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The Impact of the 2017 Tax Cuts and Jobs Act on U.S. Multinationals' Intangible Assets *

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Abstract

This paper investigates the impact of the 2017 Tax Cuts and Jobs Act (TCJA) on U.S. multinationals' intangibles. We develop a theoretical model that incorporates key provisions of the TCJA—the Global Intangible Low-Taxed Income (GILTI) and the Foreign-Derived Intangible Income (FDII)—and derive testable implications for changes in licensing and patent transfer patterns. Using data on international royalty flows and patent assignments, we test the model's predictions. Our findings suggest that the TCJA may have impacted profit shifting strategies through intangibles, aligning with our model's predictions.

Keywords: Profit-shifting, intangibles, patents, taxation

JEL codes: : F12, O33, O41, O47

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1 Introduction

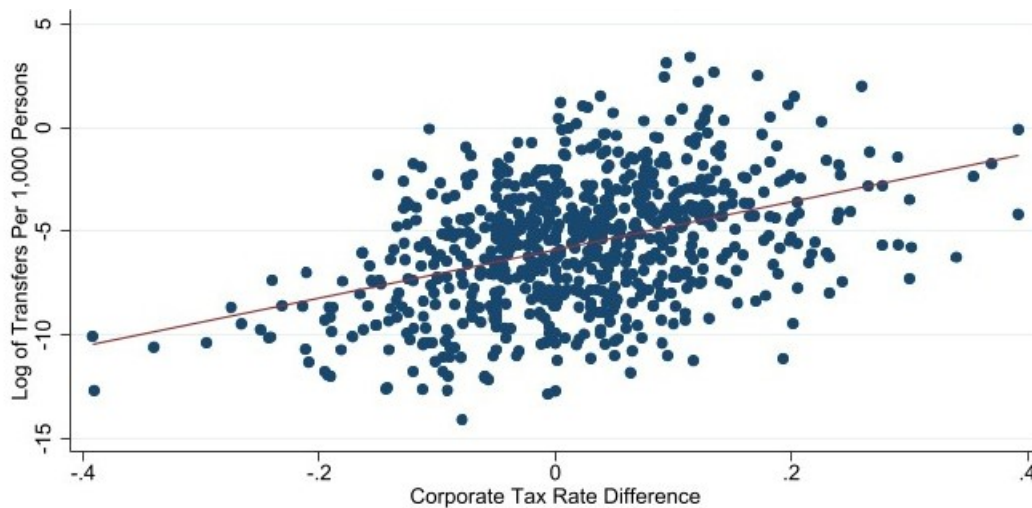
Intellectual property (IP) has become a key driver of innovation and economic growth in the increasingly technology-driven global economy. For multinational corporations (MNCs), intangibles such as patents, trademarks, copyrights, and trade secrets are highly valuable and mobile, making them an attractive tool for profit shifting. Profit shifting is a practice in which MNCs move their profits from high-tax countries to low-tax countries to lower their overall tax burden. One of the most common forms of this practice is the transfer of IP. MNCs can license their IP to foreign entities and receive royalty payments taxed at the domestic rate, or they can transfer ownership of the IP to foreign affiliates, often at a discounted rate, and have the royalty payments taxed at the foreign rate. The decision between these two options is largely influenced by differences in corporate tax rates across countries. By strategically allocating their profits to subsidiaries or affiliates located in these low-tax jurisdictions, MNCs can significantly reduce their overall tax burden, even if the majority of their economic activity occurs in higher-tax countries.

The sensitivity of MNCs to corporate tax rates has led to a global race to the bottom where countries compete with each other to attract MNCs by progressively lowering their corporate tax rates. As a result of this race to the bottom, average corporate tax rates have fallen from 49% to 24% between 1985 and 2018 (Tørsløv, Wier, and Zucman, 2023). Countries like Ireland and Bermuda have leveraged this trend by establishing themselves as tax havens, offering extremely low or even zero corporate tax rates. These tax havens enable MNCs to engage in legal tax evasion by engaging in profit-shifting activity.

The link between corporate tax rates and MNCs' behavior is evidenced by the positive correlation between patent transfers and corporate tax differences, as illustrated in Figure 1. The larger the difference in corporate tax rates between countries, the greater the incentive for MNCs to engage in these cross-border IP transfers. This correlation suggests that corporate taxation is a critical factor in MNCs' decisions regarding transfer of IP and profit shifting.

Moreover, empirical evidence from Santacreu and LaBelle (2023) shows that since 1980, the US has been selling an increasing number of patents to tax havens compared to non-havens (see

Figure 1: Patent Transfers: 2001-2015



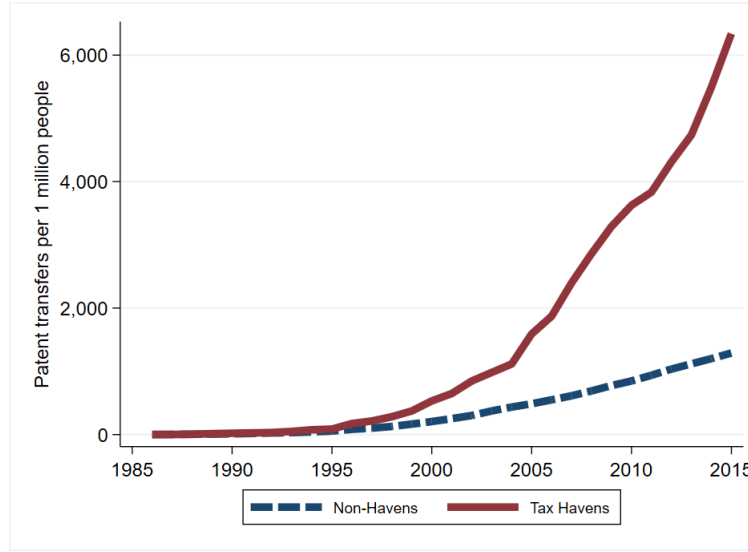
SOURCE: Bass, Santacreu, and LaBelle (2024)

Figure 2), which indicates a potential channel through which MNCs may engage in profit-shifting activities is via transactions involving intangibles.

The impact of profit shifting on the US has been significant, with Clausing (2020) estimating that one-third of US corporate income taxes, equivalent to \$100 billion in revenue, are lost annually due to this practice. Tørsløv, Wier, and Zucman (2023) estimate that the United States loses about 15% of its corporate tax revenue because of the relocation of profits to low-tax places. The rise of tech companies has exacerbated the issue. In particular, Apple strategically avoided billions in US taxes by registering profits in Ireland despite having proportionately fewer employees and consumers there.

