

The Consequences of the 2017 US International Tax Reform: A Survey of the Evidence

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Abstract

The 2017 US tax legislation - widely referred to as the Tax Cut and Jobs Act (TCJA) - fundamentally transformed the US system of international taxation. It ostensibly ended worldwide taxation but introduced, for instance, a new tax on “Global Intangible Low-Taxed Income” (GILTI). This paper surveys the emerging empirical literature on the impact of the TCJA’s international provisions. It documents five robust findings in this empirical literature. First, the TCJA led to a general decline in US MNCs’ foreign acquisitions. Second, the TCJA increased US MNCs’ investment in routine foreign tangible assets. Third, the reform did not lead to any change in profit shifting by US MNCs beyond the magnitude that would be expected based on the TCJA’s tax rate reduction. Fourth, The TCJA appears to have reduced the market value of US MNCs relative to domestic US firms. Fifth, the TCJA does not appear to have had any detectable impact on domestic US investment and wages (although there are some contrary results for capital expenditures). The welfare implications of these findings depend crucially on whether US MNCs’ are viewed as having engaged in too much or too little foreign activity prior to the TCJA. This depends on the choice of theoretical framework and the relevant normative benchmark, and cannot readily be resolved empirically.

JEL-Codes: H250, F230.

Keywords: international taxation, multinational firms, Tax Cut and Jobs Act (TCJA), repatriation taxes, global intangible low-taxed income tax.

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1) Introduction

The 2017 US tax legislation, generally referred to as the Tax Cut and Jobs Act (TCJA), fundamentally transformed the US system of international taxation. The prior worldwide system of taxing US multinational corporations (MNCs) imposed a tax at the time of repatriation (i.e., the payment of dividends from foreign affiliates to the US parent firm). The TCJA abolished the repatriation tax. However, it introduced a new minimum tax – known as the “Global Intangible Low-Taxed Income” (GILTI) tax - on the foreign income of US MNCs, along with several other new provisions.

Prior to the reform, the US was the only major economy to implement a system of worldwide taxation of its resident MNCs. Thus, the TCJA represented a major change in the tax regime facing MNCs at a global level. Moreover, many of its provisions – especially the GILTI tax – arguably responded to concerns about the phenomenon of “base erosion and profit shifting” (BEPS) that involves MNCs reporting profits disproportionately in low-tax jurisdictions. The BEPS phenomenon – along with related issues of corporate tax avoidance, tax competition among governments, and wider concerns about income inequality – has attracted rapidly growing attention among scholars and policymakers in recent years. It has also led to a major multilateral initiative led by the Organization for Economic Cooperation and Development (OECD) to reform the global system of taxation of MNCs (known as “Pillars One and Two”). This seeks, for instance, to establish a global minimum tax on MNCs to deter base erosion and profit shifting and to mitigate international tax competition. This multilateral initiative aims to transform the system – established through the League of Nations in the 1920s - by which MNCs’ cross-border activities have been taxed for the past century.

This paper surveys the emerging empirical literature on the impact of the TCJA. About six years have elapsed since the enactment of the 2017 reforms. This has proven to be sufficient time for the relevant data to become available and for researchers to produce a substantial body of work analyzing the impact of the reforms on various important outcomes. While some of this emerging literature is not yet published, it is an opportune time to take stock of the findings so far, in view of the ongoing multilateral OECD-led reform process that is related in many ways to the 2017 US reforms. Moreover, the COVID-19 pandemic created radically different conditions from 2020 onwards, implying that 2018 and 2019 are likely to prove to be the only available years over which

the effects of the 2017 reforms can be analyzed without significant confounding factors being operative.

The empirical literature on the effects of the international provisions of the TCJA establishes five major findings that are quite robust across different studies, using a variety of datasets and empirical approaches. First, this literature finds a general decline in cross-border acquisitions by US MNCs after the TCJA. This finding appears to be robust across approaches that estimate the post-TCJA change in the likelihood that the acquirer in a global sample of cross-border acquisitions is a US MNC (Amberger and Robinson, 2021; Dunker, Overesch and Pflitsch, 2021) and those that use a sample of US firms to estimate the post-TCJA change in the likelihood that a firm announces a foreign acquisition (Atwood et al., 2020). The magnitude is substantial.

One way to understand this magnitude is to build on simulations of synergy losses under the pre-TCJA system by Feld et al. (2016). “Synergy loss” refers to the loss of joint surplus from (efficient) acquisitions that do not take place due to tax considerations. While these losses cannot be directly observed and their calculation requires a number of assumptions, the decline in foreign acquisitions estimated in Amberger and Robinson (2021) suggests that the TCJA almost doubled the synergy losses associated with US taxation of US MNCs’ foreign activity. The welfare implications of a decline in acquisitions by US MNCs depend on whether their pre-TCJA level of acquisitions was too high or too low relative to some relevant “optimal” benchmark. As discussed in Section 3.1 below, different theoretical frameworks suggest different answers to this question (e.g., Feld et al., 2016; Albertus, Glover and Levine, 2022; Dharmapala, 2023).

Second, the literature finds that an exception to reduced post-TCJA US investment abroad is provided by the acquisition of routine tangible assets (and capital expenditures generating such assets). Atwood et al. (2020) interpret an increase in foreign acquisitions for a subset of their sample that is most likely to be subject to the GILTI tax as being induced by the GILTI tax provision that allows a deduction for a 10% presumptive return on tangible foreign assets. Along similar lines, Beyer et al. (2022) find an increase in foreign – but not domestic – capital expenditures among GILTI-affected firms.

