From Discovery to Production: The Impact of the 2017 Tax Credit on U.S. Manufacturing Capacity for New Medicines *[Extended Abstract – October 2026]*

Yongzheng Liang, M.A, Antonio J. Trujillo, Ph.D.

A. Motivation and contribution

Does corporate tax relief help pharmaceutical firms build the manufacturing capacity needed to bring new medicines to patients? Developing a therapy requires more than research, patents, and successful clinical trials. Firms must also establish reliable production at commercial scale. Manufacturing is therefore a critical link in the innovation chain, yet relatively little is known about how broad corporate tax incentives affect this manufacturing stage. We propose to examine how domestic pharmaceutical manufacturing portfolios changed following the 2017 Tax Cuts and Jobs Act (TCJA), with particular attention to capacity supporting new products, differences between young and established firms, and the role of local manufacturing capabilities.

This study is the third paper in our research series on corporate tax reform and pharmaceutical innovation. Our first paper examined the effect of tax cuts on total R&D spending. Our second moved beyond aggregate expenditure to examine 12 innovation outcomes spanning patenting, clinical trial initiation, trial completion, and development speed. In its main comparison of high-debt and low-debt firms, the second paper found that short-run differential responses were concentrated in patenting and Phase I trial initiation, with weaker evidence of higher patent value. We found no consistent differential improvements in later-stage trial initiation, trial completion, or development speed. These findings suggest that financial relief can affect particular innovation activities without producing a uniform response throughout development. The present paper extends the series to manufacturing, asking whether tax reform also changes firms' capacity to produce medicines. Together, the three papers examine R&D investment, the activities and outcomes it supports, and the production capabilities required for commercialization.

Our central distinction is between expanding production of existing medicines and developing capacity for new medicines. Both can increase output, but their implications for innovation policy differ. Expansion for established products strengthens production capability; capacity for newly introduced therapies supports commercialization. Teece's (1986) framework emphasizes the complementary assets needed to commercialize discoveries, while Howell's (2017) evidence on R&D grants and prototyping highlights financing constraints along this pathway. Pharmaceutical production also requires specialized process knowledge and regulatory validation, with important differences between chemical and biotechnology-based manufacturing (Pisano, 1994; FDA, 2011).

The TCJA reduced the federal corporate tax rate from 35% to 21%, expanded eligible investment expensing, and changed international taxation (Joint Committee on Taxation, 2018). These provisions could affect investment incentives and internal funds, but their effects may depend on firms' tax positions, financial constraints, and existing capabilities. Established, tax-paying firms may expand incumbent facilities, whereas younger firms may rely more on external finance or manufacturing partners. Prior studies document heterogeneous investment responses to tax incentives and different TCJA provisions (Zwick and Mahon, 2017; Albertus, Glover, and Levine, 2025; Chodorow-Reich et al., 2026; Duan and Moon, 2026; Appelt et al., 2026).

We connect these responses to identifiable pharmaceutical plants, production technologies, and, where observable, the products they support. Our geographic analysis builds on research on within-firm reallocation, local investment responses, and manufacturing clusters (Giroud and Rauh, 2019; Garrett, Ohrn, and Suárez Serrato, 2020; Greenstone, Hornbeck, and Moretti, 2010), as well as pharmaceutical establishment responses to Puerto Rico's tax-credit withdrawal (Chen and Feliciano, 2024). The analysis distinguishes capacity supporting new products from expansion for existing medicines and separates net additions to U.S. capacity from geographic reallocation and changes in ownership.

B. Data and outcomes

We propose to link historical establishment records from YourEconomy Time Series and Data Axle to pharmaceutical parents using SEC filings, dated transactions, and Orbis Historical data. S&P Compustat and public filings data would provide financial characteristics and pre-reform foreign cash holdings; founding histories would establish firm age. FDA records and relevant Cortellis modules would identify manufacturing roles, technologies, and product relationships. Industrial Info Resources would provide investment-project and operating-capacity histories, subject to verification of historical coverage. BLS Quarterly Census of Employment and Wages data would measure baseline state pharmaceutical specialization. The main sample would include U.S.-tax-resident public pharmaceutical parents operating before the reform.

