INTELLECTUAL PROPERTY RIGHTS PROTECTION, INVESTMENT, AND FIRM GROWTH*

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Abstract

This paper investigates whether strong protection of intellectual property rights (IPR) fosters or deters corporate investment and firm growth. My identification strategy exploits the adoption and subsequent invalidation of laws that prohibit the duplication of manufactured products using an efficient reverse engineering process. The results show increases in physical and intangible capital investments and sales and employment growth after the laws' adoption, followed by significant decreases when the laws are reversed. More pronounced effects for firms in less concentrated industries and increases in profitability suggest that strong IPR protection incentivizes investment and growth by decreasing the competitive threat of product imitation.

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To compete effectively in international markets, a nation's businesses must continuously innovate and upgrade their competitive advantages. Innovation and upgrading come from sustained investment in physical as well as intangible assets. *(Porter, 1992, p. 65)*

1. Introduction

Innovation plays an important role in driving long-run economic growth (e.g., Solow (1957), Romer (1990)). Yet, due to the public good nature of knowledge assets, firms operating in competitive markets may underinvest in innovation because of insufficient incentives (e.g., Nelson (1959)).[1] In theory, intellectual property rights (IPR) help solve the investment incentives problem by increasing the private returns to innovation. While most would agree that some level of IPR protection is necessary for spurring innovation, the strength or strictness of the protection is the subject of an ongoing debate (e.g., Boldrin and Levine (2002), Moser (2013)).

The case against strong IPR protection as a mechanism to encourage investment in innovation typically centers on its negative effects on cumulative innovation. Innovation does not occur in isolation, but rather, it is a cumulative process involving knowledge spillovers across generations of innovative firms (e.g., Scotchmer (1991), Galasso and Schankerman (2015)). Thus, strong IPR protection for earlier generations of firms can weaken the investment incentives of later generations (e.g., Williams (2013)). This "intellectual monopoly" granted to mature incumbents may also decrease their incentives to make follow-on investments because subsequent innovations could serve only to replace the rents it already earns from its existing products (e.g., Arrow (1962)).

Conversely, the case for strong IPR protection can be made via at least two channels. First, strong IPR protection might increase firms' investment incentives by reducing the ex-post threat that product market rivals can appropriate their intellectual property (IP) and compete away the expected returns (e.g., Schumpeter (1934), Aghion and Howitt (1992)). This incentive effect could be especially pronounced for firms in competitive industries that frequently engage in investment-intensive innovation races (e.g., Gu (2016)). Second, because strong IPR protection results in safer

[1] Knowledge assets (e.g., ideas, information) are considered public goods because they are nonexcludable (i.e., it is difficult or impossible to exclude other firms from using the asset once it is made public) and nonrivalrous (i.e., the assets use by one firm does not detract or prevent other firms from also using it).

IP, it may spur investment in innovation by reducing firms' financial risk and improving their access to capital (e.g., Klasa et al. (2018), Suh (2022)).

My paper makes two important contributions to the literature on how strong IPR protection relates to investment in innovation. First, I introduce two novel sources of identifying variation in IPR protection to address the endogeneity challenge faced by prior studies that mostly use variation from cross-country differences in IPR protection (e.g., Aghion, Howitt, and Prantl (2015), Papageorgiadis and Sharma (2016)). In particular, I exploit the adoption of anti-plug molding laws by U.S. states between 1978 and 1987 and their subsequent invalidation via a U.S. Supreme Court ruling in 1989. An anti-plug molding law increases the strength of IPR protection for firms located in the enacting state by prohibiting the duplication of manufactured products from an efficient type of reverse engineering known as the direct molding process. This process uses an existing product as a "plug" to form a mold, which is then used for making imitations of the original item; thus, allowing the imitating firm(s) to bypass the investment costs incurred by the originator. The enacting states adopt versions of the law that either protect all manufacturing items ("all-item") or that only protect boat hulls and their component parts ("boat-item") from direct molding. My identification strategy focuses on the all-item anti-plug molding laws and employs a difference-in-differences (DiD) estimator that compares changes in the investment and growth of the manufacturing firms that gain and subsequently lose the strong IPR protection with manufacturers that locate elsewhere and never experience a change in protection.[2]

Second, because the all-item anti-plug molding laws protect both patentable and non-patentable IP, my study adds new insights into how strong IPR protection affects investment in innovation beyond the patent system's scope. In contrast, prior work almost exclusively focuses on patent-based IPR protection (e.g., Lerner (2009), Suh (2022)). For a product to be eligible for patent protection, it must meet the requirements and conditions of utility, novelty, and non-obviousness. The only requirements and conditions to receive protection via the anti-plug molding laws are that the firm locates in a state that adopts the law and that the product can be copied via

[2] Only seven firms in my sample of publicly traded firms are identifiable as boat manufacturers, and only three of the seven locate in a state that passes a boat-item anti-plug molding law, prohibiting statistical analysis of this law.

the direct molding process. While patents are useful barometers of innovation, survey evidence suggests that only a small percentage of firms depend on patents to protect their IP; rather, firms report a heavier dependence on alternative protection mechanisms, such as lead time and trade secrecy (e.g., Hall et al. (2014)), which the all-item anti-plug molding laws strengthen.

I begin my analysis by examining whether this law provides an effective means of IPR protection. To do this empirically, I analyze firm-level patenting behavior between 1975 and 1988. An all-item anti-plug molding law may offer a competitive advantage in protection relative to patents because it does not require disclosure of information. Conversely, to receive patent protection, a firm must apply to the United States Patent and Trademark Office (USPTO) and disclose its IP in a technically precise and standardized format. The law also offers indefinite IPR protection, while the length of protection for a utility (design) patent during my sample period is 17 (14) years from its grant date. Consistent with the all-item anti-plug molding laws providing at least a partial substitute to patents, I find that, after its adoption, firms decrease their patenting activity by about 4% relative to the sample mean.

Further consistent with the IPR protection from the laws providing a competitive advantage relative to patents, the Supreme Court rejected the all-item anti-plug molding law because it deemed that it conflicted with the federal patent system. The Court stated that the law "reassert[*s*] a substantial property right in the idea, thereby constricting the spectrum of public knowledge. Moreover, it does so without the careful protections of high standards of innovation and limited monopoly contained in the federal schemes." (*Bonito Boats* v. *Thunder Craft*, 489 U.S. 160). Extending the sample period to 1992 and incorporating this event into the analysis, I find that, relative to the sample mean, firms located in the enacting states increase their patenting activity by about 14% after the ruling renders the IPR protection provided by the laws invalid.

My next set of analyses aim to establish the plausible exogeneity of these events. Focusing first on the adoption of the all-item anti-plug molding law, I find in a state-level determinants model that amongst a comprehensive set of predictor variables (e.g., local economic and political conditions, the adoption of other business laws), none determine its passage. Further, using internet and library database searches, I am unable to find any anecdotal evidence of firms and trade associations lobbying for or against the all-item anti-plug molding laws.[3] Next, I consider the exogeneity of the Supreme Court's ruling by testing whether capital markets reacted to the announcement of the decision. Employing a short-run event study, I find that the cumulative abnormal stock returns of firms located in states that adopt these laws are roughly 100 basis points lower in the days surrounding the announcement of this ruling that invalidates the laws, consistent with the news of the loss of IPR protection being unexpected. Moreover, decisions by the Supreme Court are unlikely to be influenced by lobbying.

For my main analysis, I compare changes in the investment and growth of firms located in states that adopt all-item anti-plug molding laws with firms located elsewhere. Motivated by the opening quote that "[*i*]nnovation and upgrading come from sustained investment in physical as well as intangible assets" (Porter, 1992, p. 65), I measure a firm's investment in innovation using its expenditures on physical and intangible capital inputs.[4] I measure growth with a firm's annual sales and employment growth rate. The regressions include firm and industry-year fixed effects to restrict the comparisons of within-firm changes to firms that operate in the same industry. Among the control variables, I include indicators for other relevant state laws to isolate the effect of the anti-plug molding laws from other laws adopted during my sample (Karpoff and Wittry (2018)).

The main findings show that firms increase investments in physical and intangible capital and have faster rates of sales and employment growth following the laws' adoption. For example, relative to their standard deviations, capital expenditures increase by about 10%, intangible expenditures increase by roughly 7%, sales growth is faster by nearly 11%, and employment growth is faster by almost 10% when the all-item anti-plug molding laws are enforceable. Results from timing tests indicate that these effects occur after the laws are passed and not before,

[3] Two legal studies mention that lobbying may have influenced Florida's boat-item anti-plug molding law: Samuelson and Scotchmer (2002, p.1593) infer that "some features of the Florida law suggest that it was the product of a rent-seeking special interest group," and Aoki (2007, p. 976) concludes that "boat hull design companies that spent resources in designing new types of boat hulls had undoubtedly lobbied the Florida legislature to give them protection from plug-molding of boat hulls."

[4] Following prior work, I measure physical capital expenditures as the ratio of capital expenditures to lagged property, plant, and equipment, and intangible capital expenditures as research and development (R&D) plus 0.3 times selling, general, and administrative (SG&A) expenses scaled by lagged total capital.

consistent with the "parallel trends" assumption of the DiD methodology. I extend the analysis using a triple-differences approach to estimate the effect of the laws' invalidation. Using the same fixed effects and controls, I continue to find increases in investment and growth when the laws are in force. However, after the Supreme Court's ruling rejects the laws, investments in physical and intangible capital decrease and growth rates in sales and employment decline. These results are robust to (i) concerns from a recent literature showing that the staggered-DiD estimator is subject to bias in the presence of (dynamic) heterogeneous treatment effects, (ii) using a firm's exposure to an all-item anti-plug molding law based on estimates of its operations in each state instead of its headquarters state, (iii) alternative investment measures, such as R&D, SG&A, and advertising expenses, and (iv) additional fixed effects (firm age, historical headquarters state). Overall, the results are consistent with strong IPR protection fostering investment and growth.

Next, I test whether these findings support arguments for strong IPR protection because of its incentive and capital market effects. First, if an increase in incentives drives the main results, I expect to find a stronger effect of the all-item anti-plug molding laws on firms operating in more competitive industries where the risk of product imitation is high. Because strong protection reduces the risk that a firm's rivals appropriate its IP and compete away its expected return on that investment, firms in more competitive product markets might invest and grow more with stronger protection. Consistent with this expectation, increases in investments and growth following the laws' adoption concentrate amongst firms operating in more competitive industries. Conversely, firms with more market power and fewer product rivals do not show changes in investment or growth after the laws' passage. Bolstering support for the explanation that strong IPR protection increases incentives by reducing competition, I find that firm profitability increases when the anti-plug molding laws are enforceable and that it declines after their reversal.

Second, if strong IPR protection benefits firms by decreasing their financial risk and improving access to capital, I expect firms that are more reliant on external financing and face burdensome financial constraints to have larger increases in investment and growth after the laws' adoption. The results show that firms dependent on external financing invest more in physical and intangible capital and have faster sales and employment growth after the laws' passage. However, the findings on firms that are more financially constrained are mixed, offering only marginally supportive evidence that better access to finance is a channel that explains the results.[5]

A potential concern for my identification strategy is that because a limited number of states adopt all-item anti-plug molding laws (California, Michigan, and Tennessee), it could be that some local economic factors that correlate with their enactment and the dependent variables, drive the post-adoption differences in the outcomes and I spuriously attribute these effects to strong IPR protection.[6] Two features of my setting help address this concern. First, my identification strategy is enriched by the Supreme Court's ruling that rejects the laws because it provides a counter-effect to their adoption. Thus, any local economic factors that correlate with the adoption of the laws would also have to correlate with the Supreme Court's ruling.

The second unique feature is that the all-item and boat-item anti-plug molding laws only affect firms that make certain products that can be copied via the direct molding process. I take advantage of this in a set of placebo tests to show that firms that should not be affected by the laws (i.e., firms that do not make "moldable" products in the states that adopt all-item anti-plug molding laws and firms that do not make boat-related moldable products in the states with boat-item anti-plug molding laws) do not experience changes in outcomes. The idea behind these tests is that if there are omitted variables confounding the results by driving the adoption of the laws and the changes in the dependent variables, they should impact *all* firms located in the enacting state and not be exclusive to the firms that make the certain products that are protected by the laws. The findings from these tests indicate no changes in the patenting, investment, and growth of firms that do not make moldable products, inconsistent with the concern that omitted variables drive my results.

This study adds to the literature on the intersection of innovation and competition and its impact on corporate decisions and performance. Related work shows how intense product market competition can have negative effects on patenting activity (e.g., Aghion et al. (2005), Goettler

[5] Prior work finds that firms use patents as collateral in securing debt financing (e.g., Mann (2018)) and that firms that substitute patents for trade secrets have higher costs of debt (e.g., Guernsey, John, and Litov (2022)). Thus, the lack of strong support for this channel could be due to firms' decreasing reliance on patents after the laws' adoption.
[6] The sample includes 475 firms and 4,153 firm-year observations from these three states.

and Gordon (2011), Spulber (2013)) and the market valuations of innovative firms (e.g., Sundaram, John, and John (1996), Blundell, Griffith, and Van Reenen (1999), Gu (2016)). My paper provides new insights into how competition in IP from efficient product imitation can disincentivize investments in physical and intangible capital and sales and employment growth.[7]

A few related studies examine the role of strong IPR protection for investment. Fang, Lerner, and Wu (2017) show that state-owned enterprises in China increase their patenting activity after privatization, especially for firms located in cities with stronger IPR protection. Because ownership structures and IP laws differ materially between the U.S. and China, my evidence offers unique insight into the innovation policies of private U.S. firms. Qiu and Wang (2018) find that firms' SG&A expenses increase after the adoption of the Inevitable Disclosure Doctrine (IDD) and infer that strong knowledge protection leads to more investment.[8] However, limiting the scope of this inference, the IDD has been shown not to affect R&D and capital expenditures (Klasa et al. (2018)). My study presents systematic evidence showing how strong IPR protection incentivizes investment in each of these policies. Lastly, Suh (2022) finds that stronger firm-ownership of patents helps solve employee holdup problems and increases financial leverage, R&D, and patenting. My paper differs from hers in two important ways. First, the economic channel I identify is distinct, indicating that firms' incentives to invest and grow increase because strong IPR protection reduces the risk of product imitation. Second, instead of focusing on patent protection, my paper shows how an alternative IPR protection mechanism can also generate strong investment incentives. In this sense, my findings broadly add to studies that seek to understand whether the patent system is optimal for fostering innovation (e.g., Boldrin and Levine (2013)).

The remainder of this paper is organized as follows. Section 2 discusses the institutional background of the anti-plug molding laws. Section 3 describes the data, empirical design, and identification strategy. Section 4 reports the main findings and provides robustness checks. Section 5 investigates potential channels. Section 6 concludes.

[7] Other related studies examine the effect of competition arising from trade shocks and financial constraints on innovative firms' performance and investment policies (e.g., Hombert and Matray (2018), Grieser and Liu (2019)).
[8] The IDD increases IPR protection by reducing the mobility of workers with knowledge of trade secrets to rival firms.

2. Institutional Background

2.1. Reverse engineering and the direct molding process

There are two methods for engineering manufacturing products: forward engineering and reverse engineering. Forward engineering is the traditional process of progressing from high-level ideas to their material implementation. This usually includes the preparation of engineering drawings from which models and molds are formed with the end goal of mass production. In contrast, reverse engineering is the process of recreating a finished product without the original plans, drawings, models, or molds (Raja and Fernandes (2007)). Rather, the reverse engineer analyzes the design and components of the existing product to discover and extract its "know-how." In general, reverse engineering is a widely accepted tool for innovation. However, the incentives of forward engineers can be compromised if reverse engineering becomes a relatively costless and quick way to make a competing product (Samuelson and Scotchmer (2002)).

The "direct molding process" is a specific type of reverse engineering that provides an efficient way to duplicate manufacturing products (Brown (1986)). Direct molding uses a finished product as a "plug" to form a mold, upon which imitations of the original item can be manufactured. The typical process involves the reverse engineer spraying the existing product with a mold-forming substance (e.g., fiberglass) and then removing the original item and using the remaining mold to produce a replica product, which benefits imitators by allowing them to bypass the R&D, design, and manufacturing costs incurred by the originator (Sganga (1989), Devience (1990)).

2.2. Anti-plug molding laws

In October of 1978, California passed an anti-plug molding law prohibiting the duplication and sale of any product that could be made by the direct molding process. The law defines direct molding as "any process in which the original manufactured item was itself used as a plug for the making of the mold which is used to manufacture the duplicate item" (Cal. Bus. & Prof. Code § 17300[c]). Eleven other states followed, enacting similar laws to protect local consumers and manufacturers from plug molding reverse engineering. However, only Michigan and Tennessee adopted anti-plug molding laws identical to California's, which protect *all* manufacturing products (i.e., “all-item anti-plug molding laws”). The other nine states (Florida, Indiana, Kansas, Louisiana, Maryland, Mississippi, Missouri, North Carolina, and Wisconsin) passed laws only prohibiting plug molding of originally manufactured hulls and components of boats (e.g., Carstens (1990), Crockett (1990)). My study focuses on the all-item anti-plug molding laws and, (primarily) due to data limitations, only uses the boat-specific versions of the law for placebo tests.

In terms of jurisdictional scope, the history of court cases relating to anti-plug molding laws suggests that the relevant jurisdiction for firms filing lawsuits is generally the state where the plaintiff maintains its principal place of business (e.g., Althauser (1989)), which is typically interpreted as the firm’s headquarters state (e.g., Ribstein and Kobayashi (1996), Almeling et al. (2010)). As a result, anti-plug molding laws provide reverse engineering protection for a firm even when an accused duplicator is located in a different state that has not enacted the law. Panel A of Appendix Table A1 details the type and adoption date of each enacting state’s anti-plug molding law. The first state to adopt a law was California in 1978, and the last state to adopt it was Indiana in 1987. The number of states passing anti-plug molding laws in the interim period is fairly evenly distributed, with four passing laws in 1983, one in 1984, three in 1985, and two in 1986.[9]

2.3. Court decisions leading to the invalidation of the anti-plug molding laws

The constitutionality of California’s all-item anti-plug molding law was challenged in July of 1984 when Interpart Corporation filed a pre-emptive lawsuit against Imos Italia, Vitaloni, and Torino Industries seeking a determination of its rights to copy the defendants’ unpatented products (Shipley (1990)). Interpart admitted to using the direct molding process to copy the automobile rearview mirrors that were developed by Vitaloni for notable clients like Ferrari and Lamborghini and manufactured and sold by Italia and Torino (Devience (1990)). In response, Vitaloni applied

[9] Except for two legal studies that mention that lobbying may have influenced Florida’s boat-item anti-plug molding law, I am unable to find any other account of firms and trade associations lobbying for/against anti-plug molding laws. Per the legal studies: Samuelson and Scotchmer (2002, p.1593) infer that “some features of the Florida law suggest that it was the product of a rent-seeking special interest group,” and Aoki (2007, p. 976) concludes that “boat hull design companies that spent resources in designing new types of boat hulls had undoubtedly lobbied the Florida legislature to give them protection from plug-molding of boat hulls.”

and was granted a design patent for the mirrors and subsequently counter-sued Interpart for patent infringement and copying its mirrors using the prohibited direct molding process.