Third, the literature does not to date find unambiguous evidence of a reduction in profit shifting activity by US MNCs following the TCJA. Clausing (2020) and Garcia-Bernardo, Jansky and Zucman (2022) provide descriptive evidence on the location of US MNCs’ reported profits before and after the TCJA. While the share of US MNCs’ profits reported in tax havens appears

stable, Garcia-Bernardo, Jansky and Zucman (2022) find a decline in the foreign share of US MNCs' profits. Even assuming that this is entirely due to a decline in profit shifting, the magnitude is smaller than would be expected from the TCJA's substantial corporate tax rate reduction. This holds when using widely-cited estimates in the literature of the semi-elasticity of reported profit with respect to tax rates, as surveyed for instance in Dharmapala (2014) and Beer, de Mooij and Liu (2020), and even when taking account of nonlinearities in the tax responsiveness of profit shifting, as in Dowd, Landefeld, and Moore (2017). This suggests that there is little or no incremental role for the TCJA's international provisions (such as the GILTI tax) in reducing profit shifting activity.

Fourth, the literature finds that the TCJA reduced the market value of US MNCs, relative to domestic US firms. Wagner, Zeckhauser, and Ziegler (2018) find substantial negative market reactions for US MNCs (relative to domestic US firms) during the legislative events in late 2017 that led to the enactment of the TCJA. In principle, this reaction may be due to the one-time tax on previously accumulated foreign cash holdings that formed part of the TCJA. However, Kalcheva et al. (2020) provide evidence that the negative reaction is not primarily attributable to the one-time tax, but rather to ongoing features of the TCJA regime such as the GILTI tax. Overall, these market reactions reinforce the conclusion from the first finding above that US MNCs face increased US tax burdens on foreign activity under the TCJA, relative to those under the pre-TCJA system.

Fifth, the literature has generally not found any detectable impact of the TCJA on investment or wages in the US (although there are some contrary findings on capital expenditures). While there was a surge in repatriations following the TCJA's abolition of the repatriation tax, the evidence suggests that these repatriations led to a large increase in share repurchases while having little discernible impact on domestic investment. This conclusion is quite unsurprising in the light of prior evidence from the 2005 repatriation tax holiday (e.g., Blouin and Krull, 2009; Dharmapala, Foley and Forbes, 2011)). In the context of cross-border activity, it is particularly noteworthy that there appears to have been no detectable increase in inbound FDI to the US associated with the reduction in the US statutory corporate tax rate (e.g., Matheson et al., 2022).

The paper proceeds as follows. Section 2 describes the pre-TCJA system of taxation of US MNCs' foreign income, and then describes the main international provisions of the TCJA. Section

3 reviews the empirical literature on the consequences of the TCJA's international provisions. Section 4 discusses the implications of these findings. Section 5 concludes.

2) The Pre-TCJA International Tax System and the TCJA Reforms

2.1) The Pre-TCJA US International Tax System

Prior to the TCJA, the United States imposed a system of worldwide taxation on US-resident multinational corporations (MNCs) (for an introductory discussion, see e.g., Dharmapala, 2017). The income generated by foreign affiliates of US parents was subject to taxation by the US. However, this US tax was only imposed at the time the dividends were paid (or “repatriated”) to the US parent. Consider a simple scenario in which a US parent owns a foreign affiliate, located in a foreign country B.¹ Suppose that the US tax rate is 35% (as was true prior to the TCJA) and that country B's tax rate is 20%. The foreign affiliate earns \$100 of income, and pays \$20 of tax to the government of B. There are no immediate US tax consequences. However, when the affiliate pays a dividend to its US parent, the latter has \$100 of income under US tax law, with a foreign tax credit (FTC) for the tax paid to country B. Because of the FTC, taxes due at the time of repatriation are generally equal to the difference between the foreign tax paid and the tax that would be due if earnings were taxed at the US rate. In this example, an additional \$15 would be due under the US repatriation tax when the earnings are repatriated.

In this example, the US is the “residence” country (where the MNC parent is based) and B is the “source” country (where the affiliate's business operations are located). The distinction between “residence” countries and “source” countries is fundamental to international tax law. The income generated by normal business operations in the source country is referred to as “active” business income, whereas income received from other sources unconnected to normal business operations (such as interest or dividend income from portfolio assets) is referred to as “passive” income. Residence countries (such as the US) with “worldwide” tax systems impose tax on the active foreign business income of resident MNCs (with a credit for taxes paid to the source country). Under a “territorial” (or “dividend exemption”) system, the “active” foreign income derived by resident MNCs from foreign business operations is exempt from residence country taxation (and is taxed only by the source country). Both worldwide and territorial residence

¹ This example follows Dharmapala (2017, p. 233).

countries may, however, tax the passive foreign income earned by their resident MNCs. Under US tax law, a set of provisions known as the “Subpart F rules” impose immediate US taxation (without deferral) of passive income earned by foreign affiliates.

As the US repatriation tax was imposed only at the time of repatriation, US MNCs had the ability to defer US taxes on “active” foreign income. When there were no profitable active investments abroad, deferral could be achieved by accumulating passive assets in low-tax affiliates, despite the Subpart F provisions that impose immediate US taxation of passive foreign income. Suppose that a foreign affiliate of a US MNC earned \$100 of active income, delayed repatriation, and invested in a portfolio of passive assets that earned a 10% annual return. Each year, it will be subject to immediate US tax at 35% on the \$10 return (with a credit for any foreign tax paid). However, the US tax on the original \$100 of active income would be deferred until the time of repatriation (e.g., Weichenrieder, 1996).

