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Patent Sales in Bankruptcy: What and Why?

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Failing innovative firms often use the bankruptcy system (in particular, chapter 11 in the U.S.) to reorganize and seek a "fresh start." Ideally, the bankruptcy system should help viable firms resolve temporary financial distress and emerge without losing valuable assets and growth options. One would hope that technologically critical innovations remain with the firm while underexploited innovations are unleashed to the market. However, this process can be particularly challenging for innovative firms when significant control rights are granted to secured creditors, whose goal of protecting collateral value and recovering debt with certainty is misaligned with the option-like nature of innovation assets. As a result, innovative firms may be compelled to sell a substantial number of innovation assets that they deem important, disrupting firms' innovation production and the supply in the market for technology.

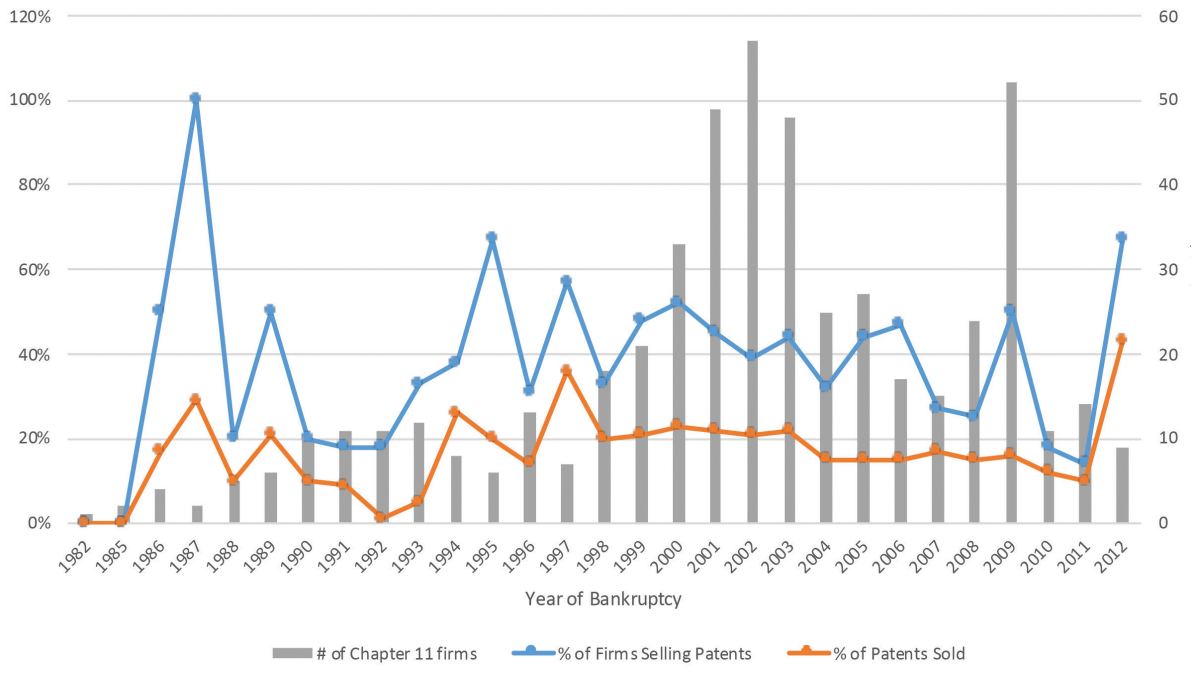
In a recent paper,[2] we constructed a comprehensive sample consisting of all chapter 11 bankruptcies filed by patent-owning U.S. public firms from 1982-2012 to examine patent reallocation by bankrupt innovative firms. Their comprehensive list of data sources includes New Generation Research's bankruptcydata.com, Public Access to Court Electronic Records (PACER), Compustat, Capital IQ, companies' Securities and Exchange Commission filings through EDGAR, National Bureau of Economic Research (NBER) patent database and the U.S. Patent and Trademark Office (USPTO). The final study sample includes 518 firms that own at least one patent at bankruptcy filing, referred to as "innovative firms." This study sample represents approximately one quarter of all chapter 11 filings by U.S. public firms during the period. Three interesting patterns have emerged from the initial data analysis.