On July 30, 1984, the Central District Court of California ruled that Vitaloni's design patent was invalid because it had been granted more than one year since its initial sale to the public and that California's anti-plug molding law was preempted by federal patent law (Wong (1990)). The preemption ruling was based on the fact that under federal patent law, the "know-how" of an invention must be made public to receive protection from practices such as reverse engineering. In contrast, no such disclosure is required for protection under an anti-plug molding law. Vitaloni's appeal of the ruling was transferred to the Court of Appeals for the Federal Circuit, which has exclusive federal appellate jurisdiction in cases arising under patent law (Shipley (1990)).

In November of 1985, the Federal Circuit upheld the constitutionality of California's anti-plug molding law, reversing the District Court's decision and ruling that Interpart was guilty of copying products via the direct molding process. The Federal Circuit reasoned that the law was not "an obstacle to the accomplishment and execution of the full purposes and objectives of Congress" (Interpart Corp., 777 F.2d at 684) and, thus, not preempted by federal patent law. The Court stated that "[i]t is clear from the…statute that it does not give the creator of the product the right to exclude others from making, using, or selling, the product as does the patent law…The statute prevents…competitors from obtaining a product and using it as the 'plug' for making a mold. The statute does not prohibit copying the design of the product in any other way; the latter, if in the public domain, is free for anyone to make, use, or sell" (Interpart Corp., 777 F.2d at 684, 685).

Subsequent court cases invoking anti-plug molding law followed. However, the most significant of these cases was: *Bonito Boats* v. *Thunder Craft Boats*. In September of 1976, a Florida-based company, Bonito Boats, began developing, designing and manufacturing the "Bonito Boat Model 5VBR" recreational boat hull. The Model 5VBR was sold to a broad interstate market, but no patent applications on the hull were filed. Thunder Craft Boats, a boat manufacturer located in Tennessee, copied the Model 5VBR using the direct molding process and sold it as its own creation under the trade name "Capri" (Carstens (1990), Heald (1990)). In May of 1983, Florida adopted a boat-item anti-plug molding law prohibiting the direct molding process for duplicating boat hulls and their components. Roughly a year and a half later, on December 21, 1984, Bonito sued Thunder Craft for violating Florida's anti-plug molding law. However, the Orange County Circuit Court in charge of the case dismissed Bonito's suit, ruling that Florida's law was preempted by federal patent law. Bonito appealed to the Florida Supreme Court, and on November 12, 1987, the Court affirmed the circuit court's invalidation of the law (Wong (1990)).

Bonito petitioned the U.S. Supreme Court, requesting a resolution of the conflicting judgments of the Florida Supreme Court and the Federal Circuit in its case involving Interpart and Imos Italia. The U.S. Supreme Court granted Bonito's petition, hearing its appeal on December 8, 1988 (Shipley (1990)). Bonito argued that an anti-plug molding law does not afford the same level of protection as patents because the law only protects against direct molding reverse engineering. Further, Bonito asserted that the law was a legitimate exercise of Florida's authority to protect local business interests by regulating and discouraging unfair and "unscrupulous" competition (Carstens (1990)). However, on February 21, 1989, the U.S. Supreme Court affirmed the ruling of the Florida Supreme Court and rejected the Federal Circuit's decision in Interpart. The Supreme Court concluded that Florida's statute granted substantially similar rights to those given to a patentee by excluding competitors from making and selling products procured by the direct molding process. It further remarked that "the competitive reality of reverse engineering may act as a spur to the inventor, creating an incentive to develop inventions that meet the rigorous requirements of patentability" (Bonito Boats, 489 U.S. at 160). As a consequence, all states' anti-plug molding laws were ruled invalid.[10] Panel B of Appendix Table A1 summarizes these cases.

3. Data and Empirical Design

3.1. Sample selection and descriptive statistics

My main sample uses firm-level financial data from the CRSP/Compustat Merged database and the Peters and Taylor Total Q database (see Peters and Taylor (2017)), respectively, excluding firms that are headquartered or incorporated outside the U.S. and firm-year observations with

[10] Congress passed the Vessel Hull Design Protection Act in 1998, granting federal protection of boat hulls and their components from the direct molding process. However, it was too late for Bonito Boats, which shut down in 1990.

missing data for the main dependent variables. The sample begins in 1975, three years before the first state, California, adopts an all-item anti-plug molding law, and ends in 1992, three years after the U.S. Supreme Court invalidates the laws. I use location data from the legacy CRSP/Compustat Merged historical header information databases, which are mostly available beginning in 1994, to identify and backfill each firm's historical state of headquarters and incorporation.

I further restrict the sample to manufacturing firms (SIC codes 2000-3999) that, based on inspection of their 2-digit SIC code industries, are classifiable as firms that manufacture products that can be copied using the direct molding process and for which the all-item anti-plug molding laws are relevant. For example, firms that operate in the "Rubber and Miscellaneous Plastics Products" and "Transportation Equipment" industries are included in the sample because they make tangible products that can be duplicated using direct molding reverse engineering. In contrast, firms operating in the "Food and Kindred Products" and "Tobacco Products" industries do not make products that can be molded and are therefore excluded. Appendix Table A2 summarizes which 2-digit SIC code industries are included and excluded from the main sample.[11]

The resulting sample consists of 2,099 firms and 19,527 firm-year observations; however, I allow the total number of observations in the main regressions to vary by the dependent variable. Specific to the states that adopt an all-item anti-plug molding law (*All APML*), the sample includes 475 firms and 4,153 firm-years. I winsorize all continuous variables at the 1% level, and dollar values are adjusted for inflation using 1992 dollars. Table 1 presents summary statistics for the variables used in the main tests. Columns 1-5 are specific to the period 1975-1988 when the laws are enforceable. Columns 6-10 extend the sample to 1992 to include the years after the Supreme Court invalidates the laws. Appendix Table A3 provides variable definitions.

3.2. Empirical specification

I use a DiD estimator to compare changes in corporate investment and growth among firms located in states that adopt an all-item anti-plug molding law with firms located elsewhere. Specifically, I estimate the following regression:

[11] In the Internet Appendix, I show that the main results are robust to including all manufacturing firms.

$$Y_{ijlst+1} = \beta_1 All\ APML_{lt} + \gamma_1' X_{lst} + \gamma_2' Z_{ilBase\ t} \times Year_t + f_i + \omega_{jt} + \varepsilon_{ijlst}, \quad (1)$$

where *Y* is the dependent variable for firm *i*, operating in industry *j*, located in headquarters state *l*, incorporated in state *s*, in year *t+1*, and *All APML* is an indicator that equals one if state *l* has an all-item anti-plug molding law in effect by year *t*. I allow *All APML* to adjust for firms located in California as the legal validity of this law changes over time via the *Interpart* v. *Imos Italia* court case.[12] Two sets of controls, *X* and *Z*, are also specified. Controls in *X* include state law indicators for whether a firm's headquarters state passes the: IDD (*IDD*), Uniform Trade Secrets Act (*UTSA*), R&D tax credits (*R&D Tax Credit*), and wrongful discharge law exceptions (*Good Faith*, *Implied Contract*, *Public Policy*). Also contained in *X* is an index variable that ranges from zero to five and increases by one for each anti-takeover law passed in a firm's incorporation state (*ATP Index*). Including these controls helps isolate the effect of the all-item anti-plug molding laws on *Y* from other law adoptions during my sample period (Karpoff and Wittry (2018)).

The set of controls *Z* includes a firm's: headquarters state's per capita GDP growth rate to control for its local economic conditions (data comes from the U.S. Bureau of Economic Analysis); log of total assets to control for its size; book leverage to control for its financial leverage; and market-to-book ratio to control for its market valuation. However, a concern with including the controls in *Z* is that because they are endogenous, the adoption of an all-item anti-plug molding law could cause a change in the controls, rendering it impossible to infer whether the law caused a change in *Y* directly or if the laws' effect on the controls leads to the change in *Y* (Angrist and Pischke (2010)). I deal with this "bad control" problem in two ways. First, in every test, I estimate Equation 1 without any controls and with only the set of controls *X*. Second, when including the controls in *Z*, I hold them fixed in the year that the firm enters the sample (*Base t*) and interact them with year fixed effects. This approach allows me to circumvent the bad controls problem while still controlling for time shocks that could differentially affect firms of different endogenous characteristics (Bertrand and Mullainathan (2003)). In all specifications, I include firm fixed

[12] Specifically, *All APML* reverts to zero for firms located in California as of July 1984 (via the District Court's decision) and back to one as of November 1985 (via the Federal Circuit's decision).

effects (f) to control for unobserved, time-invariant differences within firms and 3-digit SIC industry-year fixed effects (ω) to control for time-varying differences within industries. Lastly, standard errors are adjusted for clustering at the state of headquarters level.

Further, because the Supreme Court eventually rejected the laws, I test for a reversal effect on investment and growth by estimating the following triple differences regression:

$$Y_{ijlst+1} = \beta_1 All\ APML_{lt} + \beta_2 Post\ 88_t \times All\ APML_{lt} + \gamma_1' X_{lst} + \gamma_2' Z_{ilBase\ t} \times Year_t + f_i + \omega_{jt} + \varepsilon_{ijlst}, \quad (2)$$

where the interacting variable, *Post 88*, is an indicator that equals one in 1989-1992, i.e., when the all-item anti-plug molding laws are invalid; its standalone term is omitted from Equation 2 because the industry-year fixed effects absorb it. All other terms are defined as before.

3.3. Identification strategy

I use the adoption and invalidation of all-item anti-plug molding laws to identify the effect of strong IPR protection on investment and growth. There are two key assumptions underlying my identification strategy. First, the passage and reversal of this law provide a relevant source of variation in IPR protection for firms in the adopting states. Second, if not for the laws' passage, the investment and growth rates of firms located inside and outside the adopting states would follow parallel trends. In the following subsections, I examine the validity of these assumptions.

3.3.1. Do all-item anti-plug molding laws substitute for patents?

In Table 2, I study the relevancy of all-item anti-plug molding laws for IPR protection by examining whether firms headquartered in enacting states change their patenting activity. IPR protection arising from the laws may offer a competitive advantage relative to patents because the laws do not require that the firm's IP be disclosed in order to receive protection, while with patent protection, a formal application to the USPTO that discloses the IP in a technically precise and standardized format is required. Another benefit of an all-item anti-plug molding law for firm-level IP is the term of protection. For an applicable product under the law, protection is indefinite and can be applied retroactively to the laws' adoption date, whereas during my sample period, the length of protection for a utility (design) patent is 17 (14) years from its grant date.

I use the following two measures to test the relation between all-item anti-plug molding laws and patenting activity. First, I use the natural logarithm of one plus the number of patents a firm applies for and is eventually granted in a given year to measure its quantity of patents. Second, as a measure of the overall quality of patents, I use the natural logarithm of one plus the total number of citations that a firm's patents receive. Data for these measures comes from Noah Stoffman's website (Kogan et al. (2017)).[13] Following prior work, I lead these measures by two years because this is the average time it takes to obtain a patent (e.g., Fang, Tian, and Tice (2014)).

Panel A (B) of Table 2 presents the findings using patent counts (citations) as the dependent variable. The first three columns of both Panels report results estimating variations of Equation 1 over the sample period 1975-1988, while the last three columns tabulate the results estimating variants of Equation 2 over the period 1975-1992. In the first two regressions for each measure of patenting activity (Columns 1 and 4 of both panels), I include the all-item anti-plug molding indicator and firm and industry-year fixed effects. In the second set of regressions (Columns 2 and 5), I add the state law controls *X*. The last two regressions for each dependent variable (Columns 3 and 6) further add the control set *Z* that is fixed in a firm's base year and interacted with year fixed effects. Columns 4-6 also include the interaction of the all-item anti-plug molding law indicator with a dummy for whether the sample year occurs after 1988.

Starting with patent counts, Panel A of Table 2 shows that the firms located in states that pass all-item anti-plug molding laws decrease their quantity of patents following the laws' adoption. Depending on the specification and sample period analyzed, the coefficients on the all-item anti-plug molding law indicator in each of the six columns imply that the dependent variable decreases significantly between 3.1% to 4.5% (=exp(-0.031 or -0.046)-1) after the passage of the law. Relative to its sample mean (not log-transformed) of 7.13 over the full sample period, this represents a decrease in the firm's quantity of patents from 3.5% to 5.1% (=(0.031 or 0.045)×((1+7.13)/7.13)). However, after the laws and the IPR protection they provide are invalidated by the Supreme Court, firms headquartered in these states begin patenting again. The

[13] This data set provides information on all granted patent applications by the USPTO between 1926 and 2010. https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-Growth-Replication-Kit.

coefficients in Columns 4-6 on the interaction term range from 0.099 to 0.126, implying that firms increase their patent applications (not log-transformed) by 11.9% to 15.3% (=(0.104 or 0.134)×(8.13/7.13)), relative to its sample mean following the laws' reversal.

Moving to the results using patent citations, Panel B of Table 2 shows that firms in the all-item anti-plug molding law states also decrease their quality of patents after the passage of the laws. Across the varying specifications and sample periods, all six of the columns report a negative and significant coefficient on the all-item anti-plug molding law indicator that ranges from -0.036 to -0.050, implying a decrease in the dependent variable of 3.5% to 4.9% (=exp(-0.036 or -0.050)-1). Given that the sample mean of patent citations (not log-transformed) is 16.15 over the full period, this suggests that the number of citations that a firm's patents receive decreases by 3.8% to 5.2% ((0.035 or 0.049)×(17.15/16.15)) after the laws' passage. Conversely, when the IPR protection stemming from these laws is lost following the Supreme Court's ruling, firms in adopting states increase the quality of their patents. Columns 4-6 show that the natural logarithm of one plus total patent citations for firms in all-item anti-plug molding law states increase by 12.2% to 14.3% (=exp(0.115 or 0.134)-1) after the laws are overturned.[14]

Overall, the results in Table 2 suggest that the all-item anti-plug molding laws matter for the patenting activity of firms located in the enacting states, consistent with the laws providing at least a partial substitute for patents and a relevant source of variation in IPR protection for these firms.

3.3.2. What determines the adoption of the all-item anti-plug molding law?

Next, I examine the predictability of the passage of the all-item anti-plug molding laws. A concern with the parallel trends assumption underlying my identification strategy is that other state-level factors drive the adoption of these laws and the changes in firm-level policies. For instance, if the motivation for the laws' passage stems from these states' economies experiencing slow growth, then any positive trends in firm-level investment or growth could reflect mean

[14] Internet Appendix Table IA1 shows that the results are robust to leading the patent measures by one or three years. Internet Appendix Table IA2 shows that the conclusions from Table 2 are similar using a third measure of patenting activity, the market value of a firm's patents (Kogan et al. (2017)).

reversion in economic activity (e.g., the local economy strengthens, and this improves the local firms' investment opportunities). Additionally, if adopting an all-item anti-plug molding law is predictable (perhaps because of the lobbying efforts of local firms), then firms could anticipate the change in IPR protection and adjust their policies before the passage of the law.

Following the prior literature, I estimate a state-level determinants model of the decision to adopt an all-item anti-plug molding law to test whether the timing of its passage is a function of local economic and political factors (e.g., Acharya, Baghai, and Subramanian (2014)). I estimate linear probability models for all regressions because my preferred specification includes state and year fixed effects, and including these fixed effects in a Cox proportional hazard, logit, or probit model could introduce an "incidental parameters" bias (Allison (2009)). The sample period is 1975 to 1988, and states are excluded from the analysis after they enact a law. I standardize all continuous variables to have a mean of zero and a standard deviation of one. All predictor variables are measured in the year *t*-1 relative to the laws' passage.

Table 3 presents the findings. Columns 1-2 show that the adoption of an all-item anti-plug molding law is not determined by the preexisting state-level patenting, investment, or growth activities of the firms that are headquartered in those states (measured by the median value of patents, citations, capital expenditures, intangible expenditures, sales growth, and employment growth, respectively, for all firms in a state in a given year). The adjusted R^2 in each column is also low at 0.7%. Adding state fixed effects in the next two columns does not change the significance of the modeled determinants, but the adjusted R^2 values increase to roughly 10%. The last two columns add controls for other local economic, political, and legal factors, such as the natural logarithm of a state's per capita GDP, one-year per capita GDP growth, the "political balance" of a state's representation in the U.S. House of Representatives (measured as the percentage of a state's Congress members that are Democrat), and indicators for whether the state has passed the IDD, UTSA, R&D tax credits, and the good faith, implied contract, and public policy at will employment exceptions. None of these additional variables significantly predict the adoption of an all-item anti-plug molding law, and the adjusted R^2 levels remain at around 10%.

Overall, Table 3 indicates that these potentially confounding state-level factors do not determine the adoption of these laws and that their passage should be mostly unanticipated by firms.

3.3.3. Is the invalidation of the all-item anti-plug molding laws predictable?

Similar to the adoption of an all-item anti-plug molding law, there is the concern that the Supreme Court's ruling that overturned the law was not an exogenous event. For instance, the firms in those states could have anticipated the resulting loss in IPR protection and adjusted their policies beforehand. I address this concern by employing a short-run event study around the Court's decision, testing if capital markets already incorporated the news that the laws were going to be overturned or if the stock prices of the firms headquartered in those states reacted to the announcement of the ruling (e.g., Serfling (2016)). Table 4 shows the results.

I study the abnormal stock returns around the Supreme Court's decision on February 21, 1989, of the firms headquartered in states that adopt all-item anti-plug molding laws. In the first two columns, cumulative abnormal returns (CARs) are estimated using the three-factor model, while the last two columns use the four-factor model (Fama and French (1993), Carhart (1997)). The odd-numbered columns use an equally-weighted market index, and the even-numbered columns employ a value-weighted market index. The regression parameters are estimated over the trading window [-280,-61] relative to the Supreme Court's ruling date. I adjust the standard errors for a cross-sectional correlation bias following the approach in Kolari and Pynnönen (2010) because all firms located in the all-item anti-plug molding law states will be affected by the same event on the same announcement day (i.e., the Supreme Court's ruling is not independent across these firms).

The results in Table 4 show that the CARs estimated using either the three- or four-factor model and an equally-weighted or value-weighted market index are negative but statistically insignificant in the pre-announcement periods of [-30,-4] and [-20,-4]. Conversely, over the event window [-3,+2], the estimated CARs are negative and statistically significant at the 5% level, ranging from -0.94% to -1.04%, consistent with the ruling being a relative surprise to capital markets and the firms located in the enacting states.

4. Main Results

4.1. Does strong IPR protection foster corporate investment?

I investigate whether strengthening IPR protection from the adoption of all-item anti-plug molding laws leads to changes in corporate investment. Following prior work, I measure investment in two ways (e.g., Peters and Taylor (2017), Hombert and Matray (2018)). First, in Panel A of Table 5, I use capital expenditures scaled by one-year lagged fixed assets to measure a firm's investment in physical capital. Second, in Panel B of Table 5, I use R&D expenditures plus 0.3 multiplied by SG&A expenses normalized by one-year lagged total capital to measure a firm's investment in intangible capital. SG&A is multiplied by 0.3, following the assumption that only 30% of this expense represents an investment in intangible capital (Eisfeldt and Papanikolaou (2014)). Both measures are led by one year to account for the possible lag between the laws' passage and the change in investment.

For both dependent variables, the first three columns in each panel estimate Equation 1 during the sample period 1975-1988, while in the last three columns, Equation 2 is estimated over the period 1975-1992. In Columns 1 and 4, I include an indicator for whether a firm's state of headquarters adopts an all-item anti-plug molding law and firm and industry-year fixed effects. Columns 2 and 5 add the variables in X to control for the effect of other law adoptions on investment and growth during my sample period. Columns 3 and 6 further append the endogenous base year state- and firm-level controls in Z that are interacted with year dummies. The last three columns also include the interaction of the all-item anti-plug molding law indicator with an indicator for whether the sample year is after 1988.

