

A Culture of Growth: The Origins of the Modern Economy

Joel Mokyr,

Departments of Economics and History

Northwestern University

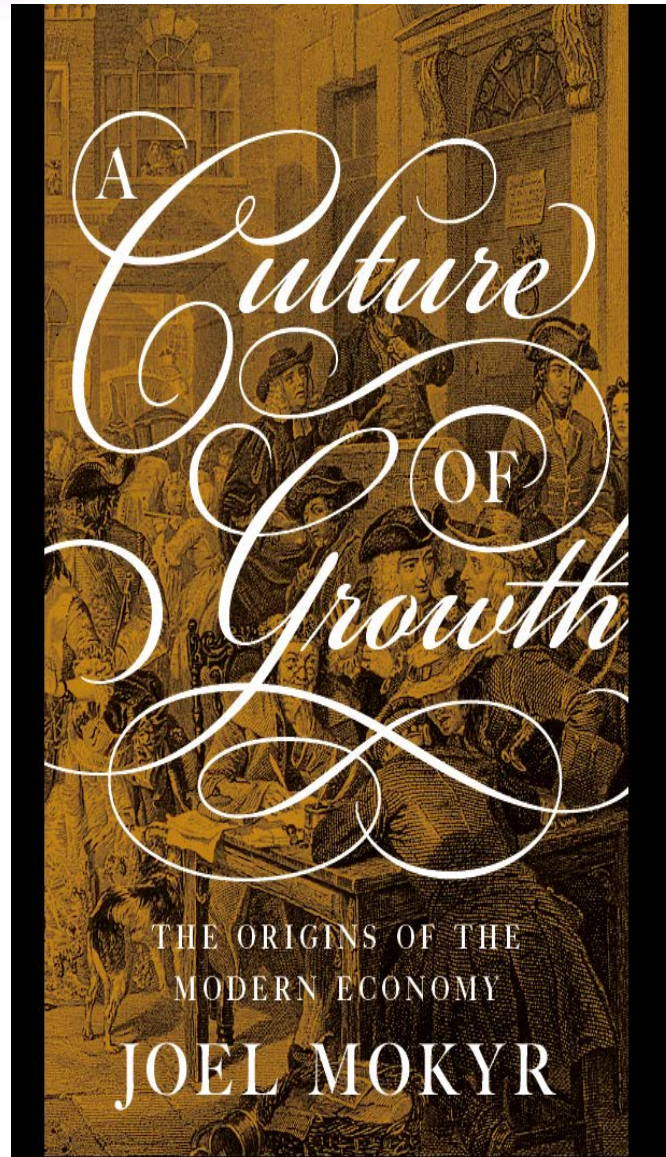
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“The institutional turn” in economic history

The puzzle of the new institutional economic history:

The puzzle is this: In recent years, following the work of North, Rodrik, Greif, Acemoglu and many others, a consensus has emerged that “institutions” are central in explaining economic performance.

Law and order, good property rights, effective third-party or private-order contract enforcement, low rent-seeking, openness and inclusiveness, and efficient governance and provision of public goods are among the mechanisms cited.



However:

The European Industrial Revolution that started modern growth was above all about technological progress, not just better allocations and more efficient markets. Institutional change in the “narrow” sense of better markets (gains from trade and specialization, rule of law and a “civil economy”, and better government cannot explain the full extent of modern growth.

If growth before 1750 was based primarily on “Smithian Growth,” and afterwards increasingly on innovation or “useful knowledge,” whence the different dynamic?

One way of approaching the issue is this: what kind of institution was instrumental in bringing about the rise in intellectual innovations that eventually led to the Industrial Revolution?



To solve this question I need to deal with “culture”

What part of culture? Primarily beliefs about the physical environment and humans’ relations with it (unlike Greif etc.).

Whose culture? When we are talking about “culture” I have in mind the small minority (UTHC), the intellectual elite, *not* popular culture: literate, curious, open-minded, ambitious people.

[Is this “elitist”? Need to keep in mind that then as now, the envelope of science and technology is pushed by UTHC: a very small number of people, a small minority even within the class of intellectuals (Voigtländer and Squicciarini, 2016)].



The Concept of a “Market for Ideas”

The basic model is built upon the concept of a “market for ideas” and its evolution in this period.

The “market for ideas” --- is this a useful metaphor?

Basically, in the market for ideas, intellectual innovators try to *persuade* “buyers” to accept their novel ideas and findings. When they do so they “gain a reputation.”

Although this is not quite a real “market,” it is a useful metaphor. We can ask questions such as *how competitive* was this market, what were the *barriers to entry*, how high and prohibitive *transactions costs*, how many *taboos* does it observe, and how *efficient* is it? No “prices,” but incentives matter.