When repatriation could be deferred for a considerable period of time, the present value burden of the repatriation tax arguably became relatively small (e.g., Dharmapala, 2018). Nonetheless, a substantial body of evidence showed that the repatriation tax affected the global market for corporate control, with US MNCs being tax-disfavored acquirers of foreign firms, relative to those firms’ domestic owners and to MNCs based in other (territorial) countries (e.g., Feld et al., 2016).

2.2) The TCJA’s Reforms to International Taxation

The TCJA reduced the US corporate income tax rate from 35% to 21% and fundamentally transformed the US system of international taxation. In particular, the TCJA abolished the repatriation tax. However, taken in its entirety, the TCJA should not be viewed as a territorial reform (such as the reforms implemented by the UK and Japan in 2009). Rather, the TCJA introduced a new minimum tax – known as the “Global Intangible Low-Taxed Income” (GILTI) tax - on the foreign income of US MNCs, along with several other new provisions affecting MNCs. Dharmapala (2018) argues that under reasonable conditions, the burden of the new GILTI tax may well exceed that of the former repatriation tax for many and perhaps most US MNCs. Thus, the 2017 reform could arguably be said to have transformed an ostensibly worldwide but functionally territorial system into one that is ostensibly territorial but functionally worldwide.

The GILTI tax involves first computing what is termed the “tested income” of a US parent.² This is the pretax foreign income (denoted below by X) aggregated over all foreign affiliates, subject to certain exclusions and deductions. The deduction that is perhaps of most relevance is for foreign taxes. Simplifying substantially, tested income can be defined as $(1 - \tau_F)X$, where τ_F is the foreign tax rate. The GILTI provision grants the US MNC a deduction for a presumptive return at a rate α (which the TCJA set equal to 10%) on its tangible foreign assets, denoted by R . The value of R is determined by the affiliates’ basis in depreciable physical assets, or “Qualified Business Asset Investment” (QBAI). GILTI is defined as the excess of tested income X over the presumptive 10% return on foreign tangible assets.³ Thus:

$$GILTI = (1 - \tau_F)X - \alpha R \quad (1)$$

GILTI tax liability is determined by applying the tax rate on GILTI to GILTI as defined in Equation (1). The GILTI tax rate is denoted by τ_G , set by the TCJA initially at a 10.5% rate, though it is scheduled to increase in the future.⁴ In addition, a partial FTC is allowed for any foreign taxes paid. This entails grossing up GILTI by these foreign taxes and using 80% of the foreign tax for the FTC. Thus, the GILTI tax liability, denoted T_{GILTI} , can be defined as:

$$T_{GILTI} = \tau_G \left((1 - \tau_F)X - \alpha R + \frac{(1 - \tau_F)X - \alpha R}{(1 - \tau_F)} \tau_F \right) - 0.8 \left(\frac{(1 - \tau_F)X - \alpha R}{(1 - \tau_F)} \tau_F \right) \quad (2)$$

This applies for sufficiently low values of τ_F ; otherwise, $T_{GILTI} = 0$.

While our discussion will focus primarily of the GILTI tax, the TCJA included a number of other significant international provisions. The “Foreign-Derived Intangible Income” (FDII) provision provides a reduced tax rate for US firms’ export income. In particular, the component of income (above a presumptive rate of return on US tangible assets) derived from exports is taxed at 13.125% rather than the standard 21% rate. The “Base Erosion and Anti-Abuse Tax” (BEAT) is a new minimum tax regime introduced under the TCJA that disallows deductions for payments to foreign related parties in certain circumstances. The TCJA also imposed a one-time tax on foreign cash holdings (through a deemed repatriation mechanism); this is sometimes termed the “deemed repatriation tax.” As a one-time tax associated with the transition to the TCJA system, it is not intended to have ongoing applicability.

² This formulation follows Dharmapala (2018), but some of the notation has been modified.

³ Net interest expense is added to GILTI, but it is assumed here that net interest expense is zero.

⁴ The 10.5% rate represents a 50% deduction relative to the baseline 21% corporate tax rate. From 2026, the GILTI rate will increase to 13.125%.

3) A Survey of the Evidence

The survey below of the empirical literature on the effects of the international provisions of the TCJA focuses on a set of five major findings that are quite robust across different studies, using a variety of datasets and empirical approaches. This robustness allays concerns associated with the relatively limited span of useful data, and with respect to the possibility that future research may overturn these findings.

3.1) The Impact on Cross-Border Acquisitions by US MNCs

Prior to the TCJA, a robust literature examined the effects of taxation on cross-border acquisitions, with a particular focus on the effects of the repatriation tax imposed by the US and by certain other countries, including the UK and Japan until 2009. As reviewed in Dharmapala (2017), this literature suggests that cross-border ownership patterns were substantially affected by repatriation taxes in the pre-TCJA period. For instance, Huizinga and Voget (2009) analyze a large sample of cross-border acquisitions over 1985–2004. They estimate that the elimination of the US repatriation tax would have increased the fraction of post-merger entities with US residence from 53% to 58%. Voget (2011) studies relocations of MNC headquarters or residence over 1997–2007 and finds that a 10 percentage point increase in the repatriation tax increases relocations by one third. Feld et al. (2016) estimate that abolishing the US repatriation tax would increase the number of acquisitions with US MNC acquirers by 11%.