Beginning in Panel A of Table 5, each of the coefficients on the all-item anti-plug molding law indicator suggests that the strong IPR protection arising from the laws leads to increases in physical capital investments by the firms located in the enacting states. In particular, all six-point estimates are positive and statistically significant at the 1% level, ranging from 0.032 to 0.043. Given that the mean ratio of capital expenditures to fixed assets is 34% over the full sample, this effect results in a 9.4% to 12.6% increase in capital expenditures. However, the differential increase in investment only occurs while these laws are in force, whereas after the Supreme Court strikes them down, firms headquartered in the enacting states decrease their rate of capital expenditures to fixed assets. Columns 4-6 show that the coefficients on the interaction of the all-item anti-plug molding law and post-1988 indicators range from -0.053 to -0.059 and are statistically significant at the 1% level. These results imply that the capital expenditures of firms in the adopting states decrease by 15.6% to 17.4% of fixed assets after the laws' invalidation, relative to its sample mean.

Panel B of Table 5 tells a similar story for investments in intangible capital. When the all-item anti-plug molding laws are in effect, firms headquartered in the enacting states increase their intangible expenditures on average by 0.009 to 0.012 percentage points, significant across all six columns at the 1% level. Given that the sample mean of the ratio of intangible expenditures to total capital is 22%, this finding represents a relative increase in the investment rates in intangible capital from 4.1% to 5.5%. Conversely, after 1988, when the laws no longer provided IPR protection, firms in the adopting states reduced their rate of intangible expenditures to total capital. Depending on the specification, the coefficient on the interaction of the all-item anti-plug molding law indicator with the indicator for whether the sample year follows the Supreme Court's ruling ranges between -0.014 and -0.020; although the statistical significance of the point estimates gradually weakens from the 1% level to the 10% level when the full set of controls are included. In terms of economic significance, these results indicate that the firms headquartered in the adopting states decrease their intangible expenditures by 6.4% to 9.1% of total capital after the laws are overturned, relative to its mean over the full sample.

4.2. Does strong IPR protection spur firm growth?

Next, I assess whether strengthened IPR protection arising from the passage of an all-item anti-plug molding law affects firm growth. I measure growth in two ways, using either a firm's one-year sales growth rate or its one-year employment growth rate respectively (e.g., Hombert and Matray (2018), Bai, Fairhurst, and Serfling (2020)). Both dependent variables are led by one year because the adoption of the law may affect growth with a lag. Panel A (B) of Table 6 reports the results using sales (employment) growth as the dependent variable. As in the prior table, the first (last) three columns of each panel estimate Equation 1 (2) over the period 1975-1988 (1992).

Columns 1 and 4 of Panel A show that the coefficient on the all-item anti-plug molding law indicator is negative and statistically significant at the 1% level. The point estimates from these models that only include controls for firm and industry-year fixed effects range from 0.037 to 0.042. Adding controls for relevant state laws adopted during the sample period in Columns 2 and 5 increases the magnitude of the range of the coefficients to 0.040-0.043. In Columns 3 and 6, including the set of endogenous base year state- and firm-level controls and their interaction with year dummies, further increase the point estimate magnitudes, ranging from 0.042 to 0.046. These findings suggest that the adoption of the all-item anti-plug molding laws leads to an increase in sales growth between 9.5% to 11.8%, relative to its full sample standard deviation of 39%.[15] However, during the sample period when the laws are invalidated, firms headquartered in the enacting states experience significant declines in their sales growth rate. The point estimates on the interaction variable in Columns 4-6 imply a 0.038 to 0.044 percentage point reduction in sales growth following the reversal of the laws. Relative to its standard deviation, this amounts to a reduction in sales growth between 9.7% and 11.3%.

In Panel B of Table 6, the results show that these firms also experience increases in employment growth when the all-item anti-plug molding laws are valid. Across the six columns, the coefficient on the all-item anti-plug molding law indicator is positive and statistically significant at the 1% level. In particular, the point estimates suggest that the adoption of the law leads to increases in employment growth on average between 0.022 and 0.031 percentage points. Given that the full sample standard deviation of employment growth is 28%, this implies a relative increase in the employment growth rate from 7.9% to 11.1%. In contrast, when the laws are struck down, and the stronger IPR protection is lost, the employment growth rates of these firms decrease on average by 0.020 to 0.021 percentage points (Columns 4-6); however, the statistical significance of these estimates weakens from the 1% level to the 10% level when the full set of

[15] I use the sample standard deviation of sales (and employment) growth instead of its mean when interpreting the economic magnitude of the effect of the all-item anti-plug molding law because sales (and employment) growth can take negative values. For completeness, interpreting the change in sales growth relative to its sample mean of 15% implies that firms located in the all-item-adopting states experience relative sales growth increases of 24.7% to 30.1%; these magnitudes are comparable to estimates in prior work (e.g., Bai, Fairhurst, and Serfling (2020)).

controls are added. Relative to its standard deviation, these findings suggest that employment growth rates decline by 7.1% to 7.5% following the laws' invalidation.[16]

4.3. Cross-sectional variation in the effect of strong IPR protection: Innovative vs. copycat firms

Before examining the robustness of the main results, I investigate whether the strong IPR protection from an all-item anti-plug molding law differentially benefits the investment and growth rates of firms with a greater innovative ability ("innovators"). I measure a firm's innovative ability using research quotient (RQ) from Knott (2008). RQ estimates the output elasticity of R&D (i.e., how efficient are firms at converting their R&D expenditure into sales revenue). Prior work shows that RQ captures information beyond traditional measures of innovation (e.g., R&D, patenting) and that it correlates positively with firm value (Cooper, Knott, and Yang (2022)).

I categorize firms as having endogenously low innovative ability using the indicator *Low RQ*, which equals one if a firm's RQ during its sample base year is below the sample median-base year RQ and zero otherwise. I then interact *Low RQ* with the indicator for the all-item anti-plug molding law. Thus, the coefficient on the standalone law indicator represents the effect of strong IPR protection for the firms that are more likely to be innovators, and its interaction with the low RQ indicator is the heterogeneous effect of the law for firms with less innovative ability, which may be more likely to copy products via plug molding ("copycats"). Table 7 presents the results.

Panel A estimates Equation 1 from 1975 to 1988, while Panel B employs Equation 2 and extends the sample period to 1992. The first four columns of each panel specify physical and intangible capital investment, and the last four use sales and employment growth. The coefficient estimates on the all-item anti-plug molding law indicator and its interaction with *Low RQ* in either panel indicate that firms with higher levels of innovative ability show significantly higher rates of investment and growth, whereas firms with less innovative ability do not. Focusing on the

[16] The economic magnitude of the effect of all-item anti-plug molding laws on employment (and sales) growth relative to its standard deviation also compares similarly to the magnitudes for physical and intangible capital investment. When the law provides IPR protection, firms increase their investment in physical (intangible) capital by 8.2% to 11.0% (6.0% to 8.0%) of its standard deviation, whereas after the protection is lost, investment rates decrease by 13.6% to 15.1% (9.3% to 13.3%) of its standard deviation.

interaction terms with the *Post 88* indicator in Panel B, the estimates suggest that firms of high innovative ability experience significant declines in investment and growth after the laws are invalidated, while the coefficients for firms of low innovative ability that regain the right to copy products using the direct molding process are always positive and, in a few cases, significantly so (Columns 2, 4, and 8). Overall, the results from Table 7 are consistent with the intuition that an all-item anti-plug molding law should differentially benefit innovative firms.

4.4. Robustness tests

To examine the robustness of the main results, I conduct several additional analyses. All of the results in this section are reported in the Internet Appendix.

First, instead of relying on the assumption that a firm's headquarters state is its principal place of business when constructing the *All APML* indicator variable, I take a different approach in Table IA3 and create a weighted average of this indicator (*Weighted All APML*), where the weights represent the distribution of a firm's operations across states (Bena, Ortiz-Molina, and Simintzi (2022)). Data for the weights come from Garcia and Norli (2012) and is based on the frequency in which a firm mentions each state in its Form 10-K when describing its business operations. Using the earliest firm-year available in this data, I backfill the weights in my sample and re-estimate the main regressions over the sample period 1975-1992. The results continue to show significant increases in investment and firm growth when an all-item anti-plug molding law is in effect and significant decreases after the Supreme Court invalidates the law.

Second, in Table IA4, I show that the results in Table 5 are robust to using alternative investment measures. In particular, I continue to find that corporate investment increases following the adoption of an all-item anti-plug molding law when it is defined as (1) capital expenditures normalized by one-year lagged total capital, (2) capital expenditures plus R&D expenditures plus 0.3 multiplied by SG&A expenses all scaled by one-year lagged total capital, (3) R&D expenditures divided by one-year lagged sales, (4) SG&A expenses scaled by one-year lagged sales, and (5) advertising expenses normalized by one-year lagged sales. These increases in investment also dissipate after the Supreme Court's ruling.

Third, I specify additional fixed effects to Equations 1 and 2 and re-run the main analyses. I include firm age fixed effects, measured as the number of years a firm has been in Compustat, headquarters state fixed effects to control for time-invariant local heterogeneity, and incorporation state fixed effects to control for time-invariant heterogeneity within the firm's state of incorporation. Table IA5 shows that the main findings are robust to this alternative specification.

Fourth, in Table IA6, I include the additional control variables (defined in the Table's caption): *Political Balance*, *Ln(Age)*, *Cash Holdings*, *Cash Flow*, and modified Altman's *Z Score*. The main results continue to hold. And finally, I use an alternative sample consisting of all firms in the manufacturing sector. Table IA7 shows that the main conclusions are robust in this sample.

4.4. Threats to identification

In Section 3, I describe the two main assumptions underlying my identification strategy and provide evidence supporting the validity of those assumptions. For instance, Table 3 shows that many relevant economic, political, and legal factors do not predict whether a state adopts an all-item anti-plug molding law, consistent with its adoption being mostly unanticipated by local firms. However, even if these firms do not anticipate the passage of the law, there is still a concern that their policies start to change before it is passed and would have taken place regardless, i.e., the parallel trends assumption is violated. Another potential concern is that because a limited number of states adopt an all-item anti-plug molding law, omitted variables that correlate with its passage and the dependent variables could drive the post-adoption trend differences. Finally, a recent literature shows that estimates from DiD models with variation in "treatment" timing and effects can be biased (e.g., Baker, Larcker, and Wang (2022)), which could be a concern for my setting that exploits the staggered treatment of firms by the all-item anti-plug molding law. In this section, I examine the seriousness of these concerns for my identification strategy.

4.4.1. Timing of changes in patenting, investment, and growth

Table 8 explores the concern that there are preexisting trends in the patenting, investment, and growth of firms located in all-item anti-plug molding law-enacting states. I estimate Equation 1 over the sample period 1975-1988 but replace the all-item anti-plug molding law indicator with dummy variables that indicate a firm's state will pass this law in either two (*-2*) or one (*-1*) years, respectively, or that indicate that the law was passed in the current year (*0*), or one (*1*), two (*2*), three (*3*), or four or more (*4+*) years ago, respectively. Thus, for the parallel trends assumption to hold, only the coefficients on the variables that indicate the law is in effect (*0-4+*) should be significant, whereas the assumption is violated if the coefficients on the variables indicating the laws will be passed at a future date (*-1* and *-2*) are significant. For brevity, I report the results including the full set of control variables, but the findings (unreported) are similar when controlling for only firm and industry-year fixed effects or the fixed effects and state law controls.

Columns 1 and 2 show no preexisting trends in the quantity and quality of patents of the firms headquartered in the enacting states. The coefficients on the variables that indicate a law will be passed in one or two years are always statistically insignificant. However, in Column 1, for example, the point estimates on the variables indicating that the law was passed in the current year and one, two, and three years ago are significantly negative, suggesting that the patent counts of these firms started to decrease strictly in the period when the laws are in effect. Column 2 shows patent citations also only significantly decrease in the year of and three years after the law is passed. The point estimates in Columns 3 and 4 indicate that there are no preexisting trends in investment activity. For physical capital expenditures, significantly positive increases happen in the two and three years after the adoption of an all-item anti-plug molding law, while for intangible capital expenditures, firms in the enacting states significantly increase their investments two years after the laws are passed. Lastly, Columns 5 and 6 show that the sales and employment growth rates of firms located in adopting states also only increase after the laws are passed and not before. In particular, Column 5 indicates that sales growth increases significantly in the one, two, and three years after the law is adopted, and Column 6 shows employment growth rises significantly in the year of and three years after the adoption of the law.

4.4.2. Placebo tests

Next, I investigate the concern that omitted variables that correlate with the timing of the adoption of an all-item anti-plug molding law and the dependent variables, drive my results. Two unique features of my setting help to address this concern. First, the identification strategy is enriched by the Supreme Court's invalidation of the law, as it provides a counter-effect to its adoption. Thus, a scenario in which omitted variables significantly correlate with the timing of the passage of an all-item anti-plug molding law and the dependent variables in one direction and then also significantly correlate with the timing of the Supreme Court's ruling and the dependent variables in the opposite direction seems unlikely.

A second unique feature of my identification strategy is that both the all-item and boat-item anti-plug molding laws provide protection only to firms that have products that can be copied via the direct molding process, whereas the laws should not be relevant for the firms in those states that do not manufacture the protected products. I exploit this feature in placebo tests to show that firms located in the all-item and boat-item enacting states that should not be affected by the laws do not change their patenting, investment, and growth policies. The idea behind these tests is that if some local omitted variables are confounding my results by driving the adoption of the laws and the changes in the outcomes, they should impact *all* firms located in the state and not be exclusive to the firms that make products that are protected by the laws. Table 9 shows the findings from these tests for the placebo firms that locate in states with an anti-plug molding law that protects all items (Panel A) and boat items (Panel B), respectively.

In Panel A of Table 9, I compare the effect of an all-item anti-plug molding law on firms that operate in industries that do not make "moldable" products with similar firms located elsewhere. Firms operating in the "Agriculture, Forest, Fishing," "Wholesale Trade-Nondurable Goods," and most "Services" industries (SIC codes: 01-09, 51, 72, 79-86, 88-89) are identified as definitively not producing moldable products. I find no significant changes in the patenting, investment, or growth of the firms that do not make moldable products.[17]

[17] For brevity, Table 9 reports estimations of Equation 1 over the sample period 1975-1988 with all controls and fixed effects specified; however, the results (unreported) are similar using Equation 1 with controls for the fixed effects only or controls for the fixed effects and state laws. Internet Appendix Table IA8 shows the results estimating Equation 2 over the sample period 1975-1992.

Panel B of Table 9 exploits the adoption of boat-item anti-plug molding laws. Nearly every firm in my sample (of publicly traded firms) does not make boat-related products; seven firms in the sample are clearly identifiable as boat manufacturers, and, of the seven, only three locate in states that pass this law. I create an indicator *Boat APML* by setting it equal to one after a firm's headquarters state adopts a boat-item anti-plug molding law and zero otherwise. I repeat the analyses from Panel A, including the *Boat APML* indicator and excluding states that pass all-item anti-plug molding laws. For each dependent variable, the coefficients on *Boat APML* are insignificant and often opposite in sign of those on the all-item anti-plug molding law indicator. Overall, the results in Table 9 are inconsistent with local omitted variables driving my findings.

4.4.3. Heterogeneous treatment effects

Recent studies find that the canonical DiD estimator with two-way fixed effects can be biased when there is variation in treatment timing and effects (e.g., De Chaisemartin and d'Haultfoeuille (2020)). This could be problematic for my setting that exploits the staggered treatment of firms by state and time depending on if and when its headquarters state adopts an all-item anti-plug molding law. Specifically, the estimates from the DiD models that I employ are weighted averages of the estimates of four possible comparisons (Goodman-Bacon (2021)): (i) firms located in all-item anti-plug molding law states ("treatment") with firms located elsewhere ("never treated"), (ii) firms located in states that adopt the law early in the sample period ("earlier group treatment") with firms from later in the sample period that are located in states without the law ("later group control"), (iii) firms located in states that adopt the law later in the sample period ("later group treatment") with firms from earlier in the sample period that are located in states without the law ("earlier group control"), and (iv) firms located in states that are adopting the law (treatment) with firms located in states that previously adopted the law ("already treated"). This last comparison group can create a bias in the weighted average estimator if the treatment effect is dynamic; hence, this is typically referred to as a "bad" or "forbidden" comparison. In this situation, staggered DiD models can yield estimates that are the opposite sign of the true treatment effect.

Following Goodman-Bacon (2021), I decompose the weighted average DiD estimator from my findings on patents, investment, and growth over the period 1975 to 1988 to assess whether "treatment effect heterogeneity" is problematic in my setting. I use the "ddtiming" command in Stata to obtain the weights and DiD estimates for each of the four comparison groups. A caveat to the analysis is that because this approach assumes a balanced panel dataset, I adjust Equation 1 to include only firm and year fixed effects because including higher dimensional fixed effects typically increases the "unbalance" of a panel dataset (e.g., due to the exclusion of singleton observations). Figure 1 plots the results, with Panel A (B) specific to the effect of an all-item anti-plug molding law on patenting (investment), and Panel C showing the effect on firm growth.

The weights across the four comparisons in each of the three panels indicate that nearly 90% of the weighted average DiD estimates come from comparisons between the "Treatment" and "Never Treated" firms, which are the least susceptible to bias from (dynamic) heterogenous treatment effects (Baker, Larcker, and Wang (2022)). Conversely, the bad comparison group of "Treatment vs. Already Treated" accounts for less than 10% of the weight, and the remaining two groups ("Earlier Group Treatment vs. Later Group Control" and "Later Group Treatment vs. Earlier Group Control") contribute roughly 1% each. Moreover, all of the DiD estimates from the "Treatment vs. Never Treated," "Treatment vs. Already Treated," and "Later Group Treatment vs. Earlier Group Control" comparisons are the same sign as the weighted average effect. Five of the six estimates from the "Earlier Group Treatment vs. Later Group Control" also align in sign with the overall estimator with the one exception shown in the *Sales Growth* plot in Panel C, but its impact on the weighted average estimate is trivial (= 1% × -0.001).

Figure 1 suggests that my estimates are unlikely to be significantly biased by (dynamic) heterogeneity in treatment effects. Nevertheless, as an additional check, I implement a version of the stacked DiD regression approach. As shown in Figure 1, a benefit of my setting having only a few states that adopt an all-item anti-plug molding law is that the control firms used for the counterfactual comparisons mainly come from states that never adopt the law. This makes it relatively straightforward to exclude firms that were treated earlier in the sample from being used as comparisons for later treatment firms. In particular, California adopted the law in 1978, and

Michigan and Tennessee adopted it in 1983. Therefore, I exclude firms located in California after 1983 and re-estimate the regressions from Tables 2, 5, and 6 over the period 1975-1988. Thus, the average treatment effect is estimated over the same number of post-adoption years for all firms located in all-item law-enacting states, and only firms without laws (not treated) at the time of comparison are used as "control" firms in the estimates. Additionally, using this approach, I dummy out the *All APML* indicator by year relative to the adoption of the law to plot the timing of its effect on patenting, investment, and growth, using the year before its adoption (*t*-1) as the reference year. Figure 2 shows the findings.

