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INTRODUCTION TO SYMPOSIUM: ECONOMICS AND ITS BOUNDARIES

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The history of economics shows that the discipline has always borrowed from other sciences (moral sciences, sociology, biology, physics, psychology, political science, mathematics, etc.) to develop itself and innovate. In the same way, other disciplines (law, physics, management, geography, engineering, etc.) have borrowed from economics to develop and innovate. While the exchanges between economics and other disciplines have already been analyzed in the literature, investigation of the nature and continual redefinition of economics' disciplinary boundaries brings something new to the history of economics. New relationships between economics and other disciplines are ever emerging, but how do the boundaries between them both distinguish them and yet still allow for this exchange between them? Complicating this, the growing fragmentation of knowledge within economics accompanying the growing autonomy of some of its subfields creates intradisciplinary boundaries within economics. How, then, do these intradisciplinary boundaries interact with economics' interdisciplinary boundaries with other disciplines?

The study of the disciplinary boundaries of economics is an important subject of research for the history of economics, though it also is an inherently complex and often controversial subject. It tests the expertise and breadth of historians of economics, and challenges them to put the history of economics on a wider history of science map. In addition, the subject raises difficult philosophical issues. Economics' disciplinary boundaries may appear natural and inevitable, even though they are always at some level inherently artificial and constructed. There is also the historiographic problem that

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a given set of ideas may make multiple boundary crossings between disciplines, subjecting it to changing interpretations.

To illustrate, consider how ideas have moved from economics to physics and back to economics. Thus, one scholar may focus on how Louis Bachelier, in discovering Brownian motion in 1900, applied the idea to financial markets, only to have it move back into physics later as well, and then also back again into economics. However, while Bachelier used financial data only once and for the purpose of proving his demonstration in mathematics (i.e., the equivalence between the results in probability obtained in discrete time and in continuous time, which led him to discover the Brownian motion), he was a mathematician who published only in journals of mathematics. For one scholar the use of financial data is enough to label Bachelier's work as economics, while for another the mathematical goal of Bachelier's demonstration is more relevant and sufficient to label his work as mathematics.

The study of the disciplinary boundaries of economics is also controversial because the discipline's existing boundaries have been used as a tool for justifying dominant views and dominant networks of researchers in economics. For instance, behavioral economics and financial economics originated outside departments of economics. Financial economics was introduced in France outside of departments of economics because leading economists defended other views on this topic. Today, these subfields are taught in departments of economics as if they were always part of economics, and they have indeed been awarded the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel. Intellectual activity is inherently limited by the boundaries that already exist but is also quick to adopt new boundaries.

By analyzing changes in the nature of boundaries in economics, this symposium contributes to clarifying the role boundaries play between economics and other disciplines and within economics itself in determining the nature of the discipline. The papers included here are four case studies that highlight specific aspects of disciplinary boundary crossings that also influence boundaries within economics. They show that economics' boundaries are not permanently established, while it is difficult to introduce novelties.

In "The Emergence of Geographical Economics: At the Contested Boundaries of Economics, Geography, and Regional Science," Jasmeen Rahman and Robert W. Dimand analyze the emergence of "new economic geography" (NEG), or "geographical economics," after Paul Krugman's first use of the 1977 Dixit-Stiglitz model of monopolistic competition to incorporate space into the realm of mainstream (neoclassical) economics. As such, NEG was quickly confronted with other fields also interested in localization of economic activities, particularly economic geography, that is, geography proper, and regional science, that is, a hybrid discipline between geography and economics founded by the economist Walter Isard in the mid-1950s. The authors propose to interpret the emergence during the 1990s of NEG at the frontiers of the contested boundaries among geography, economics, and regional science. They nonetheless go back to Johann Heinrich von Thünen in 1826 and the German location theory that influenced regional science and more particularly Masahisa Fujita and Hesham Abdel-Rahman, who had adapted the Dixit-Stiglitz model to the explanation of economic agglomeration a few years before Krugman. Actually, the fact that these preceding attempts by Fujita and Abdel-Rahman remained largely ignored, even after Fujita's collaboration with Krugman, represents certainly the most original and interesting

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aspect highlighted by the authors. The paper covers a very rich history, with multiple traditions, over a long time span. It sheds light on the debates that raised questions whether these analyses were multidisciplinary, drawing on distinct disciplines, or crossed disciplinary boundaries (as when geographical economics in the style of economists is undertaken in geography departments), or transcends disciplinary boundaries, or involved the emergence of a new discipline.