Much like any market, which institutions are supporting it and make it work?



This market, of course, is riddled with “failures” and bad incentives

Institutions, after all, are about incentives.

1. Above all, there will be systematic underproduction of new knowledge because of its well-understood public good properties (*weak positive incentives*) [much like a common resource, and the solution was much in the spirit of Elinor Ostrom’s work, e.g. Ostrom and Hess, 2007].

2. But there is a second issue that is at times under-emphasized: the fact that new ideas often degrade the value of the human capital of the existing orthodoxy and thus intellectual innovation will be resisted and sometimes persecuted as “apostasy” or “heresy” (Benabou, Ticchi, and Vindigni, 2014). *Strong negative incentives.*



A Culture of Growth:

My argument is that in Europe between 1500-1700 the educated elite developed a culture and a set of institutions that was more suitable for intellectual innovation and the accumulation of useful knowledge than before. They came up with a better solution to these difficulties than other societies (especially China).

This is not to argue that the European solution was in any sense “optimal” or even “good” --- just that it worked sufficiently well to produce in the end an elite culture, which we can call “Enlightened” and that was far more friendly to the growth of useful knowledge than any other society.

What happened is that both the positive and the negative incentives in 1700 were much improved relative to 1500.



To see why, I want to take a step back and sketch out a very rough framework on how intellectuals persuade one another, which is what happens in a market for ideas.



Choice-based cultural evolution

- Every person forms a unique cultural phenotype, but how is this formed?
- This is essentially a Lamarckian evolutionary process, because individuals have as their default the cultural beliefs they are socialized with.
- But in addition they can acquire cultural characteristics along their lifetime and pass these on to others. They “choose” their cultural elements.



Choice-based cultural evolution depends on the “market” for ideas.

When new items appear on the menu, people can choose among new alternative and competing variants, which is what makes this *choice-based cultural evolution*

Within every society ideas are competing for acceptance. Some ideas become “fixed” in the populations, some are abandoned and go extinct. Some co-exist with their competitors.

They are “selected for” by individuals making these choices. In that sense we can see this as a market for ideas.



How do people make these choices? Boyd & Richerson's concept of "biases"

They happen when people change their minds about things they knew. Why and how they do is a long story. Most important mechanism:

- Content-based bias ("persuasion")
- Direct bias (authority)
- Model-based bias (imitation)
- Frequency-dependent bias (conformism)
- Rhetorical bias (framing)
- Low risk of penalty for heterodoxy.



Among the new “cultural variants” that established themselves between 1500 and 1700 were Protestantism, heliocentrism, iatrochemical medicine, Vesalian anatomy, Cartesian dualism, blood circulation, Galilean mechanics, infinitesimal mathematics, the presence of an atmosphere, the possibility of vacuum, Newtonian celestial mechanics, and much more.

Most important: the age produced ideas we associate with “the Enlightenment.”



The winners in the market for ideas in this era:

The three main ones associated with the Enlightenment were:

- Belief in the possibility and desirability of *human progress*, a fundamental element of the Enlightenment.
- A (Baconian) belief that “useful knowledge” is actually supposed to be *used* (that is, applied to production), which set a new agenda for scientific research and is instrumental in bringing about progress (the “industrial enlightenment”).
- A belief in the superiority of the “moderns” over the “ancients” and the loss of blind respect for the classical canon.



The market for ideas produced many other important new “equilibrium meta-ideas” that affected how content bias changed.

- The value of “experimental philosophy” in scientific research (Bacon etc.) and the persuasiveness of experimental results.
- The importance of mathematics and quantification as tools of investigation (Galileo, Newton).
- The importance of collecting facts and data, and classifying and organizing them in accessible forms looking for “empirical regularities.”
- The religious virtuousness of research into natural philosophy (Merton, 1938), and the (eventual) separation of science from metaphysics.



These cultural changes prepared Europe for carrying out the Baconian program that led to the Industrial Revolution.

This new culture was firmly in place by the early eighteenth century in Britain and the Western European Continent and was a necessary (if perhaps insufficient) condition for the Industrial Revolution and the “Great Enrichment” that came after it.



Between c1500 and c1700

The European market for ideas changed dramatically:

- Became more competitive
- Created more and better incentives to produce intellectual innovation
- Enjoyed lower entry barriers
- Lowered transactions costs.
- Had fewer topics that were “taboo”
- The research agenda shifted to subject matters that were potentially more promising for solving technological needs and might support economic growth.

[note the subjunctive and conditional clauses in the last bullet]



How do markets succeed?

North-Greif view of markets: to work effectively, they need an *institutional foundation* that specifies the incentives that drive participants and enforces the rules by which this market operates.