Since the TCJA, this literature has been extended to shed light on the impact of the TCJA on cross-border acquisitions by US MNCs. Amberger and Robinson (2023) use data on cross-border acquisitions over the 2011-2019 period (spanning the TCJA) from the Zephyr database provided by the Bureau van Dijk. Their dataset consists of 3266 target firms located in 46 different countries. The basic empirical approach is a linear probability model that regresses an indicator for the acquirer being US-based on an indicator for the post-TCJA period (2018-2019), along with various target firm characteristics and target country and target industry fixed effects. In essence, this approach tests whether, conditional on a firm being acquired, it is more or less likely that the acquirer is US-based (rather than non-US-based) following the TCJA.

As reported in Amberger and Robinson (2023, Table 2), the main result is that targets of cross-border acquisitions are less likely to be acquired by US MNCs following the TCJA. The

authors interpret this decline as being potentially value-enhancing in a setting where there was excessive foreign investment prior to the TCJA. The idea that pre-TCJA foreign activity was excessive is derived from the theoretical model in Albertus, Glover, and Levine (2022). In that framework, repatriation taxes induce excessive foreign activity due to the opportunity cost of capital being low when cash is “trapped” abroad, to managerial agency costs at the affiliate level (which result in “empire-building” affiliate managers wishing to make inefficient acquisitions), and to the anticipation of possible future reforms that would abolish the repatriation tax. However, as discussed in Section 4 below, it is also possible to interpret this result as indicating that the TCJA was welfare-decreasing in a setting where pre-TCJA foreign activity was excessively low.

A secondary result – somewhat at odds with the main result - in Amberger and Robinson (2023) is that the subset of US acquirers with little foreign presence prior to the TCJA increased their acquisitions after the TCJA. This can perhaps be explained in terms of an increase in after-tax cash flows due to the TCJA’s corporate tax rate reduction (especially for firms that are financially constrained), rather than indicating that the TCJA’s international provisions lowered the US tax burden on foreign activity. However, it is also consistent with a pre-TCJA scenario in which US MNCs with a large foreign presence engaged in excessive foreign acquisitions, while those with little foreign presence were under-investing abroad.

Atwood et al. (2020) use data over 2010-2019 on the universe of US firms (both MNCs and non-MNCs) from Compustat. This is merged with acquisitions data from the Securities Data Company (SDC) database provide by Refinitiv. In particular, they focus on whether a US firm in a particular year made an acquisition announcement that appears in the SDC data. Their empirical approach uses a probit model of the probability that a US firm announces a foreign acquisition in a given year.⁵ The variable of interest is an interaction between an indicator for being an MNC and an indicator for the post-TCJA period, with controls for time-varying acquirer characteristics. The paper also constructs a measure of the extent to which US MNCs in the sample were subject to the repatriation tax prior to the TCJA; this is inferred using data on foreign effective tax rates and other variables. In the analysis, MNCs are divided into those that faced higher and lower repatriation tax burdens pre-TCJA.

The main result of relevance for our purposes is that the overall impact of the TCJA on the probability of a US firm making a foreign acquisition was negative, across different categories of

⁵ The paper also analyzes domestic acquisitions, but these are less relevant for our purposes.

firms facing different repatriation tax burdens prior to the TCJA (see in particular Table 6, Panel A, Column 2). This decline is particularly marked for firms that were inferred to face no significant repatriation taxes prior to the TCJA. The effect is mitigated for firms that faced higher repatriation taxes prior to the TCJA. This pattern of findings implies a general decline in US acquisitions after the TCJA. The weaker finding for firms with higher repatriation taxes is broadly consistent with the idea that the more burdensome the repatriation tax, the less a US parent would invest abroad *ex ante*, implying a smaller decrease post-TCJA.

Dunker, Overesch and Pflitsch (2021) also use data over 2010-2019 from the SDC database provide by Refinitiv. They collect a sample of 8,598 cross-border acquisitions (excluding those with US targets), of which 873 have US-based acquirers. They conduct an analysis of US acquirers' share of the global sample of cross-border acquisitions. Specifically, they estimate a logit model of an indicator for an acquirer being a US MNC (rather than a non-US MNC) on a post-TCJA indicator and a variety of deal and target characteristics and industry fixed effects. Their point estimates (see Table 5) show that the overall probability of a cross-border acquirer being US-based fell after the TCJA, although the decline is not statistically significant. However, under the circumstances where we might expect the TCJA reforms to matter most – i.e., where the target is located in a country with a corporate tax rate below the sample median and where the US MNC is inferred (based on its worldwide foreign effective tax rate and on proxies for excess returns) to be likely to be subject to the GILTI provision – there is a statistically significant decline in the probability of a cross-border acquirer being US-based.⁶

The results in Dunker, Overesch and Pflitsch (2021) are thus basically consistent with those of the other papers. They also find a weaker result – that is not generally statistically significant – that acquisitions by US MNCs not inferred to be subject to the GILTI tax increased. Arguably, such an effect – if it indeed exists - would be consistent with the UK and Japanese evidence following their 2009 territorial reforms that did not include a GILTI-like provision (e.g., Feld et

⁶ Pflitsch (2022) analyzes market reactions to the announcement of cross-border acquisitions with US acquirers before and after the TCJA. He finds that announcements returns are lower post-TCJA. This finding is not straightforward to interpret, or to reconcile with the consensus result in the literature that US acquisitions fell after the TCJA. However, it appears to rest on an unconventional interpretation of market reactions (as embodying the degree of dissatisfaction of investors with managerial policies, rather than as reflecting changes in fundamental market value).

al., 2016). It may also suggest the impact of a hypothetical US territorial reform that more closely mirrored the UK and Japanese reforms.⁷

The general finding of a decline in US MNCs' cross-border acquisitions after the TCJA, especially of targets in lower-tax jurisdictions (i.e., those with below-median tax rates) appears to be robust across a variety of approaches. These include analyses that estimate the post-TCJA change in the likelihood that the acquirer in a global sample of cross-border acquisitions is a US MNC (Amberger and Robinson, 2021; Dunker, Overesch and Pflitsch, 2021) and those that use a sample of US firms to estimate the post-TCJA change in the likelihood that a firm announces a foreign acquisition (Atwood et al., 2020).