In Panel A (B) of Figure 2, the regressions use the patenting (investment) outcomes, and Panel C specifies measures of firm growth. All the regressions in Figure 2 employ Equation 1 with all controls and firm and industry-year fixed effects; the results (unreported) are similar, controlling only for the fixed effects or the fixed effects and other state laws. Each of the three panels shows that my results on patenting, investment, and growth are robust to this alternative approach that excludes post-adoption comparisons with "Already Treated" firms and that there are no significant changes in the outcomes before the laws are passed. In sum, these findings are inconsistent with the results being materially biased by treatment effect heterogeneity.

5. Potential Channels

My results indicate that strong IPR protection fosters investment and facilitates growth. Two economic channels could explain these findings. First, if the IPR protection from an all-item anti-plug molding law makes it costlier for competitors to imitate products, then firms located in the enacting states might have greater incentives to invest and grow following its adoption. Thus, if an increase in incentives from a reduction in competition is a channel that drives my results, I would expect to find that firms in states with these laws are more likely to have increases in investments and growth if they operate in more competitive industries, where the risk of product imitation is high. Moreover, if strong IPR protection from the law reduces competition, then firms located in the enacting states should be able to appropriate more of the rents from their investments and earn higher profits. Second, if strong IPR protection makes it easier for firms to raise financing (because their IP is safer and, thus, their financial risk is lower), then the increases in investment and growth after the law is adopted should be greater for firms that benefit more from having better access to capital. In this section, I examine whether these channels explain the main results.

5.1. The reduced product market competition channel

I first investigate whether the increases in investment and growth following the adoption of an all-item anti-plug molding law are due to strong IPR protection increasing firms' incentives by reducing product market competition. My first test of this channel analyzes the heterogenous effect of stronger protection for firms operating in more competitive industries. Following prior work, I measure competition using the Herfindahl-Hirschman Index (*HHI*), defined as the sum of squared market shares for all firms in a 3-digit SIC code industry, where the market share of a firm is measured as the value of its sales divided by the total value of sales in its industry (e.g., Gu (2016)). To split industries based on their intensity of competition, I create the indicator *High HHI* that equals one if a firm's respective HHI is above the sample median and zero otherwise. I then interact the high HHI indicator with the all-item anti-plug molding law indicator. Thus, the coefficient on the *All APML* indicator represents the effect of stronger IPR protection for firms in more competitive industries, and its interaction with the high HHI indicator is the heterogeneous effect of the law for firms operating in industries with less competition. However, because HHI is endogenous, in my preferred specification, I define the high HHI indicator based on whether the firm's base year level of HHI exceeds the sample median-base year HHI. The Internet Appendix shows that conclusions are similar using one-year lagged HHI (see Table IA9).

Table 10 presents the results estimating Equation 1 with the interaction of the high HHI and all-item anti-plug molding law indicators from 1975-1988.[18] The odd(even)-numbered columns exclude (include) all controls besides (and) firm and industry-year fixed effects. Starting in Columns 1 and 2, the coefficients on the all-item anti-plug molding law indicator suggest that firms in more competitive industries increase their investment in capital expenditures to fixed assets by 0.056 to 0.064 percentage points following the laws' adoption. Conversely, the point

[18] Internet Appendix Table IA10 reports the results using Equation 2 and the sample period 1975-1992.

estimate range of -0.083 to -0.092 on its interaction with the high HHI indicator implies that firms operating in industries with weaker competition do not increase these investments after the laws are adopted, i.e., the total effect ranges from -0.019 to -0.036 percentage points. Columns 3 and 4 show similar findings for intangible expenditures, as only the firms headquartered in the adopting states and facing higher levels of industry competition increase their investments in intangible capital after the laws are passed. The last four columns present similar evidence for sales and employment growth. For example, in Column 6, firms located in the enacting states and facing higher levels of competition experience a 0.058 percentage point increase in sales growth, while the firms facing weaker competition do not, i.e., a total effect of -0.005 percentage points.

In a second test of the channel that reduced competition increases investment and growth, I analyze whether the strong IPR protection from an all-item anti-plug molding law enables the protected firms to appropriate more rents and generate higher profits. I measure profitability in year t+1 in the following four ways: (1) operating income scaled by one-year lagged assets (*Return on Assets*), (2) the ratio of net income to one-year lagged common equity (*Return on Equity*), (3) sales minus the cost of goods sold scaled by one-year lagged sales (*Gross Profit Margin*), and (4) an indicator set to one if net income is negative (*Net Income Loss*). Table 11 presents the results.

The odd(even)-numbered columns of Table 11 estimate Equation 1 (2) over the sample period 1975 to 1988 (1992). Columns 1 and 2 show that stronger IPR protection is associated with higher returns on assets after the adoption of an all-item anti-plug molding law. Relative to its full sample mean of 11.9%, the respective coefficients of 0.010 and 0.011 suggest that firms headquartered in a state that adopts this law experience a relative increase in their return on assets of 8.4% to 9.2%. Conversely, the point estimate on *All APML × Post 88* in Column 2 implies that *Return on Assets* significantly decreases by 12.6% relative to its sample mean after the IPR protection is lost. Columns 3-6 indicate similar results for returns on equity and gross profit margins, and Columns 7 and 8 show that firms located in a state with an all-item anti-plug molding law are about 3.0% less (more) likely to have negative net income after the law is adopted (invalidated).[19]

[19] Providing additional evidence in support of increasing market power, Internet Appendix Table IA11 shows that the all-item anti-plug molding laws are positively associated with measures of firm value.

Overall, the results in Tables 10-11 are consistent with the view that strong IPR protection incentivizes investment and growth by reducing the competitive threat of product imitation.

5.2. The better access to capital channel

Finally, I explore whether the increases in investment and firm growth following the passage of an all-item anti-plug molding law are also explained by strong IPR protection improving firms' access to financing. Following prior work, I identify firms that should benefit more from better access to capital based on their dependence on external finance and financial constraints (e.g., Farre-Mensa and Ljungqvist (2016), Bai, Fairhurst, and Serfling (2020)).

Dependence on external finance is measured as a firm's capital expenditures minus its cash flows from operations scaled by its capital expenditures (Rajan and Zingales (1998)), where operating cash flows are calculated following Byoun (2008). From this, I create an indicator that equals one if the firm's capital expenditures surpass its operating cash flows in its base year. To measure financial constraints, I use three indicators based on a single firm characteristic and three based on multiple characteristics. The following indicators are based on a single characteristic and set to one if in the firm's base year its: (1) book value of assets is below the sample median-base year book value of assets (*Small Firm*), (2) age is below the sample median-base year age (*Young Firm*), and (3) common dividend is zero (*Non-Dividend Firm*). The last three indicators are based on the indices proposed in Kaplan and Zingales (1997), Whited and Wu (2006), and Hadlock and Pierce (2010) and are set to one if a firm's base-year value of the respective index is above the sample median-base year value of that index. Table 12 shows the results.

Panel A estimates Equation 1 using capital expenditures as the dependent variable and the sample period 1975-1988. These estimations include the interaction of the "high financial constraints" (*High FC*) indicators with the all-item anti-plug molding law indicator.[20] The coefficients on the interaction term in Panel A imply limited support for the "better access to capital" channel. Only two of the seven-point estimates are positive and statistically significant. This suggests that the strong IPR protection from an all-item anti-plug molding law does not lead

[20] For brevity, the indicator for a firm's reliance on external finance is also defined by the catchall "*High FC*" label.

to increases in the capital expenditures of firms that should benefit more from improved access to finance. Panel B finds similar results for intangible expenditures, with only three of the seven columns showing a positive and significant coefficient on the interaction of the respective *High FC* indicators with the *All APML* indicator. Panels C and D use sales and employment growth as dependent variables. Again, the support for this channel is mixed. In Panel C, five of the seven columns show positive and significant point estimates on the interaction term, suggesting that firms located in the enacting states and with more to gain if the strong IPR protection leads to improved access to financing experience significant increases in sales growth. However, in Column 7, the significantly negative point estimate on the interaction implies the opposite conclusion. Panel D provides mostly consistent support, with four of the seven coefficients on the interaction indicating a positive and significant relation with employment growth.

Internet Appendix Table IA12 repeats the analysis from Table 12 but uses lagged endogenous firm characteristics when creating *High FC* instead of base year values. Panel A (D) uses capital expenditures (employment growth) as the dependent variable and shows the most consistent support for this channel, with all (five of the) seven coefficients on the interaction term implying an increasing association with the outcome variable. However, in Panel B (C), which employs intangible expenditures (sales growth), the evidence is weak, with only three (one) of the point estimates showing a positive and significant association with investments in intangible capital (sales growth and one of the estimates indicating a significantly negative relation). Overall, I interpret the evidence in Tables 12 and IA12 as marginally supportive of the view that strong IPR protection increases investment and growth by improving access to capital.

6. Conclusion

I study the effectiveness of strong intellectual property rights (IPR) protection as a mechanism to foster corporate investment and spur firm growth by exploiting the adoption of all-item anti-plug molding laws by U.S. states and their subsequent invalidation by the U.S. Supreme Court. When enforceable, these laws strengthen the IPR protection of firms located in the enacting states by prohibiting the duplication of original manufactured products using an efficient type of reverse engineering known as the direct molding process. Using a difference-in-differences estimator, I compare changes in the investment and growth rates of firms located in states that adopt these laws to changes in the investment and growth rates of firms located elsewhere.

I show that the passage of these laws leads to higher investment rates in physical and intangible capital and faster growth rates in sales and employment. However, after the Supreme Court overturned the laws, physical and intangible capital investments declined, and sales and employment growth rates slowed. I further find that these changes in the rates of investment and growth are more pronounced for firms operating in less concentrated industries and that the adoption of the laws results in higher profitability when the laws are in force and subsequently declines once they are invalidated. These findings are consistent with the view that strong IPR protection reduces the competitive threat of product imitation by rivals, thus increasing the incentives of firms in the enacting states to invest and expand their operations.

My results have research and policy implications. For researchers, they suggest that future studies examining IPR protection may consider using the adoption and invalidation of the all-item anti-plug molding laws as a source of plausibly exogenous variation. For policymakers, my findings imply that strong IPR protection might be warranted when methods to duplicate inventions are so competitively disadvantageous that they compromise the investment incentives of originating firms, potentially impeding innovation and economic growth.

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Table A1
Anti-plug molding laws.

The table lists the month and year when each anti-plug molding law (APML) adopting state enacted its respective statute (Panel A) as well as the month and year when an important court ruling related to the validity of a respective APML was decided (Panel B). The states omitted from Panel A did not adopt an APML and therefore do not have a related court decision. The states included in Panel A but omitted in Panel B may have had a related court decision but the initial (and, if applicable, final) ruling(s) validated the law.

Panel A: The month and year of APML adoption

State	Statute	Month/Year Adopted	Covered Products
California	*CAL. BUS. & PROF. CODE § 17300*	10/1978	All items
Florida	*FLA. STAT. § 559.94*	05/1983	Boat hulls
Indiana	*IND. CODE §§ 24-4-8-1*	08/1987	Boat hulls
Kansas	*KAN. STAT. ANN. § 50-802*	07/1984	Boat hulls
Louisiana	*LA. REV. STAT. ANN. § 51: 462.1*	07/1985	Boat hulls
Maryland	*MD. COM. LAW CODE ANN. § 11-1001*	04/1986	Boat hulls
Michigan	*MICH. COMP. LAWS §§ 445.621*	03/1983	All items
Mississippi	*MISS. CODE ANN. § 59-21-41*	03/1985	Boat hulls
Missouri	*MO. REV. STAT. § 306.900*	04/1986	Boat hulls
North Carolina	*N.C. GEN. STAT. §§ 75A-27*	07/1985	Boat hulls
Tennessee	*TENN. CODE ANN. § 47-50-111*	07/1983	All items
Wisconsin	*WIS. STAT. ANN. § 134.34*	06/1983	Boat hulls

Panel B: The month and year of an important APML related court decision

Jurisdiction	Court	Case	Month/Year Decided	Decision
California	District Court	*Interpart Corporation* v. *Imos Italia*	07/1984	Invalidates California's law
California	Federal Circuit	*Interpart Corporation* v. *Imos Italia*	11/1985	Validates California's law
Florida	District Court	*Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*	12/1984	Invalidates Florida's law
Florida	Supreme Court	*Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*	11/1987	Invalidates Florida's law
United States	Supreme Court	*Bonito Boats, Inc.* v. *Thunder Craft Boats, Inc.*	02/1989	Invalidates all states' law

Table A2
Industries with "moldable products."

This table provides the 2-digit SIC code classifications for the moldable products-industries included and excluded from the main sample.

2-Digit SIC Codes	Description	"Moldable Products" Industry
20	Food and Kindred Products	No
21	Tobacco Products	No
22	Textile Mill Products	No
23	Apparel and other Finished Products Made from Fabrics and Similar Materials	No
24	**Lumber and Wood Products, except Furniture**	**Yes**
25	**Furniture and Fixtures**	**Yes**
26	Paper and Allied Products	No
27	Printing, Publishing, and Allied Industries	No
28	Chemicals and Allied Products	No
29	Petroleum Refining and Related Industries	No
30	**Rubber and Miscellaneous Plastics Products**	**Yes**
31	**Leather and Leather Products**	**Yes**
32	**Stone, Clay, Glass, and Concrete Products**	**Yes**
33	Primary Metal Industries	No
34	**Fabricated Metal Products, except Machinery and Transportation Equipment**	**Yes**
35	**Industrial and Commercial Machinery and Computer Equipment**	**Yes**
36	**Electronic and other Electrical Equipment and Components, except Computer Equipment**	**Yes**
37	**Transportation Equipment**	**Yes**
38	**Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks**	**Yes**
39	**Miscellaneous Manufacturing Industries**	**Yes**

Table A3
Variable definitions.

This table provides the definitions for the main variables used in this study. Variables used in auxiliary tests and not included here are defined in the corresponding table captions.

Variable	Definition (Compustat variables are in parentheses when appropriate)
All APML	An indicator variable equal to one if the firm is headquartered in a state that adopts an anti-plug molding law (APML) that provides intellectual property (IP) protection for all manufacturing items, and zero otherwise.
Assets	Total assets in millions (at), where assets are adjusted using 1992 dollars.
ATP Index	An index that ranges from 0 to 5, depending on the number of antitakeover laws that a firm's state of incorporation has adopted. Following Guernsey, Sepe, and Serfling (2022), the laws included in the index are business combination, control share acquisition, directors' duties, fair price, and poison pill laws.
Book Leverage	The value of debt in current liabilities (dlc) plus long-term debt (dltt) scaled by the book value of assets (at).
Capital Expenditures	Capital expenditures (capx) scaled by one-year lagged property, plant, and equipment (ppent).
Citations	The total number of citations received by each patent that is applied for and eventually granted by the USPTO. Data comes from Noah Stoffman's website (see Kogan et al. (2017)).
Employment Growth	The one-year employment growth rate $(emp_t - emp_{t-1})/emp_{t-1}$.
GDP Growth	The state-level GDP growth rate over the fiscal year. Data comes from the U.S. Bureau of Economic Analysis.
Good Faith	An indicator variable equal to one if the firm is headquartered in a state that adopts a good faith exception wrongful discharge law, and zero otherwise (Serfling (2016)).
IDD	An indicator variable equal to one if the firm is headquartered in a state that adopts the Inevitable Disclosure Doctrine (IDD), and zero otherwise (Klasa et al. (2018)).
Implied Contract	An indicator variable equal to one if the firm is headquartered in a state that adopts an implied contract exception wrongful discharge law, and zero otherwise (Serfling (2016)).
Intangible Expenditures	R&D investment (xrd) + 0.3 × selling, general and administrative (SG&A) expense (xsga), scaled by one-year lagged total capital (= K_phy + K_int). K_phy equals the replacement cost of physical capital measured using property,

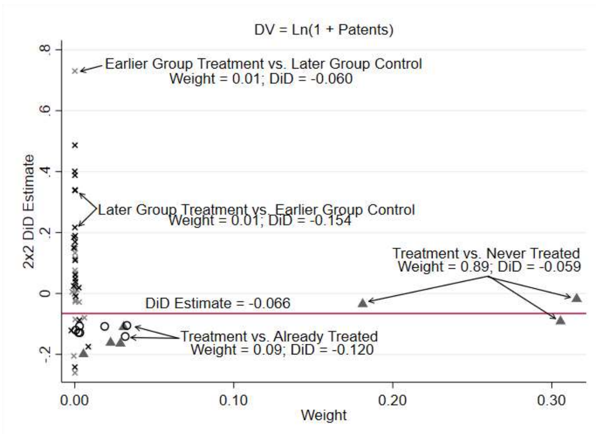
	plant, and equipment (ppent). K_int equals the replacement cost of intangible capital and comes from Peters and Taylor (2017).
MTB	A firm's market-to-book ratio, measured as the market value of assets (at + prcc_f × csho - be) scaled by the book value of assets (at). Book equity (be) is defined as the difference between stockholders' equity (seq) and preferred stock (either pstkrv, pstkl, or pstk).
Patents	The total number of patents that are applied for and eventually granted by the USPTO. Data comes from Noah Stoffman's website (see Kogan et al. (2017)).
Public Policy	An indicator variable equal to one if the firm is headquartered in a state that adopts a public policy exception wrongful discharge law, and zero otherwise (Serfling (2016)).
R&D Tax Credit	An indicator variable equal to one if the firm is headquartered in a state that adopts a tax credit for R&D, and zero otherwise (Wilson (2009)).
Sales Growth	The one-year sales growth rate $(sale_t – sale_{t-1})/ sale_{t-1}$
UTSA	An indicator variable equal to one if the firm is headquartered in a state that adopts the Uniform Trade Secrets Act (UTSA), and zero otherwise (Guernsey, John, and Litov (2022)).

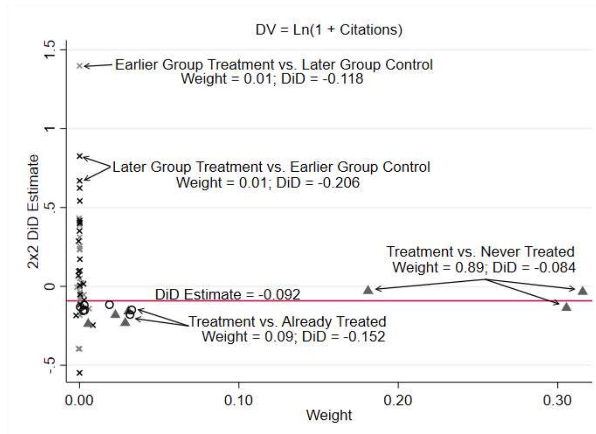
Figure 1

All-item anti-plug molding laws, and patenting, investment, and growth.

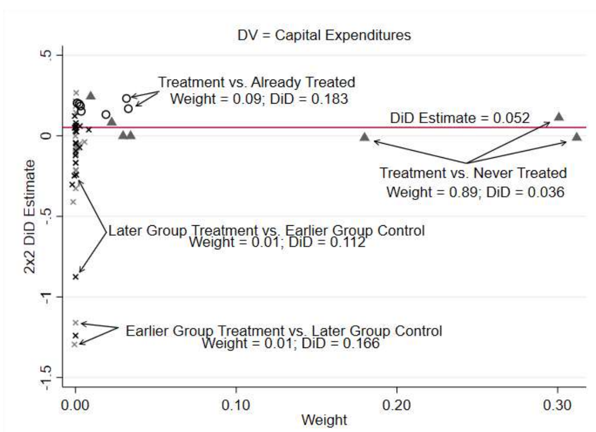
This figure plots the 2x2 DiD estimates of the effect of an all-item anti-plug molding law on patenting, investment, and firm growth using the Goodman-Bacon (2021) decomposition. Figure A plots the estimates for patent counts (left) and patent citations (right). Figure B plots the estimates for physical capital investment (left) and intangible capital investment (right). Figure C plots the estimates for sales growth (left) and employment growth (right).