In the case of the market for ideas, the institution was especially challenging because it had to overcome the public good properties of knowledge and find a solution to the “commons” problem. The institution created unprecedented incentives for innovators to engage in proposing new ideas to the market.



These incentives, as noted, were of two kinds:

1. Increase *positive* incentives by finding ways in which intellectual innovators could be rewarded despite obvious appropriability problems.
2. Reduce *negative* incentives by weakening the forces that would suppress innovation.

Against all odds, between 1500 and 1700 Europe produced an institution that did all that.



The Solution found: a unique institution

Europe was not the first and only place to have a market for ideas. But it was the first and only one to stumble upon an institutional solution that supported a market for ideas that actively encouraged intellectual innovation and led to an exponential growth in useful knowledge.

What emerged was an institution that solved the problem in a novel way. In so doing, it laid the foundation of a more efficient market for ideas in Europe and to all that that entailed.



The “Republic of Letters”: an early “virtual community”

Within Europe, the “intellectual commons resource” was organized after c. 1500 through a transnational community of scholars, which referred to itself as the *Respublica Literaria*.

This group included the European educated elite, the intellectual *crème de la crème*: scientists, physicians, philosophers, mathematicians (as well as theologians, astrologers, and mystical and occultist writers). They were relatively homogeneous: they were also educated, literate, polyglot, religious-but-open-minded, and they subscribed to a common ideology or culture.



Earliest mention of the term is in 1417, but came into its own in the first half of the sixteenth century with the work of Erasmus and his friend Juan Luis Vives, and reached a peak in the Age of Enlightenment.

It was an institution that was *ex post* efficient, even if it was not *designed* to be that way and its efficiency does not explain its longevity.

It was a classic emergent property, a complex phenomenon resulting from much simpler interactions.

What is clear is that it was uniquely European and that no other civilization ever came up with a similar arrangement though other networks of information diffusion of course existed.



It was most certainly *not* a construct of historians or “an imagined past.”



Pierre Bayle, the French Huguenot philosopher who lived in exile in Rotterdam and who began publishing in 1684 his newsletter named *Nouvelles de la République des Lettres*, wrote that

“The Common-wealth of learning [= the Republic of Letters] is a State extremely free... the Empire of Truth and Reason is only acknowledged in it... everybody is both sovereign and under everybody’s jurisdiction... the laws of of the society have done no Prejudice to the Independency of the State of Nature as [much as to] Error and Ignorance”

(Bayle, [1694], 1734, Vol. II, p. 389, essay on *Catius*).



“The Republic of Letters. . . embraces the whole world and is composed of all nationalities, all social classes, all ages and both sexes . . . All languages, ancient as well as modern, are spoken. The arts are joined to letters, and artisans also have their place in it . . . Praise and honor are awarded by popular acclaim.”

Noel Bonaventure d’Argonne (1634-1704)
Mélanges d’Histoire et de Littérature, 1699

“During the Age of Louis XIV, a Republic of Letters was established, almost unnoticed, despite the wars and despite the difference in religions...all the sciences and arts received mutual assistance this way...True scholars in each field drew closer the bonds of this great society of minds, spread everywhere and everywhere independent... this institution is still with us, and is one of the great consolations for the evils that ambition and politics have spread through the earth”

Voltaire, *Age of Louis XIV, (1751)*



What was the Republic of Letters ?

The Republic of Letters was above all a community (sometimes known as an “invisible college)” that shared, distributed, and evaluated knowledge.

As such it provided the kind of “community” needed to resolve the common resource problem.

It was a classic “weak ties” network (Granovetter, 1983): its members did not know each other very well. Levels of trust were relatively low, so that ideas had to be backed up (e.g., Shapin and Schaffer, 1989). But the information tended to be less redundant than in strong-ties communities.



The Republic of Letters set the rules for the “knowledge commons” in the age of Enlightenment.

What were the rules?



The rules of the RofL:

1. It was an *open* community: anyone (within reason) could enter.
2. It was in principle egalitarian and non-hierarchical (although Newton became a bit of an idol, and birth and wealth may have counted for more than they liked to admit).
3. Knowledge and data should be open and *shared*. (When someone refused, e.g., John Flamsteed, this could create a scandal.)
4. Priority conveyed property rights in the sense of “credit” and reputation but not exclusionary rights. Many priority fights.



The rules of the RofL (cont'd)

5. All knowledge, both new and old, was contestable (“*in nullius verba*”). No sacred cows.
6. All new propositions were to be reproduced, checked, tested and evaluated (making the new knowledge more reliable to outsiders).
7. It was a *transnational* community: “The sciences are never at war”.



What explains its success?

