

Patent Disclosures and Stock Market Valuation: Evidence from 4IR and Non-4IR Technologies

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Abstract

Fourth Industrial Revolution (4IR) technologies, including artificial intelligence, big data, and Internet of Things applications, are expected to play a central role in future economic development. While previous research has shown that patents contribute to firm value and may affect stock market performance, little is known about how investors react to patent disclosures related to 4IR technologies compared with other technological fields. This study examines whether stock markets value 4IR patents differently from non-4IR patents. Using patent data from the European Patent Office (EPO) and stock market information from LSEG Workspace, we conduct an event study to estimate abnormal returns (AR) and cumulative abnormal returns (CAR) around three key stages of the patenting process: filing, publication, and grant. Unlike previous studies, which typically focus on a single patent event or a single technology domain, we compare market reactions across the entire patent grant process and distinguish between 4IR and non-4IR technologies. The analysis is based on a global sample of 497 publicly listed firms holding EPO patents between 2002 and 2022 (23,132 patent events). Results indicate that, on average, AR and CAR are not statistically significant, regardless of whether patents belong to 4IR technologies or not. However, firm-level evidence suggests that stock markets react more frequently to 4IR patent events than to non-4IR patent events, although these reactions are mixed in sign and tend to be more negative for 4IR. These findings remain broadly robust across regions, industrial sectors, and time periods, with only limited exceptions concentrated around grant events in some subsamples. The study contributes to the literature on innovation, patents, and financial markets by providing a comprehensive assessment of stock market reactions to 4IR patent disclosures at the EPO and by examining whether investors value these emerging technologies differently from other forms of innovation.

Keywords: fourth industrial revolution, innovation, event study, European patent office (EPO)

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