In "The Penetration of Engineering by Economics: McFadden and the Transformation of Road Demand Estimation," Ariane Dupont-Kieffer, Sylvie Rivot, and Jean-Loup Madre illustrate how economics can be a source of inspiration for other disciplines. Specifically, they detail the integration of the classical theory of the consumer in the field of transport engineering during the 1970s. As they show, by incorporating economic concepts and reasonings, Daniel McFadden contributed to make the boundaries between economics and engineering more permeable, leading to a significant shift in those boundaries. In doing so, McFadden pushed the boundaries of economic analysis even further into the field of transportation engineering. Moreover, as the authors conclude, the integration of economics into transportation engineering has created a new dynamic, providing the opportunity to move the analysis away from economics and engineering by borrowing from geographers and urban planners.

The integration of concepts, methods, theories, or models from one discipline to another is not always easy. In "Polly Hill: Crossing and Contesting the Boundaries of Anthropology, Economics, African Studies, and Entrepreneurship Studies," Robert W. Dimand and Kojo Saffu examine the remarkable career of economist-turned-anthropologist Polly Hill. They pose the question of why, despite a life of productive scholarship on the boundaries of economics, history, and anthropology, which yielded ten books and fifty articles, she never obtained a secure academic position. The authors ruminate on this question, tracing the history of her unorthodox and interdisciplinary approach and contrasting it with the successful careers of Peter Bauer and Scarlett Epstein. This paper sheds light on the difficulties of the integration of research methodologies that bridged and trampled upon disciplinary boundaries. The contrasting careers of Peter Bauer and Scarlett Epstein, on one hand, and Polly Hill, on the other hand, raises also the question of why economists who become interested in anthropology have to find jobs in anthropology departments rather than economics departments, whereas those who seek to combine mathematics or psychology with economics are celebrated with Nobel prizes in economics. While many economic anthropologists have taken a path similar to Epstein's, it is extremely rare that an anthropologist became an economist. The paper also recalls the difficulties women have faced in having an academic career. Cambridge was a boys-only club up until 1948. Women, like Polly Hill, who studied there before then were not able to be full members of the university.

In "The Economist as Scientist, Engineer, or Plumber?" Huei-chun Su and David Colander put the focus on one specific recent aspect of economics: the randomized field experiments in development economics. By doing so, they offer stimulating perspectives on economics as a discipline but also on experimental development economics. They investigate the change within economics over a long period, showing the necessity to re-examine the boundaries of economics. Such boundaries, for the authors, have left aside the issue of policy domain. They investigate the history of the boundary between economics as a science and policy-applied economics. Such a boundary disappeared during the twentieth century, otherwise it would have allowed a more fruitful analysis of

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applied economics. The authors also discuss Esther Duflo's metaphor and show that it is incomplete but would be complete if economists were seen in the policy-applied domain as general contractors. The authors emphasize the need for multiple training of economists. To take this multiplicity of roles into account, this paper argues, in addition to the traditional boundary that delineates the disciplinary domain of economics against other sciences, an overarching boundary between economic science and applied policy needs to be recognized.

These four articles show that economics' borrowing from other disciplines is often contested, both because it can bring into question reigning views about the nature of economics and because it can challenge established intradisciplinary boundaries. Yet the borrowing between economics and other disciplines goes on nonetheless, and is thus important to explaining how economics changes. We hope, then, that the papers in this symposium will stimulate further investigation in the history of economics into the nature and continual evolution of economics' disciplinary boundaries and reflection upon what this implies about economics as a discipline.

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