The primary outcomes are employment and operating capacity at incumbent plants relative to their 2016 levels. Additional outcomes include expansion projects at existing facilities, new-site openings, operating-site counts, and commissioned capacity measured within comparable technologies. Announcements, construction starts, and commissioning would be tracked separately to distinguish investment intentions from completed capacity. Consolidated parent capital expenditures would provide a complementary investment measure, rather than a measure of spending at individual U.S. plants.

Where reliable product-plant links are available, we would distinguish capacity supporting newly introduced therapies from expansion for established products. We would also distinguish integrated from contract manufacturing and chemical from biologic production. Where product links cannot be established, the analysis would identify manufacturing expansion without attributing it to new medicines. This distinction is essential to interpreting the study as evidence about the commercialization of innovation.

C. Empirical strategy

We combine flexible event studies with difference-in-differences (DiD) models to examine domestic manufacturing portfolios. Firm age and geographic capabilities would be measured before reform. Event studies would assess 2012–2016 trends, treat 2017 as transitional, and initially examine 2018–2019 responses. Longer follow-up would capture slower capacity investments while separately accounting for pandemic demand and subsequent policy changes. Age cutoffs would be fixed before outcome analysis, with sensitivity analyses using continuous age.

The principal DiD specification compares post-reform changes between young and established firms, with group membership fixed in 2016. Firm and year fixed effects would absorb persistent firm differences and common annual shocks. Baseline size, cash, leverage, profitability, tax status,

product mix, and manufacturing footprint interacted with year would address differences in investment opportunities. Plant-level models would additionally include state-by-year and technology-by-year effects. Because both age groups encountered the TCJA, this comparison identifies a differential response under conditional parallel trends, rather than the reform's aggregate effect. Firm age captures organizational maturity and is not itself a measure of tax exposure.

We would supplement the age comparison with analyses of pre-reform foreign-cash-to-assets exposure among multinational firms with comparable disclosures. This measure captures one potential financial channel rather than exposure to every TCJA provision. To examine local capabilities, we would interact post-reform timing and baseline financial exposure with states' 2014–2016 pharmaceutical employment shares. A separate specification with baseline-parent-by-year fixed effects would compare locations within the same firm, separating geographic allocation from total domestic portfolio responses. Baseline ownership would define the original network, with post-sale observations assessed separately.

Identification requires the absence of unaccounted differential trends or concurrent shocks across comparison groups. We would examine pre-trends, placebo dates, reweighted comparisons within common support, ownership changes, and contemporaneous tariff exposure. The within-network analysis would also require sufficient identifying variation across overlapping parent firm-state networks.

D. Interpretation of potential findings

Increases in employment and commissioned capacity associated with pre-reform financial exposure would be consistent with a production-side response to tax reform. Links to new therapies would strengthen the interpretation that this response supports commercialization. Expansion concentrated at incumbent facilities would suggest that existing capabilities shape adjustment; new commissioned sites would indicate expansion along the entry margin. Gains in some states offset by contractions elsewhere within the same parent would indicate domestic reallocation, while acquisitions without physical expansion would indicate consolidation. Identifying reshoring would require evidence of foreign production declines or documented transfers, rather than U.S. growth alone.

Precisely estimated null responses despite observable financial relief would weaken the view that financial incentives alone are sufficient to expand manufacturing. However, a null young-established contrast could conceal similar responses in both groups, and imprecise estimates would remain inconclusive. Interpretation would therefore emphasize effect sizes and confidence intervals.

E. Policy relevance

First, pharmaceutical innovation policy. This paper would help assess whether incentives extend through the production stage of innovation. Read alongside our earlier studies of R&D spending and 12 innovation outcomes, it would show where responses emerge along the innovation chain and where constraints may remain. Capacity supporting new therapies would provide evidence of a manufacturing response relevant to commercialization; expansion for established products would demonstrate a different benefit. These distinctions can improve the choice of outcomes used to evaluate innovation policy.

Second, corporate tax policy. The study would inform whether broad tax relief generates additional productive investment and which firms respond. Differences by tax position, financial exposure, and organizational maturity could help explain why similar headline incentives yield different manufacturing outcomes. The evidence could inform the design of investment incentives and the case for complementary support where constraints persist. It would not, by itself, establish that targeted incentives outperform broad corporate tax reductions.

