The Dissertations of Vincent Delabastita, Vinzent Ostermeyer, and Lukas Rosenberger: 2023 Alexander Gerschenkron Prize Competition

The Alexander Gerschenkron Prize is awarded for the best dissertation in the economic history of the world outside North America. The prize definition reminds me of the much-parodied New Yorker cartoon of the View of the World from 9th Avenue, with everything of interest sitting on this side of the Hudson River. I am pleased to present the finalists of the prize competition, who have comprehensively demonstrated that the rest of the world has more to show us than a few bumps on a distant horizon.

As ever, the prize submissions as a whole reveal the scale and quality of doctoral research in this large part of the world. This year, I received 23 submissions. Ten were from students at U.S. institutions; 12 came from European universities, despite the exclusion of LSE graduates from the competition to avoid any conflict of interest; and 1 came from Chile. The topics of the dissertations were also dominated by Europe, with ten on Western Europe and four on Eastern Europe, including Russia.

Africa, China, Latin America, the Middle East, and India were the subjects of the rest, with none attracting more than three students. Most of the dissertations, moreover, centered on the nineteenth and twentieth centuries. As a discipline, we are perhaps not entirely keeping to the spirit of Gerschenkron's work and pushing out the boundaries of economic historical understanding into neglected areas.

But, as a judge, I am not either. The shortlist that I drew up is embarrassingly Eurocentric. That is not because the other 20 submissions were not good. In fact, a number were excellent. If we awarded honorable mentions, there are several I would be mentioning loudly. But whatever way I shuffled my notes and scores, I felt the three shortlisted contributors each richly deserved their place on this platform, and that it would be a disservice to replace any of them with one of the alternates, no matter how distinguished.

Before I turn to the finalists, I should say that I began the task by defining my selection principles. I wanted to reward dissertations that engaged with and contributed to the history of economic events as well as the economics that helps explain them. I wanted dissertations to engage with big questions and move our knowledge forward in ways that would matter beyond the specifics of their period or place. I wanted dissertations to be coherent. And, finally, I wanted them to largely be single-authored.

While my first two priors held firm, I had to abandon the last two early on in my reading as outdated relics of my own rose-tinted view of scholarship. In particular, all three of the finalists have worked collaboratively with other outstanding scholars. The coherence across their work left me in no doubt that they must have been at least equal partners in these enterprises, and we can see here that outstanding entrants to a field are often found working with outstanding people.

I will leave the details of each finalist's work to their summaries, but I want to explain what it was that drew me to their work. I highlight here selections from their research, not the whole thing.

VINCENT DELABASTITA

Let me begin with Vincent Delabastita of K.U. Leuven. Vincent is thinking hard about labor markets and particularly about how technological change affects workers.

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This is one of the questions of the moment, and one where insights from historical cases can be particularly fruitful in showing us the longer-run effects of change.

Vincent takes two main lines of attack. In the first, he looks at how technological progress affects real wages and inequality. This is the definition of a rounded paper, with a neat and powerful model that gives us a good way to think about technological change and wages through tasks alongside—what I particularly appreciated—a way to measure the way technology affects wage distribution across the entire economy. We are seeing here all of Belgian industry at two points in the nineteenth century in enough depth that we can observe how the adoption of steam led real wages to rise. So far, so predictable, perhaps. But Vincent also shows how it lowered wage inequality by expanding the tasks of low-wage workers, the opposite of deskilling. Technological change, tasks, wage inequality, and deskilling: Vincent stands out for integrating an array of big themes.

The second line of Vincent's attack is less optimistic, turning to employer collusion and worker exploitation in the industrial revolution. Again, the case is Belgium in the nineteenth century, and again, he brings something novel: an empirical technique to identify collusion using firm-level data on production, cost, and wages that allows him to estimate wage markdowns. This is not going to be easy to replicate exactly, but evidence for collusion is never easy to find. And the results are telling: collusion is modest but persistent until a coal cartel is formed around 1900, at which point things get nastier. I have picked on the two most outstanding papers, but the package has more—on the intergenerational mobility of daughters as well as sons, and on how medieval manors cooperate within networks.

