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Changes in Transfer Pricing Regulations and Corporate Investment Decisions

Shabestari, Mehrzad Azmi / Safaei, Reyhaneh

Changes in Transfer Pricing Regulations and Corporate Investment Decisions[*]

Mehrzad Azmi Shabestari
Towson University
Email: **mazmishabestari@towson.edu**

Reyhaneh Safaei
Paderborn University
Email: **reyhaneh.safaei@upb.de**

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Abstract: This study examines the role of changes in transfer pricing regulations on multinational enterprises' (MNEs) investment decisions. In the wake of international guidelines, countries implement many changes in their transfer pricing regulation. We find evidence that changes in transfer pricing regulations are negatively associated with the MNEs' affiliate investment. This effect is due to the high uncertainty about the implementation and enforcement of transfer pricing regulations as perceived by MNEs, particularly in the first years after the change. Furthermore, we analyze the effect of frequent changes and find, on average, affiliates reduce their investment in countries with frequent changes in transfer pricing regulations. Additional tests suggest that affiliates respond differently to changes in transfer pricing regulations which increase or decrease transfer pricing risk and reduce (increase) investment if a change leads to higher (lower) transfer pricing risk. Lastly, the results of additional cross-sectional analyses indicate that changes in transfer pricing regulations in developing countries lead to more affiliates' investment, reflecting that changes in these countries are towards eliminating the peculiarities in transfer pricing rules and aligning the rules with global standards.

Keywords: Transfer pricing, uncertainty, investment, MNE
JEL classification: D81, H25, H26, F23

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1. Introduction

In this study, we focus on changes in transfer pricing regulations across countries and examine whether and to what extent MNEs change their capital investment in foreign affiliates following a change in transfer pricing regulations. Following the path of OECD Transfer Pricing Guidelines, countries adopt changes in transfer pricing rules at different times and to different degrees. For example, OECD's Action Plan on Base Erosion and Profit Shifting (BEPS) proposed a thorough review of transfer pricing guidelines, resulting in many changes in transfer pricing regulations across countries. The implication of changes in transfer pricing rules is especially relevant for MNEs, as it affects their global operation, tax burden and compliance costs. This is reflected in the survey results of EY (2019), that executives indicate that the pace of change in transfer pricing rules is so rapid, and the degree of expanded transparency is now so pronounced that a wave of tax controversy is imminent.

Since the introduction of transfer pricing guidelines in 1979, these rules have been subject to many developments and changes.[2] While transfer pricing rules are underpinned by the arm's length principle, OECD reviews its application and proposes new changes to transfer pricing guidelines from time to time. These changes include, for example, changes in the extent of the transfer pricing documentation requirement, in the condition for comparability analysis, in the priority of methods for determining the transfer price, in penalties on wrong or incomplete documentation, and advance pricing agreements (e.g., Lohse & Riedel, 2013; Mescall & Klassen, 2018).[3] Countries mainly implement the core of OECD guidelines into their domestic

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[2] Examples of these changes are the amendment and revision of the OECD Transfer Pricing Guidelines in 1995, the report on cost contribution arrangements in 1997, the issuance of the report on the attribution of profits to permanent establishments in 2006, the update of the OECD Transfer Pricing Guidelines in 2008, publishing of a new version for the OECD Transfer Pricing Guidelines in 2010, Guidance on Transfer Pricing Documentation and Country-by-Country Reporting in 2014, issuance of the BEPS Actions in 2015, Update of OECD Transfer Pricing Guidelines in 2017 (OECD, 2010, 2017).
[3] For an overview of elements regarding the transfer pricing regimes across countries, see (Deloitte, 2014; EY 2017).

tax systems and include specific regulations according to their regulatory characteristics.

We explore several potential explanations for how changes in transfer pricing regulations could affect the compliance cost of MNEs and their economic activity. The first intuition is that firms perceive a change in transfer pricing regulations as uncertain[4], regardless of whether the change leads to stricter or more lenient regulations. Particularly, this effect could be observed in the first years after a change, when there is high uncertainty regarding the implementation and enforcement of the rule, even if the change in the rule aims to create more certainty for the MNEs, such as the Advance Pricing Agreements (APA).

Some changes in transfer pricing rules increase uncertainty and risk in MNEs' transfer pricing positions, and other changes reduce uncertainty and risk.[5] For example, adopting a regulation that precludes foreign comparables for comparability analysis increases transfer pricing risk, and adopting APA reduces transfer pricing risk (Mescall & Klassen, 2018).

Whereas the impact of tax uncertainty on investment is ambiguous in theory (Niemann, 2004), empirical evidence is more clear-cut and indicates the adverse effect of tax uncertainty on shaping investment decisions (Edmiston, 2004; Jacob et al., 2022). Tax practitioners and politicians also highlight the negative effect of tax uncertainty on investment (e.g., IPI, 2015). We expect the impact of changes in transfer pricing regulations on investment decisions of foreign affiliates of MNEs to be highly dependent on the level of uncertainty and risks related to transfer pricing after the change in these regulations. The simple intuition underlying this relationship is that if a change in transfer pricing regulation in a country leads to more uncertainty, MNEs are expected to reduce their capital investment since firms anticipate the uncertainty of future tax burden and cash flows. However, if MNEs benefit from the uncertainty stemming from a change in the rules to avoid more taxes, they are expected to increase their investment in

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[4] Lisowsky et al. (2013) define tax uncertainty as the difficulty in applying the tax law and uncertainty about future tax payments.
[5] In line with prior literature, we define transfer pricing risk as the tax risk of a transfer pricing position being discovered and denied and the risk of penalties (Mescall & Klassen, 2018).

countries with more changes in transfer pricing rules. In contrast, if a transfer pricing change decreases transfer pricing uncertainty, for instance, by resolving peculiarities in transfer pricing rules, changes in transfer pricing rules might lead to more investment. Limiting the transfer pricing uncertainty by harmonizing the transfer pricing rules could foster the economic activity of firms and reduce their challenges (e.g., risk of double taxation or extensive documentation cost) stemming from different rules.

To analyze the effect of changes in transfer pricing regulations on affiliates' investment level, we use a cross-country approach and employ rich data on MNEs' affiliates for the years 2007 to 2015 taken from the ORBIS database. To account for changes in transfer pricing regulations, we use the transfer pricing measure by Mescall and Klassen (2018)[6], which includes 16 features of countries' transfer pricing rules and enforcement and weights them according to an extensive survey of 76 transfer pricing practitioner experts based in 33 countries. To proxy for *change* in transfer pricing regulations in a country, we calculate the difference between the current and previous year's transfer pricing measure and define an indicator variable equal to one when the change in country-year transfer pricing measure is greater or less than the standard deviation of all the changes in the sample. We exploit 63 significant changes in transfer pricing regulations in 38 countries and employ a first-difference model to capture time-invariant characteristics related to the investment and accommodate multiple transfer pricing changes per country. Through the analysis of a cross-country panel, we find evidence that a change in transfer pricing rules in affiliates' countries is associated with a reduction in affiliates' investment, and this effect increases over two periods. We measure investment by subsidiaries' annual change in net fixed assets scaled by lagged total assets, following Amberger et al. (2021), and control for country characteristics such as political risk and statutory tax rates and firm-specific variables that might affect investment. The results imply that, in general, changes in transfer pricing rules

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[6] We are grateful to Devan Mescall and Kenneth Klassen for sharing the transfer pricing data with us.

are deemed to cause more uncertainty for MNEs. This could be due to the fact that it is difficult for firms to process the information about the regulations and implementation after the adoption of the rules, and complying with the rules seems costly, especially in the first years after the implementation.

In supplementary analyses, we investigate the impact of frequent changes in transfer pricing regulations and compare the frequency of changes in these regulations by measuring the volatility of changes in transfer pricing measures across countries. Frequent changes create challenges for firms to process the information about the regulations and their implementation and also cause firms to distrust the transfer pricing framework in the country and expect more changes in the future. Therefore, MNEs are expected to reduce their investment in countries with more frequent changes. Having some countries with more changes and some with fewer and no changes helps us better understand and investigate the effect of changes in transfer pricing regulations on capital investment decisions by MNEs in their foreign affiliates. The results indicate that frequent changes in transfer pricing regulations in a country are associated with lower investments in MNE's subsidiaries. This is consistent with the OECD survey results that the frequency of legislative changes in tax policy is considered a major source of tax uncertainty among tax administrations and business executives (IMF & OECD, 2017). We further examine the direction of change regarding whether it leads to higher or lower transfer pricing risk.[7] We find that both changes leading to higher or lower transfer pricing risk affect corporate investment, suggesting a symmetric effect.

