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How Soon Will This New Technology Be Popular Antecedents that Predict Subsequent Inventions

Reinhilde Veugelers*

Peterson Institute for International Economics, Washington DC, USA

Introduction

Despite academics' keen interest in discovering high-impact discoveries, little emphasis has been paid to understanding what motivates the (rapid) reuse of unique technology embedded in these inventions in later inventions[1].We solve this limitation by empirically finding innovative technologies, mapping their re-use trajectories, and investigating how the novel technologies' properties affect the shape of the trajectories. We identify novel technologies as unique combinations of existing technological components on a broad scale using patent data. The technological trajectory begins with the first invention that uses the new combination, and it is shaped by all subsequent inventions that use the same new combination. We found 10,782 technological paths in our research sample. We determine the take-off time and maximum technological impact for each of these trajectories, as measured by the maximum number of follow-on inventions.

In order to improve economic development, new technologies are critical. Those technologies are rarely embedded in a single invention, and they frequently attain their full influence through a development process that results in a trail of following inventions that reflect modifications or alternate uses of the technology. Evolutionary economics proposed the notions of technological paradigm and progress along defined trajectories to explain the systematic process of novel technology development[2].Scholars have sought to empirically measure these trajectories, but most of their work has concentrated on case studies involving only one or a few trajectories. For example, reconstructs the technological trajectory of fuel cell technology with an emphasis on hybrid electric vehicles, as well as four technological trajectories connected to antibacterial medicine classes[3].It was only the first time I tried to compare different trajectory trajectories over time. She identified 56 technologies using patent technology classes (IPC) and tracked patented inventions through time.

Description

Technological trajectories, antecedents, and novel technologies

To find novel technologies, examine their development trajectories, and investigate antecedents influencing the shape of the trajectories, our study uses a systematic large-scale quantitative approach. To demonstrate our approach, we take the case of "transgenic mammalian technology."Identifying novel technologies

We identify new technologies based on the premise that technological components are the core components of inventions. argues that creators explore among existing technological components and recombine them to achieve something new, elaborating on the concept of innovation as a "recombinant search"[4].We identify combinations emerging for the first time in an invention as signifying the development of a new "basic principle" or "novel technology on which innovators rely to produce their inventions1" among all the potential combinations of technological components.

Tracing technological trajectories

After identifying new technologies, the next stage is to follow their progress. We assume that any technology is based on a fundamental concept, or "backbone," that remains consistent across time. We establish the trajectory of a novel technology by tying together all subsequent innovations that re-use the same new combination of technological components over time, given that creations belonging to the same trajectory share the same underlying principle.

Similarity of components

The combination of components that are similar to each other can result in novel technology. For a single inventor or a group of inventors with comparable backgrounds, combining similar components is a simple task. Typically, single-field technological competencies are sufficient. Combining incompatible components, on the other hand, is difficult and frequently necessitates cross-field technological expertise. These skills may not yet exist in the innovators' team and must be learnt or obtained through the formation of teams with specialists from various technological disciplines[5].Complex novel technologies originating from the combination of incompatible components are predicted to take a long time to take off, as learning and building new teams are time-consuming operations.

Conclusion

Despite historians' keen interest in finding successful inventions, little attention has been paid to how novel technologies embedded in these inventions are re-used across time and how the shape of their ensuing trajectory is related to the novel technologies' antecedent qualities. Such research necessitates a large-scale trajectory analysis, which has been lacking in the literature thus far.

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***Corresponding author:** Reinhilde Veugelers, Peterson Institute for International Economics, Washington DC, USA, Email: reinhilde.veugelers@kuleuven.be

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