Panel A: Patenting





Panel B: Investment



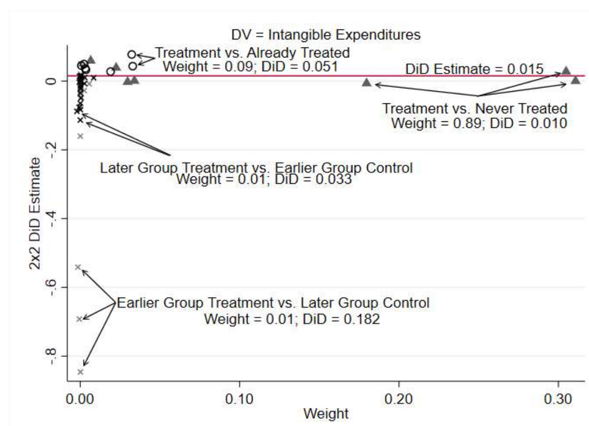
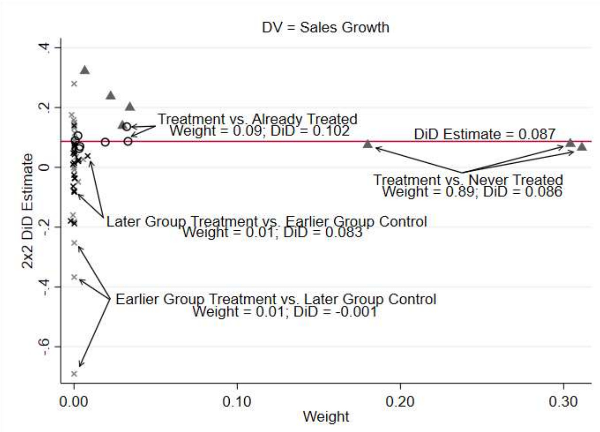


Figure 1 – (*Continued*)

Panel C: Firm growth



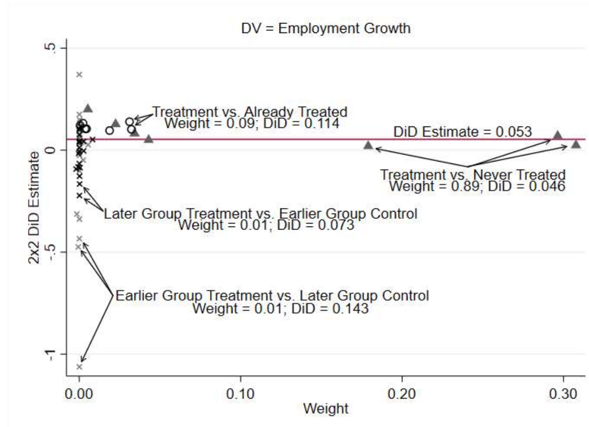


Figure 2

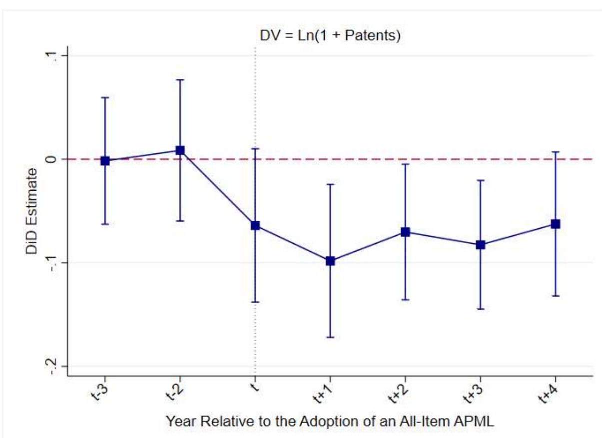
All-item anti-plug molding laws, and patenting, investment, and growth: Timing analysis.

This figure plots the coefficient estimates from the following OLS regression relating patenting, investment, and firm growth to the adoption of an all-item anti-plug molding law (APML) over the period 1975 to 1988:

$$Y_{ijlst+1} = \sum_{-3+}^{-2} \beta_t All\ APML_{lt} + \sum_{0}^{4+} \delta_t All\ APML_{lt} + Controls + \varepsilon_{ijlst}$$

Panel A dependent variables include *Ln(1+Patents)* and *Ln(1+Citations)*. Panel B dependent variables include *Capital Expenditures* and *Intangible Expenditures*. Panel C dependent variables include *Sales Growth* and *Employment Growth*. *All* $APML_{[-3+]}$ (*All* $APML_{[-2]}$) is an indicator equaling one if a firm's headquarters state will adopt the law in three or more (two) years, and zero otherwise. *All* $APML_{[0]}$ is an indicator equaling one if a firm's headquarters state adopts the law in the current year, and zero otherwise. *All* $APML_{[1]}$ (*All* $APML_{[2]}$) is an indicator equaling one if a firm's headquarters state adopted the law one (two) year(s) ago, and zero otherwise. *All* $APML_{[3]}$ (*All* $APML_{[4+]}$) is an indicator equaling one if a firm's headquarters state adopted the law three (four or more) years ago, and zero otherwise. *All* $APML_{[-1]}$ is omitted and used as the reference year. Observations from firms headquartered in California after 1983 are excluded to remove "bad comparisons" between "Treatment" and "Already Treated" firms. Controls measured in year *t*: *IDD*; *UTSA*; *R&D Tax Credit*; *Good Faith*; *Implied Contract*; *Public Policy*; *ATP Index*. Controls measured in *Base t* and interacted with year dummies: *GDP Growth*; *Ln(Assets)*; *Book Leverage*; *MTB*. All models include firm and 3-digit SIC industry × year fixed effects. 90% confidence intervals based on standards errors clustered by headquarters state are depicted.

Panel A: Patenting



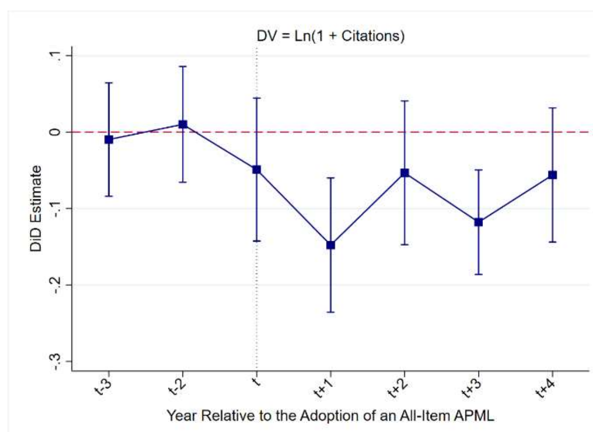
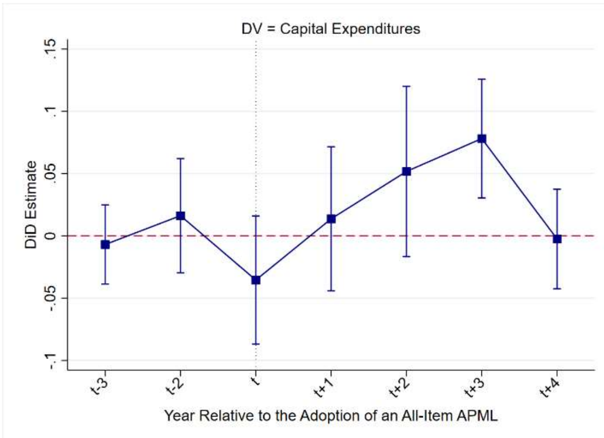
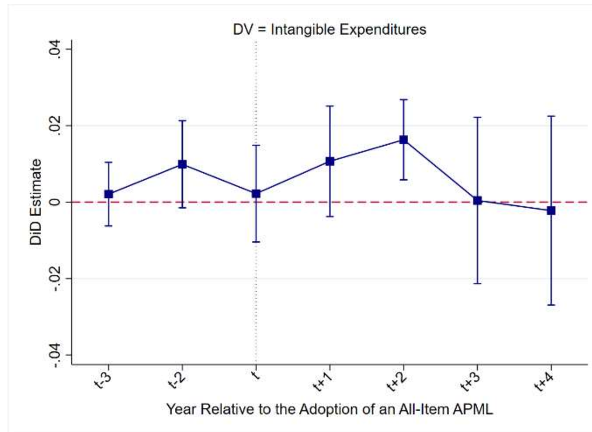


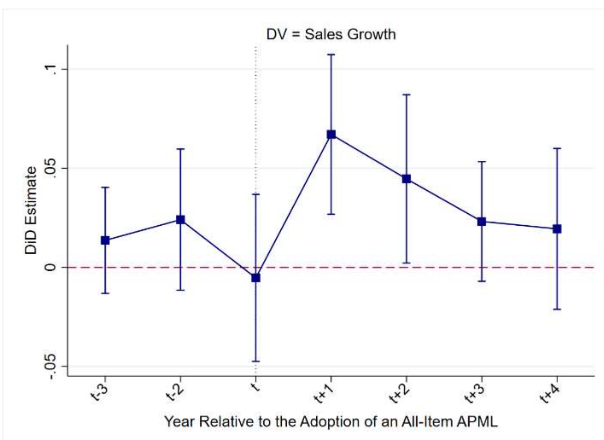
Figure 2 – (*Continued*)

Panel B: Investment





Panel C: Firm growth



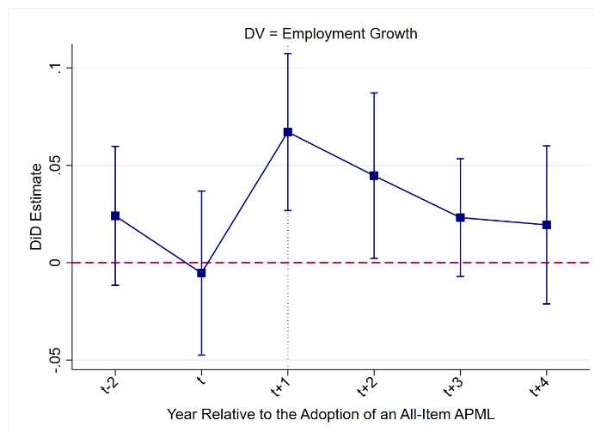


Table 1
Summary statistics.

This table reports summary statistics for the main variables used in the regressions during the periods 1975 to 1988 in Columns 1-5 and 1975 to 1992 in Columns 6-10. Continuous variables are winsorized at their 1st and 99th percentiles. Appendix Table A3 provides definitions of the variables.

Sample period:	1975-1988					1975-1992				
	Mean	SD	P25	Median	P75	Mean	SD	P25	Median	P75
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variables										
$\text{Patents}_{[t+2]}$	7.36	25.69	0.00	0.00	3.00	7.13	25.25	0.00	0.00	2.00
$\text{Citations}_{[t+2]}$	16.38	57.36	0.00	0.00	5.92	16.15	57.01	0.00	0.00	5.92
$\text{Capital Expenditures}_{[t+1]}$	0.35	0.39	0.14	0.24	0.41	0.34	0.39	0.13	0.23	0.39
$\text{Intangible Expenditures}_{[t+1]}$	0.21	0.15	0.12	0.17	0.26	0.22	0.15	0.12	0.17	0.26
$\text{Sales Growth}_{[t+1]}$	0.16	0.39	-0.01	0.11	0.24	0.15	0.39	-0.03	0.09	0.23
$\text{Employment Growth}_{[t+1]}$	0.06	0.28	-0.07	0.02	0.14	0.05	0.28	-0.08	0.02	0.13
Main independent variable										
$\text{All APML}_{[t]}$	0.14	0.35	0.00	0.00	0.00	0.17	0.37	0.00	0.00	0.00
Control variables										
$\text{IDD}_{[t]}$	0.25	0.44	0.00	0.00	1.00	0.30	0.46	0.00	0.00	1.00
$\text{UTSA}_{[t]}$	0.19	0.39	0.00	0.00	0.00	0.29	0.45	0.00	0.00	1.00
$\text{R\&D Tax Credit}_{[t]}$	0.09	0.28	0.00	0.00	0.00	0.17	0.38	0.00	0.00	0.00
$\text{Good Faith}_{[t]}$	0.23	0.42	0.00	0.00	0.00	0.26	0.44	0.00	0.00	1.00
$\text{Implied Contract}_{[t]}$	0.52	0.50	0.00	1.00	1.00	0.61	0.49	0.00	1.00	1.00
$\text{Public Policy}_{[t]}$	0.57	0.49	0.00	1.00	1.00	0.65	0.48	0.00	1.00	1.00
$\text{ATP Index}_{[t]}$	0.73	0.86	0.00	1.00	1.00	1.12	1.29	0.00	1.00	1.00
$\text{GDP Growth}_{[t]}$	0.09	0.03	0.07	0.09	0.11	0.09	0.03	0.06	0.08	0.11
$\text{Assets}_{[t]}$	1201	3985	63.81	191.2	592.4	1176	3868	62.65	198.8	612.5
$\text{Ln(Assets)}_{[t]}$	3.68	1.81	2.31	3.53	4.74	3.61	1.79	2.24	3.49	4.68
$\text{Book Leverage}_{[t]}$	0.21	0.17	0.05	0.18	0.32	0.20	0.17	0.05	0.18	0.32
$\text{MTB}_{[t]}$	2.09	2.00	0.91	1.38	2.42	2.20	2.08	0.95	1.47	2.60

Table 2
The relevance of all-item anti-plug molding laws for IPR protection.

This table reports the results from OLS regressions relating patenting activity to the adoption of all-item anti-plug molding laws (APML). The dependent variable *Ln(1+Patents)* measured in year *t*+2 in Panel A is the natural logarithm of one plus a firm's count of patents. The dependent variable *Ln(1+Citations)* measured in year *t*+2 in Panel B is the natural logarithm of one plus the number of citations for each of a firm's patents. The sample period in Columns 1-3 is 1975 to 1988 and 1975 to 1992 in Columns 4-6. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. State- and firm-level controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding laws and patent counts

	Ln(1 + Patents)$_{[t+2]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.031**	-0.046***	-0.043***	-0.032**	-0.046***	-0.043***
	(0.014)	(0.012)	(0.015)	(0.014)	(0.012)	(0.016)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.126***	0.099***	0.105***
				(0.037)	(0.033)	(0.031)
IDD$_{[t]}$		-0.116***	-0.103**		-0.110**	-0.097*
		(0.038)	(0.041)		(0.047)	(0.050)
UTSA$_{[t]}$		0.016	0.017		-0.000	-0.001
		(0.023)	(0.021)		(0.023)	(0.023)
R&D Tax Credit$_{[t]}$		-0.022	-0.034		-0.018	-0.031
		(0.022)	(0.022)		(0.021)	(0.024)
Good Faith$_{[t]}$		0.048*	0.052**		0.065*	0.067**
		(0.027)	(0.023)		(0.035)	(0.031)
Implied Contract$_{[t]}$		-0.012	-0.012		-0.009	-0.008
		(0.018)	(0.019)		(0.024)	(0.025)
Public Policy$_{[t]}$		-0.006	-0.014		0.007	-0.004
		(0.027)	(0.025)		(0.035)	(0.034)
ATP Index$_{[t]}$		-0.016*	-0.013		-0.011	-0.008
		(0.009)	(0.009)		(0.010)	(0.011)
GDP Growth$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Ln(Assets)$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Book Leverage$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
MTB$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,552	13,552	13,552	18,507	18,507	18,507
Adjusted R^2	0.864	0.864	0.865	0.846	0.847	0.847

Table 2 – (*Continued*)

Panel B: All-item anti-plug molding laws and patent citations						
	Ln(1 + Citations)$_{[t+2]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.036*	-0.050***	-0.041*	-0.036**	-0.048***	-0.040**
	(0.019)	(0.018)	(0.021)	(0.017)	(0.018)	(0.019)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.134**	0.115**	0.128***
				(0.056)	(0.048)	(0.044)
IDD$_{[t]}$		-0.118**	-0.099**		-0.100	-0.082
		(0.046)	(0.049)		(0.065)	(0.069)
UTSA$_{[t]}$		0.039	0.041		0.006	0.005
		(0.027)	(0.025)		(0.030)	(0.031)
R&D Tax Credit$_{[t]}$		-0.054	-0.074**		-0.036	-0.056*
		(0.034)	(0.031)		(0.031)	(0.033)
Good Faith$_{[t]}$		0.056	0.056*		0.081*	0.078*
		(0.037)	(0.031)		(0.047)	(0.041)
Implied Contract$_{[t]}$		-0.004	-0.002		-0.007	-0.003
		(0.023)	(0.025)		(0.031)	(0.032)
Public Policy$_{[t]}$		-0.002	-0.016		0.014	-0.004
		(0.035)	(0.032)		(0.047)	(0.044)
ATP Index$_{[t]}$		-0.024**	-0.020*		-0.010	-0.007
		(0.011)	(0.012)		(0.011)	(0.013)
GDP Growth$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Ln(Assets)$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Book Leverage$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
MTB$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,552	13,552	13,552	18,507	18,507	18,507
Adjusted R^2	0.822	0.823	0.823	0.806	0.806	0.806

Table 3
Determinants of all-item anti-plug molding law adoptions.

This table reports results from a linear probability model analyzing the determinants of adoptions of all-item anti-plug molding laws (APML). The dependent variable *All APML* (multiplied by 100) is an indicator for whether a state adopts an all-item APML. State headquarter-level (*HQ*) determinants measured in year *t*-1 include the median values of the following characteristics across all firms in a state: *Ln(1+Patents)*; *Ln(1+Citations)*; *Capital Expenditures*; *Intangible Expenditures*; *Sales Growth*; *Employment Growth*. I also include the: natural logarithm of a state's GDP per capita, *Ln(GDPPC)*; growth rate of a state's GDP, *GDP Growth*; fraction of a state's congress members in the U.S. House of Representatives that belong to the Democratic party, *Political Balance*; and indicators for whether a state adopts the following laws: *IDD*; *UTSA*; *R&D Tax Credit*; *Good Faith*; *Implied Contract*; *Public Policy*. Standard errors in parentheses are clustered by states. There are 537 observations in each column.

	All APML$_{[t]}$ × 100					
	(1)	(2)	(3)	(4)	(5)	(6)
HQ Ln(1 + Patents)$_{[t-1]}$	0.254		1.047		0.916	
	(0.284)		(0.676)		(0.665)	
HQ Ln(1 + Citations)$_{[t-1]}$		0.186		0.920		0.803
		(0.228)		(0.625)		(0.622)
HQ Capital Expenditures$_{[t-1]}$	-0.081	-0.083	-0.014	-0.018	-0.011	-0.014
	(0.083)	(0.083)	(0.090)	(0.088)	(0.098)	(0.096)
HQ Intangible Expenditures$_{[t-1]}$	-0.059	-0.064	-0.384	-0.386	-0.395	-0.397
	(0.220)	(0.220)	(0.263)	(0.262)	(0.270)	(0.269)
HQ Sales Growth$_{[t-1]}$	0.090	0.090	0.076	0.074	0.108	0.105
	(0.083)	(0.083)	(0.072)	(0.072)	(0.092)	(0.092)
HQ Employment Growth$_{[t-1]}$	-0.042	-0.043	-0.031	-0.029	-0.047	-0.045
	(0.047)	(0.047)	(0.040)	(0.039)	(0.053)	(0.053)
Ln(HQ GDPPC)$_{[t-1]}$					-1.059	-1.070
					(0.735)	(0.743)
HQ GDP Growth$_{[t-1]}$					0.543	0.540
					(0.411)	(0.410)
HQ Political Balance$_{[t-1]}$					0.287	0.305
					(0.230)	(0.234)
IDD$_{[t-1]}$					-0.575	-0.604
					(0.880)	(0.883)
UTSA$_{[t-1]}$					-1.117	-1.199
					(1.038)	(1.042)
R&D Tax Credit$_{[t-1]}$					-0.381	-0.332
					(0.784)	(0.767)
Good Faith$_{[t-1]}$					0.299	0.465
					(0.749)	(0.734)
Implied Contract$_{[t-1]}$					2.665	2.704
					(1.958)	(1.971)
Public Policy$_{[t-1]}$					-0.582	-0.577
					(0.680)	(0.673)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	Yes	Yes	Yes	Yes
Adjusted R^2	0.007	0.007	0.098	0.096	0.097	0.096

Table 4
CARs around the U.S. Supreme Court's invalidation of all-item anti-plug molding laws.