In cross-sectional tests, we investigate whether country characteristics influence the association between changes in transfer pricing regulations and investment. We further document that the negative association between transfer pricing changes and investment is stronger for affiliates

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[7] The Mescall and Klassen measure includes determinants of transfer pricing regulations and enforcement, and each feature could increase or decrease the transfer pricing risk.

located in high-tax countries, as changes in transfer pricing rules are expected to most strongly affect the transfer prices of affiliates that shift income from high-tax to low-tax affiliates. Furthermore, the analysis suggests that the effect of changes in transfer pricing differs across countries with different developmental levels. More specifically, changes in transfer pricing regulations in developing countries are associated with the increase in investment of subsidiaries in those countries. Intriguingly, subsidiaries in developing countries respond positively to the transfer pricing changes that decrease transfer pricing uncertainty by increasing their investment in these countries. On the contrary, subsidiaries do not respond to the changes that increase transfer pricing uncertainty in these countries. Therefore, the attempts of developing countries to align with global transfer pricing standards and resolve the transfer pricing peculiarities will reduce the uncertainty for firms and, thereby, increase firms' investment in these countries.

We subject this finding to several robustness tests. First, we use alternative investment measures. Second, we limit the sample period to the years after 2009 to control the potential heterogeneity that MNEs have performed differently during the Great Recession. Third, we use an alternative proxy for changes in transfer pricing rules to capture the objective changes in transfer pricing rules by gathering data from Deloitte, EY, PwC and KPMG global transfer pricing guidelines. These tests support our main results.

This study contributes to the tax literature in two ways. First, we add to the literature on taxes and investment (Becker et al., 2012; Becker & Riedel, 2012; Delis et al., 2020; Fahr et al., 2022) and, more specifically, to the literature on tax uncertainty and investment (Edmiston, 2004; Gulen & Ion, 2016; Jacob et al., 2022) by highlighting the importance of transfer pricing uncertainties arising from changes in transfer pricing rules in international tax law.

Second, while prior literature examines the effect of anti-avoidance legislation on key aspects of firm behaviour (Buettner et al., 2018; Clifford, 2019; Egger & Wamser, 2015; Hebous &

Ruf, 2017), we complement these studies by investigating how changes in transfer pricing regulations shape firms' investment decisions. Our paper is related to De Mooij and Liu (2020) and Buettner et al. (2018), which explore the effect of transfer pricing rules and investment decision of firms. Buettner et al. (2018) find that transfer pricing rules exert no significant effects on countries FDI. De Mooij and Liu (2020) focus on the introduction and strictness of transfer pricing regulation across countries and examine the effect of transfer pricing rules on MNEs investment. They find multinational corporations affiliates reduce their investment following the introduction of transfer pricing regulations. In contrast, we focus on uncertainties resulting from changes in transfer pricing regulations in 38 countries. Although the introduction and strictness of transfer pricing regulations are crucial factors in firms' investment decisions, MNEs could obtain information about the documentation requirements and enforcement, learn the procedure, and comply with the regulations. But in case of frequent changes in transfer pricing rules, MNEs face significant uncertainty about how tax authorities view the documentation requirement, the transfer price, and the transaction. Therefore, our study offers a new perspective on the role of transfer pricing in shaping investment decisions.

Given the recent policy changes triggered by the OECD BEPS action plans, exploring the role of changes in transfer pricing regulations and their unintended consequences is crucial. Understanding the uncertainty associated with changes in transfer pricing regulations in shaping real investment decisions is an essential prerequisite for informed policy debates and the efficiency of tax policy. Our findings affirm the survey results of IMF and OECD (2017) that reduced frequency of changes in the tax legislation improves tax certainty. Nevertheless, our findings indicate that the changes in transfer pricing regulations in developing countries can promote the investment of MNEs in those countries by reducing uncertainty. This finding is particularly important for developing countries.

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2. Background and Hypothesis Development

2.1. Overview of Transfer Pricing Regulations

Transfer pricing is considered to be one of the key channels of profit shifting in prior literature (Heckemeyer & Overesch, 2017). MNEs shift profit from high-tax to low-tax jurisdictions to take advantage of tax rate differential through transfer pricing by manipulating the intra-firm transactions. Consequently, many countries adopt and enforce transfer pricing rules mainly based on guidelines prepared by OECD, which are based on the arm's length principle.

The OECD first introduced and published the practical guidance for transfer pricing in 1979, which served as a basis for transfer pricing guidelines in 1995. Countries introduced transfer pricing regulations at different times. The USA was the first country to introduce transfer pricing regulations in 1968, followed by other large economies such as Germany, Australia, and Japan (Zinn et al., 2014). By increasing the number of firms operating in several countries, which led to a significant increase in the number of transactions between multinational firms, tax authorities started to pay particular attention to profit shifting via transfer pricing. Therefore, international attempts to cope with transfer pricing for tax purposes have accelerated. The OECD issued several reports regarding the transfer pricing rules, such as the issuance of a report on cost contribution arrangements in 1997 and the report on attribution of profit to permanent establishments in 2006. In addition, the OECD reviewed the application of the arm's length principle in 2010 to consider the guidance on comparability and profit methods. In 2013, OECD's Action Plan on BEPS proposed a thorough review of transfer pricing guidelines. The action plan includes four actions related to transfer pricing. The transfer pricing guidelines were reviewed in 2017 regarding the Report on Action 8-10 of BEPS, which was approved in 2015. Given the transfer pricing changes triggered by the OECD guidelines, the number of countries issuing detailed transfer pricing guidelines has grown substantially in recent years (Marques & Pinho, 2016).

Determining different aspects of transfer pricing frameworks in various countries is difficult because it depends on subjective attributes. However, prior studies aim to analyze the main characteristics of transfer pricing regulations in different countries (Lohse & Riedel, 2013; Marques & Pinho, 2016; Mescall & Klassen, 2018; Zinn et al., 2014). Zinn et al. (2014) analyze the development of transfer pricing regulations in 44 countries between 2001 and 2009, and provide a descriptive comparison of transfer pricing provisions through a six-level measure of strictness of national transfer pricing regulations. The six categories for strictness of transfer pricing rules are mainly based on the transfer pricing documentation requirements in the national tax legislation; however, additional factors such as the definition of related parties, the deadline for documenting transfer pricing, the limitation period and the penalties are also considered. Relatedly, Lohse and Riedel (2013) investigate the effectiveness of transfer pricing rules in restricting profit-shifting behavior for a sample of 26 countries from 1999 to 2009. For this purpose, they categorize countries based on transfer pricing rules into three categories based on the scope and evolution of transfer price documentation requirements, and also take into consideration other issues such as existence of specific penalties and availability of advance price agreements. Marques and Pinho (2016) developed a transfer pricing strictness index based on two pillars: rules on transfer pricing (legal rules and documentation requirements) and law enforcement mechanisms (issues related to sanctions, transfer pricing audit, and penalty aspects.). Relatedly, Mescall and Klassen (2018) developed a measure that uses 16 features of countries' transfer pricing rules and enforcement and weights them according to an extensive survey of 76 transfer pricing practitioner experts based in 33 countries. Their measure includes not only the detailed aspects of documentation requirements (for example, features related to the data used by tax authorities and foreign comparables) but also enforcement aspects (features related to penalty and enforcement). Yet, Rathke et al. (2020) examine the characteristics of transfer pricing rules across countries and cluster countries into four categories regarding the

consistency of transfer pricing rules with the OECD Transfer Pricing Guidelines. Based on their analysis, the most relevant differences in transfer pricing characteristics among countries include the priority of TP methods, APA, and the effectiveness of competent authority procedures.

To sum up, despite the difficulty of determining the different features of transfer pricing rules among countries, the characteristics of transfer pricing rules according to the prior literature can be divided into five general categories: the existence and applicability of transfer pricing rules, the priority of methods, documentation requirements, APA, and penalties.