To address the taxation of foreign profits from technology licensing and discourage profit shifting, the US Congress passed the Tax Cut and Jobs Act (TCJA) in 2017. The TCJA introduced several key provisions, including the Global Intangible Low-Taxed Income (GILTI) and the Foreign-Derived Intangible Income (FDII) regimes, which aim to incentivize firms to keep intangible assets in the US and transfer back ownership of previously shifted technology. GILTI imposes an additional tax on supernormal returns, which are all profits in excess of 10% of the tangible assets owned by an MNC's foreign subsidiary. By using this methodology, GILTI places particular focus

Figure 2: Intellectual Property Transfers from the US



SOURCES: ktMINE & Santacreu and LaBelle (2023)

on re-incorporating foreign profit earned through intangible assets.. The goal of this policy is to increase the foreign income tax burden on firms, reducing the incentive to shift profits to low-tax jurisdictions.¹

FDII, on the other hand, provides a tax break for companies by allowing them to deduct 37.5% of their foreign-derived profits related to the export of intangible goods or services, lowering the effective tax rate. This provision, similar to “patent box” policies, encourages US MNCs to keep their IP within the US by offering a reduced tax rate on royalty payments received from foreign firms using their IP.²

In this paper, we examine potential changes in profit-shifting behavior through IP movements following the TCJA reforms by analyzing data on royalty payments and patent transfers. We begin by developing a theoretical framework that models the profit-shifting decisions of US MNCs in response to corporate tax differentials. Armed with this model, we examine how global tax policies might change these profit shifting decisions. Our model considers three countries: the United States, a tax haven (TH), and the rest of the world (ROW). US firms are innovators, creating patents

¹For more information on GILTI, visit the Tax Foundation.

²For more information on FDII, visit the Tax Foundation.

for intermediate goods production. These firms aim to maximize their ideas' value through global royalty payments. While royalties are taxed at US rates, multinationals can reduce tax burdens by transferring IP ownership to affiliates in tax havens at a discount. This strategy, though costly, potentially increases global profits by leveraging lower tax rates. The optimal fraction of technologies transferred through profit-shifting depends on the corporate tax differential, the discount rate for technology sales to foreign affiliates, and transfer costs. In other words, firms balance the benefits of higher post-tax royalties against the costs of IP transfers when making profit-shifting decisions. Our model incorporates the TCJA's key provisions, GILTI and FDII, which modify the effective tax rates for U.S. multinationals' foreign and domestic income respectively. These changes decrease the optimal fraction of technologies transferred to foreign affiliates, potentially reducing incentives for profit shifting. As a result, more IP is retained domestically.³ While our analysis suggests changes in multinational behavior following the TCJA, establishing a direct causal relationship between the Act and observed shifts in royalty flows presents significant challenges. Various confounding factors, including global economic trends, changes in other countries' tax policies, and firm-specific strategies, may also influence these patterns.

The model yields several testable implications regarding the TCJA's potential impact on profit-shifting behavior and international technology licensing: First, the model predicts an overall increase in U.S. royalty receipts from foreign firms licensing US-owned IP. Second, it anticipates a decrease in royalty payments from US MNCs to their affiliates in tax havens. Third, the model suggests an increase in US royalty receipts specifically from tax haven countries. Finally, it predicts changes in US MNCs' IP trade patterns with tax havens, including shifts in both the volume and direction of IP asset transfers.

To empirically test these implications, we use data from multiple sources. We gather information on global patent transfers from ktMINE, a comprehensive platform that tracks IP transactions worldwide, which covers the period 1980-2015. This data allows us to examine changes in the volume and direction of patent transfers between the US, tax havens, and other countries before

³However, because these decisions are made on a period-by-period basis, the model does not predict existing IP returning to the US.

and after the implementation of the TCJA. Additionally, we use data on bilateral royalty payments and licensing fees reported in the OECD's Balanced Trade in Services dataset. This dataset, which covers the period from 2005 to 2021, provides detailed information on cross-border transactions related to the use of intellectual property. This data allows us to analyze changes in royalty flows between the US, tax havens, and the rest of the world, testing whether the TCJA has led to the expected shifts in these flows. Finally, we incorporate revenue data from the Bureau of Economic Analysis (BEA) regarding the sale of proprietary rights. This data helps us to evaluate the overall impact of the TCJA on US MNCs' revenues from IP licensing and to reinforce our findings from the patent transfer and royalty payment analyses.

Our analysis reveals changes in intangible asset patterns, including shifts in IP trade and royalty flows, following the implementation of the TCJA, which align with the model's predictions. The data suggests a delayed response, with significant shifts becoming more apparent several years after the reform's enactment in 2017. This lag may be attributed to the time required for US MNCs to adjust their profit-shifting strategies in response to the new tax provisions. The delayed nature of these changes is consistent across multiple indicators, including US royalty receipts and payments involving tax havens. These results do not appear to be driven by global trends or confounding factors, as evidenced by the robustness of other high-tax countries during the same period.

A few important observations emerge from our analysis. Notably, Ireland plays a disproportionate role in driving the observed changes in royalty flows, which reflects the complexity of international tax dynamics and the importance of considering country-specific factors when interpreting the TCJA's effects. While the overall trends align with our model's predictions, the outsized influence of Ireland suggests the need to consider factors beyond just US tax policy changes when interpreting the results. For instance, changes in Ireland's own tax policies during this period may have interacted with the effects of the TCJA, further complicating the analysis. These findings highlight the complex nature of international tax policy and its effects on MNC's behavior.⁴

While our analysis suggests certain trends in the behavior of U.S. multinationals following

⁴See <https://www.stlouisfed.org/on-the-economy/2024/aug/unpacking-discrepancies-american-irish-royalty-reporting>.

the implementation of the TCJA, it is crucial to interpret these findings with caution. As Clausen (2024) emphasizes, the full effects of the TCJA are complex and still unfolding. Our model and data indicate potential shifts in royalty flows and IP ownership patterns, but these changes must be contextualized within broader trends in corporate taxation and profit shifting. The impact of the TCJA on overall corporate tax revenues, competitiveness of U.S. multinationals, and domestic investment has been mixed and, in some cases, less pronounced than initially anticipated. Furthermore, establishing definitive causal links between the TCJA and observed changes in multinational behavior remains challenging due to various confounding factors and the relatively short post-reform period analyzed. It is also important to consider how the TCJA interacts with global efforts to address profit shifting, such as the Pillar 2 international tax agreement. Given these complexities and uncertainties, our findings should be viewed as preliminary evidence of the TCJA's impact on profit-shifting strategies. Further research is needed to fully understand the long-term effects of this significant tax reform and its implications for U.S. and global corporate taxation.

Our paper relates to several recent strands of literature. First, it contributes to a growing literature exploring the connection between corporate taxation and movements of IP. Using firm-level data, Karkinsky and Riedel (2012); Bharanidaran (2024); Griffith, Miller, and O'Connell (2014) find that firms in high-tax countries tend to transfer technology ownership to affiliates in low-tax countries. The counterpart of these transactions is reflected in cross-border royalty payments. Recently Tørsløv, Wier, and Zucman (2023) and Guvenen et al. (2022) argued that locating IP in low-tax jurisdictions has become one of the main channels of profit-shifting. The former estimates that 36 percent of all profits worldwide are shifted to tax havens. The latter finds that 38 percent of foreign income reported by the US is generated in the United States. Dyrda, Hong, and Steinberg (2022) and Santacreu (2023) explore, through the lens of quantitative static models, the role of differences in corporate taxation on profit shifting. They find that profit-shifting erodes high-tax countries' tax bases, and that countries with higher corporate income taxes relative to their trading partners tend to receive fewer royalty payments.