This table reports the cumulative abnormal returns (CARs) surrounding the announcement of the U.S. Supreme Court's ruling in *Bonito Boats v. Thunder Craft Boats* on February 21, 1989 that invalidated the all-item anti-plug molding laws (APMLs). The CARs are estimated over the event window [-3,+2] and the pre-event windows [-30,-4] and [-20,-4]. CARs are estimated using the 3-factor model in Columns 1-2, where the three factors include: market (MKT), small-minus-big (SMB), and high-minus-low (HML). CARs are estimated using the 4-factor model in Columns 3-4, where the four factors include: MKT, SMB, HML, and momentum. The market factor in Columns 1 and 3 is based on CRSP equal-weighted returns. The market factor in Columns 2 and 4 is based on CRSP value-weighted returns. The parameters of the respective factor models are estimated over the window [-280,-61] relative to the announcement date. The estimated *t*-statistics in parentheses have been corrected for cross-sectional correlation bias (i.e., event-day clustering) following Kolari and Pynnönen (2010). *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Model:	Fama-French 3-Factor		Fama-French 4-Factor	
	EW Index	VW Index	EW Index	VW Index
CAR Window:	(1)	(2)	(3)	(4)
[-30,-4]	-1.39%	-0.16%	-1.17%	-0.00%
	(-1.41)	(-0.16)	(-1.20)	(-0.00)
[-20,-4]	-0.34%	-0.24%	-0.22%	-0.15%
	(-0.44)	(-0.30)	(-0.28)	(-0.19)
[-3,+2]	-0.98%**	-1.04%**	-0.94%**	-1.01%**
	(-2.02)	(-2.06)	(-1.96)	(-2.02)
Observations	345	345	345	345

Table 5
The effect of all-item anti-plug molding laws on investment.

This table reports the results from OLS regressions relating investment to the adoption of all-item anti-plug molding laws (APML). The dependent variable *Capital Expenditures* measured in year *t*+1 in Panel A is the ratio of a firm's capital expenditures over its one-year lagged property, plant, and equipment. The dependent variable *Intangible Expenditures* measured in year *t*+1 in Panel B is the ratio of R&D expenses plus 0.3 × SG&A expenses over its one-year lagged total capital. The sample period in Columns 1-3 is 1975 to 1988 and 1975 to 1992 in Columns 4-6. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. Statel law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. State- and firm-level controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding laws and capital expenditures

	Capital Expenditures$_{[t+1]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	0.032***	0.036***	0.043***	0.034***	0.036***	0.042***
	(0.009)	(0.008)	(0.010)	(0.008)	(0.009)	(0.010)
All APML$_{[t]}$ × Post 88$_{[t]}$				-0.053***	-0.059***	-0.054***
				(0.015)	(0.013)	(0.012)
IDD$_{[t]}$		-0.025**	-0.032***		-0.004	-0.014
		(0.011)	(0.009)		(0.019)	(0.015)
UTSA$_{[t]}$		0.016	0.015		0.010	0.012
		(0.015)	(0.013)		(0.016)	(0.014)
R&D Tax Credit$_{[t]}$		0.009	0.022		0.031**	0.037***
		(0.014)	(0.016)		(0.014)	(0.012)
Good Faith$_{[t]}$		-0.047**	-0.045***		-0.033*	-0.031*
		(0.017)	(0.017)		(0.018)	(0.018)
Implied Contract$_{[t]}$		-0.015	-0.015		-0.010	-0.009
		(0.018)	(0.015)		(0.016)	(0.013)
Public Policy$_{[t]}$		0.002	0.016		0.013	0.027**
		(0.015)	(0.014)		(0.013)	(0.012)
ATP Index$_{[t]}$		0.015**	0.015**		0.004	0.004
		(0.006)	(0.006)		(0.005)	(0.004)
GDP Growth$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Ln(Assets)$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Book Leverage$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
MTB$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,111	14,111	14,111	19,351	19,351	19,351
Adjusted R^2	0.249	0.250	0.265	0.241	0.242	0.258

Table 5 – (*Continued*)

Panel B: All-item anti-plug molding laws and intangible expenditures						
	Intangible Expenditures $_{[t+1]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	0.009***	0.011***	0.012***	0.010***	0.011***	0.012***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
All APML$_{[t]}$ × Post 88$_{[t]}$				-0.020***	-0.016**	-0.014*
				(0.007)	(0.006)	(0.007)
IDD$_{[t]}$		0.006	0.002		0.003	-0.001
		(0.007)	(0.007)		(0.009)	(0.009)
UTSA$_{[t]}$		0.002	-0.001		0.000	-0.001
		(0.009)	(0.007)		(0.007)	(0.006)
R&D Tax Credit$_{[t]}$		-0.005	0.001		0.001	0.003
		(0.007)	(0.008)		(0.005)	(0.005)
Good Faith$_{[t]}$		-0.004	-0.002		-0.003	-0.002
		(0.006)	(0.004)		(0.005)	(0.005)
Implied Contract$_{[t]}$		0.006	0.006		0.003	0.003
		(0.007)	(0.005)		(0.006)	(0.005)
Public Policy$_{[t]}$		-0.002	0.002		-0.000	0.005
		(0.006)	(0.005)		(0.005)	(0.004)
ATP Index$_{[t]}$		0.003	0.003		0.003*	0.003**
		(0.002)	(0.002)		(0.002)	(0.001)
GDP Growth$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Ln(Assets)$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Book Leverage$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
MTB$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,144	14,144	14,144	19,362	19,362	19,362
Adjusted R^2	0.733	0.733	0.750	0.705	0.705	0.724

Table 6
The effect of all-item anti-plug molding laws on firm growth.

This table reports the results from OLS regressions relating investment to the adoption of all-item anti-plug molding laws (APML). The dependent variable *Sales Growth* measured in year *t*+1 in Panel A is a firm's one-year sales growth rate. The dependent variable *Employment Growth* measured in year *t*+1 in Panel B is a firm's one-year employment growth rate. The sample period in Columns 1-3 is 1975 to 1988 and 1975 to 1992 in Columns 4-6. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. State- and firm-level controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding laws and sales growth

	Sales Growth$_{[t+1]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	0.037***	0.040***	0.042***	0.042***	0.043***	0.046***
	(0.008)	(0.009)	(0.011)	(0.007)	(0.008)	(0.009)
All APML$_{[t]}$ × Post 88$_{[t]}$				-0.038***	-0.042***	-0.044**
				(0.012)	(0.015)	(0.017)
IDD$_{[t]}$		-0.003	-0.005		-0.006	-0.010
		(0.015)	(0.015)		(0.018)	(0.017)
UTSA$_{[t]}$		-0.003	-0.008		-0.004	-0.006
		(0.013)	(0.013)		(0.012)	(0.012)
R&D Tax Credit$_{[t]}$		0.017	0.023		0.021*	0.019*
		(0.015)	(0.014)		(0.011)	(0.011)
Good Faith$_{[t]}$		-0.031**	-0.031**		-0.035**	-0.034**
		(0.015)	(0.012)		(0.015)	(0.014)
Implied Contract$_{[t]}$		-0.006	-0.010		-0.017	-0.019
		(0.021)	(0.018)		(0.019)	(0.016)
Public Policy$_{[t]}$		-0.002	0.003		-0.003	-0.000
		(0.016)	(0.017)		(0.013)	(0.014)
ATP Index$_{[t]}$		0.013**	0.014**		0.006	0.007
		(0.006)	(0.006)		(0.005)	(0.005)
GDP Growth$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Ln(Assets)$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Book Leverage$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
MTB$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,224	14,224	14,224	19,527	19,527	19,527
Adjusted R^2	0.240	0.240	0.253	0.211	0.211	0.226

Table 6 – (*Continued*)

Panel B: All-item anti-plug molding laws and employment growth						
	Employment Growth$_{[t+1]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	0.022***	0.023***	0.026***	0.027***	0.027***	0.031***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.009)
All APML$_{[t]}$ × Post 88$_{[t]}$				-0.021**	-0.020**	-0.020*
				(0.009)	(0.010)	(0.011)
IDD$_{[t]}$		0.006	0.007		0.004	0.003
		(0.009)	(0.010)		(0.010)	(0.010)
UTSA$_{[t]}$		0.014	0.009		0.019**	0.015*
		(0.011)	(0.011)		(0.008)	(0.009)
R&D Tax Credit$_{[t]}$		0.008	0.011		0.004	0.006
		(0.013)	(0.013)		(0.007)	(0.007)
Good Faith$_{[t]}$		-0.007	-0.007		-0.013	-0.013
		(0.011)	(0.010)		(0.010)	(0.009)
Implied Contract$_{[t]}$		-0.001	-0.001		-0.006	-0.006
		(0.014)	(0.013)		(0.011)	(0.011)
Public Policy$_{[t]}$		-0.006	-0.006		-0.008	-0.005
		(0.012)	(0.013)		(0.009)	(0.010)
ATP Index$_{[t]}$		0.010**	0.011***		0.005*	0.006**
		(0.004)	(0.004)		(0.003)	(0.002)
GDP Growth$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Ln(Assets)$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Book Leverage$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
MTB$_{[Base\ t]}$ × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,885	13,885	13,885	19,085	19,085	19,085
Adjusted R^2	0.170	0.171	0.175	0.147	0.147	0.152

Table 7

The differential effect of all-item anti-plug molding laws on investment and growth for firms with more versus less innovative ability.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1988 in Panel A and 1975 to 1992 in Panel B. The respective dependent variables include: *Capital Expenditures*, *Intangible Expenditures*, *Sales Growth*, and *Employment Growth*. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *RQ* is a firm-level measure of "research quotient" from Knott (2008) and is defined as firm-specific output elasticity of R&D. *Low* $RQ_{[Base\ t]}$ is an indicator that equals one if a firm's *RQ* in its base year is below the sample median-base year *RQ*, and zero otherwise. Higher (lower) levels of *RQ* are indicative of a firm that has a higher (lower) level of innovative ability. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: The sample period is 1975 to 1988

	Capital Expenditures$_{[t+1]}$		Intangible Expenditures$_{[t+1]}$		Sales Growth$_{[t+1]}$		Employment Growth$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.046*	0.067**	0.013*	0.018**	0.079***	0.081***	0.058***	0.059***
	(0.026)	(0.030)	(0.007)	(0.008)	(0.014)	(0.016)	(0.009)	(0.011)
All APML$_{[t]}$ × Low RQ$_{[Base\ t]}$	-0.031	-0.040*	-0.020***	-0.022***	-0.052***	-0.055***	-0.041***	-0.043***
	(0.033)	(0.023)	(0.007)	(0.005)	(0.006)	(0.008)	(0.005)	(0.006)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,679	7,679	7,721	7,721	7,735	7,735	7,655	7,655
Adjusted R^2	0.299	0.319	0.751	0.766	0.273	0.289	0.209	0.216

Table 7 – (*Continued*)

Panel B: The sample period is 1975 to 1992	Capital Expenditures$_{[t+1]}$		Intangible Expenditures$_{[t+1]}$		Sales Growth$_{[t+1]}$		Employment Growth$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.050**	0.068**	0.015**	0.019**	0.086***	0.088***	0.066***	0.069***
	(0.024)	(0.028)	(0.007)	(0.007)	(0.014)	(0.015)	(0.009)	(0.009)
All APML$_{[t]}$ × Low RQ$_{[Base\ t]}$	-0.031	-0.039*	-0.020***	-0.022***	-0.059***	-0.061***	-0.047***	-0.049***
	(0.032)	(0.023)	(0.007)	(0.004)	(0.006)	(0.009)	(0.005)	(0.006)
All APML$_{[t]}$ × Post 88$_{[t]}$	-0.096***	-0.082***	-0.027***	-0.024**	-0.043**	-0.041*	-0.045***	-0.042***
	(0.013)	(0.013)	(0.008)	(0.010)	(0.021)	(0.023)	(0.010)	(0.009)
All APML$_{[t]}$ × Low RQ $_{[Base\ t]}$ × Post 88$_{[t]}$	0.054**	0.067***	0.015	0.023*	0.035	0.047	0.024	0.032**
	(0.023)	(0.023)	(0.012)	(0.014)	(0.025)	(0.032)	(0.017)	(0.015)
Low RQ$_{[Base\ t]}$ × Post 88$_{[t]}$	-0.014	-0.020	-0.002	-0.005	0.033*	0.028	0.019	0.015
	(0.020)	(0.020)	(0.009)	(0.009)	(0.019)	(0.019)	(0.013)	(0.011)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,076	10,076	10,122	10,122	10,157	10,157	10,066	10,066
Adjusted R^2	0.280	0.301	0.704	0.725	0.218	0.245	0.176	0.187

Table 8
The timing of the effect of all-item anti-plug molding laws on patents, investment, and firm growth.

This table reports the results from OLS regressions relating patenting, investment, and growth to the adoption of all-item anti-plug molding laws from 1975 to 1988. Dependent variables include: *Ln(1+Patents)*; *Ln(1+Citations)*; *Capital Expenditures*; *Intangible Expenditures*; *Sales Growth*; *Employment Growth*. *All APML*$^{[-2]}$ (*All APML*$^{[-1]}$) is an indicator equaling one if a firm's headquarters state will adopt the law in two (one) years, and zero otherwise. *All APML*$^{[0]}$ is an indicator equaling one if a firm's headquarters state adopts the law in the current year, and zero otherwise. *All APML*$^{[1]}$ (*All APML*$^{[2]}$) is an indicator equaling one if a firm's headquarters state adopted the law one (two) year(s) ago, and zero otherwise. *All APML*$^{[3]}$ (*All APML*$^{[4+]}$) is an indicator equaling one if a firm's headquarters state adopted the law three (four or more) years ago, and zero otherwise. Controls: *IDD*; *UTSA*; *R&D Tax Credit*; *Good Faith*; *Implied Contract*; *Public Policy*; *ATP Index* and *Base t* controls (*GDP Growth*; *Ln(Assets)*; *Book Leverage*; *MTB*) × year dummies. FEs: firm and 3-digit SIC industry × year fixed effects. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Ln(1 + Patents)$_{[t+2]}$	Ln(1 + Citations)$_{[t+2]}$	Capital Expenditures$_{[t+1]}$	Intangible Expenditures$_{[t+1]}$	Sales Growth$_{[t+1]}$	Employment Growth$_{[t+1]}$
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$^{[-2]}$	-0.004	-0.003	0.016	0.004	0.025	0.011
	(0.048)	(0.057)	(0.026)	(0.007)	(0.029)	(0.040)
All APML$^{[-1]}$	-0.039	-0.045	0.002	-0.002	0.032	0.019
	(0.044)	(0.065)	(0.021)	(0.004)	(0.031)	(0.026)
All APML$^{[0]}$	-0.084*	-0.066	-0.037	-0.004	-0.009	0.036*
	(0.047)	(0.058)	(0.031)	(0.008)	(0.024)	(0.020)
All APML$^{[1]}$	-0.126**	-0.175***	0.023	0.009	0.070***	0.053
	(0.050)	(0.059)	(0.029)	(0.008)	(0.022)	(0.044)
All APML$^{[2]}$	-0.084*	-0.060	0.061*	0.018***	0.046*	0.046
	(0.043)	(0.060)	(0.031)	(0.005)	(0.027)	(0.029)
All APML$^{[3]}$	-0.083**	-0.112**	0.095***	0.010	0.040***	0.049***
	(0.040)	(0.047)	(0.033)	(0.008)	(0.014)	(0.013)
All APML$^{[4+]}$	-0.063	-0.080	0.024	-0.000	0.031	0.002
	(0.045)	(0.052)	(0.020)	(0.010)	(0.019)	(0.017)
Controls & FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,552	13,552	14,111	14,144	14,224	13,885
Adjusted R^2	0.865	0.823	0.265	0.750	0.252	0.175

Table 9
Placebo tests: Patents, investment, and firm growth.

This table reports the results from OLS regressions relating patenting, investment, and firm growth to the adoption of all-item and boat-item anti-plug molding laws (APML), respectively, over the period 1975 to 1988. The respective dependent variables include: *Ln(1+Patents)*, *Ln(1+Citations)*, *Capital Expenditures*, *Intangible Expenditures*, *Sales Growth*, and *Employment Growth*. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Boat APML* is an indicator that equals one if a firm's state of headquarters adopts a boat-item APML, and zero otherwise. Panel A includes all-item APML adoptions and firms that do not make moldable products. Non-moldable products firms are defined by industry of operation and include: "Agriculture, Forestry, Fishing", "Wholesale Trade-Nondurable Goods", and most "Services" (SIC codes: 01-09, 51, 72, 79-86, 88-89). Panel B includes *Boat APML* and excludes states that adopt all-item APMLs. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and firms without moldable products

	$Ln(1 + Patents)_{[t+2]}$	$Ln(1 + Citations)_{[t+2]}$	Capital $Expenditures_{[t+1]}$	Intangible $Expenditures_{[t+1]}$	Sales $Growth_{[t+1]}$	Employment $Growth_{[t+1]}$
	(1)	(2)	(3)	(4)	(5)	(6)
$All\ APML_{[t]}$	0.012	0.038	0.026	0.002	0.064	-0.022
	(0.037)	(0.061)	(0.022)	(0.006)	(0.051)	(0.027)
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes
Base t × Year FE Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,576	1,576	1,645	1,655	1,662	1,596
Adjusted R^2	0.663	0.645	0.327	0.761	0.249	0.142

Table 9 – (*Continued*)

Panel B: Boat-item anti-plug molding law adoptions						
	Ln(1 + Patents)$_{[t+2]}$	Ln(1 + Citations)$_{[t+2]}$	Capital Expenditures$_{[t+1]}$	Intangible Expenditures$_{[t+1]}$	Sales Growth$_{[t+1]}$	Employment Growth$_{[t+1]}$
	(1)	(2)	(3)	(4)	(5)	(6)
Boat APML$_{[t]}$	-0.021	-0.009	-0.023	0.004	-0.009	-0.019
	(0.051)	(0.066)	(0.019)	(0.007)	(0.015)	(0.014)
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes
Base t × Year FE Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,748	10,748	11,183	11,205	11,271	10,987
Adjusted R^2	0.875	0.836	0.260	0.740	0.248	0.148

Table 10

The differential effect of all-item anti-plug molding laws on investment and firm growth for more versus less concentrated industries.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1988. The respective dependent variables include: *Capital Expenditures*, *Intangible Expenditures*, *Sales Growth*, and *Employment Growth*. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *HHI* is the 3-digit SIC Herfindahl-Hirschman index based on the sales of all firms in the CRSP-Compustat merged database in a given year. *High* $HHI_{[Base\ t]}$ is an indicator that equals one if a firm's industry *HHI* in its base year is above the sample median-base year *HHI*, and zero otherwise. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Capital $Expenditures_{[t+1]}$		Intangible $Expenditures_{[t+1]}$		Sales $Growth_{[t+1]}$		Employment $Growth_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All $APML_{[t]}$ × High $HHI_{[Base\ t]}$	-0.092***	-0.083***	-0.028***	-0.024***	-0.073***	-0.063***	-0.032**	-0.030**
	(0.021)	(0.019)	(0.005)	(0.005)	(0.017)	(0.017)	(0.015)	(0.015)
All $APML_{[t]}$	0.056***	0.064***	0.016***	0.018***	0.056***	0.058***	0.031***	0.034***
	(0.011)	(0.013)	(0.003)	(0.004)	(0.010)	(0.013)	(0.009)	(0.009)
$HHI_{[Base\ t]}$ × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,111	14,111	14,144	14,144	14,224	14,224	13,885	13,885
Adjusted R^2	0.252	0.267	0.735	0.751	0.240	0.252	0.170	0.174

Table 11
The effect of all-item anti-plug molding laws on profitability.