2.2. Relevant Literature and Hypothesis Development

Understanding the role of anti-avoidance rules on MNEs' behavior is essential to navigate how MNEs shape their real investment decisions. Both the effectiveness of anti-tax avoidance rules in restricting international income shifting (Klassen & Laplante, 2012; Lohse & Riedel, 2013; Saunders-Scott, 2013), and their consequences on investment and capital structure decisions are confirmed by prior research (e.g., Branzoli & Caiumi, 2020; Buettner et al., 2018; Eberhartinger et al., 2020; Egger & Wamser, 2015). For example, a strand of literature document the effect of Controlled Foreign Corporation (CFC) rules on investment and capital structure of firms (Branzoli & Caiumi, 2020; Clifford, 2019; Egger & Wamser, 2015; Hebous & Ruf, 2017). Clifford (2019) examines the change in the financial and locational structure of MNEs in response to CFC rules, and shows that CFC rules cause MNEs to locate fewer subsidiaries in low-tax countries. Buettner et al. (2018) inquire the sensitivity of Foreign Direct Investment (FDI) of German multinationals' affiliates to tax rates and interaction with the strictness of anti-profit shifting rules. They find that thin capitalization rules increase the sensitivity of investment to tax rates and result in lower investment by MNEs in higher tax countries.

Turning to the transfer pricing rules, they have real consequences on investment decisions of firms since they increase the cost of tax avoidance (Buettner et al., 2018; Jacob, 2022). With

stricter regulations, the cost of tax avoidance increases, thereby firms engage in less tax avoidance activities. De Mooij and Liu (2020) argue that transfer pricing regulations make profit shifting costlier for MNEs, and reduce the optimal supply of intermediate inputs, thereby reducing the return on investment in the foreign affiliates. Consistent with this prediction, they find that the introduction of transfer pricing regulations dampens MNEs' investment in their affiliates, but this effect is significantly weaker for firms that heavily rely on intangibles. In comparison, Buettner et al. (2018) find no significant result regarding the effect of transfer pricing rules on FDI.

While the prior literature document the ambiguous effect of the strictness of transfer pricing rules on the investment decisions of MNEs, our study focuses on changes in transfer pricing rules across countries, including changes that lead to stricter or more lenient transfer pricing regulations. Apart from the introduction or strictness of transfer pricing rules, understanding the effect of changes in these rules on MNEs' behavior is crucial, as transfer pricing rules are currently under continuous changes around the globe. These frequent changes in transfer pricing regulations might have a positive or negative impact on corporate investment.

We investigate several potential explanations for how changes in transfer pricing regulations could affect the compliance cost and economic activity of MNEs. On the one hand, many countries continue to expand and change transfer pricing documentation requirements, transparency initiatives, and audits, which can increase uncertainty and risk in MNEs' transfer pricing positions. Mescall and Klassen (2018) define transfer pricing risk as the risk of a transfer pricing position being discovered and denied and the risk of penalties. The features of transfer pricing regulations in a country that increase transfer pricing risk, based on Mescall and Klassen (2018), including using secret comparables by tax authorities, precluding foreign comparables, precluding cost contribution arrangements, requiring concurrent documentation, and having uncertainty over penalties (Mescall & Klassen, 2018). For example, in 2010, the Italian

government introduced the transfer pricing documentation requirements in the national law, and Greece increased the transfer pricing penalties. On the other hand, other features in transfer pricing regulations, such as APA and availability of benchmark data to determine transfer price to taxpayers, reduce transfer pricing risk.

Moreover, some changes in transfer pricing regulations, especially in developing countries such as Russia, India, and Brazil, could lead to a more uniform global standard, which reduces the transfer pricing uncertainty. For instance, Brazil's approach to transfer pricing legislation was notoriously different from that of the OECD, and this caused obvious compliance issues for corporations. Another example is Indian transfer pricing rules which were unique in the sense that they required the computation of a single arm's length instead of a range. Limiting the transfer pricing uncertainty by harmonizing transfer pricing rules could foster the economic activity of firms and reduce their challenges stemming from different rules.

Changes in transfer pricing regulations could affect firms' perception of uncertainty of the transfer pricing framework of countries. Depending on the level of uncertainty perceived by firms, both negative and positive effects of changes in transfer pricing regulations on MNEs' affiliate investment are possible.

First, changes in transfer pricing regulations could reduce investment if the change leads to more uncertainty in the transfer pricing position of MNEs, which may reduce cash flow. This effect could be observed particularly in the first years following a change when there is high uncertainty regarding the implementation and enforcement of the rules. Prior literature documented the effect of uncertainty on investment. Julio and Yook (2012) focus on political uncertainty and examine cycles in corporate investment in the context of national elections across the world. They find that firm investment expenditure declines by an average of 4.8% during election years. Prior research also indicates that country-level risk factors can influence the impact of taxes on corporate risk-taking. For instance, Osswald and Sureth-Sloane (2020)

provide evidence that tax-specific inefficiencies in tax administrations and tight fiscal budgets mitigate the incentivizing effect of loss-offset provisions on corporate risk-taking. Theoretical literature document the ambiguous effect of tax uncertainty on investment decisions (Niemann, 2004, 2011). Yet, there seems to be a consensus in the empirical studies that tax uncertainty is harmful to investment (Edmiston, 2004; Jacob et al., 2022). Relatedly, Gallemore et al. (2021) suggest that expectation and uncertainty about tax policy could potentially affect the efficiency of tax policy changes and shape investment decisions.

Second, some firms are likely insensitive to change or may even increase their investment due to more uncertainty. The uncertainty resulting from changes in transfer pricing regulations could potentially lead to considerable benefits and create opportunities for some firms. Firms could exploit the uncertainty inherent in transfer pricing rules (for example, firms with a high share of intangibles) in their favour to avoid more taxes and increase the benefit from shifting profit internationally. Therefore, they may increase their investment in countries with more transfer pricing uncertainty.

Third, changes in transfer pricing regulations might increase investment if changes reduce or eliminate transfer pricing uncertainty. Diller et al. (2017) use advance tax rulings as an instrument to mitigate tax uncertainty and investigate under which circumstances investors have an incentive to request advance tax rulings to offset uncertainty. They show that advance tax rulings could potentially foster investment. Consequently, changes in transfer pricing regulations could also promote investment by reducing transfer pricing uncertainty and potentially benefit tax authorities as well as firms.

Taken together, firms assess the risk and uncertainty of tax burden and future cash flows when making an investment decision. MNEs are expected to reduce their capital investment when dealing with higher uncertainty sourcing from the change in transfer pricing regulation in the affiliates' countries. Alternatively, some changes in transfer pricing regulations could reduce

the uncertainty, thereby leading to more investment. Moreover, some firms might benefit from the uncertainty stemming from changes in the regulations, to avoid more taxes, and increase their investment in countries with more changes in transfer pricing regulations. We expect the impact of changes in transfer pricing regulations on investment decisions of foreign affiliates of MNEs to be highly dependent on the level of uncertainty and risks perceived by firms related to the transfer pricing framework in the country following the change in these regulations. Thus, it is an empirical question whether and to what extent MNEs change their capital investment in foreign affiliates following a change in transfer pricing regulations in their country. Therefore, we hypothesize the following:

Change in transfer pricing regulations is negatively correlated with the investment level of

MNE's subsidiaries.

3. Research Design and Sample Selection

3.1. Changes in Transfer Pricing Regulations

Our empirical analysis focuses on changes in transfer pricing regulations. We employ the country-year transfer pricing measure developed by Mescall and Klassen (2018) to capture the changes in various aspects of transfer pricing regulations and enforcement. To develop a time-varying proxy for transfer pricing, they employ country-level transfer pricing regulations and enforcement using expert assessments.[8] They capture 16 aspects of transfer pricing regulations and enforcement in countries and estimate a country-year model for the strictness of the transfer pricing system in countries and label it as transfer pricing risk.[9]

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[8] Transfer pricing experts were asked in the survey whether specific transfer pricing regulations increase, decrease or have no effect on the transfer pricing risk.

[9] The 16 characteristics of transfer pricing regulations and enforcement are age of rules, whether tax authority allows advance pricing agreements, whether benchmark data are available to taxpayer; whether tax authority requires contemporaneous documentation, whether tax authority allows cost contribution arrangements, whether tax authority precludes commissionaire arrangements, whether tax authority allows foreign comparables for estimating the transfer price, if tax authority allows related party setoffs, if taxpayers have to pay the tax assessment before going to competent authority, if there is a priority of methods, whether tax authority requires disclosure on the tax return concerning related party transactions, whether tax authority allows a self-initiated adjustment, if the

The Mescall and Klassen measure includes some features of transfer pricing regulations that reduce the transfer pricing risk, such as APAs, reduction of penalty, availability of benchmark data to taxpayers, and some features that increase the transfer pricing risk, such as ambiguity of transfer pricing enforcement and acceptability of foreign comparables by tax authorities. Using this measure helps our empirical analysis in different ways. First, compared to other available measures, which mainly focus on documentation requirements, this measure encompasses various aspects of transfer pricing regulations in countries, such as documentation requirements, the strictness of enforcement, acceptance of cost contribution and commissionaire arrangements. Second, this measure enables us to exploit changes in transfer pricing regulations in a cross-country setting. Third, the time window of the measure is large, enabling us to track the changes in transfer pricing rules from 2007 to 2015. Lastly, we are able to capture the changes that increase and decrease the transfer pricing risk.