Importantly, these findings – based on a difference-in-difference approach with a clearly defined control group – suggest that raw descriptive statistics about the number of US outbound acquisitions in 2018 or the volume of US outbound FDI may be misleading. For instance, Carroll, Mackie, and Pizzola document a substantial increase in the volume of cross-border acquisitions by US firms in 2018, though they caution that this should not necessarily be attributed to the TCJA.⁸ Spencer (2022) reports aggregate Bureau of Economic Analysis (BEA) data suggesting an increase in US outbound FDI in 2018. Such raw numbers may, however, lead us astray in the absence of a control group, fixed effects, and control variables.

One way to interpret the magnitude of the decline in foreign acquisitions is to combine the prior work of Feld et al. (2016) and the estimates from the linear probability model of Amberger and Robinson (2023, Table 2). Feld et al. (2016) use data from the Zephyr database provided by the Bureau van Dijk on all cross-border acquisitions among firms in OECD countries over 2004-2013 (with 341,719 observations). They apply a mixed logit approach to analyze the impact of repatriation taxes, using the variation generated by reforms in the UK, Japan, and New Zealand that abolished these countries' repatriation taxes. In their (pre-TCJA) data, the baseline probability of a cross-border acquirer being a US MNC is 0.3438. Based on their regression results, they estimate that the abolition of the US repatriation tax would increase this probability by 11% to

⁷ Spencer (2022) constructs a heterogenous firm model, in which firms endogenously decide whether to export or undertake FDI, and analyzes the impact of the abolition of the US repatriation tax on simulations of domestic US outcomes such as the incentives for firm entry and growth. However, the model completely ignores the GILTI tax and its impact. Thus, its results can, at best, be interpreted as shedding light on the consequences of a hypothetical US “pure” territorial reform that resembles the UK and Japanese reforms.

⁸ See: https://www.bloomberglaw.com/product/tax/document/XDD5OEO0000000?bna_news_filter=daily-tax-report&jcsearch=BNA%252000000169da66de1eaff9ffe66b250000#jcite

0.3816. This corresponds to an increase of \$12.7 billion per year in deal value. Using simulations of the synergy value associated with acquisitions (see Feld et al. (2016, pp. 11-12)), they estimate that the US repatriation tax led to synergy losses of \$537 million per year.

Amberger and Robinson (2023, Table 2) report post-TCJA declines in the probability of a cross-border acquirer being a US MNC of between 0.035 and 0.06, depending on the specification. Using the strongest specification (column 5, with country-by-industry fixed effects), the estimated decline is 0.035. This corresponds to a decline in the probability of a cross-border acquirer being a US MNC from the pre-TCJA Feld et al. (2016) baseline of 0.3438 to 0.3088 (a decline of 10.2%, i.e., a reduction in deal value of \$11.8 billion per year). Assuming the same ratio of synergy losses to deal value as in Feld et al. (2016), the TCJA would then be estimated to generate an additional \$498 million per year in synergy losses (i.e., a 93% increase in annual synergy losses from \$537 million pre-TCJA to \$1.035 billion after the TCJA).

Of course, synergy losses are a theoretical construct that cannot be directly observed. Their calculation requires simulations based on a number of assumptions. Thus, both the estimates of Feld et al. (2016) and those in the extension to the effect of the TCJA above should be viewed with some caution. Nonetheless, this concept provides one way to understand, albeit in quite rough terms, the magnitude of the effect. In particular, under these assumptions above, the estimates in the literature suggest that the TCJA nearly doubled the synergy losses associated with US taxation of US MNCs' foreign activity.

3.2) The Impact on Investment in Routine Foreign Tangible Assets by US MNCs

An exception to the pattern of reduced US investment abroad post-TCJA is provided by the acquisition of routine tangible assets (and capital expenditures generating such assets). Atwood et al. (2020) find an overall decrease in the probability of US firms making foreign acquisitions after the TCJA (as described above); however, they also find an increase in foreign acquisitions for a subset of US firms with high inferred repatriation tax burdens. This latter effect is stronger for firms with GILTI inclusions. Moreover, targets' return on tangible assets is lower for acquisitions by US MNCs with GILTI inclusions. Thus, Atwood et al (2020) interpret this increase in foreign acquisitions for a subset of their sample that is most likely to be subject to the GILTI tax as being induced by the GILTI tax provision that allows a deduction for a 10% presumptive

return on tangible foreign assets (see Equation (1) above). That is, increased investment in routine foreign tangible assets appears to be motivated by the desire to shield income from the GILTI tax.