This table reports the results from OLS regressions relating profitability to the adoption of all-item anti-plug molding laws (APML) over the periods 1975 to 1988 (odd-numbered columns) and 1975 to 1992 (even-numbered columns). The dependent variables include: *Return on Assets* measured in year *t*+1 in Columns 1-2 is operating income (*oibdp*) scaled by one-year lagged assets (*at*); *Return on Equity* measured in year *t*+1 in Columns 3-4 is net income (*ni*) scaled by one-year lagged common equity (*ceq*); *Gross Profit Margin* measured in year *t*+1 in Columns 5-6 is sales minus the cost of goods sold (*sale - cogs*) scaled by one-year lagged sales; *Net Income Loss* measured in year *t*+1 in Columns 7-8 is an indicator variable that equals one if a firm has negative net income, and zero otherwise. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Return on Assets$_{[t+1]}$		Return on Equity$_{[t+1]}$		Gross Profit Margin$_{[t+1]}$		Net Income Loss$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.010**	0.011**	0.029***	0.030***	0.026***	0.028***	-0.031***	-0.032***
	(0.004)	(0.005)	(0.011)	(0.011)	(0.005)	(0.005)	(0.010)	(0.008)
All APML$_{[t]}$ × Post 88$_{[t]}$		-0.015**		-0.065***		-0.014		0.031*
		(0.006)		(0.019)		(0.010)		(0.017)
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Base t Controls × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,217	19,516	14,223	19,526	14,223	19,526	14,223	19,526
Adjusted R^2	0.567	0.546	0.274	0.251	0.578	0.573	0.315	0.296

Table 12

The differential effect of all-item anti-plug molding laws on investment and growth for more versus less financially constrained firms.

This table reports the results from OLS regressions relating investment and growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1988. Dependent variables include: *Capital Expenditures* (Panel A); *Intangible Expenditures* (Panel B); *Sales Growth* (Panel C); *Employment Growth* (Panel D). *All APML* is an indicator that equals one if a firm's headquarters state adopts an all-item APML, and zero otherwise. *High* $FC_{[Base\ t]}$ is an indicator that is defined in each of the respective columns as follows. In Column 1, it equals one if a firm depends on external capital, measured in its base year as a firm with capital expenditures exceeding its operating cash flows, and zero otherwise. In Column 2, it equals one if a firm's book value of assets (in 1992 dollars) in its base year is below the sample median-base year book value of assets, and zero otherwise. In Column 3, it equals one if a firm's age in its base year (based on its years in Compustat) is below the sample median-base year age, and zero otherwise. In Column 4, it equals one if the firm does not pay a common dividend in its base year, and zero otherwise. Columns 5-7 measure a firm's degree of financial constraints using the indices in Kaplan and Zingales (1997), Whited and Wu (2006), and Hadlock and Pierce (2010) as defined in Farre-Mensa and Ljungqvist (2016). For these indices, *High* $FC_{[Base\ t]}$ is an indicator that equals one if the value of the index in the firm's base year is above the sample median-base year of that index, and zero otherwise. Controls: *IDD*; *UTSA*; *R&D Tax Credit*; *Good Faith*; *Implied Contract*; *Public Policy*; *ATP Index*; *Base t* controls interacted with year dummies (*GDP Growth*; *Ln(Assets)*; *Book Leverage*; *MTB*). Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and capital expenditures

High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]}$ × High $FC_{[Base\ t]}$	0.128***	0.001	0.056	0.077***	0.038	0.020	-0.011
	(0.017)	(0.038)	(0.035)	(0.007)	(0.030)	(0.029)	(0.020)
All $APML_{[t]}$	0.013	0.042	0.016	-0.006	0.029**	0.034**	0.044***
	(0.011)	(0.025)	(0.021)	(0.010)	(0.013)	(0.014)	(0.013)
High $FC_{[Base\ t]}$ × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,111	14,111	14,111	14,111	14,111	14,111	14,111
Adjusted R^2	0.268	0.265	0.267	0.268	0.266	0.266	0.266

Table 12 – (*Continued*)

Panel B: All-item anti-plug molding law adoptions and intangible expenditures							
High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]}$ × High $FC_{[Base\ t]}$	0.023**	0.008	0.028**	0.023***	0.007	0.009	0.010
	(0.009)	(0.005)	(0.013)	(0.005)	(0.008)	(0.006)	(0.008)
All $APML_{[t]}$	0.006*	0.007	-0.001	-0.003	0.009**	0.009**	0.008*
	(0.003)	(0.005)	(0.008)	(0.004)	(0.003)	(0.004)	(0.004)
High $FC_{[Base\ t]}$ × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,144	14,144	14,144	14,144	14,144	14,144	14,144
Adjusted R^2	0.751	0.750	0.754	0.752	0.750	0.750	0.750

Panel C: All-item anti-plug molding law adoptions and sales growth							
High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]}$ × High $FC_{[Base\ t]}$	0.085***	0.000	0.109***	0.074***	0.073***	0.025*	-0.035***
	(0.020)	(0.009)	(0.015)	(0.016)	(0.019)	(0.013)	(0.010)
All $APML_{[t]}$	0.021*	0.041***	-0.010	-0.006	0.018*	0.033***	0.051***
	(0.011)	(0.012)	(0.009)	(0.011)	(0.010)	(0.012)	(0.011)
High $FC_{[Base\ t]}$ × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,224	14,224	14,224	14,224	14,224	14,224	14,224
Adjusted R^2	0.258	0.252	0.254	0.254	0.253	0.254	0.253

Table 12 – (*Continued*)

Panel D: All-item anti-plug molding law adoptions and employment growth							
High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]}$ × High $FC_{[Base\ t]}$	0.080***	0.002	0.039**	0.039**	0.084***	0.001	-0.007
	(0.014)	(0.012)	(0.016)	(0.015)	(0.015)	(0.013)	(0.015)
All $APML_{[t]}$	0.007	0.025**	0.009	0.001	-0.002	0.025***	0.027***
	(0.009)	(0.011)	(0.013)	(0.007)	(0.009)	(0.007)	(0.008)
High $FC_{[Base\ t]}$ × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm and Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,885	13,885	13,885	13,885	13,885	13,885	13,885
Adjusted R^2	0.177	0.175	0.176	0.175	0.175	0.175	0.175

Intellectual Property Rights Protection, Investment, and Firm Growth

Internet Appendix

Scott Guernsey

Table IA1
The effect of all-item anti-plug molding laws on patenting activity.

This table reports the results from OLS regressions relating patenting activity to the adoption of all-item anti-plug molding laws (APML). The dependent variable *Ln(1+Patents)* measured in year *t*+1 (*t*+3) in Panel A (B) is the natural logarithm of one plus a firm's count of patents. The dependent variable *Ln(1+Citations)* measured in year *t*+1 (*t*+3) in Panel C (D) is the natural logarithm of one plus the number of citations for each of a firm's patents. The sample period in Columns 1-3 is 1975 to 1988 and 1975 to 1992 in Columns 4-6. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. State- and firm-level controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding laws and patent counts at t+1

	Ln(1 + Patents)$_{[t+1]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.023	-0.035**	-0.035**	-0.024	-0.034**	-0.034**
	(0.016)	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.096***	0.076*	0.079**
				(0.035)	(0.042)	(0.038)
State Law Controls	No	Yes	Yes	No	Yes	Yes
Base t Controls × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,530	13,530	13,530	18,469	18,469	18,469
Adjusted R^2	0.867	0.867	0.868	0.849	0.850	0.850

Panel B: All-item anti-plug molding laws and patent counts at t+3

	Ln(1 + Patents)$_{[t+3]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.028*	-0.039**	-0.036**	-0.029*	-0.044**	-0.041**
	(0.016)	(0.016)	(0.017)	(0.016)	(0.018)	(0.020)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.146***	0.122***	0.126***
				(0.028)	(0.021)	(0.022)
State Law Controls	No	Yes	Yes	No	Yes	Yes
Base t Controls × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,865	12,865	12,865	17,511	17,511	17,511
Adjusted R^2	0.865	0.866	0.867	0.848	0.849	0.849

Table IA1 – (*Continued*)

Panel C: All-item anti-plug molding laws and patent citations at t+1						
	Ln(1 + Citations)$_{[t+1]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.026	-0.038*	-0.031	-0.028	-0.036*	-0.029
	(0.020)	(0.020)	(0.021)	(0.020)	(0.021)	(0.022)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.113**	0.096	0.101*
				(0.053)	(0.060)	(0.053)
State Law Controls	No	Yes	Yes	No	Yes	Yes
Base t Controls × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,530	13,530	13,530	18,469	18,469	18,469
Adjusted R^2	0.825	0.825	0.826	0.806	0.807	0.807

Panel D: All-item anti-plug molding laws and patent citations at t+3						
	Ln(1 + Citations)$_{[t+3]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.051**	-0.059**	-0.054**	-0.051**	-0.063**	-0.058*
	(0.020)	(0.023)	(0.025)	(0.020)	(0.025)	(0.029)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.151***	0.136***	0.143***
				(0.039)	(0.029)	(0.029)
State Law Controls	No	Yes	Yes	No	Yes	Yes
Base t Controls × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,865	12,865	12,865	17,511	17,511	17,511
Adjusted R^2	0.826	0.826	0.827	0.810	0.810	0.810

Table IA2

The effect of all-item anti-plug molding laws on the stock market value of patents.

This table reports the results from OLS regressions relating patenting activity to the adoption of all-item anti-plug molding laws (APML). The dependent variable *Ln(1+Patent Value)* measured in year *t*+2 is the natural logarithm of one plus the stock market value of a firm's patents. The sample period in Columns 1-3 is 1975 to 1988 and 1975 to 1992 in Columns 4-6. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. State- and firm-level controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Ln(1 + Patent Value)$_{[t+2]}$					
		1975-1988			1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	-0.051***	-0.071***	-0.066***	-0.060***	-0.075***	-0.070***
	(0.017)	(0.013)	(0.020)	(0.018)	(0.017)	(0.024)
All APML$_{[t]}$ × Post 88$_{[t]}$				0.131***	0.097**	0.105**
				(0.047)	(0.042)	(0.041)
State Law Controls	No	Yes	Yes	No	Yes	Yes
Base t Controls × Year FE	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,552	13,552	13,552	18,507	18,507	18,507
Adjusted R^2	0.908	0.908	0.911	0.887	0.887	0.889

Table IA3

The effect of all-item anti-plug molding laws on investment and firm growth: Measured using a firm's operations by state.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1992. The respective dependent variables include: *Capital Expenditures*, *Intangible Expenditures*, *Sales Growth*, and *Employment Growth*. *Weighted All APML* is calculated for each firm and is defined as the weighted average of *All APML* based on each state where a firm operates. The state-by-state weights come from Garcia and Norli (2012) and are estimated using the frequency in which a firm mentions each state in its annual reports and related documents when describing its business operations. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Capital Expenditures$_{[t+1]}$		Intangible Expenditures$_{[t+1]}$		Sales Growth$_{[t+1]}$		Employment Growth$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Weighted All APML$_{[t]}$	0.064***	0.075**	0.011***	0.016**	0.082***	0.097***	0.047***	0.061***
	(0.023)	(0.031)	(0.004)	(0.006)	(0.019)	(0.020)	(0.016)	(0.016)
Weighted All APML$_{[t]}$ × Post 88$_{[t]}$	-0.108***	-0.097***	-0.032***	-0.024**	-0.077**	-0.080*	-0.057***	-0.055**
	(0.020)	(0.018)	(0.009)	(0.011)	(0.029)	(0.040)	(0.020)	(0.025)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,779	13,779	13,749	13,749	13,878	13,878	13,632	13,632
Adjusted R^2	0.263	0.280	0.721	0.736	0.219	0.235	0.158	0.164

Table IA4

The effect of all-item anti-plug molding laws on alternative definitions of investment.

This table reports the results from OLS regressions relating investment to the adoption of all-item anti-plug molding laws (APML) over the periods 1975 to 1988 (Panel A) and 1975 to 1992 (Panel B). The dependent variable *Physical Expenditures* measured in year *t*+1 in Columns 1-2 is the ratio of a firm's capital expenditure (*capx*) over its one-year lagged total capital (*ppent* + *K_int*). The dependent variable *Total Expenditures* measured in year *t*+1 in Columns 3-4 is the ratio of a firm's capital expenditure (*capx*) plus its intangible expenditure (*xrd* + 0.3 × *xsga*) over its one-year lagged total capital (*ppent* + *K_int*). The dependent variable *R&D Expenditures* measured in year *t*+1 in Columns 5-6 is the ratio of a firm's R&D expenditure (*xrd*) over its one-year lagged sales (*sale*). The dependent variable *SG&A Expenditures* measured in year *t*+1 in Columns 7-8 is the ratio of a firm's selling, general and administrative expenses (*xsga*) over its one-year lagged sales. The dependent variable *Advertising Expenditures* measured in year *t*+1 in Columns 9-10 is the ratio of a firm's advertising expenditure (*xad*) over its one-year lagged sales. *All APML* is an indicator variable that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. *Base t* controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: The sample period is 1975 to 1988										
	Physical Expenditures$_{[t+1]}$		Total Expenditures$_{[t+1]}$		R&D Expenditures$_{[t+1]}$		SG&A Expenditures$_{[t+1]}$		Advertising Expenditures$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All APML$_{[t]}$	0.012***	0.014***	0.022***	0.028***	0.003***	0.003***	0.016***	0.019***	0.001***	0.002***
	(0.003)	(0.003)	(0.005)	(0.006)	(0.001)	(0.001)	(0.004)	(0.006)	(0.000)	(0.000)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,043	14,043	14,043	14,043	14,224	14,224	14,224	14,224	14,224	14,224
Adjusted R^2	0.379	0.393	0.538	0.561	0.709	0.719	0.662	0.670	0.763	0.765

Table IA4 – (*Continued*)

Panel B: The sample period is 1975 to 1992	Physical Expenditures$_{[t+1]}$		Total Expenditures$_{[t+1]}$		R&D Expenditures$_{[t+1]}$		SG&A Expenditures$_{[t+1]}$		Advertising Expenditures$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All APML$_{[t]}$	0.013***	0.014***	0.026***	0.030***	0.003***	0.003**	0.015***	0.019***	0.001***	0.002***
	(0.003)	(0.003)	(0.005)	(0.006)	(0.001)	(0.001)	(0.005)	(0.007)	(0.000)	(0.000)
All APML$_{[t]}$ × Post 88$_{[t]}$	-0.019***	-0.018***	-0.047***	-0.040***	0.000	0.001	-0.017	-0.014	-0.001	-0.000
	(0.005)	(0.005)	(0.011)	(0.011)	(0.003)	(0.002)	(0.014)	(0.015)	(0.001)	(0.001)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,201	19,201	19,201	19,201	19,527	19,527	19,527	19,527	19,527	19,527
Adjusted R^2	0.367	0.381	0.522	0.547	0.710	0.722	0.645	0.656	0.735	0.741

Table IA5

The effect of all-item anti-plug molding laws on investment and firm growth: Alternative fixed effects.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the periods 1975 to 1988 (Columns 1-2 and 5-6) and 1975 to 1992 (Columns 3-4 and 7-8). Panel A dependent variables include: *Capital Expenditures* in Columns 1-4, and *Intangible Expenditures* in Columns 5-8. Panel B dependent variables include: *Sales Growth* in Columns 1-4, and *Employment Growth* in Columns 5-8. *All APML* is an indicator variable that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. *Base t* controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Age fixed effects are based on the number of years a firm has been included in Compustat. Headquarters state fixed effects are based on a firm's state of headquarters. Incorporation state fixed effects are based on a firm's state of incorporation. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and investment

	Capital Expenditures$_{[t+1]}$				*Intangible Expenditures$_{[t+1]}$*			
	1975-1988		1975-1992		1975-1988		1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.034***	0.040***	0.033***	0.036***	0.010***	0.011***	0.010***	0.010***
	(0.008)	(0.009)	(0.007)	(0.010)	(0.002)	(0.003)	(0.002)	(0.003)
All APML$_{[t]}$ × Post 88$_{[t]}$			-0.033*	-0.039***			-0.010**	-0.006
			(0.017)	(0.013)			(0.005)	(0.006)
Additional fixed effects:								
Firm Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Headquarters State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Incorporation State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm and Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,111	14,111	19,351	19,351	14,144	14,144	19,362	19,362
Adjusted R^2	0.272	0.278	0.271	0.276	0.765	0.769	0.747	0.752

Table IA5 – (*Continued*)

Panel B: All-item anti-plug molding law adoptions and firm growth								
	Sales Growth$_{[t+1]}$				*Employment Growth$_{[t+1]}$*			
	1975-1988		1975-1992		1975-1988		1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.038***	0.038***	0.041***	0.041***	0.023***	0.024***	0.026***	0.027***
	(0.009)	(0.010)	(0.008)	(0.008)	(0.006)	(0.007)	(0.007)	(0.010)
All APML$_{[t]}$ × Post 88$_{[t]}$			-0.024***	-0.034**			-0.009	-0.009
			(0.009)	(0.013)			(0.009)	(0.009)
Additional fixed effects:								
Firm Age FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Headquarters State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Incorporation State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm and Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,224	14,224	19,527	19,527	13,885	13,885	19,085	19,085
Adjusted R^2	0.261	0.269	0.238	0.244	0.178	0.178	0.162	0.163