To proxy for *change*, we first calculate the difference between the current and previous year's transfer pricing measure, and define *change* as a dummy variable equal to one if the change in the country-year transfer pricing measure is greater or less than the standard deviation of all the changes in the sample. Table 1 provides an overview of the *change* in transfer pricing regulations in our sample countries.

As discussed before, some transfer pricing changes help with reducing uncertainty in the transfer pricing framework in the country. For example, a change in transfer pricing regulations in 2012 in Russia led to less uncertainty. Although the general transfer pricing regulations were introduced in Russia before 2012, the documentation requirements were not legally required, but in practice, the Russian tax authority asked for documentation requirements. Therefore, there was a high uncertainty about the transfer pricing rules in Russia before 2012. The new

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tax authority has rules for transfer pricing documentation, whether there is provision related to reduction of penalty, whether tax authority uses proprietary tax data to calculate a "revised" transfer price, and the level of transfer pricing enforcement in country.

Russian transfer pricing rules became effective in January 2012, in which cost contribution arrangements, APA, and commissionaire arrangements were allowed by the tax authority and the taxpayers had to prepare contemporaneous documentation. The new regulations also accepted the foreign comparables for estimating the transfer price and whether taxpayers were allowed to make adjustments to the tax base. As a result of these changes, the transfer pricing measure decreased from 3.47 to 2.94 in 2012. Another example is Austria, which revised its transfer pricing guideline in 2010. This change in transfer pricing regulations caused substantial changes regarding transfer pricing rules; for example, changes in the priority of methods, the availability of benchmarking data for taxpayers, and the acceptance of foreign comparables. Consequently, the transfer pricing measure increased from 1.9 to 2.9 in 2010. Later in 2011, there was a formal procedure for obtaining unilateral APAs in Austria; thereby, the transfer pricing measure decreased.

Our sample includes countries with no substantial changes in transfer pricing regulations between 2007 and 2015, such as Germany, Japan, and the USA, as well as countries with multiple changes, for instance, Argentina, Colombia, and Australia. Figure 1 provides an overview of the frequency of change in transfer pricing rules in our sample countries.

< Insert Figure 1 about here >

< Insert Table 1 about here >

3.2. Empirical Specification

To examine the effect of uncertainty arising from changes in transfer pricing regulations on firms' investment decisions, we test the following first-difference regression:

$$\Delta K_{ijt} = \beta_0 + \beta_1 TP\ Change_{jt-1} + \beta_2\ \Delta\ \theta_{jt} + \beta_3\Delta\ \chi_{it} + \varepsilon_{ijt} \qquad (1)$$

Where i, j, and t denote subsidiary, subsidiary country, and year; and Δ is the first-difference operator. The dependent variable ΔK represents the subsidiary's annual change in net fixed

assets scaled by lagged total assets, winsorized at the first and 99th percentiles. The variable $TP\ Change_{jt\_1}$ is an indicator variable equal to one when the change in country-year transfer pricing measure by Mescall and Klassen (2018) is greater or less than the standard deviation of all the changes in the sample countries. We also include a set of country-level controls to account for the subsidiaries' country characteristics. We include statutory corporate tax rates to control for the potential confounding effect of taxation on investment (Becker & Riedel, 2012). Moreover, country controls such as *GDP per Capita*, *GDP Growth,* and unemployment rate as proxies for market size and overall economic activity are included in the model. We include *Openness*, measured as the sum of imports and exports divided by GDP, to control for the dependence of the economy on foreign trade (Jacob & Vossebürger, 2022). Furthermore, following Osswald and Sureth-Sloane (2020), we use the Worldwide Governance Indicators (WGI) to proxy for political risk by measuring governance and political stability.

$X_{i,j,t}$ denotes a set of time-varying firm control variables. We control for changes in leverage (*ΔLeverage*), return on assets (*ΔROA*), and size following prior investment literature (e.g., Baker et al., 2003; Shroff, 2017). We employ the first-difference approach, which removes unobserved time-invariant firm characteristics and, unlike a level specification with firm fixed effect, can easily accommodate multiple transfer pricing changes per country. We further include industry-country-year fixed effects in all regressions.[10] Lastly, standard errors are clustered at the country-industry level following He et al. (2022). All variables are defined in Appendix A.

3.3. Data and Sample

The subsidiary-level unconsolidated financial data for this study is collected from Bureau van Dijk's (Bvd) Orbis database from 2007 to 2015. We use ownership information available in Orbis to re-construct MNEs' holding structure and determine directly and indirectly held

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[10] Industry-country-year fixed effects consist of 2-digit NACE code, the year and country.

subsidiaries.[11] We require a total participation of more than 50 percent by a parent in a single subsidiary to include that subsidiary in our sample (Amberger et al., 2021). We further require MNEs to have at least two subsidiaries as our research question explores the change in the investment pattern of MNEs in their subsidiaries resulting from changes in the affiliates' local country transfer pricing regulations. Following the previous literature and based on the industry classification code, we drop observations in the financial sector because of their unique investment patterns (Badertscher et al., 2013). All observations with the missing industry classification code are discarded. Moreover, we require subsidiaries with non-missing values for total assets, operating revenue, fixed assets, or cash and cash equivalents. Following Bethmann et al. (2018), we exclude subsidiaries with total or fixed assets of less than US$100,000. See Appendix B for a more detailed overview of the sample selection process.

The change in transfer pricing regulations is constructed based on the measure of transfer pricing developed and provided by Mescall and Klassen (2018), as explained in detail before. We collect data on country-level control variables such as *GDP*, *GDP growth*, *Openness*, *Unemployment* and *Political Risk* from the World Bank. The data on statutory tax rates are obtained from KPMG Corporate Tax Rates Table[12].

We exploit changes in transfer pricing regulations. Our sample consists of 240,656 affiliate-year observations that include 63 significant changes in transfer pricing regulations in 38 countries. Table 2 presents the number of subsidiary-year observations in our sample by country. Our sample comprises both developed and developing countries. We observe that 21.5 percent of the total subsidiaries are located in France, followed by Italy (12.26 percent), Spain (9.46 percent) and the largest number of parents residing in large, developed countries such as

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[11] The ownership information is time-invariant in Orbis data, meaning the group ownership structure in our sample is defined at the time of the download of the data (Dec 2021). Despite this limitation, the ORBIS is the most comprehensive financial dataset which is extensively has been used in academic and policy research.

[12] See KPMG Corporate Tax Rates Table, https://home.kpmg/it/it/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html.

France (16.87 percent), Germany (12.13 percent), and Italy (8.01 percent).

< Insert Table 2 about here >

Table 3 presents the descriptive statistics for our sample.[13] We winsorize all firm-level and country variables at the 1 percent and 99 percent levels following (De Simone et al., 2022). Our dependent variable is the subsidiary's annual change in net fixed assets scaled by lagged total assets (*Investment*). The mean annual change in fixed assets amounts to 0.9 percent of total assets. On average, subsidiaries report leverages of 9.1 percent and a return on assets of 3.3 percent. The average (median) corporate tax rate is 28.5 (30) percent. The average (median) for *Unemployment* and *Political Risk* are 9.633 (8.725) and 5.676 (6.598), respectively.