Second, our paper is related to a strand of literature analyzing the affect of the TCJA on US

MNCs’ profit-shifting strategies. Several studies have found only a minimal affect on international profit shifting (see Gale and Haldeman (2021) and Atwood and Johnson (2021)). Krull and Wu (2022) found that only firms facing foreign tax rates between 21 percent and 35 percent changed their profit shifting behavior. These “mid-tax” firms shifted 80 percent less income out of the U.S. following the Act. However, Garcia-Bernardo, Janský, and Zucman (2022) estimate that the share of profits booked abroad by US multinationals fell 3–5 percentage points largely due to repatriations of IP to the US. However, their findings revealed that the share of foreign profits booked in tax havens remained stable between 2015 and 2020. Clausing (2020) suggests that the complexity of the tax law changes and the interactions among them make it difficult to draw conclusions regarding the impact of the TCJA. We contribute to this ongoing debate by providing a comprehensive analysis of the TCJA’s impact on intangible assets, specifically examining changes in IP trade patterns and royalty flows. Our approach offers new insights into the complex effects of the TCJA on profit-shifting strategies, potentially reconciling some of the mixed findings in the existing literature.

Finally, it relates to a literature analyzing the impact of the TCJA on tangible investment. Chodorow-Reich et al. (2024) find that the TCJA led to a 7.4% long-run increase in domestic corporate tangible capital, with multinational firms experiencing even larger increases of 14-18%. Instead, we examine the TCJA’s impact on intangible assets and royalty flows, finding evidence of increased repatriation of intangible assets to the United States. Similarly to Chodorow-Reich et al. (2024), we observe a delayed response to the TCJA, with effects becoming more pronounced several years post-reform, suggesting that adjusting corporate strategies for both tangible and intangible assets requires time. The impact of the TCJA on both tangible and intangible investment by U.S. multinationals suggests complementarity between these types of capital.

This paper is organized as follows. Section 2 outlines our theoretical model. Section 3 discusses the data and its limitations. We then use the data to evaluate the reforms through the lens of the model. Section 4 concludes.

2 A Theory of MNCs, Profit Shifting through IP, and the 2017 TCJA Reform

To explore the profit-shifting strategies employed by US multinationals, we provide a theory of MNCs and their incentives to engage in profit shifting. We consider a three-country model consisting of the United States (US), a tax haven (TH), and the rest of the world (ROW). The model is based on Santacreu (2023) and Dyrda, Hong, and Steinberg (2022). US multinationals invest resources to create new ideas (patents), which are blueprints used to produce intermediate goods. For simplicity, we assume that the US is the only innovator in this model. The other countries do not engage in innovation themselves. Instead, they rely on licensing to produce intermediate goods. The innovator's objective is to maximize the value of their ideas, which is given by the total amount of royalty payments received from the world (i.e., from both domestic and foreign firms using their IP).

Under the current US tax system, royalty payments are taxed at the US rate. However, multinationals can reduce their tax burden by selling the ownership of their ideas to affiliates in tax haven countries, which face lower tax rates. By doing so, the affiliates receive the royalty payments and pay taxes at the lower tax haven rate, thereby increasing the multinational's global profits. This profit-shifting strategy results in lower tax revenues for the US government, but it allows the multinational to increase the value of its innovation, as ideas are non-rival and can be used anywhere regardless of ownership. Transferring the ownership of IP is a costly activity, as multinationals need to hire lawyers, accountants, and pay legal fees to do so. When choosing their optimal strategy between licensing and IP transfers, U.S. multinational corporations consider the trade-offs between receiving higher post-tax royalty payments from licensing and incurring increased costs associated with transferring IP ownership to foreign subsidiaries.

We extend the model developed by Santacreu (2023) and Dyrda, Hong, and Steinberg (2022), focusing on the equations most relevant to our analysis.

Technology Licensing, Profit Shifting, and Global Profits A U.S. multinational corporation develops and patents Z ideas in each period. The firm's objective is to maximize global profits by licensing these ideas worldwide in exchange for royalties, subject to the cost of developing the ideas.⁵

The U.S. multinational has two options for commercializing its IP worldwide. First, it can license technologies directly to other countries in exchange for royalty payments V , which are taxed at the U.S. corporate tax rate, τ_{US} . Alternatively, the U.S. parent can sell the IP ownership to its affiliate located in a tax haven for a transfer price T , incurring a cost C . The portion of domestic profits associated with the transfer price, net of the costs, will be taxed at the U.S. tax rate. The affiliate owning the IP will receive royalty payments V , which will be taxed at the affiliate's corporate tax rate, τ_{TH} .⁶

If the multinational licenses the idea, it receives

$$(1 - \tau_{US})V$$

Instead, if the multinational transfers the IP ownership to a foreign affiliate that then licenses the technology, it receives

$$(1 - \tau_{US})(T - CT) + (1 - \tau_{TH})V$$

The US multinational corporation chooses the fraction of ideas λ to transfer in order to maximize global profits, which are the sum of the profits that are booked and taxed in the US and those booked and taxed in the tax haven. Global profits are given by:

$$\Pi_{US}^{MNC} = Z \left[\underbrace{(1 - \lambda)(1 - \tau_{US})V + (1 - \tau_{US})\lambda(T - CT)}_{\text{US profits}} + \underbrace{(1 - \tau_{TH})\lambda V}_{\text{Foreign profits}} \right] \quad (1)$$

⁵This model focuses on licensing activities, although the firm can also commercialize technology through exports, FDI, and other means.

⁶We assume that the royalty payments received for an idea generated by a U.S.-headquartered MNC will be the same, before taxes, whether the idea is licensed from the U.S. or from the tax haven affiliate.

Next, we determine the transfer price at which a US multinational sells IP to its tax haven affiliate. Multinationals often sell IP to tax haven affiliates at a discount to shift profits. This allows them to report lower profits in high-tax jurisdictions and shift a larger portion of their profits to low-tax jurisdictions. We assume that the price is set as a fraction ψ of the royalties it would receive from licensing the technology instead. Hence,

$$T = \psi V$$

Moreover, following Santacreu (2023) and Dyrda, Hong, and Steinberg (2022), we assume the functional form for the cost of transferring the ownership of $C(\lambda) = 1 + \frac{1-\lambda}{\lambda} \log(1 - \lambda)$. This functional form implies that the cost is increasing in λ , is bounded between 0 and 1, and ensures that the fraction of licensed technologies is between 0 and 1.

The optimal fraction of technologies transferred through profit-shifting practices is given by:

$$\lambda = 1 - \exp\left(-\frac{1 - \psi}{\psi} \frac{\tau_{\text{US}} - \tau_{\text{TH}}}{1 - \tau_{\text{US}}}\right) \quad (2)$$

if $\tau_{\text{US}} > \tau_{\text{TH}}$, and 0 otherwise. The share of technologies transferred to a foreign affiliate depends on three factors: (i) the corporate tax difference between the the US and the tax haven, $\tau_{\text{US}} - \tau_{\text{TH}}$ (ii) the discount rate ψ , and (iii) the transfer cost. When tax rates are identical or $\psi = 1$, there is no incentive for profit shifting. Selling technology at a discount ($\psi < 1$) allows multinationals in the US to increase global post-tax profits by reallocating profits to tax havens. The costly technology transfer prevents corner solutions, ensuring that firms do not transfer all new technologies abroad.