VINZENT OSTERMEYER

Vinzent Ostermeyer of Lund University reframes why some parts of the world are rich and some are poor into why some firms become big while others do not. Using yet *another* astonishingly rich Scandinavian dataset, a theme in the discipline, he can explore how industrialization and firms change together with unprecedented precision in the late nineteenth century, as Sweden experiences a period of rapid structural change and industrialization.

Three questions matter here: First, how did the organizational form of establishments affect their performance, or why did factories out compete smaller establishments? Second, what was it that explained why some firms grew and took on new technologies, looking at incorporation on the one hand, and tariffs on the other? And how industrialization affected services, showing that this helped services to grow through multiplier effects.

There is a coherence and subtlety to the dissertation that I found particularly compelling. The underlying dataset is evidently the work of a group, not an individual, but Vinzent played his part. But the test comes in what is done with this heap of novel data. And what Vinzent does is elegant and compelling. The rise of the factory is such a fundamental change that it deserves this degree of analysis and care. The story is convincing. Factories grow because they survive longer, but this is a slow process that does not stop small artisan shops from being set up. It is just that the artisans tend to fail. What enables factories to grow? In his second paper, Vinzent shows us that incorporation really matters, and the Swedes fortunately chose a general incorporation law that allows marginal firms to take on the risk and raise the funds they need to install steam technology and operate at a larger scale. Like many countries, Sweden raised tariff barriers at the end of the nineteenth century, and Vinzent shows us that if we look at the

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firm level, we can see that the effect varies depending on how productive they were to start with. So, the mix of firms can help us explain why the relationship between tariffs and growth varies, solving the paradox.

LUKAS ROSENBERGER

Questions do not get bigger or better known than the ones that Lukas Rosenberger of Ludwig-Maximilians-University Munich takes on. Why does growth first occur in the West? And was it a story of British divergence or a Northwest European process? Hats off for courage, but also for bringing in a series of clever ways to think through the question. The first paper, for example, gives us a set of insights into the relative inventiveness of France and England, showing that both led, but often in different industries. Behind this is Lukas's observation of a characteristic of the French patent system that allows foreign ideas to be "imitated" and protected, as well as new innovations, allowing good ideas from both England and France to be tracked and compared in the same data. It is a lovely research design and an elegant conceptualization around "revealed relative technological advantage" that should catch on, and suggests that innovation accelerated simultaneously in both countries. In his second paper, he goes further, arguing that Britain grows faster because it has the "right" inventors—those working in technologies that will affect the rate of growth. The idea of a "technology space" is appealing. Again, it is patent data, but looking at the distribution of inventors between sectors is a lovely touch. And they get to a nice piece of causal identification.

You could stop reading here, but Lukas goes further, using the Encyclopédie—not a novelty in itself, of course—to show a causal relationship between access to ideas via books and city growth, and between prior education in an area and books that give evidence about the interaction of types of human capital and knowledge. Again, big questions and clever strategies.

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Enlightenment, Industrial Revolution, and the Knowledge Economy

The question of why modern economic growth began has intrigued economic historians for generations. However, approaching such a broad question directly poses a challenge. Where should one even start looking for evidence? For instance, can the answer be found by studying why the Industrial Revolution was British and not French? Or should the answer be sought by studying why it began in Northwestern Europe but not elsewhere?

To make progress, I focused on the *how,* instead of the *why*, asking what happened to technological progress during the Industrial Revolution.

The first part of my thesis compares technological creativity in Britain and France, the classical comparison for the Industrial Revolution. Two chapters present novel, stylized facts: Chapter 1 quantifies the relative technological leadership between Britain and France at the technology level. Chapter 2 shows that the technologies that Britain specialized in were more central in the innovation network, resulting in faster aggregate technological progress in Britain.

Considering the commonalities, however, these differences in technological creativity between Britain and France seem not very large. Both were technological leaders in some technologies and maintained their leadership over the period. Both experienced a gradual acceleration of innovation during the eighteenth century and a substantial surge in the early nineteenth century. Thus, it appears they may have shared the fundamental conditions enabling technological creativity. What were those mutual factors that sparked the surge of technological creativity leading to the Industrial Revolution?