< Insert Table 3 about here >

4. Empirical Results

4.1. Baseline

Our baseline regression results are presented in Table 4. We estimate equation (1) to test the effect of changes in transfer pricing regulations on the investment decisions of multinational firms. Columns (1) and (3) present the results without parent country fixed effects, and columns (2) and (4) present the results with parent country fixed effects to control for the parent country characteristics such as legal or regulatory factors that might affect investment behavior of subsidiaries. The coefficients of *TP Change* in columns (1) to (4) indicate that the capital investment of subsidiaries is influenced following a change in transfer pricing regulation. The results hold when parent country fixed effects are included (Columns 2 and 4). All the *TP Change* variables are significant at the 1% level. The coefficient estimate -0.008 in column (2) indicates that following a change in transfer pricing regulations in the subsidiary country, MNEs reduce their investment in the respective country by 0.8 percentage points on average ($p < 0.001$). We

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[13] Appendix C displays the Pearson correlations for the variables used to test our hypothesis.

also find that the effect of change in transfer pricing regulations on capital investments increases over two periods as the coefficient of *TP Change t-2* is larger than the coefficient of *TP Change t-1*, showing that MNEs even further decrease their investment levels after two periods (*TP Change t-1* = -0.008 and *TP Change t-2* = -0.017). Regarding the timing of investments, Columns (1) to (4) reveal a delayed investment response a year later, which is consistent with the notion that MNEs need time to respond to the tax policy and changing the investment may take some time.[14] The baseline results suggest that changes in transfer pricing regulations matter for the MNEs' investment decisions, as the change is associated with uncertainty about their tax positions, future cash flow and potential penalty.

The results for control variables are generally consistent with our expectations. That is, the level of investment increases in the subsidiary's *ROA*, *Leverage*, and *Size*. Moreover, consistent with prior literature (Becker & Riedel, 2012; Giroud & Rauh, 2019), we find that higher corporate taxes reduce investments, although the results are not statistically significant.

Thus, consistent with our hypothesis, we find that affiliates reduced their level of investment following a change in transfer pricing rules due to a more uncertain transfer pricing environment. This result is consistent with the notion that the uncertainties surrounding transfer pricing regulations are significant for MNEs to consider in their investment decision.

< Insert Table 4 about here >

4.2. Supplementary Analysis

Increase versus Decrease in Transfer Pricing Risk

We further examine whether MNEs respond differently to change in transfer pricing regulations which leads to higher or lower transfer pricing risk. The first intuition could be that firms perceive a change in transfer pricing rules as uncertain, regardless of whether the change leads

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[14] We also test for the anticipatory investment effects, i.e., we would expect that investments in *t* do not respond to changes in transfer pricing in *t+1* and *t+2*. Consistent with our expectations, the results are insignificant.

to higher or lower transfer pricing risk. Particularly, this effect could be observed in the first years after a change, when there is high uncertainty regarding the enforcement of the rule, even if the change in the rule aims to create more certainty for the MNEs, such as the APA. On the contrary, MNEs might respond differently to transfer pricing changes when they perceive that the change leads to higher risk or lower risk of transfer pricing, for example, if a change in transfer pricing rules preclude the commissionaire arrangements or require contemporaneous documentation. We thus create a dummy for the *TP Change-lower risk* equals one if the country-year *TP Change* variable equals one and the change in transfer pricing measure is decreasing. The *TP Change-higher risk* denotes a dummy variable equal to one if the country-year *TP Change* variable is equal to one and the change in transfer pricing measure is increasing. We then use these dummy variables in our baseline regression.

Table 5 shows results of the regressions separately for changes in the rules that lead to decrease and increase in the risk of transfer pricing. The results in columns (1) to (4) are generally consistent with the notion that MNEs reduce their investment in the subsidiary country following a change that leads to higher risk of transfer pricings and slightly increase their investment in the subsidiaries when the changes in regulations leads to lower risk of transfer pricing.

Frequency of Change in Transfer Pricing Regulations

We further examine the association between frequent changes in transfer pricing regulations in countries and investment of MNE's subsidiaries. Frequent changes in transfer pricing regulations makes it difficult for firms to process the information about the regulations and implementation, leading to unintentional mistakes, non-compliance, and even litigation and penalties. MNEs require more time to adopt to changes in countries where the changes in transfer pricing rules are frequent, because of the difficulties in understanding and incorporating the changes in the rules in their compliance system. Moreover, when MNE's perceive that there were frequent changes in transfer pricing regulations in the past years, the uncertainty created

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as a result about the future of transfer pricing system in respective countries, is expected to reduce MNE's investment in those countries.

In Columns (5) and (6) of Table 5, we include the volatility in change in transfer pricing regulations (*TP Vol*) among countries to compare the investment of subsidiaries in countries with more and less frequent changes. Intuitively, frequent changes in transfer pricing rules would increase the uncertainty in these rules, and there is a substantial variation in tax uncertainty among countries. We use the standard deviation of transfer pricing measure per country to measure the transfer pricing uncertainty, denoted by *TP Vol*. The results in columns (5) and (6) of Table 5 indicate that frequent changes in the transfer pricing regulations in a country is associated with lower investments of MNE's subsidiaries in that country.

< Insert Table 5 about here >

4.3. Heterogeneous Country Characteristics

Next, we investigate whether the negative association estimated in Table 4 might vary across heterogeneous country characteristics. To obtain more insights into the responses of firms concerning country characteristics, we first focus on subsidiaries in low and high-tax countries. Since transfer pricing regulations aim to retrain firms from cross-border profit shifting, higher uncertainties associated with changes in transfer pricing regulations in high-tax countries likely have a stronger effect on respective subsidiaries since the risk and cost of profit shifting in these countries become higher. In order to test the potential heterogeneous impacts of low and high-tax countries, we split the sample based on statutory tax rates. *Low-tax* denotes the firms in countries at the 25th statutory tax rate percentile and *High-tax* represents the firms in countries at the 75th percentile. We run separate regressions for the subsamples of high versus low tax. The results are shown in Table 6. Columns (1) and (2) present results of *TP Change* for observations, where the corporate tax rate in the subsidiary country is low (column (1)) versus high (column (2)). Consistent with our expectation, we find stronger association between the

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changes in transfer pricing regulations and investment in subsidiaries located in high-tax countries.

The association between changes in transfer pricing regulations and investment of subsidiaries may differ also across countries with different developmental levels. The spectrum of transfer pricing advances across developed countries and developing countries is vast and also ranges from the introduction of transfer pricing regulations and alignment with the OECD to issuing landmark rulings. While the trend of changes in transfer pricing regulations in developed countries is toward more strict regulations, developing have increased focus on aligning the rules with the OECD standards (UN, 2021). Relatedly, Rathke et al. (2020) classify countries for the period 2010-2016 based on the consistency of transfer pricing regulations with the OECD guidelines. The largest group in their samples comprises of mainly developed countries[15] that adopted the OECD guidelines into their domestic legal system with few complementary domestic provisions. In comparison, they show that countries such as Chile, Colombia, and Ecuador have domestic transfer pricing provisions that differ substantially from the OECD baseline standards. The major differences between countries in Rathke et al. (2020) study is related to the priority of TP methods and the availability of APA, which reduces the transfer pricing uncertainty for the firms. Therefore, harmonizing the transfer pricing regulations with the OECD standard in developing countries creates certainty for MNEs to boost their activities and increase their investment.

To test the effect of transfer pricing changes on the investment of MNEs in subsidiaries in developing countries, we first use the International Monetary Fund's (IMF's) classification for developed and developing countries.[16] The database lists forty countries as developing

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[15] The countries in this group are: Australia, Austria, Belgium, Canada, China, Denmark, France, Germany, Greece, India, Indonesia, Ireland, Italy, Japan, Malaysia, Mexico, Netherlands, Poland, Portugal, Slovak Republic, Spain, Sweden, United Kingdom, United States.

[16] There are two classifications based on IMF: developed and emerging markets and middle-income economies. We denote emerging markets and middle-income economies as developing countries.

See https://www.imf.org/external/datamapper/datasets/FMEconGroup.xlsx

countries.[17] Thus, we create a dummy variable that is equal to one if the countries in our sample belong to the list of developing countries from the IMF database and zero otherwise. Columns (3) and (4) of Table 6 represent the two subgroups' results. Results indicate that *TP Change* in developing countries increases the investment of MNEs in those countries, whereas the coefficient for the *TP change* is still negative and significant for the subsidiaries in other countries. We find consistent results when splitting the sample by GDP per capita in columns (5) and (6). To test whether this association is related to changes that lead to higher or lower transfer pricing risk, in Columns (7) and (8), we include *TP Change-higher risk* and *TP Change-lower risk* and re-estimate the baseline regression for developing countries. We performed F-tests for the differences in coefficients of Columns (1) and (2), Columns (3) and (4), Columns (5) and (6), and Columns (7) and (8); our results report statistical significance in all the cases.