The TCJA reform and model implications The 2017 TCJA introduced two key provisions that affect the incentives for profit shifting: the GILTI and the FDII. GILTI imposes a minimum tax on foreign income earned by U.S. multinationals, while FDII provides a lower tax rate for U.S. multinationals' domestic income derived from exports. In the context of our model, a higher share of technologies transferred to foreign affiliates (λ) results in more royalty payments for the tax haven

and less for the U.S., leading to lower tax revenues for the U.S. government. The introduction of GILTI and FDII alters the optimal transfer of technologies by modifying the effective tax rates faced by U.S. multinationals.

The optimal fraction of technologies transferred under the TCJA becomes:

$$\lambda_{\text{TCJA}} = 1 - \exp \left(-\frac{1 - \psi}{\psi} \frac{\tau_{\text{US}}(1 - \tau_{\text{FDII}}) - \tau_{\text{TH}}(1 + \tau_{\text{GILTI}})}{1 - \tau_{\text{US}}(1 - \tau_{\text{FDII}})} \right) \quad (3)$$

if $\tau_{\text{US}}(1 - \tau_{\text{FDII}}) > \tau_{\text{TH}}(1 + \tau_{\text{GILTI}})$ and 0 otherwise. Here, τ_{FDII} represents the tax rate reduction for U.S. multinationals' domestic income derived from exports, and τ_{GILTI} denotes the minimum tax rate on foreign income earned by U.S. multinationals. The FDII provision reduces the effective U.S. tax rate, making it more attractive for U.S. multinationals to keep IP ownership domestic. Conversely, GILTI increases the effective tax rate in tax havens, reducing the incentive to transfer IP to foreign affiliates.

The TCJA's FDII and GILTI provisions aim to reduce the incentives for profit shifting by U.S. multinationals. Through the lens of the model, this should lead to a lower optimal share of technologies transferred to foreign affiliates (λ_{TCJA}) compared to the pre-TCJA scenario. As a result, we expect to observe the following changes in the data on licensing and patent transfers:

1. Increase in U.S. royalty receipts: With a lower λ_{TCJA} , more IP will be retained in the U.S., leading to an increase in royalty receipts from foreign entities licensing the technology from the U.S. parent company.
2. Decrease in royalties received by tax havens: As U.S. multinationals reduce their profit shifting activities, tax havens should experience a decline in royalty receipts from U.S. companies.
3. Increase in U.S. royalty receipts from tax havens: With the reduced incentive to transfer IP to tax havens, U.S. multinationals may license more technology directly from the U.S. to entities in tax havens, resulting in an increase in U.S. royalty receipts from these jurisdictions.

4. Decrease in IP transfers from the U.S. to tax havens: The TCJA should lead to a reduction in the sale of IP from U.S. multinationals to their affiliates in tax havens. Additionally, some companies may choose to buy back previously transferred IP from their tax haven affiliates and relocate the IP to the U.S. to benefit from the FDII provision. However, it's important to note that this is not a direct implication of our model, which is solved period by period. Rather, this trend is likely to be observed in the data as firms adjust their strategies in response to the TCJA over time, despite not being captured in our static model framework.

To test these implications empirically, we analyze data on royalty payments, patent transfers, and IP ownership before and after the implementation of the TCJA.

3 Evidence on the Impact of the 2017 TCJA Reform

This section examines data on international technology licensing and patent transfers before and after the 2017 TCJA reform to test the model's implications. We focus on three country groups: tax havens, low-tax countries, and non-havens. While often used interchangeably in the literature, we distinguish between “low-tax” countries and “tax havens.” Tax havens are smaller nations or territories with little financial regulation and economic activity, whereas low-tax countries offer competitive corporate tax rates but are still considered innovative. Our country classification follows Tørsløv, Wier, and Zucman (2023), with a complete list of tax havens and low-tax countries provided in the Appendix.

3.1 The Data

We explore the evolution of patent transfers using IP transactions data from the platform ktMINE. In our analysis, the assignor is the country in which the multinational selling the patent is located; the assignee is the country to which ownership is transferred. Data on global patent transactions is available for 1980-2022, featuring over 141 million patents for 146 countries. We end our sample in 2015 due to data inconsistencies. Post-2015, we observed unexplained fluctuations and gaps

in patent transfer data, particularly for key countries including tax havens. These inconsistencies could not be reconciled with other sources or economic trends. To ensure data reliability, we limit our analysis to the pre-2015 period, which allows us to describe patterns of IP transfers prior to the reform. While this data source limitation hinders our ability to examine patent transfers post-reform, it provides insight into patent locations at the time of the reform's passage. For many MNCs, patent transfers make up a large proportion of all IP transactions. Therefore, tracking the movement of IP such as patent transfers helps inform what we know about the flow of royalty payments in the pre- and post-2017 periods. Typically, the primary assignees of U.S. patents would be large exporters of technology (i.e., large recipients of royalty payments), particularly back to the states.

With this in mind, we take advantage of data on royalty payments and licensing fees reported in the OECD Balanced Trade in Services dataset (EBOPS) to follow the flow of royalties before and after the TCJA. Bilateral royalty and license fees, are available for over 200 countries for the period 2005-2021. They are recorded in the balance of payments of a country as a trade in services and includes: (i) charges for the use of proprietary rights, such as patents, trademarks, copyrights, industrial processes and designs, trade secrets, and franchises, where rights arise from research and development; and (ii) charges for licenses to reproduce and distribute intellectual property embodied in produced originals or prototypes (copyrights on books and manuscripts, computer software, etc). This is the most comprehensive longitudinal dataset on royalty and license fees, with the highest coverage in terms of the number of countries and time period.

Finally, we supplement the above information with sales revenue data from the Bureau of Economic Activity (BEA). Data can be found in *Table 2.2. U.S. Trade in Services, by Type of Service and by Country or Affiliation* and is reported as the "Sale of proprietary rights arising from research and development," which includes patents, industrial processes, and trade secrets. One drawback of the BEA data is , for many individual countries, the data are reported as a value between zero and +/- \$500,000, presumably to protect firm identity. This makes it difficult to know the true value of sales between the United States and other countries, especially smaller countries

like tax havens. We opt to focus on aggregate sales revenue both earned and spent by the U.S. These values notify us to the success of the TCJA in bringing IP back to the United States.

3.2 Testing Implications

Here we test some of the predictions on international technology licensing and IP transfer predicted by the model. Specifically, we examine four key implications: (1) an increase in U.S. royalty receipts, (2) a decrease in royalty payments to tax havens, (3) an increase in U.S. royalty receipts from tax havens, and (4) shifts in U.S. IP ownership involving tax havens. For each implication, we analyze relevant data and compare the observed patterns to the model's predictions. This empirical analysis allows us to assess the extent to which the TCJA's provisions may have influenced the behavior of U.S. multinationals with respect to their intangible assets and profit-shifting strategies.

Increase in US Royalty Receipts. The two provisions introduced by the 2017 TCJA—FDII and GILTI—aimed to encourage U.S. multinational companies to maintain their IP ownership within the United States. The FDII provision offers a reduced tax rate on income generated from exports that are based on IP owned by U.S. entities.⁷ As a result, we would expect the United States to experience an increase in royalty receipts following the implementation of these provisions in 2017.