Table IA6

The effect of all-item anti-plug molding laws on investment and firm growth: Additional controls.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1992. Panel A dependent variables include: *Capital Expenditures* in Columns 1-3, and *Intangible Expenditures* in Columns 4-6. Panel B dependent variables include: *Sales Growth* in Columns 1-3, and *Employment Growth* in Columns 4-6. *All APML* is an indicator variable that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. Additional base year controls include: *Political Balance* measured as the fraction of a state's congress members representing their state in the U.S. House of Representatives that belong to the Democratic party; *Ln(Age)* measured as the natural logarithm of one plus the number of years a firm's been in Compustat; *Cash Holdings* measured as cash and short-term investments (*che*) scaled by book assets (*at*); *Cash Flow* measured as the sum of income before extraordinary items (*ib*) and depreciation and amortization (*dp*) scaled by book assets; and *Z Score* measured as modified Altman's Z-score, calculated as: 1.2×(*wcap*/*at*) + 1.4(*re*/*at*) + 3.3×(*ebit*/*at*) + (*sale*/*at*). State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. *Base t* controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and investment						
	Capital Expenditures$_{[t+1]}$			*Intangible Expenditures$_{[t+1]}$*		
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	0.042***	0.035***	0.035***	0.012***	0.011***	0.011***
	(0.010)	(0.010)	(0.010)	(0.003)	(0.003)	(0.003)
All APML$_{[t]}$ × Post 88$_{[t]}$	-0.053***	-0.041***	-0.043***	-0.012	-0.009	-0.008
	(0.013)	(0.014)	(0.015)	(0.007)	(0.006)	(0.006)
Additional Controls:						
Political Balance$_{[Base\ t]}$ × Year FE	Yes	No	Yes	Yes	No	Yes
Ln(Age)$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
Cash Holdings$_{[Base\ t]}$× Year FE	No	Yes	Yes	No	Yes	Yes
Cash Flow$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
Z Score$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes
Base t Controls × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,351	19,277	19,277	19,362	19,272	19,272
Adjusted R^2	0.258	0.267	0.267	0.724	0.739	0.739

Table IA6 – (*Continued*)

Panel B: All-item anti-plug molding law adoptions and firm growth						
	Sales Growth$_{[t+1]}$			*Employment Growth$_{[t+1]}$*		
	(1)	(2)	(3)	(4)	(5)	(6)
All APML$_{[t]}$	0.047***	0.036***	0.036***	0.030***	0.025**	0.025**
	(0.009)	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)
All APML$_{[t]}$ × Post 88$_{[t]}$	-0.045**	-0.034***	-0.038***	-0.021*	-0.009	-0.011
	(0.017)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)
Additional Controls:						
Political Balance$_{[Base\ t]}$ × Year FE	Yes	No	Yes	Yes	No	Yes
Ln(Age)$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
Cash Holdings$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
Cash Flow$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
Z Score$_{[Base\ t]}$ × Year FE	No	Yes	Yes	No	Yes	Yes
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes
Base t Controls × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,527	19,432	19,432	19,085	18,999	18,999
Adjusted R^2	0.226	0.249	0.249	0.152	0.162	0.162

Table IA7

The effect of all-item anti-plug molding laws on investment and firm growth: All manufacturing firms.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML). Columns 1-2 and 5-6 provide estimates using the sample period 1975 to 1988, while Columns 3-4 and 7-8 are specific to the period 1975 to 1992. The sample includes all manufacturing firms that operate in a 2000-3999 SIC industry. Panel A dependent variables include: *Capital Expenditures* in Columns 1-4, and *Intangible Expenditures* in Columns 5-8. Panel B dependent variables include: *Sales Growth* in Columns 1-4, and *Employment Growth* in Columns 5-8. *All APML* is an indicator variable that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls include: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. State- and firm-level controls measured in a firm's base year and interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and investment

	Capital Expenditures$_{[t+1]}$				Intangible Expenditures$_{[t+1]}$			
	1975-1988		1975-1992		1975-1988		1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.031***	0.041***	0.035***	0.042***	0.007**	0.010***	0.009**	0.012***
	(0.007)	(0.008)	(0.006)	(0.008)	(0.004)	(0.003)	(0.004)	(0.003)
All APML$_{[t]}$ × Post 88$_{[t]}$			-0.052***	-0.049***			-0.021***	-0.015**
			(0.014)	(0.013)			(0.007)	(0.006)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,106	21,106	29,039	29,039	21,189	21,189	29,124	29,124
Adjusted R^2	0.247	0.262	0.241	0.256	0.748	0.762	0.729	0.745

Table IA7 – (*Continued*)

Panel B: All-item anti-plug molding law adoptions and firm growth

	Sales Growth$_{[t+1]}$				Employment Growth$_{[t+1]}$			
	1975-1988		1975-1992		1975-1988		1975-1992	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$	0.015***	0.018**	0.019***	0.024***	0.010	0.011	0.015*	0.016*
	(0.005)	(0.007)	(0.005)	(0.007)	(0.008)	(0.007)	(0.008)	(0.009)
All APML$_{[t]}$ × Post 88$_{[t]}$			-0.034***	-0.032**			-0.020**	-0.020**
			(0.011)	(0.013)			(0.008)	(0.009)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,283	21,283	29,313	29,313	20,824	20,824	28,705	28,705
Adjusted R^2	0.242	0.253	0.211	0.224	0.156	0.160	0.140	0.146

Table IA8

Placebo tests: Patents, investment, and firm growth.

This table reports the results from OLS regressions relating patenting, investment, and firm growth to the adoption of all-item and boat-item anti-plug molding laws (APML), respectively, over the period 1975 to 1992. Dependent variables include: *Ln(1+Patents)*; *Ln(1+Citations)*; *Capital Expenditures*; *Intangible Expenditures*; *Sales Growth*; *Employment Growth*. *All APML* is an indicator that equals one if a firm's headquarters state adopts an all-item APML, and zero otherwise. *Boat APML* is an indicator that equals one if a firm's headquarters state adopts a boat-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. Panel A includes all-item APML adoptions and firms that do not make moldable products. Non-moldable products firms are defined by industry of operation and include: "Agriculture, Forestry, Fishing" (SIC codes: 01-09), "Wholesale Trade-Nondurable Goods" (SIC code: 51), and most "Services" (SIC codes: 72, 79-86, 88-89). Panel B includes *Boat APML* and excludes states that adopt an all-item APML. State law controls: *IDD*; *UTSA*; *R&D Tax Credit*; *Good Faith*; *Implied Contract*; *Public Policy*; *ATP Index*. *Base t* controls interacted with year dummies: *GDP Growth*; *Ln(Assets)*; *Book Leverage*; *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and firms without moldable products

	$Ln(1 + Patents)_{[t+2]}$	$Ln(1 + Citations)_{[t+2]}$	Capital $Expenditures_{[t+1]}$	Intangible $Expenditures_{[t+1]}$	Sales $Growth_{[t+1]}$	Employment $Growth_{[t+1]}$
	(1)	(2)	(3)	(4)	(5)	(6)
$All\ APML_{[t]}$	0.018	0.045	0.030	0.004	0.067	-0.020
	(0.045)	(0.070)	(0.024)	(0.006)	(0.053)	(0.030)
$All\ APML_{[t]} \times Post\ 88_{[t]}$	-0.036	-0.063	0.030	-0.022	-0.045	-0.014
	(0.056)	(0.069)	(0.072)	(0.014)	(0.080)	(0.064)
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes
Base t × Year FE Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,426	2,426	2,600	2,586	2,623	2,495
Adjusted R^2	0.625	0.623	0.290	0.755	0.212	0.140

Table IA8 – (*Continued*)

Panel B: Boat-item anti-plug molding law adoptions	Ln(1 + Patents)$_{[t+2]}$	Ln(1 + Citations)$_{[t+2]}$	Capital Expenditures$_{[t+1]}$	Intangible Expenditures$_{[t+1]}$	Sales Growth$_{[t+1]}$	Employment Growth$_{[t+1]}$
	(1)	(2)	(3)	(4)	(5)	(6)
Boat APML$_{[t]}$	-0.043	-0.038	-0.017	0.004	-0.001	-0.006
	(0.049)	(0.066)	(0.016)	(0.007)	(0.017)	(0.016)
Boat APML$_{[t]}$ × Post 88$_{[t]}$	0.043	0.046	0.050***	0.019***	0.019	0.010
	(0.061)	(0.071)	(0.015)	(0.005)	(0.013)	(0.016)
State Law Controls	Yes	Yes	Yes	Yes	Yes	Yes
Base t × Year FE Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,531	14,531	15,191	15,189	15,323	14,962
Adjusted R^2	0.859	0.819	0.247	0.715	0.222	0.147

Table IA9

The differential effect of all-item anti-plug molding laws on investment and firm growth for more versus less concentrated industries.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1988. The respective dependent variables include: *Capital Expenditures*, *Intangible Expenditures*, *Sales Growth*, and *Employment Growth*. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *HHI* is the 3-digit SIC Herfindahl-Hirschman index based on the sales of all firms in the CRSP-Compustat merged database in a given year. *High* $HHI_{[t-1]}$ is an indicator that equals one if a firm's industry *HHI* in year *t*-1 is above the sample median, and zero otherwise. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Capital Expenditures$_{[t+1]}$		Intangible Expenditures$_{[t+1]}$		Sales Growth$_{[t+1]}$		Employment Growth$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All $APML_{[t]}$ × High $HHI_{[t-1]}$	-0.031**	-0.038**	-0.019***	-0.021***	-0.030**	-0.032**	-0.053***	-0.055***
	(0.015)	(0.014)	(0.003)	(0.003)	(0.014)	(0.015)	(0.013)	(0.012)
All $APML_{[t]}$	0.048***	0.054***	0.010***	0.013***	0.032***	0.033***	0.044***	0.045***
	(0.011)	(0.009)	(0.004)	(0.003)	(0.008)	(0.009)	(0.007)	(0.008)
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,808	12,808	12,837	12,837	12,907	12,907	12,633	12,633
Adjusted R^2	0.222	0.231	0.737	0.748	0.196	0.206	0.147	0.150

Table IA10

The differential effect of all-item anti-plug molding laws on investment and firm growth for more versus less concentrated industries.

This table reports the results from OLS regressions relating investment and firm growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1988. The respective dependent variables include: *Capital Expenditures*, *Intangible Expenditures*, *Sales Growth*, and *Employment Growth*. *All APML* is an indicator that equals one if a firm's headquarters state adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. *HHI* is the 3-digit SIC Herfindahl-Hirschman index based on the sales of all firms in the CRSP-Compustat merged database in a given year. *High* $HHI_{[Base\ t]}$ is an indicator that equals one if a firm's industry *HHI* in its base year is above the sample median-base year *HHI*, and zero otherwise. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Capital Expenditures$_{[t+1]}$		Intangible Expenditures$_{[t+1]}$		Sales Growth$_{[t+1]}$		Employment Growth$_{[t+1]}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All APML$_{[t]}$ × High HHI$_{[Base\ t]}$	-0.098***	-0.090***	-0.030***	-0.027***	-0.071***	-0.064***	-0.025*	-0.025**
	(0.020)	(0.017)	(0.005)	(0.005)	(0.017)	(0.017)	(0.013)	(0.012)
All APML$_{[t]}$	0.059***	0.065***	0.018***	0.019***	0.060***	0.063***	0.033***	0.037***
	(0.009)	(0.011)	(0.003)	(0.003)	(0.009)	(0.010)	(0.009)	(0.010)
All APML$_{[t]}$ × High HHI$_{[Base\ t]}$ × Post 88$_{[t]}$	0.050	0.064	-0.000	0.005	-0.003	0.012	-0.033	-0.029
	(0.077)	(0.069)	(0.019)	(0.017)	(0.028)	(0.027)	(0.033)	(0.032)
All APML$_{[t]}$ × Post 88$_{[t]}$	-0.065***	-0.070***	-0.020*	-0.015	-0.037**	-0.048**	-0.012	-0.013
	(0.022)	(0.023)	(0.010)	(0.010)	(0.015)	(0.019)	(0.013)	(0.015)
High HHI$_{[Base\ t]}$ × Post 88$_{[t]}$	-0.051	-0.062	-0.013	-0.014	0.026	0.019	0.054*	0.049
	(0.051)	(0.052)	(0.010)	(0.011)	(0.058)	(0.058)	(0.030)	(0.030)
HHI$_{[Base\ t]}$ × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Law Controls	No	Yes	No	Yes	No	Yes	No	Yes
Base t Controls × Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,351	19,351	19,362	19,362	19,527	19,527	19,085	19,085
Adjusted R^2	0.244	0.259	0.708	0.725	0.211	0.225	0.147	0.152

Table IA11

The effect of all-item anti-plug molding laws on firm value.

This table reports the results from OLS regressions relating firm value to the adoption of all-item anti-plug molding laws (APML). The dependent variables include: *Ln(Tobin's Q)* in Columns 1-3 is the natural logarithm of a firm's Tobin's Q, defined the same as *MTB*; *Ln(Market Value of Equity)* in Columns 4-6 is the natural logarithm of a firm's market value of equity (*prcc_f* × *csho*); *Total Q* in Columns 5-6 is a modified version of Tobin's Q that scales a firm's market value of assets by the sum of its physical and intangible capital (*q_tot*). Data for *Total Q* comes from Peters and Taylor (2017). The sample period in Columns 1-2, 4-5, and 7-8 is 1975-1988, and in Columns 3, 6, and 9, it is 1975-1992. *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *Post 88* is an indicator that equals one if year *t* is after 1988, and zero otherwise. State law controls: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, and *ATP Index*. Base year controls interacted with year dummies include: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*. Industry fixed effects are based on 3-digit SIC industries. Standard errors in parentheses are clustered by state of headquarters. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Ln(Tobin's Q)$_{[t]}$			Ln(Market Value of Equity)$_{[t]}$			Total Q$_{[t]}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
All APML$_{[t]}$	0.060***	0.043**	0.043***	0.075***	0.044**	0.051**	0.132***	0.140**	0.159***
	(0.017)	(0.018)	(0.016)	(0.018)	(0.020)	(0.024)	(0.045)	(0.063)	(0.058)
All APML$_{[t]}$ × Post 88$_{[t]}$			-0.054**			0.006			-0.291*
			(0.024)			(0.058)			(0.154)
State Law Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Base t Controls × Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,785	14,785	20,479	14,785	14,785	20,479	14,753	14,753	20,443
Adjusted R^2	0.687	0.740	0.705	0.905	0.909	0.887	0.602	0.682	0.639

Table IA12

The differential effect of all-item anti-plug molding laws on investment and growth for more versus less financially constrained firms.

This table reports the results from OLS regressions relating investment and growth to the adoption of all-item anti-plug molding laws (APML) over the period 1975 to 1988. The dependent variables include: *Capital Expenditures* (Panel A), *Intangible Expenditures* (Panel B), *Sales Growth* (Panel C), and *Employment Growth* (Panel D). *All APML* is an indicator that equals one if a firm's state of headquarters adopts an all-item APML, and zero otherwise. *High* $FC_{[t-1]}$ is an indicator that is defined in each of the respective columns as follows. In Column 1, it equals one if a firm depends on external capital, measured in year *t*-1 as a firm with capital expenditures exceeding its operating cash flows, and zero otherwise. In Column 2, it equals one if a firm's book value of assets (in 1992 dollars) measured in year *t*-1 is below the sample median, and zero otherwise. In Column 3, it equals one if a firm's age in year *t*-1 (based on its years in Compustat) is below the sample median, and zero otherwise. In Column 4, it equals one if the firm does not pay a common dividend in year *t*-1, and zero otherwise. Columns 5-7 measure a firm's degree of financial constraints using the indexes in Kaplan and Zingales (1997), Whited and Wu (2006), and Hadlock and Pierce (2010) as defined in Farre-Mensa and Ljungqvist (2016). For these indices, *High* $FC_{[t-1]}$ is an indicator that equals one if the value of the index in year *t*-1 is above the sample median, and zero otherwise. Controls & FEs: *IDD*, *UTSA*, *R&D Tax Credit*, *Good Faith*, *Implied Contract*, *Public Policy*, *ATP Index* and Base year controls interacted with year dummies: *GDP Growth*, *Ln(Assets)*, *Book Leverage*, and *MTB*, and firm and 3-digit SIC industry × year fixed effects. Standard errors in parentheses are clustered by headquarters state. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: All-item anti-plug molding law adoptions and capital expenditures

High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]}$ × High $FC_{[t-1]}$	0.023**	0.055***	0.022*	0.080***	0.018*	0.067***	0.054***
	(0.011)	(0.017)	(0.012)	(0.011)	(0.010)	(0.016)	(0.017)
All $APML_{[t]}$	0.035***	0.016	0.034***	-0.002	0.012	-0.003	0.024**
	(0.009)	(0.010)	(0.011)	(0.013)	(0.011)	(0.015)	(0.010)
High $FC_{[t-1]}$	-0.083***	0.094***	-0.027**	0.014	-0.064***	0.064***	0.139***
	(0.012)	(0.021)	(0.011)	(0.012)	(0.009)	(0.022)	(0.023)
Controls & FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,808	12,113	12,113	12,808	11,583	11,665	12,808
Adjusted R^2	0.239	0.234	0.229	0.232	0.221	0.217	0.241

Table IA12 – (*Continued*)

Panel B: All-item anti-plug molding law adoptions and intangible expenditures							
High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]} \times$ High $FC_{[t-1]}$	-0.000	0.024***	0.000	0.010	0.004	0.010*	0.014***
	(0.003)	(0.007)	(0.003)	(0.007)	(0.003)	(0.005)	(0.003)
All $APML_{[t]}$	0.007**	-0.004	0.008*	0.001	0.002	0.000	0.002
	(0.003)	(0.007)	(0.004)	(0.005)	(0.003)	(0.004)	(0.003)
High $FC_{[t-1]}$	-0.019***	0.013***	-0.019***	-0.004	-0.017***	0.000	0.020***
	(0.002)	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)
Controls & FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,837	12,143	12,143	12,837	11,618	11,697	12,837
Adjusted R^2	0.751	0.751	0.751	0.748	0.746	0.742	0.750

Panel C: All-item anti-plug molding law adoptions and sales growth							
High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]} \times$ High $FC_{[t-1]}$	0.020	0.027	0.016	0.065***	-0.004	-0.028**	-0.015
	(0.022)	(0.022)	(0.012)	(0.016)	(0.025)	(0.012)	(0.022)
All $APML_{[t]}$	0.018**	0.006	0.012	-0.014	0.003	0.011	0.027***
	(0.007)	(0.011)	(0.012)	(0.011)	(0.010)	(0.007)	(0.007)
High $FC_{[t-1]}$	0.013*	0.101***	-0.033***	0.039***	0.007	0.116***	0.171***
	(0.007)	(0.018)	(0.010)	(0.011)	(0.013)	(0.013)	(0.017)
Controls & FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,907	12,211	12,211	12,907	11,672	11,755	12,907
Adjusted R^2	0.206	0.211	0.207	0.207	0.176	0.185	0.219

Table IA12 – (*Continued*)

Panel D: All-item anti-plug molding law adoptions and employment growth							
High FC variables:	External Financial Dependence	Small Firm	Young Firm	Non-Dividend Firm	Kaplan and Zingales (1997)	Whited and Wu (2006)	Hadlock and Pierce (2010)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
All $APML_{[t]} \times$ High $FC_{[t-1]}$	0.032**	0.045***	0.038***	0.052***	0.017	0.019**	0.010
	(0.012)	(0.014)	(0.009)	(0.008)	(0.012)	(0.007)	(0.012)
All $APML_{[t]}$	0.020***	0.009	0.013*	0.001	0.012	0.010	0.026***
	(0.006)	(0.012)	(0.008)	(0.008)	(0.008)	(0.007)	(0.007)
High $FC_{[t-1]}$	-0.030***	0.070***	-0.037***	0.021**	-0.032***	0.048***	0.112***
	(0.007)	(0.009)	(0.007)	(0.008)	(0.010)	(0.009)	(0.012)
Controls & FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,633	11,957	11,957	12,633	11,446	11,527	12,633
Adjusted R^2	0.151	0.156	0.152	0.150	0.141	0.141	0.159