The second part of my thesis, again comprising two chapters, provides empirical evidence on two determinants of technological creativity related to the European Enlightenment. To analyze the determinants, the chapters use city-level data and variation. Chapter 3 focuses on access to the knowledge frontier and shows that the sale of pivotal encyclopedias increased city growth. Chapter 4 explores the determinants of upper-tail human capital in ancien-régime France, highlighting how science education in secondary schools created an educated class that was important for the "Industrial Enlightenment."

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The factors I analyzed, access to knowledge and human capital, were certainly not the only ones that mattered. And how they were provided varied across countries. Nevertheless, a basis of useful knowledge emerged, which much of Europe shared. Taken together, the evidence presented here indicates that differences in technological creativity between Britain and France may have been more about degree rather than kind.

CHAPTER 1: TECHNOLOGICAL LEADERSHIP
with Carl Hallmann and Emre E. Yavuz

Britain is widely considered as "leader" during the first Industrial Revolution. What constituted British leadership in that period? This chapter specifically focuses on Britain's *technological leadership in invention*.[1] In light of this definition, however, it is far from obvious whether Britain truly was the "the leader" and other countries "followers."

In fact, there are two contrasting views in the literature on British technological leadership, but no systematic empirical evidence to test them. The first proposes that Britain created new technologies while the European continent, especially France, imitated British technology (e.g., Landes 1969; Allen 2009). The second view, in contrast, proposes that Britain and France specialized in different sectors or types of inventions, with both leading in some areas (O'Brian and Keydar 1979; Mokyr 1990).

These views have starkly different implications for explaining and modeling the surge of technological creativity during the Industrial Revolution, yet key questions remain open: How large was the British technological leadership at the sectoral level? Was France also leading Britain in some sectors? And which paradigm better characterizes the situation on the aggregate?

This chapter addresses these questions from the perspective of France by comparing the rate of imitation (of British invention) to domestic invention across sectors. We introduce a concept called *revealed relative technological lead* and measure it using imitation and invention patents in France. We then combine the quantitative estimates of relative leadership with historical case studies to bound Britain's aggregate technological lead relative to France.

The comparison of imitation to invention is feasible within France due to specific features of French patent law and the high quality of available patent data. Notably, the French patent law allowed "importation patents" from 1791 to 1844, enabling imitators to claim property rights on foreign ideas. Furthermore, unlike in Britain, French records include the full name and address of all patentees, allowing us to identify British inventors who patented their original ideas in France.

The revealed relative technological lead is computed as a sector's ratio of the imitation–invention rate over the average imitation–invention rate. Calculating it for broad industries and detailed technology classes and adjusting for patent quality, our estimates reveal several interesting facts. For instance, France imitated about three times as many ideas from Britain than on average in focal technology classes like "spinning" and "steam engines." (Bob Allen was right!) In contrast, in other technologies like

[1] Technological leadership in invention is commonly defined as having the highest rate of invention. Another concept, economic or industrial leadership, is commonly defined as having the highest total factor productivity.

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"hydraulic pumps" or "distillation," France imitated between two and two and a half times fewer ideas from Britain than on average. (Joel Mokyr was also right!)

But what about *absolute* technological leadership? Combining the estimates of relative lead with history, we show how to obtain plausible bounds for the absolute lead. Suppose we were confident based on historical case studies that Britain was absolutely leading in "railways and rails" and France in "papermaking." Then, the absolute aggregate leadership must fall between the estimates for these technologies. As a result, our estimates would imply that Britain was possibly equally inventive but not more than 25 percent more inventive than France.

In conclusion, we document that while Britain held technological leadership, France did so as well, albeit in different sectors. Moreover, Britain may not have been substantially more inventive than France on the aggregate.