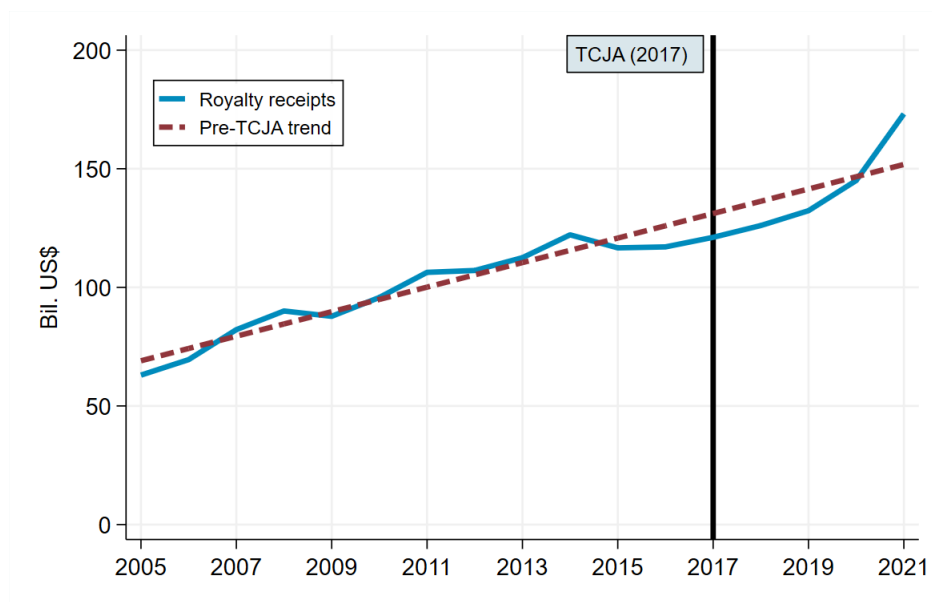
In Figure 3, using data on royalty payments and licensing fees, we observe that, beginning in 2015, the US experienced a shift in royalty receipts with foreign-derived profits falling below what would be expected based on prior trends. We take this result as suggestive evidence that the U.S. MNCs may have begun to shift profits abroad. Additionally, there is not an immediate increase in US royalty receipts after 2017. The US is still receiving fewer royalty payments than possibly expected. However, in 2020, the share of royalty payments being subject to US taxes sharply rises. While data is so far only available until 2021, this sudden change could suggest a short-term lag in the policy's impact.

⁷Likewise, the GILTI provision creates an incentive for companies to bring their IP back to the U.S. from low-tax jurisdictions.

Interestingly, we do not observe the same patterns for other high-income countries (see Appendix). The royalty payments and licensing fees for these countries remain relatively stable throughout the period, without exhibiting the distinct shift seen in the US data. This suggests that the changes in the US royalty receipts may be attributed to country-specific factors, such as the implementation of the new tax provisions, rather than a global trend affecting all high-income nations.

While these provisions create a favorable tax environment for repatriating IP to the United States, the data suggest that the process of actually moving IP ownership may require more time. As a result, the expected increase in U.S. royalty receipts following the implementation of these provisions in 2017 may not be immediately evident and could take several years to materialize.

Figure 3: US Royalty Receipts from the Rest of the World



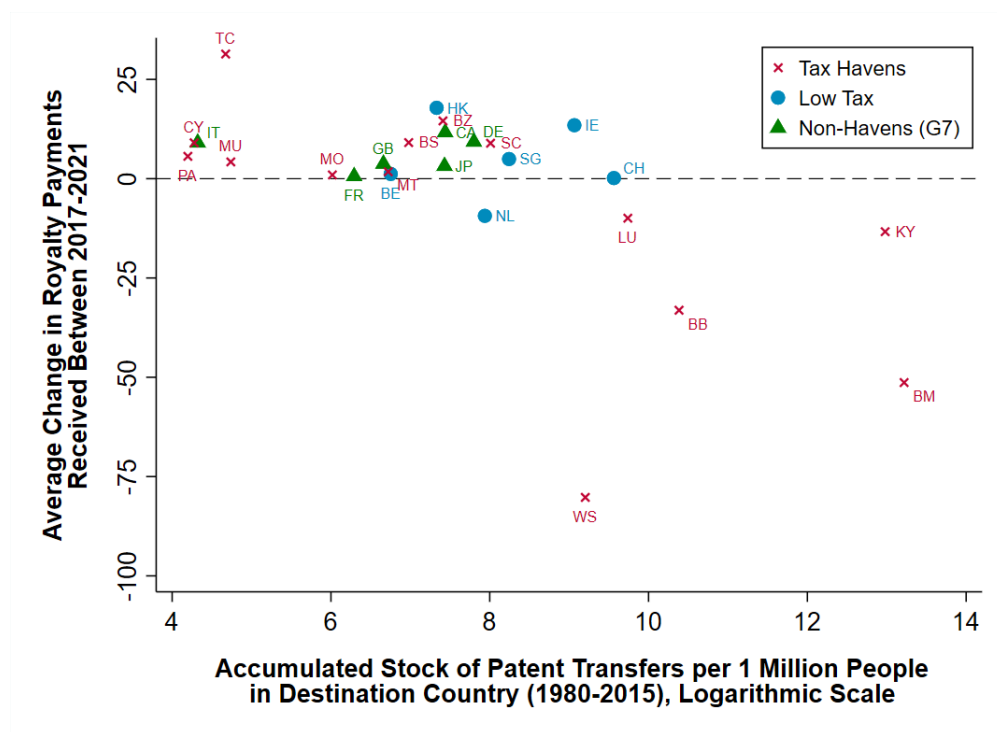
SOURCE: OECDstat EBOPS 2010

Decrease in Royalty Payments to Tax Havens. The GILTI provision of 2017 TCJA imposes a minimum tax on the foreign earnings of U.S. multinationals above a certain threshold, reducing the incentive to shift profits to low-tax jurisdictions like tax havens. Consequently, the model predicts

that tax havens would receive a smaller share of royalty payments from U.S. multinationals after the TCJA's implementation in 2017.

Figure 4 illustrates that countries receiving more patent transfers from the U.S. between 1980-2015 (prior to the reform) experienced larger declines in royalty payments in the four years following the reform. The largest recipients of U.S. IP, particularly Bermuda, the Cayman Islands, Barbados, Luxembourg, and American Samoa, saw the most significant declines in royalty payments. Interestingly, low-tax countries like Switzerland and Ireland, which also received a large number of patent transfers per capita, were minimally affected by the reform.⁸

Figure 4: Royalty Receipts from the US Post-TCJA



SOURCES: ktMINE & OECDstat EBOPS 2010

NOTES: We aggregate U.S.-assigned patent transfers over the entire sample period. We calculate transfers per capita using the average population of each destination country. Our country classifications come from Tørsløv, Wier, and Zucman (2023).

⁸The Appendix includes scatter plots for Germany, UK, Japan, and France. Initially intended for robustness, these plots show significant overlap in tax haven usage with the US, limiting their utility for independent verification of US tax reform impacts.