Interestingly, the results in Columns (7) and (8) of Table 6 indicate that subsidiaries located in developing countries do not respond to a change that leads to higher transfer pricing risk (the coefficient is not statistically significant, although it is negative), but they increase their investment in these countries after a change that reduces transfer pricing risk. This result shows that in the case of developing countries, changes in transfer pricing regulations that eliminates uncertainty of transfer pricing framework could promote investment of the MNEs in the subsidiaries located in those countries. This result highlights that resolving uncertainties and peculiarities in transfer pricing regulations in developing countries could foster economic activity and attract MNEs' investment. In line with our findings, the report of the joint project on transfer pricing between OECD and Receita Federal do Brasil implies that divergences and gaps in transfer pricing regulations in Brazil are harmful to its economy, as many taxpayers avoid Brazil as the destination of their investments due to the inherent double taxation risk and high

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[17] From our sample countries, Argentina, Brazil, Chile, Ecuador, Hungary, India, Mexico, Peru, Philippines, Poland, Romania, Russia, Thailand and Uruguay are among the emerging markets and middle-income economies based on IMF classification.

compliance cost (OECD/Receita Federal do Brasil, 2019). The report indicates that Brazil could attract more foreign investment by aligning the transfer pricing rules with international standards.[18]

< Insert Table 6 about here >

4.4. Robustness Tests

To test the robustness of our baseline findings, Table 7 presents regressions from alternative specifications. In column (1), we present results using an alternative investment measure. The investment measure in this specification is the change of the natural logarithm of fixed assets from *t-1* to *t*. We continue to observe a negative and significant coefficient for change in transfer pricing rules. Moreover, to control for the potential heterogeneity that MNEs have performed differently during the Great Recession, we limit the sample period to the years after 2009 in olumn (2). The results indicate that controlling for the potential differential influence of the Great Recession on MNEs investment does not substantially change our main variable of interest, *TP Change*. In column (3), we assess the robustness of our results to alternative fixed_effects structures. The result shows that the coefficient estimates for *TP Change* remain unchanged.

In our last test, to validate the robustness of our results, we re-estimate equation (1) using an alternative proxy for changes in transfer pricing rules, using *TP Change**. To capture the objective changes in transfer pricing rules, we gather data from Deloitte, EY, PwC, and KPMG Global Transfer Pricing Guidelines. *TP Change** is an indicator variable equal to one if the global transfer pricing guidelines report a change in transfer pricing rules in a given country in

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[18] This anecdotal evidence could be observed in other developing countries as well. For instance, in 2008, KPMG in India called for comprehensive changes to India's transfer pricing rules in its submission to the union government. The reason for this call was inconsistencies in the interpretation and application of the transfer pricing rules by authorities in India, which were solved with a set of rules and guidelines in several transfer pricing issues. See https://www.internationaltaxreview.com/article/b1fyfxynm8bymn/kpmg-india-calls-for-new-transfer-pricing-guidelines. Another example is Russia's transfer pricing law change in 2010 that includes many of the features of international systems, such as contemporaneous documentation, guidance on the use of new methods, and advance pricing agreements.

a given year. We continue to observe a negative and significant relation between the change in transfer pricing rules and the level of investment of the subsidiaries.

< Insert Table 7 about here >

5. Conclusion

In this study, we focus on changes in transfer pricing regulations across countries and investigate to what extent these changes affect the investment of MNEs. Using a sample of subsidiaries in 38 countries, we find that the level of investment in affiliates is reduced following a change in transfer pricing regulations. The measure of transfer pricing from Mescall and Klassen (2018) provides cross-country variation in transfer pricing regulations and enforcement from 2007 to 2015, thereby enables us to capture changes in these regulations for our sample countries. We further find that subsidiaries' investment is lower in countries with higher transfer pricing uncertainties (frequent changes).

Considering cross-country variations, our results present crucial differences regarding the response of firms to transfer pricing changes across countries. The negative effect of changes in transfer pricing regulations on subsidiaries' investments is more pronounced for the subsidiaries located in high-tax countries. Our result also indicates that the impact of changes in transfer pricing differs across countries with different developmental levels. The attempts of developing countries to align with global transfer pricing standards and resolve the transfer pricing peculiarities will reduce the uncertainty for firms and, therefore, increase investment level in these countries.

The global legislative framework on transfer pricing has undergone several changes during the past years in the wake of international guidelines. Our results indicate that changes in transfer pricing regulations increase uncertainty about the transfer pricing framework and induce less investment, and this association is higher in the countries that have frequent changes. As

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frequent changes in transfer pricing regulations in the past cause firms in general to distrust the transfer pricing framework and also expect more changes in the future. Moreover, international organizations such as OECD and UN highlight the importance of harmonizing the rules and inclusion of developing countries to address transfer pricing regulations mismatches and seeking to reduce compliance costs and the risk of double taxation (UN, 2021). Our findings provide insights for policymakers and tax administrations globally. Our results provide evidence that developing countries could attract and boost MNEs' investment in their countries by reducing transfer pricing uncertainty through eliminating the peculiarities and aligning the transfer pricing regulations with global standards.

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Figure 1. Frequency of change in transfer pricing regulations across countries

Notes: This figure presents the frequency of change in transfer pricing regulations in our sample countries between 2007 and 2015. The transfer pricing data is taken from Mescall and Klassen (2018). The transfer pricing measure of Mescall and Klassen (2018) includes 16 features of countries' transfer pricing rules and enforcement. Change in transfer pricing (*TP Change*) is an indicator variable equal to one if the change (the difference between the current and previous year's transfer pricing measure) in country-year transfer pricing measure is greater or less than the standard deviation of all changes in the sample.
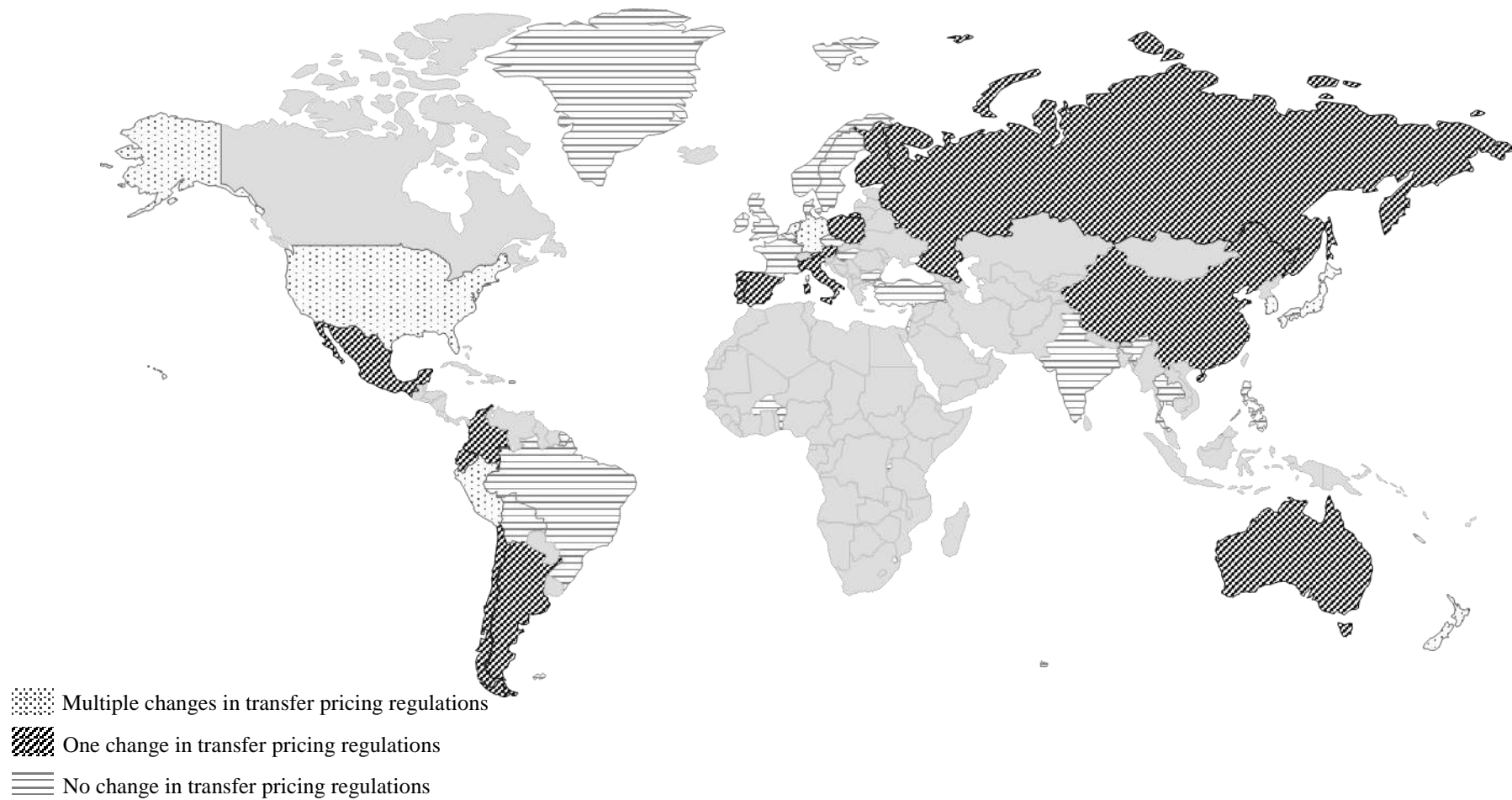