Third, domestic manufacturing and trade policy. The analysis would distinguish additional U.S. capacity from domestic relocation, consolidation, and documented reshoring. These outcomes matter when judging whether onshoring initiatives expand the ability to manufacture medicines. Although the TCJA cannot identify the effects of tariffs, the study could provide evidence about the time required to complete investments, the firms able to respond, and the importance of existing production capabilities. These are relevant considerations when setting expectations for tariff-based manufacturing initiatives.

Fourth, regional development policy. The geographic analysis would examine whether manufacturing responses reinforce established pharmaceutical clusters or extend to new locations. Expansion concentrated in existing clusters would suggest that local capabilities condition the response to financial incentives. Entry elsewhere would indicate broader geographic opportunities. These findings could guide the evaluation of complementary investments in workforce training and production infrastructure, while helping states distinguish local gains from net additions to national manufacturing capacity.

Acknowledgement

The authors declare that they have no relevant financial or non-financial interests to disclose. No funding was received.

References

Albertus, James F., Brent Glover, and Oliver Levine. 2025. "The real and financial effects of internal liquidity: Evidence from the Tax Cuts and Jobs Act." Journal of Financial Economics 166: 104006.

Appelt, Silvia, et al. 2026. "How Effective are R&D Tax Incentives? Reconciling the Micro and Macro Evidence." American Economic Journal: Economic Policy 18(4): 383–422

Chen, Meng-Ting, and Zadia M. Feliciano. 2024. "Intangible assets, corporate tax credits and pharmaceutical establishments." Emerging Markets Review 60: 101141.

Chodorow-Reich, Gabriel, Matthew Smith, Owen Zidar, and Eric Zwick. 2026. "Tax Policy and Investment in a Global Economy." Author manuscript, January 7; accepted, American Economic Review.

Duan, Yige, and Terry Moon. 2026. "Impacts of corporate tax cuts on firms and workers: Evidence from small businesses." American Economic Journal: Economic Policy 18(4): 208–244.

Flaaen, Aaron, Ali Hortaçsu, and Felix Tintelnot. 2020. "The Production Relocation and Price Effects of US Trade Policy: The Case of Washing Machines." American Economic Review 110(7): 2103–2127.

Flaaen, Aaron, and Justin Pierce. 2026. "Disentangling the Effects of the 2018–2019 Tariffs on a Globally Connected U.S. Manufacturing Sector." Review of Economics and Statistics. DOI: 10.1162/rest_a_01498.

Garrett, Daniel G., Eric Ohrn, and Juan Carlos Suárez Serrato. 2020. "Tax Policy and Local Labor Market Behavior." American Economic Review: Insights 2(1): 83–100.

Giroud, Xavier, and Joshua Rauh. 2019. "State Taxation and the Reallocation of Business Activity: Evidence from Establishment-Level Data." Journal of Political Economy 127(3): 1262–1316.

Goldberg, Pinelopi Koujianou, Amit Kumar Khandelwal, Nina Pavcnik, and Petia Topalova. 2010. "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India." Quarterly Journal of Economics 125(4): 1727–1767.

Greenstone, Michael, Richard Hornbeck, and Enrico Moretti. 2010. "Identifying Agglomeration Spillovers: Evidence from Winners and Losers of Large Plant Openings." Journal of Political Economy 118(3): 536–598.

Howell, Sabrina T. 2017. "Financing Innovation: Evidence from R&D Grants." American Economic Review 107(4): 1136–1164.

Joint Committee on Taxation. 2018. "General Explanation of Public Law 115-97." JCS-1-18. Washington, DC: U.S. Government Publishing Office.

Pisano, Gary P. 1994. "Knowledge, Integration, and the Locus of Learning: An Empirical Analysis of Process Development." Strategic Management Journal 15(S1): 85–100.

Teece, David J. 1986. "Profiting from technological innovation: Implications for integration, collaboration, licensing and public policy." Research Policy 15(6): 285–305.

U.S. Food and Drug Administration (FDA). 2011. "Process Validation: General Principles and Practices." Guidance for Industry. January.

White House. 2026. "Adjusting Imports of Pharmaceuticals and Pharmaceutical Ingredients into the United States." Presidential proclamation, April 2.

Zwick, Eric, and James Mahon. 2017. "Tax Policy and Heterogeneous Investment Behavior." American Economic Review 107(1): 217–248.