First, patent sales during bankruptcy reorganization are a surprisingly pervasive phenomenon. Exhibit 1 presents the annual number of chapter 11 filings, the fraction of firms that sold patents during bankruptcy reorganization and the percentage of patents sold. Selling patents in bankruptcy is not a recent phenomenon. In fact, the fraction of firms that sell patents and the percentage of patents

1 Dr. Ma is also a faculty research fellow at the National Bureau of Economic Research.

2 Song Ma, Joy Tianjiao Tong & Wei Wang, "Bankrupt Innovative Firms," *Management Science* (forthcoming), *available at* papers.ssrn.com/sol3/papers.cfm?abstract_id=2903003 (last visited Sept. 28, 2021). This article provides an executive summary of that paper.

Exhibit 1: Percentage of Firms Selling Patents and Percentage of Patents Sold by Year



transacted have remained at fairly stable levels over the three decades in the sample period. On average, 40 percent of firms sell at least one patent in chapter 11 reorganization, and the sold patents account for 18 percent of their patent stock.

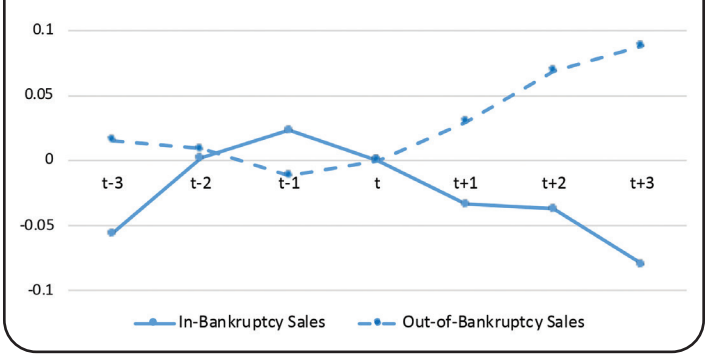
Second, patent sales concentrate in the first two quarters immediately after the bankruptcy filing despite the restructuring process typically taking 16 months to complete. The probability of a chapter 11 firm selling a patent is 9.6 percent higher than that of a nonbankrupt firm in the first quarter after filing. The probability of selling a patent increases more than sixfold from the quarter before chapter 11 filing to the quarter after. The fast selling of patents reflects the use of § 363 sales, which allow the sale of assets "free and clear of liens and encumbrances."

Third, patent-related sales after bankruptcy filing occur with greater intensity relative to the sale of nonpatent assets. For example, in the quarter after filing, about 60 percent of § 363 sales contain at least one patent, and the ratio drops to 17 percent by the fourth quarter after filing. The evidence suggests that patents appear to be front-loaded in asset sales in chapter 11.

After documenting the general patterns of patent sales, it is natural to ask what type of patents are sold and whether chapter 11 firms are able to retain their technologically critical innovation in a bankruptcy reorganization. A striking and robust finding emerges: Bankrupt innovative firms are more likely to sell their core, rather than peripheral, patents during chapter 11 reorganization. Whether a patent is sold or not is determined by the technological proximity between a patent and the firm's core innovation expertise. Patents in the highest quartile of the core measure are 30 percent more likely to be sold compared to the selling rate of an average patent. This is not a result of a firm's decision to liquidate all assets. Moreover, the selling of core innovation in bankruptcy is diametrically opposed to patterns observed in nonbankrupt firms. These results demonstrate that chapter 11 firms sell patents that are strategically important to their core innovation and the long-term growth of their businesses. But why?

The authors' main analysis focuses on the role of financial contracting and creditor control in patent sales. The regression results show that the selling of core patents concentrates in firms that extensively use secured debt for financing prior to bankruptcy filing. A core patent is 8.1 percentage points more likely to be sold if the firm's ratio of secured debt (including drawn bank revolvers, term loans, secured bonds and notes, capital leases and other secured debt) to total debt is high. In addition, when dividing the sample by the turn of the century, they find that the selling of core patents is pronounced only from the 2000s to the present, a period characterized as having strong secured creditor control. In contrast, firms that filed for chapter 11 before 2000 are even less likely to have sold their core patents.