Along similar lines, Beyer et al. (2022) find an increase in foreign – but not domestic – capital expenditures among firms more likely to be subject to the GILTI tax. They use Compustat data on US MNCs, combined with hand-collected data on foreign and domestic net property, plant, and equipment (PPE) for fiscal years ending during the 2015-2018 period (the latter data allows for the computation of changes in net foreign PPE over a period spanning the TCJA). The paper takes the view that investment in foreign PPE is typically financed internally using foreign cash holdings. Thus, the empirical approach involves regressing foreign capital expenditures on a post-TCJA indicator and an interaction between the post-TCJA indicator and foreign cash holdings (and various control variables).

Beyer et al. (2022) find that US MNCs that are likely to be subject to the GILTI provision and that have larger foreign cash holdings increase foreign capital expenditures but do not increase domestic (US) capital expenditures. They interpret this result as indicating a response (presumably unintended by policymakers) to the GILTI tax provision that allows a deduction for a 10% presumptive return on tangible foreign assets. This is generally consistent with the discussion in Dharmapala (2018): this feature of the GILTI provision may lead to US MNCs acquiring routine foreign assets that would be more productive if held by other potential owners, as ownership creates a tax benefit (in terms of a reduced GILTI liability) for US MNCs but typically not for other potential owners.

3.3) The Impact on Profit Shifting Activity by US MNCs

To study the impact of the TCJA on profit shifting activity by US MNCs, Garcia-Bernardo, Jansky and Zucman (2022) combine a variety of data sources, including firms' financial statement data from Compustat, country-by-country tax reports, and aggregate BEA data. They describe the resulting locational patterns of US MNCs' reported profits before and after the TCJA, concluding that the share of US MNCs' income reported in tax haven jurisdictions remained relatively stable over time, notwithstanding the enactment of the TCJA (Clausing (2020) also finds a relatively stable share in havens). However, Garcia-Bernardo, Jansky and Zucman (2022) find a decline of about 3 to 5 percentage points in the foreign share of US MNCs' profits; the baseline foreign share of US MNCs' profits before the TCJA varies across their data sources, but is generally around

40%. Garcia-Bernardo, Jansky and Zucman (2022) concede that this descriptive evidence does not constitute causal evidence of an effect of the TCJA. Due to other contemporaneous changes,⁹ they note (p. 15) that “the observed decline in the foreign income share of US companies should probably be seen as an upper bound for the effect of the Tax Cuts and Jobs Act.”

Even assuming that the reduction in the foreign share is entirely due to a decline in profit shifting, however, the magnitude is arguably smaller than would be expected from the TCJA’s substantial corporate tax rate reduction (from 35% to 21%). Estimates in the profit shifting literature using micro-level data suggest a semi-elasticity of reported profit with respect to the tax rate differential across countries of 0.8 (see in particular the survey by Dharmapala (2014)). This entails that a 14 percentage point decrease in the tax rate difference between a US parent and its foreign affiliate (due to a tax cut in the US from 35% to 21%) would increase profits reported in the US by about 11% (e.g., from \$100,000 to \$111,000). A more recent meta-regression analysis (Beer, de Mooij and Liu, 2020) finds a somewhat larger semi-elasticity of 1 (implying an increase in profits reported in the US of 14%). To place the post-TCJA increase in US reported profits in context, assume that a US MNC reported 60% of its profits in the US before the TCJA. Then, a 3 to 5 percentage point increase in US reported profits implies an increase of 5% to 8% in profits booked in the US, considerably below the expected 11% increase due to the tax rate cut (and even further below this when using the higher semi-elasticity in Beer, de Mooij and Liu (2020)).

The semi-elasticities cited above are derived from a log-linear specification (see Dharmapala (2014)). Dowd, Landefeld and Moore (2017) use a quadratic specification and argue that the log-linear approach tends to underestimate (overestimate) the tax responsiveness of profit shifting when the initial tax rate is high (low). Thus, semi-elasticities estimated using the standard approach may entail too large a response for a tax rate reduction from a high rate such as 35%. However, using the estimate in Dowd, Landefeld and Moore (2017, p. 11) that “under the quadratic specification, a change in the tax rate from . . . 30% to 29% results in a 0.7% increase in profits” would imply an increase of nearly 10% in US reported profits. While lower than the predicted increase using the semi-elasticity form Dharmapala (2014), this is still substantially larger than what is observed.

⁹ In particular, they note changes in Irish law around the same time that effectively ended the use of a particularly prominent tax planning strategy known as the “Double Irish.”

Thus, even the upper bound on the decline in profit shifting post-TCJA can be attributed entirely to the TCJA's tax rate reduction. This leaves little role for the international provisions proper (such as the GILTI tax) to play any role in reducing profit shifting.¹⁰ This point is important in understanding the consequences of the TCJA's international provisions. In particular, it casts doubt on the possibility that the TCJA's international provisions proper – such as the transition from the repatriation tax to the GILTI regime - may have generated revenue gains or other benefits from reduced profit shifting that might offset the welfare loss (if any) from reduced foreign activity by US MNCs. Of course, this conclusion is provisional in the sense that changes in profit shifting may be delayed due to lags in adjusting tax planning structures and strategies. Note, though, that a decline in profit shifting for US MNCs that is not matched by similar declines for non-US MNCs could potentially exacerbate ownership distortions and synergy losses. A multilateral approach to implementing a minimum tax on MNCs (as in the Pillar Two proposal, in contrast to the unilateral approach of the TCJA) may, however, mitigate this effect.