Increase in Royalty Payments from Tax Havens to the United States. With the reduced incentive for US multinationals to transfer IP ownership to tax haven affiliates due to GILTI and FDII, we would expect a larger share of royalty payments from tax havens to the United States after 2017. This implication can be tested by examining the post-2017 royalty receipts of the US specifically from tax haven countries.

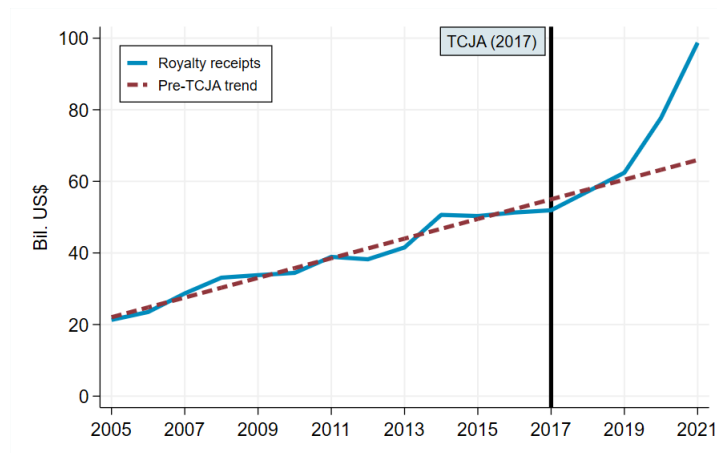
Figure 5 shows that the US experienced a decline in royalty receipts from tax havens between 2014 and 2017. However, around the time of the reform’s implementation, this number began to rise again. By 2021, royalty payments had nearly doubled, increasing from \$51.9 billion to \$98.7 billion. Similar to the trend observed in Figure 3, the rise in foreign-derived income is more pronounced a few years after the TCJA was enacted. This result suggests a delayed impact of the reform on royalty payments, possibly due to the time required for companies to adjust their IP strategies and transfer pricing arrangements.

Furthermore, between 2019 and 2021, tax havens, as a collective, were responsible for nearly 89 percent of the increased share of royalty payments received by the United States. This evidence supports recent findings by Santacreu (2023), who, after conducting a policy analysis focusing on the GILTI provision, found that tax havens were the primary source of the increased royalty payments to the US.

We explore further what may be explaining the sharp increase in US royalty receipts observed after the implementation of the Tax Cuts and Jobs Act (TCJA) in 2017. While our initial analysis showed a significant rise in royalty payments from tax havens collectively, a closer examination reveals that this trend is primarily driven by a single country: Ireland.

Ireland has long been known for its unique tax regime, which has made it a preferred location for many multinational corporations to base their intellectual property (IP) holdings. The country’s tax policies, including the now-phased-out “double Irish” arrangement, have historically provided significant tax advantages for companies managing their global IP from Ireland. Given Ireland’s outsized role in global IP management, we decided to examine the data excluding Ireland from our sample of tax havens (Santacreu, 2023).

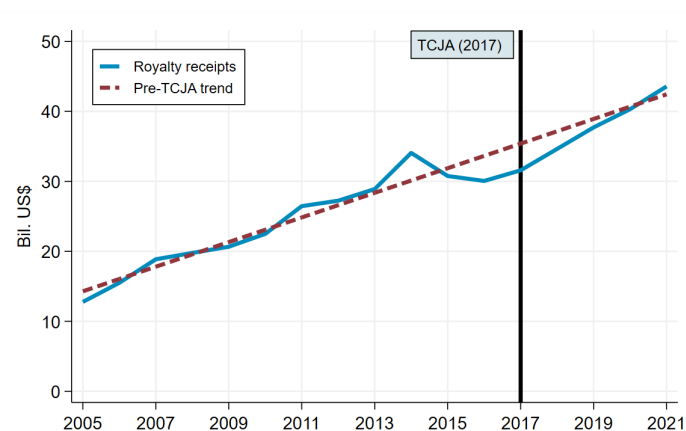
Figure 5: US Royalty Receipts from Tax Havens



SOURCE: OECDstat EBOPS 2010

NOTES: We aggregate royalty receipts from all tax havens and low-tax countries without distinguishing between classifications. The notable increase in receipts from 2019 onwards is primarily driven by “low-tax” countries: Belgium, Switzerland, Hong Kong, Ireland, the Netherlands, and Singapore.

Figure 6: How much is Ireland driving the results?



SOURCE: OECDstat EBOPS 2010

NOTES: Ireland’s unique tax regime makes it a complex case and stand out as an outlier, so we exclude it from the sample. Royalty receipts are calculated as the aggregate of all tax havens and low tax countries (excluding Ireland). We do not distinguish between the different classifications.

When Ireland is removed from the dataset, the observed increase in royalty payments from tax havens to the US becomes notably muted. The muted increase in royalty payments from other tax havens, when Ireland is excluded, suggests that the TCJA's effects on IP location and royalty payment patterns may be more complex than initially apparent. Moreover, this observation underscores the importance of examining policy changes not just in the US, but also in key partner countries. For instance, Ireland's decision to eliminate tax avoidance techniques such as the "double Irish" by changing corporate residency rules in 2019 may have interacted with the effects of the TCJA, further complicating the interpretation of the trends we observe.

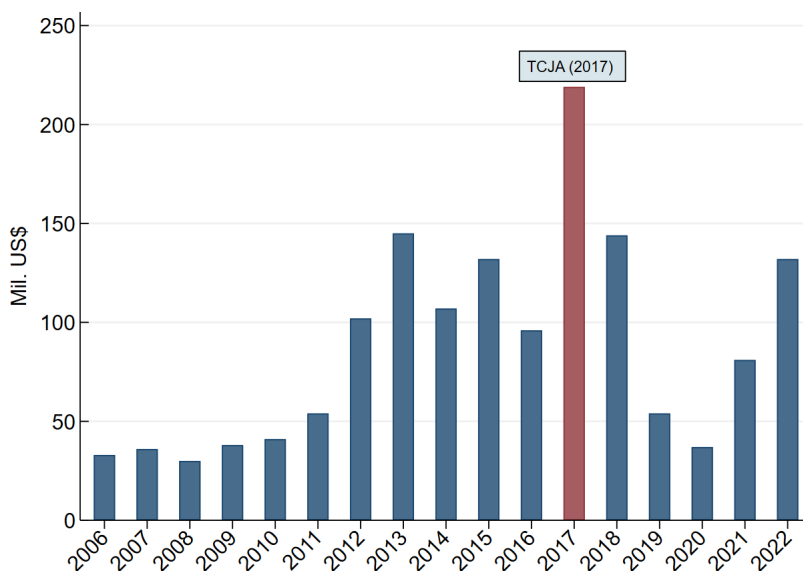
While our findings still provide evidence of the TCJA's impact on tax revenue and royalty flows, the dominant role of Ireland in driving these changes cautions against broad generalizations about the reform's effects across all tax havens.