Multiple changes in transfer pricing regulations

One change in transfer pricing regulations

No change in transfer pricing regulations

Table 1. Overview of change in transfer pricing regulations

Notes: This table presents the specific years that a change in the transfer pricing rule occurs across our sample countries. Change in transfer pricing (*TP Change*) is an indicator variable equal to one if the change in country-year transfer pricing measure based on Mescall and Klassen (2018) is greater or less than the standard deviation of all transfer pricing changes in the sample.

Panel A: Countries with changes between 2007-2015

Country	Year	Country	Year
Argentina	2008, 2010, 2011,2013	Italy	2008, 2009
Australia	2007, 2008, 2011	Mexico	2010, 2012
Austria	2008, 2010, 2011	New Zealand	2013
Belgium	2013	Philippines	2010
Brazil	2007, 2011	Poland	2011, 2012
Chile	2007, 2011, 2013	Portugal	2007, 2009
China	2007, 2008, 2010	Romania	2011
Colombia	2007, 2008, 2010, 2012	Russia	2007, 2010, 2011, 2012, 2013
Czech Republic	2010	Spain	2007, 2009, 2012
Denmark	2007	Sweden	2007, 2010
Ecuador	2007, 2010	Switzerland	2011, 2012
Finland	2007, 2008, 2013	Thailand	2011
France	2008	Uruguay	2011, 2012
Greece	2012, 2014		
Hungary	2007, 2011		
India	2009, 2011		

Panel B: Countries without change between 2007-2015

Country
Germany
Japan
Korea
Luxembourg
Netherlands
Norway
Peru
Slovakia
United States

Table 2. Distribution of subsidiary-year observations by country

Notes: This table presents the number of affiliate-year observations per country in our sample over the period from 2007 to 2015.

Subsidiary-Year			Subsidiary-Year		
Country	**N**	**%**	**Country**	**N**	**%**
Argentina	3	0.00	Luxembourg	963	0.4
Australia	148	0.06	Mexico	6	0.00
Austria	4,975	2.07	Netherlands	1,260	0.52
Belgium	12,725	5.29	New Zealand	511	0.21
Brazil	24	0.01	Norway	8,120	3.37
Chile	70	0.03	Peru	47	0.02
China	10,789	4.48	Philippines	996	0.41
Colombia	1,703	0.71	Poland	16,336	6.79
Czech Republic	12,116	5.03	Portugal	5,588	2.32
Denmark	1	0.00	Romania	3,062	1.27
Ecuador	31	0.01	Russia	1	0.00
Finland	3,775	1.57	Slovakia	3,894	1.62
France	51,966	21.59	Spain	22,773	9.46
Germany	18,971	7.88	Sweden	11,850	4.92
Greece	1,432	0.60	Switzerland	42	0.02
Hungary	2,462	1.02	Thailand	12	0.00
India	2,104	0.87	United States	1	0.00
Italy	29,510	12.26	Uruguay	17	0.01
Japan	8,863	3.68			
Korea	3,509	1.46			
Total				240,656	100

Table 3. Descriptive statistics

Notes: This table describes the sample and summary statistics for the cross-country sample of our main variables for 240,565 affiliate-year observations from 2007 to 2015 used in the empirical tests. All continuous variables are winsorized at the 1st and 99th percentiles.

Variable	Mean	SD	p25	p50	p75
Investment	0.009	0.171	-0.047	-0.009	0.019
Leverage	0.091	0.191	0.000	0.000	0.077
ROA	0.033	0.128	-0.005	0.032	0.088
Size	16.757	1.631	15.590	16.605	17.776
Str	0.285	0.054	0.250	0.300	0.333
Ln (GDP per capita)	10.133	0.714	9.789	10.405	10.539
GDP Growth	1.792	2.726	0.418	1.343	2.809
Openness	77.339	35.045	55.655	61.996	85.791
Unemployment	9.633	5.286	6.117	8.725	10.975
Political Risk	5.676	3.67	4.364	6.598	8.139
FixedInv	0.091	0.843	-0.182	-0.072	0.072
TP Vol	0.402	0.213	0.187	0.339	0.576

Table 4. Changes in transfer pricing rules and capital investment

Notes: This table presents the results of equation (1). The dependent variable is *Investment*, measured as the subsidiary's annual change in net fixed assets scaled by lagged total assets. Our main variable of interest, *TP Change*, is an indicator variable equal to one if the change (the difference between the current and previous year's transfer pricing measure) in country-year transfer pricing measure based on Mescall and Klassen (2018) is greater or less than the standard deviation of changes in the sample. All continuous variables are winsorized at the 1% and 99% levels. All variables are measured as in first differences. Variables are defined in Appendix A. Industry-year-country fixed effects are included in all regressions. We report robust standard errors clustered at the country–industry level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) Investment	(2) Investment	(3) Investment	(4) Investment
TP Change $_{t-1}$	-0.008***	-0.008***		
	(0.002)	(0.002)		
TP. Change $_{t-2}$			-0.017***	-0.016***
			(0.002)	(0.002)
ΔLeverage	0.048***	0.047***	0.047***	0.047***
	(0.008)	(0.008)	(0.008)	(0.008)
ΔROA	0.036***	0.036***	0.035***	0.035***
	(0.008)	(0.008)	(0.008)	(0.008)
ΔSize	0.250***	0.251***	0.250***	0.251***
	(0.005)	(0.005)	(0.005)	(0.005)
ΔSTR	-0.017	-0.036	0.065	0.054
	(0.060)	(0.062)	(0.059)	(0.061)
ΔGDP per Capita	-0.251***	-0.101**	-0.239***	-0.095**
	(0.043)	(0.049)	(0.038)	(0.044)
ΔGDP Growth	-0.003***	-0.003***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔOpenness	0.002***	0.001***	0.002***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Δ Unemployment	-0.004***	-0.003***	-0.005***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Δ Political Risk	-0.051***	-0.053***	-0.060***	-0.062***
	(0.013)	(0.014)	(0.014)	(0.014)
Constant	-0.004***	-0.012***	-0.002	-0.003
	(0.001)	(0.003)	(0.001)	(0.003)
Observations	240,656	240,636	240,656	240,636
R-squared	0.109	0.110	0.109	0.110
Industry_year_country FE	Yes	Yes	Yes	Yes
Parent FE	No	Yes	No	Yes

Table 5. Increase and decrease in transfer pricing risk

TP Change-lower risk equals one if the country-year *TP Change* equals one and the change in transfer pricing measure is negative. *TP Change-higher risk* denotes a dummy variable equal to one if the country-year *TP Change* is equal to one and the change in transfer pricing measure is positive. *TP Vol* is the standard deviation of transfer pricing measure per country. All continuous variables are winsorized at the 1% and 99% levels. All variables are measured as first differences from the lagged values. Variables are defined in Appendix A. Industry-year-country fixed effects are included in all regressions. We report robust standard errors clustered at the country–industry level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) Investment	(2) Investment	(3) Investment	(4) Investment	(5) Investment	(6) Investment
TP Change-lower risk $_{t-1}$	0.006**	0.007**				
	(0.003)	(0.003)				
TP Change-higher risk $_{t-1}$			-0.022***	-0.022***		
			(0.003)	(0.003)		
TP Vol					-0.005*	-0.002*
					(0.003)	(0.003)
Observations	240,656	240,636	240,656	240,636	240,656	240,636
R-squared	0.108	0.109	0.109	0.110	0.109	0.109
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry_year_country FE	Yes	Yes	Yes	Yes	Yes	Yes
Parent FE	No	Yes	No	Yes	No	Yes