3.4) The Impact on the Market Value of US MNCs

If the GILTI tax imposes a greater burden on US MNCs than did the prior repatriation tax (as suggested by Dharmapala (2018) in certain circumstances, and consistent with the decline in US MNCs' foreign activity found in the empirical literature), then we might expect that it would lead to a decline in the market value of US MNCs. There is indeed considerable evidence that the TCJA reduced the value of US MNCs relative to US domestic firms. However, there are some potential confounding factors. For instance, the TCJA included other international tax provisions, such as a one-time tax on previously accumulated foreign cash holdings, that may also have reduced the value of US MNCs. On the other hand, the reduction in the corporate tax rate (on US MNCs' US operations) may have offset the decline in overall value due to the changes in international tax provisions.

Wagner, Zeckhauser, and Ziegler (2018) study stock market reactions to events associated with the legislative events in late 2017 that led to the enactment of the TCJA. They find substantial

¹⁰ Note that the global blending feature of the GILTI tax (which allows income from high-tax and low-tax countries to be combined for GILTI purposes) may limit its effectiveness in combatting profit shifting, relative to the effect of a country-by-country minimum tax.

negative market reactions for US MNCs (relative to domestic US firms) during these events. As they note (p. 593):

“The House vote began a slide for multinationals relative to domestically focused companies. This may seem surprising, as the shift to territorial taxation should, *ceteris paribus*, help multinationals. However, this *ceteris* lost its *paribus* . . . from the House vote until passage, stock of internationally oriented companies were major relative losers.”

It is possible that the trade wars of this period and a general trend of deglobalization may have adversely affected MNCs. However, this would not account for market reactions over short time horizons around TCJA-related events.

In principle, this reaction may be due to the one-time tax on previously accumulated foreign cash holdings that formed part of the TCJA (and that is not expected to be an ongoing policy that would affect the future behavior of US MNCs). However, Kalcheva et al. (2020) provide evidence that the negative reaction is not primarily attributable to the one-time tax, but rather to ongoing features of the TCJA regime such as the GILTI tax. Their analysis finds (like that of Wagner, Zeckhauser, and Ziegler (2018)) that there was an overall decline in the relative value of US MNCs. In addition, they test whether MNCs’ negative abnormal returns on days of TCJA-related legislative events are related to firms’ unrepatriated earnings held abroad as cash (and subject to the one-time tax on unrepatriated earnings). Regressing the abnormal returns on measures of unrepatriated earnings (and other relevant variables), they find that MNCs continue to have negative abnormal returns. That is, the one-time tax on foreign cash holdings does not seem to explain the negative impact of the TCJA on the market value of US MNCs. Overall, these market reactions reinforce the conclusion from the findings described in Section 3.1 that US MNCs face increased US tax burdens on foreign activity under the TCJA, relative to those under the pre-TCJA system.

Evidence supportive of these event study results comes from financial statement measures of effective tax rates. Using Compustat data over 1995-2019, Dyreng et al. (2020) find substantial decreases in US firms’ effective tax rates – as computed using financial statement data – after the TCJA. These decreases, however, are much larger for US domestic firms relative to US MNCs.

Moreover, the reductions for US MNCs are due to decreases in the tax burden on their domestic (US) operations, not to a reduced US tax burden on their foreign income.

Additional supportive evidence is provided by the aggregate data on the US tax liability on US MNCs' foreign income, calculated by the Penn-Wharton Budget Model (based on *Statistics of Income* data from the Internal Revenue Service). In particular, this data shows that the US tax liability on US MNCs' foreign income was somewhat higher in the post-TCJA years 2018 and 2019 than in 2017.¹¹ These findings from financial statement data and tax return data thus complement the evidence from market reactions.

3.5) The Impact on Investment and Wages

Prior to the enactment of the TCJA, proponents claimed that it would greatly increase investment in the US (by US and non-US firms) and increase the wages of US workers (see e.g., the discussion and critique of such arguments in Dharmapala (2018, p. 711)). The effects of the TCJA on investment and wages (and various other outcomes) are documented in Gale and Haldeman (2021) using aggregate data for 2018-2019. While there was a surge in repatriations following the TCJA's abolition of the repatriation tax, the evidence suggests that these repatriations led to a large increase in share repurchases while having little discernible impact on domestic investment. This conclusion is quite unsurprising in the light of prior evidence from the repatriation tax holiday included in the American Job Creation Act of 2004 (e.g., Blouin and Krull, 2009; Dharmapala, Foley and Forbes, 2011)); on that occasion as well, increased repatriations were associated with increased shareholder payout (primarily in the form of repurchases) and not with increased domestic capital expenditures.

While overall investment grew after the TCJA, Gale and Haldeman (2021) argue that this growth can be entirely accounted for by pre-existing trends in aggregate demand, oil prices, and other economic conditions. Gale and Haldeman (2021) also argue that there is no evidence that the TCJA had any impact on the wages of US workers. This general picture is reinforced by Albertus, Glover and Levine (2023), who use firm-level data and find no increase in capital expenditures, employment, R&D, or acquisitions due to the lower-cost access under the TCJA to accumulated

¹¹ See Figure 1 in the Penn-Wharton Budget Model report "Did Tax Cuts and Jobs Act of 2017 Increase Revenue on US Corporations' Foreign Income?" available at: <https://budgetmodel.wharton.upenn.edu/issues/2023/10/12/did-tcja-increase-revenue-on-us-corporation-foreign-income>

foreign profits. In the context of cross-border activity, it is particularly noteworthy that there appears to have been no detectable increase in inbound FDI to the US (e.g., Matheson et al., 2022), despite the large reduction in the US statutory corporate tax rate under the TCJA.

