In the case of Schumpeterian growth, there is a specific “division or labour” between culture and institutions. The incentives provided by institutions can explain a substantial portion of the increase in useful knowledge and technological progress, but the ultimate frontier, the relationship between man and nature, is out of bound for institutions – only culture can explain that. If nothing else, Mokyr’s contribution to the explanation of the cultural change that liberated man in his relation to nature, as the change that substantially contributed to the Great Enrichment, should have been loudly praised.

Furthermore, the relationship between culture and institutions is complicated, with simultaneous two-way causality. Mokyr is very much aware of the analytical minefield he walks and is very careful to be accurate, precise and consistent in the lines he draws between culture and institutions, unlike some other intellectual authorities (Gérard Roland 2014). He also demonstrated that this area is a fertile ground of exploration, standing on the shoulders of giants such as Douglass North. People like Joel Mokyr, Daron Acemoglu, Alberto Alesina, James A. Robinson, Avner Grief are definitely the prime candidates for leading future breakthroughs in this field.

A short insight at the very end of this review: cultural evolution, like biological evolution, is going on. Culture changes every day; contemporary cultural entrepreneurs operate around the clock, and their achievements inevitably affect economic growth. We just cannot grasp ex ante what they will accomplish. Their constraints are not as drastic as in the time of Giordano Bruno, but one should not underestimate
the power of political correctness. Perhaps some of the cultural changes necessary for the acceleration of economic growth of Europe and its offspring across the ocean must be political incorrect. Perhaps, due to conformism or something else, cultural change will go the wrong way. Perhaps, in a few centuries, an author will write a book called *A Culture of Decline*. Let’s hope that this book will not be as convincing as Mokyr’s work.
References


