Abstract

In this paper, I analyze the secondary market transactions of patents from public assignor (i.e., seller) to assignee (i.e., buyer) firms. In particular, I study the causes and consequences of public assignor firms selling some of their patents. I document that firms with higher innovation productivity or innovation quality but with lower production efficiency are more likely to sell patents distant from their operations. Further, patents with lower economic value but higher scientific value are more likely to be sold. In terms of the consequences of patent transactions, I document that in the three years after patent transactions, assigner firms experience a positive and statistically significant improvement in their operating performance. In addition, their stocks enjoy a positive and significant long-run buy-and-hold abnormal return (BHAR) following these patent transactions. This pattern is robust to different holding periods and benchmark portfolios against which the long-run buy-and-hold return is calculated. I document one possible underlying mechanism driving these results, which is that assignor firms increase their focus after patent transactions.

Methods

1. Firm-level specification: Causes of patent transactions

\[(\text{Buying Patent}_{ij,t}) = \alpha_0 + \beta_1 X_{ij,t} + \epsilon_{ij,t} \]

- \(X_{ij,t}\): innovation quantity, innovation quality, total factor productivity (TFP)

2. Patent-level specification

\[\begin{align*}
\text{Patents}\_\text{Sold}_{j,t} &= \alpha_0 + \beta_1 X_{j,t} + \epsilon_{j,t} \\
\text{Patents}\_\text{Sold}_{j,t} &= \alpha_0 + \beta_2 X_{j,t} + \epsilon_{j,t}
\end{align*}\]

3. Firm-level specification: Consequences of patent transactions

\[\begin{align*}
\text{ Firmin}_{ij,t} &= \alpha_0 + \beta_1 X_{ij,t} + \beta_2 \text{Patents Sold}_{j,t} + \epsilon_{ij,t} \\
\text{Firm}_{ij,t} &= \alpha_0 + \beta_1 X_{ij,t} + \beta_2 \text{Patents Sold}_{j,t} + \epsilon_{ij,t}
\end{align*}\]

Results: Firm-level causes of patent transactions

At firm level, I document that firms with higher innovation productivity (as measured by the number of patents filed in the last 3 years) or innovation quality (as measured by the number of citations per patent for patents filed in the last 3 years) but with lower production efficiency (as measured by the TFP) are more likely to engage in a patent transaction.

Results: Patent-level causes of patent transactions

At patent level, I document that patents technologically further away from assignor firms’ operations are more likely to be sold in a patent transaction. In addition, patents with higher scientific value (as measured by the number of forward citations received by the patents) but with lower economic value (as measured by the announcement return upon the grant of patents) are more likely to be sold.

Conclusion

1. I show that firms with higher innovation productivity or innovation quality but with lower production efficiency are more likely to engage in a patent transaction. The effect of production efficiency on the probability of assignor firms selling their patents is greater for firms with higher innovation productivity.

2. I document that patents further away from assignor firms’ operations are more likely to be sold in a patent transaction. This effect is stronger for firms with higher innovation productivity. Further, patents with lower economic value but higher scientific value are more likely to be sold in a patent transaction.

3. In terms of the consequences of patent transactions, I document that in the three years after patent transactions, assigner firms experience a positive and statistically significant improvement in their operating performance. In addition, their stocks enjoy a positive and significant long-run buy-and-hold abnormal return (BHAR) following these patent transactions. This pattern is robust to different holding periods and benchmark portfolios against which the long-run buy-and-hold return is calculated. I document one possible underlying mechanism driving these results, which is that assignor firms increase their focus after the patent transactions.

References