CHAPTER 2: THE RIGHT PLACE IN TECHNOLOGY SPACE
with Walker Hanlon and Carl Hallmann

Britain's higher output growth during the Industrial Revolution, despite not being substantially more inventive than France on the aggregate, raises a key question: Were the technologies Britain specialized in more influential for growth than those France specialized in?

This chapter explains the puzzle by considering the innovation network. This network maps technologies as nodes and knowledge flows as edges. We show that Britain's advantage stemmed from her inventors focusing on technologies that were central in the innovation network, including mechanical technologies like steam engines. In contrast, French inventors focused on less central technologies, such as chemicals. Consequently, the British economy was positioned more favorably to benefit from knowledge spillovers.

Our argument proceeds in several steps, offering several contributions. First, we introduce a novel method to recover the innovation network from patent data without citation links. Second, using patent data for Britain and France up to the mid-nineteenth century, we document that their national networks were noticeably similar. Third, we examine macroinventions as shocks arriving at certain nodes at certain times, demonstrating that patenting increased differentially in closely connected technologies. Fourth, we show that British inventors who patented abroad patented more centrally than their French counterparts. Finally, we parametrize a multi-sector endogenous growth model to show that the shape of the innovation network, combined with the location of inventors within it, can explain the gap between Britain and France in industry growth circa 1810–1850.

In sum, this chapter presents a fresh perspective on why certain technologies like steam engines, which economic historians typically associate with the Industrial Revolution, were of exceptional importance during that period.

CHAPTER 3: ACCESS TO USEFUL KNOWLEDGE

The Industrial Revolution was fueled by a gradual acceleration of innovation during the eighteenth century and a substantial surge of technological creativity in the early nineteenth century. One intriguing hypothesis suggests that the Enlightenment facilitated this acceleration and eventual surge by systematically sharing the knowledge frontier through books, journals, and encyclopedias (Mokyr 2005).

This chapter empirically examines this hypothesis by studying how differences in the supply of Enlightenment encyclopedias across cities influenced city growth between 1750 and 1850.[2] I introduce a new dataset on European booksellers in 1781 based on the *Almanach de la librairie*, which cataloged booksellers dealing in French-language books across European cities. This data is combined with city-level sales data from two pivotal encyclopedias of useful knowledge, printed and shipped from Lyon and Neuchâtel, respectively.

Motivating my empirical strategy, I document that Encyclopedia sales were higher in cities with more local booksellers and in cities more proximate to the publisher. For identification, I propose using the *interaction* of local booksellers and proximity to the publisher as a supply-shifting instrumental variable. Controlling for each factor independently sidesteps potential concerns with the exclusion restrictions. I find that the interaction of local booksellers and their wholesale access strongly increased encyclopedia sales in the first stage and city growth in the second stage.

CHAPTER 4: FROM SCIENCE EDUCATION TO SCIENTIFIC SOCIETY
with Uwe Sunde

Upper-tail human capital is increasingly seen as a pivotal factor in the rise of the West. Existing evidence points to the Protestant Reformation as a key determinant. Reformed cities and territories increased school investments, boosting human capital in places like Germany, whereas the Catholic Church focused on censorship, hindering knowledge production in places like Italy. This argument, however, does not explain how *Catholic France* became a leading scientific nation in the eighteenth century.

This chapter examines human capital formation in France through science education in public secondary schools, known as "collèges." We construct a new city-level dataset on the universe of collèges from 1500 to 1789, including data on curriculum and religious affiliation. Using the data, we document a strong and robust relationship at the city-level between science education (philosophy and physics chairs) and various measures of upper-tail human capital.

Turning to the origins of schools and science curricula, we show that both Reformation and Counter- (or Catholic-) Reformation contributed. Specifically, we document that bishop's seats predict the establishment of collèges and philosophy chairs, but *not* science education, consistent with the Catholic church's need for a better-trained clergy in a contested market for religion. Moreover, we show that the curriculum shifted to science in Jesuit collèges—but only in cities with a Huguenot community. This finding highlights that religious competition extended to the realm of natural philosophy, to which Jesuits responded by teaching mathematics and physics.

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[2] City growth is widely used as a proxy for local technological progress when more direct measures are absent.

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