Shifts in U.S. IP Ownership Involving Tax Havens. The FDII provision of the TCJA incentivizes keeping IP ownership within the United States, while the GILTI provision increases the tax burden on foreign profits. Considering the combined impact of these two provisions, US MNCs have strong incentives to re-assign ownership of their IP back to the United States, where they could be eligible for the tax break provided by the FDII. In other words, post-TCJA implementation in 2017, we would expect an increase in US patent buybacks from tax havens and a decrease in initial patent sales to these jurisdictions..

To examine the direction of IP flows to the US in both the pre- and post-TCJA periods, we can turn to sales data provided by the Bureau of Economic Analysis (BEA). Figure 7 shows that the US drastically increased its imports of proprietary IP in 2017, more than half of the previous year's level. This suggests that some of the IP previously "parked" in tax havens began flowing back to the US. However, due to data limitations in the BEA dataset, it is challenging to determine the exact origins and destinations of US proprietary IP trade. Without this detailed breakdown, drawing strong conclusions becomes difficult. Nevertheless, the data indicates changes in US IP trade patterns following the implementation of the Tax Cut and Jobs Act. These findings align with

those in Santacreu (2024) and Santacreu and LaBelle (2023).

Figure 7: US IP Trade Patterns: Imports of proprietary rights from R&D



SOURCES: BEA & Santacreu and LaBelle (2023)

NOTE: Due to the significant number of missing values for individual countries in the BEA data, a detailed analysis of the U.S.'s trade patterns with specific nations is not feasible. Instead, we focus on examining U.S. trade patterns using the available aggregated data.

4 Final Remarks

In this study, we examine the impact of the 2017 TCJA on international technology licensing and patent transfers by U.S. multinationals. We develop a theoretical model of licensing and IP transfers by multinational corporations that incorporates key provisions of the TCJA, such as the GILTI and the FDII. The model generates testable implications regarding changes in licensing and patent transfer patterns following the implementation of the TCJA.

Our empirical findings provide suggestive evidence that the TCJA has influenced profit-shifting strategies, with results generally aligning with the model's predictions. However, it is crucial to emphasize the preliminary nature of the evidence presented in this study. The relatively short

post-TCJA period analyzed and the potential for delayed policy impacts necessitate a cautious interpretation of the results.

The observed changes in licensing and patent transfer patterns may be influenced by factors beyond the TCJA, and the full effects of the reform may not be immediately evident. Furthermore, our analysis is limited by the availability of data and the inherent challenges in establishing definitive causal links between the TCJA and changes in U.S. multinationals' behavior. As such, our findings should be viewed as initial evidence of the TCJA's impact on profit-shifting strategies, and further research is needed to corroborate these results and explore the long-term effects of the reform.

Finally, while our findings provide evidence of changes in intangible asset patterns following the TCJA, it is important to note that this analysis does not quantify the actual impact on tax revenues. To translate these observed changes in licensing and patent transfer behaviors into concrete estimates of tax revenue effects would require a quantitative model, which we leave as an important avenue for future research.

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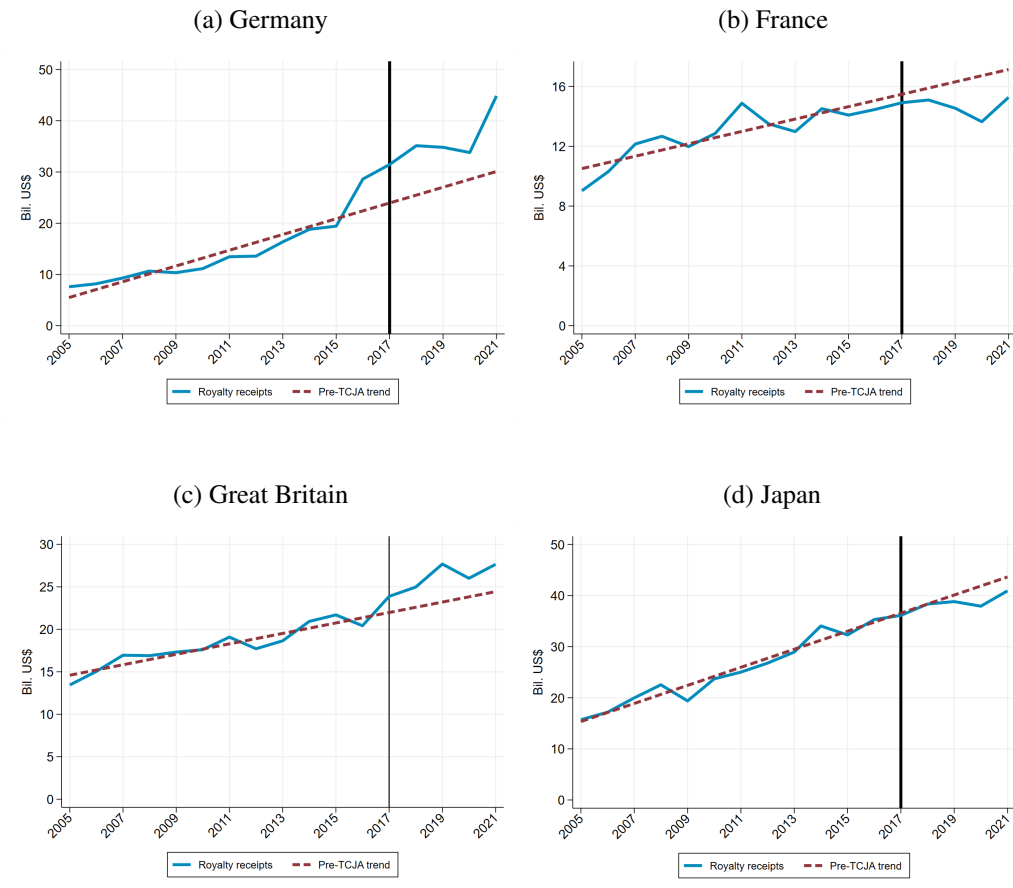
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APPENDIX

To strengthen our findings on the effect of the US TCJA, we conduct a robustness analysis by comparing measures of technology licensing and IP transfers involving other high-tax countries

