Technology Entry In The Presence Of Patent Thickets

Bronwyn H. Hall, Christian Helmers, Georg von Graevenitz

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BACKGROUND

The past two decades have seen an enormous increase in patent filings worldwide. There are signs that the level of patenting in certain sectors has become so high as to discourage innovation. The main reason is that companies inadvertently block each other's innovations because of multiple overlapping patent rights in so-called "patent thickets".

It is sometimes argued that patent thickets are a feature of rapidly developing technologies in which technological opportunities abound. In this view patent thickets are seen as a reflection of fast technological progress that is paired with increased technological complexity. This suggests that a trade-off between technological opportunity and growth on the one hand and increased transaction costs due to the emergence of patent thickets on the other may exist.

This paper contributes to the literature by analyzing the effect of patent thickets on entry into new technology areas. Our focus on entry into patenting captures the positive effects of greater technological opportunity and negative effects of greater transaction costs imposed by a complex patent landscape characterized by thickets. We are able to quantify both effects empirically. The paper makes two key contributions: first, we extend the theoretical model of patenting in complex technologies introduced by Graevenitz et al. (2013) to free entry and the interaction between incumbents and entrants. The second contribution of the paper consists of an empirical test of these predictions using data on UK firms.

METHODOLOGY

The paper contains a theoretical model, which extends prior work modeling patent thickets to free entry and generalises results from the prior analysis. The empirical section relies on a careful analysis of UK patent data to test the predictions of the model. We use hazard models to estimate the probability of entry into a technology area. The models express the probability that a firm enters into patenting in a certain area conditional on not having entered yet as a function of the firm's characteristics and the time since the firm was "at risk," which is the time since the founding of the firm.

KEY FINDINGS

Based on theoretical modelling we predict that entry increases in technology areas characterized by greater technological opportunity and complexity. These predictions are confirmed in empirically for the UK. In particular, we also show that the hold-up potential of patent thickets has negative and economically significant effects on entry into patenting.

POLICY ISSUES

Policy makers in the United States and Europe have been confronted with i) growing demand for patents and ii) the claim that too many patents may become a hindrance to growth in some technologies. While there is a fair amount of evidence that 'patent thickets', which are often cited as one of the culprits, exist, there is less evidence that they have real effects. This paper begins to address this question by showing that patent thickets are highly correlated with reduced levels of entry into patenting in key technologies.

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T: +44 (0)1603 593715
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ABOUT THE AUTHORS

- Bronwyn H. Hall is Professor of Economics Emerita at the University of California at Berkeley and Professor of Economics of Technology and Innovation at the University of Maastricht, Netherlands. She is a Research Associate of the National Bureau of Economic Research and the Institute for Fiscal Studies, London and a Visiting Fellow at the National Institute of Economics and Social Research, London
- Christian Helmers is Assistant Professor of Economics at the Leavey School of Business, Santa Clara University
- Georg von Graevenitz is Senior Lecturer in Quantitative Methods at the Business School of Queen Mary University of London. He is also an Associate member of CCP and a fellow of CREATe

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