1. The Republic of Letters could thrive because it was to a considerable extent independent of other institutions such as political or religious one. This was true even for France, where the state meddled more than elsewhere.
2. It could do so because its “citizens” took advantage of the political fragmentation of Europe by limiting rulers and organized religion from intervening or controlling knowledge creation, and when needed, by its members moving from one nation to another and playing one power against another.



Other critical components:

Supply side:

- Printing Press
- Growth of Postal services and declining transportation costs.
- Growth of “intelligencers”
- The heritage of a lingua franca and a set of traditions, real or imagined, of intellectual unity harking back to the classical world and the medieval Church.

Demand side:

- Great voyages and growth of a commercial and urban class (“demand for knowledge.”)
- *Competitive patronage*: Growing demand by great and small rulers for high quality courtiers and advisers.



The Republic of Letters and the Market for Ideas

The concept of a competitive market combines in a special way the coexistence of competition and cooperation. Participants on both the supply and the demand side competed fiercely, and the intellectual world between 1500 and 1700 was riven with conflicts, jealousy, and personal animosities and grudges. At the same time, because the game was repeated, people followed the rules and norms.

All markets combine these aspects of conflict and harmony.



Competitive patronage:

As other scholars (Westfall, 1985; David, 2008) have pointed out, the market for ideas became a game in which the payoff for leading intellectuals was a reputation among their peers through their scholarly writings. Reputation was the main incentive mechanism that spurred creative people to make advances in knowledge.

Reputation was correlated with *patronage* (though many wanted reputation for its own sake). Patronage provided intellectuals with economic security (Westfall, 1985) and legitimization (Biagioli, 1991). Patronage was nothing new, but a competitive market in it was only possible in Europe's "states system."



Patronage was a competitive market:

Not only that the sellers (i.e., people with ideas and knowledge) competed in the market for patronage, but so did the buyers, that is, the courts, universities, and academies who extended patronage to the top scientists and competed among themselves to attract the best and the brightest.

On the demand side: attracting smart people was partially a matter of prestige and ostentation for local rulers and notables and partially a matter of getting useful advice, cutting-edge medical care, tutoring for their children, and information and advice from the smartest and best-informed people in Europe).

The importance of competition and mobility was that European rulers and patrons were limited in their ability to force their clients to accept their views (and knew it).

This severely limited the ability of reactionary elements to pursue or silence “heretics” and thus weakened “negative incentives.”



“Open science” emerged as a transnational intellectual commons management device

Because the payoff was largely in *reputational* terms and intellectual property rights consisted of getting credit, people established and sometimes fought over priority (David, 2008).

The significance of open science to the economic development of the modern world is huge (David and Dasgupta, 1992). Open science meant that new knowledge would be placed in the public realm and thus be accessible to anyone who wanted to build on it or use it for technological purposes.

By 1700 the basic outlines of “open science” were fully in place and observed throughout the Republic of Letters.



The Republic of Letters helped realize economies of scale

It created a unified, pan-European institution that allowed intellectuals to enjoy a much larger constituency than they would have in their often small home-countries.

In that sense Europe had the *best of all possible* worlds between political fragmentation and intellectual unification. It was diverse and pluralistic, yet it was intellectually “integrated” in that there was a more or less unified market for ideas.

New knowledge and discoveries diffused rapidly over the entire Continent, and what seemed to be demonstrably superior ideas were eventually adopted widely.



Summary

- 1. The most important institutional change that explains the Industrial Revolution and the subsequent “take-off” is not better property rights or a decline in transactions costs or the Glorious Revolution.**
- 2. Instead, it was the institutions that governed the accumulation and diffusion of “useful knowledge” and the solution to the knowledge commons problem that the “Republic of Letters” in Europe provided. The most important outcome was a set of ideas we call the Enlightenment.**
- 3. It focuses on Europe (mostly Western) and argues that this part of the world is most critical. It does *not* explain why it all started in Great Britain.**



So what?

1. It is not at all clear that the growth of science in the period 1500-1700 (“the scientific revolution”) led directly to eighteenth-century technological change. Maybe all that science did not matter to the Industrial Revolution (Landes, 1969; McCloskey, 2010)?
2. But this takes a very narrow view of what the Industrial Revolution was about. The mechanisms by which the Republic of Letters affected technological progress are deeper and more complex than “how much science was needed to build a spinning jenny.” Science plays an ever-growing role in the subsequent history of industrialization in Europe (Mokyr, 2009).



Could there have been an Industrial Revolution without a Culture of Growth?

There might have been an industrial revolution in Europe without the Republic of Letters and the changing agenda of science, but it would have been short-lived and fizzled out after 1815 or so, another technological “efflorescence”.

Waves of invention and technological progress had occurred before in Europe, and before in the Islamic world and China.

But this time it was different.