Exhibit 2: Citation Dynamics of Sold Patents



The results highlight the effect of debt-contracting and secured creditors on patent sales by innovative firms. The secured creditors' goals of protecting their collateral value and recovering debt with certainty are typically misaligned with intangible and risky innovation investments. Secured creditors' influence in the chapter 11 process, such as the use of debtor-in-possession (DIP) financing, may compromise bankruptcy firms' ability to retain valuable innovation that they may be well-suited to exploit. To support these arguments, we explored the effect of patent collateralization and creditor recontracting on firms' ability to retain strategically important patents in bankruptcy.

A firm's core patents are more likely to be pledged as collateral for secured financing before bankruptcy. Bankrupt firms are seven times more likely to sell a collateralized patent than are healthy firms. Core patents are not more likely to be sold in bankruptcy if they are not collateralized. In addition, the selling of collateralized patents is more pronounced for firms that use more secured debt and those that obtain DIP financing. These findings not only show the strong effect of secured creditors on patent sales, but they also point out an important economic channel through which secured creditors enforce their rights.

The effect of secured debt on patent sales is governed by both the rights of creditors and their incentives in exercising such rights. To measure secured creditors' incentives, the authors determine whether secured creditors' claims are likely in the "fulcrum" class (*i.e.*, the class of debt that is most likely not recovered in full and that will be compensated with the newly issued equity) or are undercollateralized. If the claims are in the fulcrum class or are not fully protected, their recovery rates should be more aligned with the overall going-concern value of the entity as a whole rather than the value of the reorganized entity itself. Therefore, the creditors are less likely to push for the sale of core assets.

The findings show that although core patents are more likely to be sold in bankruptcy, this selling pattern is significantly mitigated when secured creditors recover less than 100 percent of the debt's face value, when secured creditors receive new equity in the reorganized firm, and when their claims are undercollateralized. When exploring sale motions and orders from court dockets, § 363 sale motions are more likely to be contested by unsecured creditors if they allow the firm to sell core patents. The evidence speaks directly to the unsecured creditors' negative view on core patent sales.

Together, the results suggest that financial contracting and creditor rights have a strong influence on patent reallocation of bankrupt innovative firms. However, beyond the failing firms themselves, what is the consequence of patent sales by bankrupt firms on the market for technology and technology diffusion?

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The authors investigated this question by first exploring citations of sold patents by bankrupt firms and comparing them to citations of patents sold by healthy firms and financially distressed (nonbankrupt) firms. Some interesting patterns emerged. First, the overall citations of the patents sold during bankruptcy experience an "up then down" dynamic (solid line in Exhibit 2). Specifically, sold patents in bankruptcy experience a 14 percent decrease of annual citations in the third year after sale. In contrast, citations of sold patents by firms out of bankruptcy experience a clear "down then up" pattern (dashed line in Exhibit 2). The evidence suggests that bankrupt firms sell better-utilized patents and hot patents, but they are not better exploited after the sale. For those sales outside of bankruptcy, patents are better matched to the buyer. The evidence shows that the functioning of the financial markets affects not only the production of innovation but also the exploitation and diffusion of innovation.

To provide further evidence to explain the decreased citations of the sold patents in bankruptcy, we examined the identity of buyers and reasons for their purchase. They found that patents sold in bankruptcy are more likely to go to a patent troll, a nonpracticing entity (NPE) that typically opportunistically purchases patents with the purpose of bringing lawsuits against cash-rich innovative firms rather than exploiting patents for production. Furthermore, patents sold in bankruptcy are 200 percent more likely to go to an NPE than are out-of-bankruptcy sales. Consistent with this evidence, the pattern of selling core patents is associated with the *ex post* litigations by NPEs using purchased patents.

Conclusion

The study's findings have several policy implications that are worth highlighting. First, in the recent debate over bankruptcy reform (such as that from the ABI Commission to Study the Reform of Chapter 11 in 2015[3]), for a knowledge-based economy it is important to consider the impact of the bankruptcy institution on innovation allocation and technology diffusion. Second, from a firm's perspective, financial contracting with lenders should factor in the *ex post* consequence to innovation. Third, this article raises, but does not fully answer, the question of how to efficiently redeploy and aggregate innovation from firms that go bust. abi

3 For more about the Commission's findings, visit commission.abi.org.