Table 6. Heterogenous country characteristics

Notes: This table presents the heterogeneity in investment responses to transfer pricing changes based on country characteristics. The dependent variable is *Investment*, measured as the subsidiary's annual change in net fixed assets scaled by lagged total assets. Our main variable of interest, *TP Change*, is an indicator variable equal to one if the change in country-year transfer pricing measure based on Mescall and Klassen (2018) is greater or less than the standard deviation of changes in the sample.
Columns (1) and (2) show results for different effects of *TP Change* on investment in low- and high-tax countries. Countries are denoted as low tax if the subsidiary's country tax rate belongs to the bottom quantile of statutory tax rates in our sample. We further divide the sample based on countries' developmental levels. Columns (3) and (4) show results for different effects of *TP Change* on investment in developed and developing countries. This classification is based on International Monetary Fund's classification for developed countries and emerging economies. Columns (5) and (6) present the results for splitting the sample by GDP per capita. Columns (7) and (8) report the results for the *TP Change-higher risk* and *-lower risk* in developing countries. *TP Change-higher risk* denotes a dummy variable equal to one if the country-year *TP Change* is equal to one and the change in transfer pricing measure is positive. All continuous variables are winsorized at the 1% and 99% levels. Variables are defined in Appendix A. Industry, year, and country fixed effects are included in all regressions. We report robust standard errors clustered at the country–industry level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1) Investment	(2) Investment	(3) Investment	(4) Investment	(5) Investment	(6) Investment	(7) Investment	(8) Investment
	Corporate Tax Rates in the Subsidiary Country		Developed and Developing Countries		GDP per capita of Subsidiary Country		Developing Countries	
	Low Tax	High Tax	Developing	Developed	Low GDP	High GDP	Higher risk	Lower risk
TP Change $_{t-1}$	-0.003*	-0.014***	0.011***	-0.012***	0.005*	-0.032***		
	(0.003)	(0.005)	(0.004)	(0.002)	(0.002)	(0.003)		
TP Change- higher risk $_{t-1}$							-0.007	
							(0.005)	
TP Change-lower risk $_{t-1}$								0.053***
								(0.009)
Observations	81,671	76,440	37,663	202,973	77,923	84,588	37,663	37,663
R-squared	0.103	0.113	0.146	0.105	0.129	0.102	0.146	0.148
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry_year_country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parent FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7. Robustness tests

Notes: This table presents the alternative estimations of the baseline regression (Table 4). Our main variable of interest, *TP Change*, is an indicator variable equal to one if the change in country-year transfer pricing measure based on Mescall and Klassen (2018) is greater or less than the standard deviation of changes in the sample.
In column (1), results for alternative investment measure is reported. Investment alternatively is measured as the change of the natural logarithm of fixed assets. In column (2), we report results for limiting the sample to the years after 2009 to eliminate the effect of the Great Recession. In column (3), we report results using alternative fixed effects structures. Column (4), presents results using an alternative proxy for changes in transfer pricing rules to estimate equation (1). *TP Change** is an indicator variable that is equal to one if the global transfer pricing guidelines report a change in transfer pricing rules in a given country in a given year.
All continuous variables are winsorized at the 1% and 99% levels. All variables are measured as first differences from the lagged values. Variables are defined in Appendix A. We report robust standard errors clustered at the country–industry level in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

VARIABLES	(1) Investment FixedInv	(2) Investment after 2009	(3) Investment Alternative FE	(4) Investment-TPchange
TP Change $_{MK}$	-0.038***	-0.006***	-0.008***	
	(0.008)	(0.002)	(0.002)	
TP Change*				-0.026***
				(0.002)
ΔLeverage	0.102***	0.049***	0.047***	0.048***
	(0.029)	(0.008)	(0.008)	(0.008)
ΔROA	-0.110***	0.039***	0.036***	0.036***
	(0.033)	(0.008)	(0.008)	(0.008)
ΔSize	0.662***	0.249***	0.251***	0.251***
	(0.022)	(0.005)	(0.005)	(0.005)
Observations	232,188	233,947	240,636	239,009
R-squared	0.028	0.109	0.110	0.111
Country controls	Yes	Yes	Yes	Yes
Industry_year_country FE	Yes	Yes	No	Yes
Parent FE	Yes	Yes	Yes	Yes
Industry_year FE	No	No	Yes	No
Country_year FE	No	No	Yes	No

Appendix A. Variable descriptions

Firm and Country Variables		
Variable	Definitions	Source
Investment	Fixed assets of subsidiary *i* in year t less fixed assets of subsidiary *i* in year t-1 scaled by total assets of subsidiary *i* in year t-1	Bureau van Dijk's Orbis
Leverage	The sum of long-term and short-term debt of subsidiary *i* in year t scaled by total assets of subsidiary *i* in year t	Bureau van Dijk's Orbis
RoA	Profit after tax of subsidiary *i* in year t scaled by total assets of subsidiary *i* in year t	Bureau van Dijk's Orbis
Size	Natural logarithm of total assets of subsidiary *i* in year t	Bureau van Dijk's Orbis
TP Change	An indicator variable equals one if the change (the difference between the current and previous year's transfer pricing measure) in the country-year measure of transfer pricing in Mescall and Klassen (2018) is above the standard deviation of change in the sample.	Mescall and Klassen (2018)
TP Vol	Standard deviation of transfer pricing measure per country	Mescall and Klassen (2018)
TP Change-lower risk	An indicator variable equals one if the country-year *TP Change* equals one and the change in transfer pricing measure is negative.	
TP Change-higher risk	An indicator variable variable equal to one if the country-year *TP Change* is equal to one and the change in transfer pricing measure is positive.	
Statutory tax rate	The average statutory corporate income tax rate in the country at year *t*	KPMG
Ln (GDP per capita)	Natural logarithm of per-capita GDP in constant 2010 USD	World Bank
GDP Growth	The percentage change in GDP in a country from year *t-1* to *t*	World Bank
Openness	Sum of import and export divided by GDP	World Bank
Political Risk	Sum of governance index of a country's WGI indicators: Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption. Following Osswald and Sureth-sloane (2021) to facilitate interpretation, we standardize the variable over the sample period and multiply it by -1, so a higher value indicates higher political risk	World Bank Worldwide Governance Indicators (WGI)
Corruption	A yearly estimate of perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption.	World Bank Worldwide Governance Indicators (WGI)

Voice and Accountability	A yearly estimate of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	World Bank Worldwide Governance Indicators (WGI)
Political Stability	A yearly estimate of citizens perception of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.	World Bank Worldwide Governance Indicators (WGI)
Government Effectiveness	A yearly estimate which captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	World Bank Worldwide Governance Indicators (WGI)
Regulatory Quality	Yearly estimate which captures the perception of the ability of the government to formulate and implement policies and regulations.	World Bank Worldwide Governance Indicators (WGI)
Rule of Law	Yearly estimate which captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	World Bank Worldwide Governance Indicators (WGI)
Unemployment	Unemployment rate in the country	World Bank

Appendix B. Sample selection

Sample Selection	Observations (subsidiary-years)
Data obtained from Bureau van Dijk's Orbis data base after dropping observations with only local subsidiaries and subsidiaries where the parent holds a total participation ≤ 50 percent	2,717,202
After dropping subsidiaries with missing country-level variables	1,037,581
After dropping subsidiaries in the financial sector (NACE 6400-6899) and missing NACE code	997,366
After dropping observations with missing or negative values for total assets, fixed assets, cash	957,718
After dropping observations with total assets and fixed assets < US$100,000	720,773
After dropping observations for countries with insufficient tax data	554,333
After dropping observations without sufficient data for variables	240,656

Appendix C. Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) *Investment*	1.000								
(2) Leverage	0.033*	1.000							
(3) ROA	0.044*	-0.160*	1.000						
(4) Size	0.051*	-0.003	0.100*	1.000					
(5) *Ln (GDP per capita)*	-0.046*	0.025*	0.015*	-0.004*	1.000				
(6) GDP Growth	0.009*	-0.053*	0.040*	0.083*	-0.439*	1.000			
(7) *STR*	-0.015*	-0.035*	-0.042*	0.017*	0.284*	-0.204*	1.000		
(8) *Openness*	-0.004*	0.005*	0.013*	-0.031*	0.228*	0.056*	-0.228*	1.000	
(9) *Political Risk*	-0.024*	0.016*	0.029*	-0.008*	0.830*	-0.269*	0.194*	0.320*	1.000

* shows significance at the .05 level