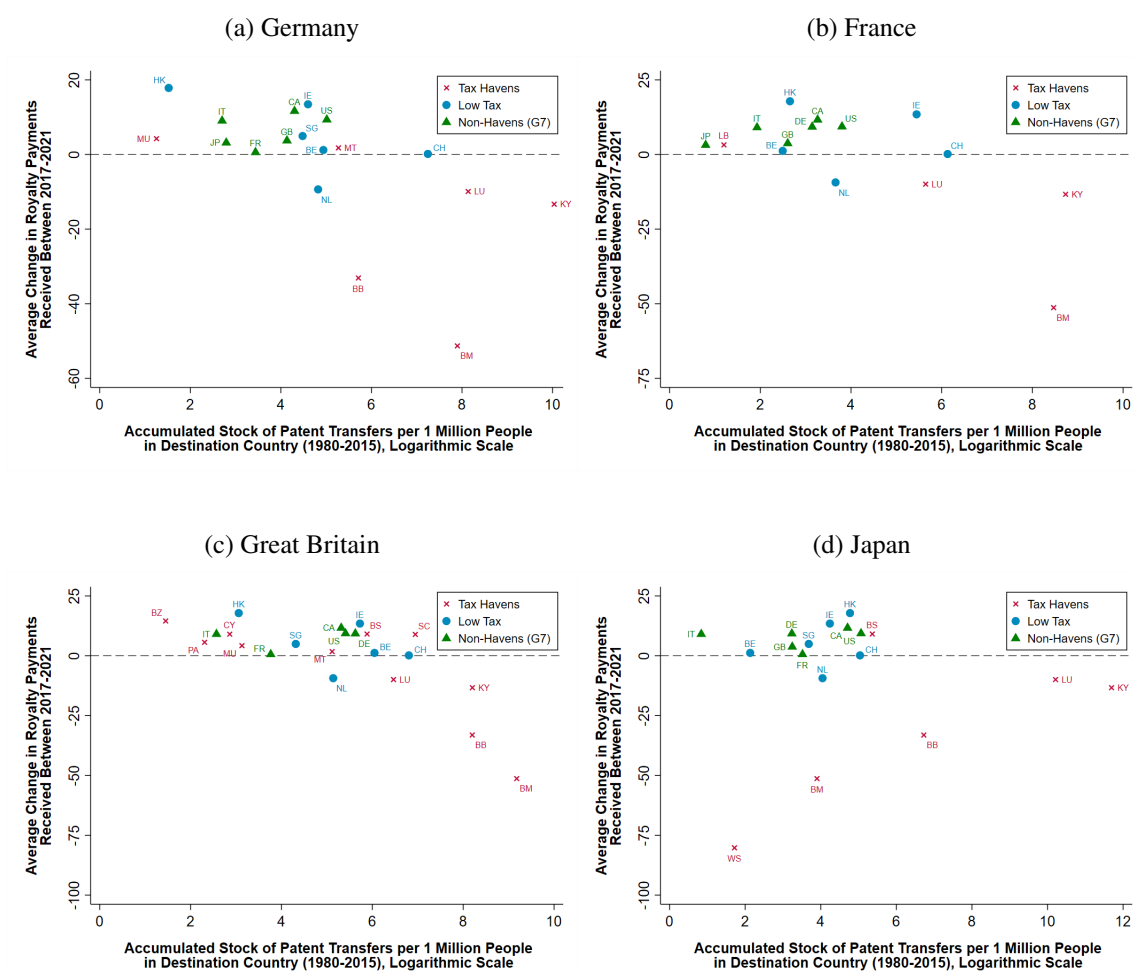
besides the United States. We focus on Germany, France, Japan, and the United Kingdom. These countries have been identified by Tørsløv, Wier, and Zucman (2023) as countries that engage in significant profit-shifting activity. This analysis helps to isolate the impact of the TCJA from other potential confounding factors and provides additional evidence for our conclusions.

Figure .8: Did other countries with high tax rates experience an increase in royalty payments received from international sources after 2017?



SOURCE: OECDstat EBOPS 2010

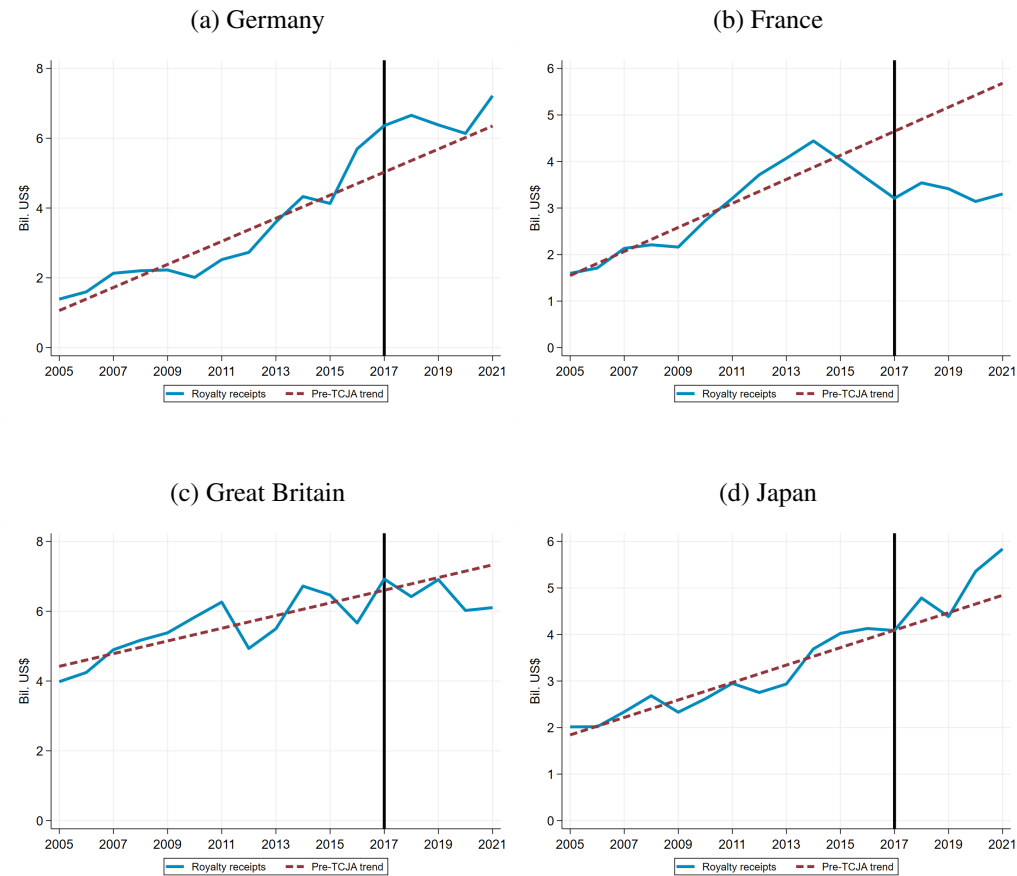
Figure .9: Did tax havens that received significant IP transfers from countries with high tax rates also experience a substantial decrease in royalty payments?



SOURCES: ktMINE & OECDstat EBOPS 2010

NOTES: We aggregate patent transfers assigned by each specified country over the entire sample period. Per capita transfers are calculated using the average population of destination countries. Our country classifications come from Tørsløv, Wier, and Zucman (2023).

Figure .10: Did countries with high tax rates experience an increase in royalty payments received from tax havens?



SOURCE: OECDstat EBOPS 2010

NOTES: Royalty receipts are calculated as the aggregate of all tax havens and low tax countries. We do not distinguish between the different classifications.

Table .1: Country Groups

Tax Havens	Low Tax Countries
Andorra	Belgium
Antigua & Barbuda	Switzerland
Anguilla	Hong Kong
Netherlands Antilles	Ireland
Aruba	Netherlands
Barbados	Singapore
Bermuda	
Bahamas	
Belize	
Cyprus	
Grenada	
Guernsey	
Gibraltar	
Isle of Man	
Jersey	
Saint Kitts & Nevis	
Cayman Islands	
Lebanon	
Saint Lucia	
Liechtenstein	
Luxembourg	
Monaco	
Marshall Islands	
Macao	
Malta	
Mauritius	
Panama	
Puerto Rico	
Seychelles	
Turks & Caicos	
Saint Vincent & the Grenadines	
British Virgin Islands	
Vanuatu	
Samoa	