There are, however, some contrary findings in the literature. Crawford and Markarian (2022) compare the capital expenditures of US and Canadian firms after the TCJA, finding an increase for the former relative to the latter. Note that even if US firms' domestic capital expenditures increased, this may be due to the effect of the TCJA's tax rate reduction (for instance, via an easing of financial constraints) or to the more favorable investment expensing provisions of the TCJA, rather than to its international provisions per se. Furthermore, even if domestic US investment and wages were to rise, this would not necessarily imply a welfare gain – investment may increase from an inefficiently high baseline, while wage increases may reflect rent-sharing by firms with market power.

4) Discussion

The empirical findings summarized in Section 3 present a compelling case that US MNCs were adversely affected in various ways by the TCJA. The welfare implications of these findings, however, depend on an understanding of the normative status of the pre-TCJA system. In particular, whether the reduced foreign activity of US MNCs to which the TCJA appears to have given rise is welfare-increasing or welfare-decreasing depends on whether there was too much or too little foreign activity prior to the TCJA.

One view of worldwide taxation and the repatriation tax has traditionally been that any extra US tax on US MNCs' foreign activity (beyond the taxes levied by foreign governments) would necessarily reduce US MNCs' foreign activity relative to its level in the absence of a repatriation tax (albeit only weakly, because the deferral of repatriation for long periods could result in the present value burden of the repatriation tax approximating zero). On the other hand, it has also long been recognized in the international tax literature (since the pioneering contribution of Hartman (1985)) that the repatriation tax results in the retained earnings of foreign affiliates becoming "trapped" (i.e., inaccessible to the parent without paying the repatriation tax). Thus, the opportunity cost of investment financed from these retained funds is low, and this may induce the managers of foreign affiliates to make investments that are excessive (from the perspective of the shareholders of the US parent). This would be particularly the case in the presence of agency costs

of free cash flow (i.e., where the managers of the foreign affiliate engage in “empire-building”). Albertus, Glover and Levine (2022) is a leading recent example of this approach.¹² They develop a model in which repatriation taxes induce excessive foreign activity. This effect is attributed to the opportunity cost of capital being low when cash is “trapped” abroad, to agency costs at the affiliate level, and to the anticipation of possible future reforms that would abolish the repatriation tax.

Dharmapala (2023) develops a model in which there exists a continuum of firms in a foreign country, each with a fixed value under domestic ownership. These firms vary in the value they would generate under the ownership of a US MNC (which may be either higher or lower than the value under domestic ownership). At time 1, a US MNC can acquire (some subset of) these firms. At time 2, the firms acquired at time 1 – now affiliates of the US parent - generate earnings that may be repatriated to the US parent or used to finance further acquisitions. The opportunity cost of further acquisitions at time 2 is low due to the repatriation tax, and – if left to its own devices – an affiliate would make excessive time 2 acquisitions (from the perspective of the US MNC at time 1). Anticipating this, the US parent limits its acquisitions at time 1 such that the cash generated at time 2 is only (just) sufficient to acquire the remaining firms for which acquisition is optimal (from the parent’s perspective).

In this framework, under the assumption that affiliates do not have access to sources of financing other than retained earnings and funds from the parent (or, more generally, that parents

¹² Hanlon, Lester and Verdi (2015) and Edwards, Kravet and Wilson (2016) find evidence that foreign acquisitions by US MNCs with large (“trapped”) foreign cash holdings generate less positive market reactions than other acquisitions. This is usually interpreted as evidence of agency costs leading to value-destroying acquisitions in the presence of the repatriation tax. However, Feld et al. (2016) question this interpretation, pointing out that the results are also “consistent with a generally impeding effect of repatriation taxes on foreign acquisitions which is moderated by the current state of foreign capital stock in the set of all U.S. firms. In fact, if there was no threat of ending up in a position with locked-out cash, it is not clear how an impeding effect of repatriation taxes on foreign investment would come about” (pp. 18-19).

The framework in Dharmapala (2023) also casts some doubt on the notion of “trapped” cash. Ultimately, the US parent chooses whether to acquire foreign affiliates and how, if at all, to stagger acquisitions over time. The repatriation tax existed for about a century prior to its abolition in 2017, and so is unlikely to have represented a surprise to US MNCs. Thus, it would have been readily anticipated that cash flows generated by affiliates would become “trapped.” Rather than viewing the accumulation of large amounts of foreign cash as an exogenous event that generates agency costs, one might view this accumulation as a conscious choice that tends to be made precisely when agency and incentive-alignment problems have been solved or mitigated.

Olson (2021) provides some evidence that may be broadly consistent with this perspective. He finds that following the 2017 reform, US MNCs with lower inferred agency costs (based on the presence of institutional investors with the incentive and ability to monitor) were less likely to repatriate foreign cash and repurchase shares. This suggests that, while agency costs are important, firms strategically anticipate and respond to them in ways that mitigate their effects.

exert substantial control over affiliates' access to external finance), the level of foreign activity never exceeds that which would prevail when the repatriation tax is zero. Moreover, this result continues to hold when there are agency costs of free cash flow (which can also be anticipated by the US parent) and when the US parent underestimates the future repatriation tax (e.g., because it expects the repatriation tax to be abolished and this does not occur). This does not necessarily generalize to all circumstances, and it is not the case that over-investment abroad by US MNCs was impossible in the pre-TCJA period. However, the model suggests that the commonly cited reasons do not imply over-investment in equilibrium when US MNCs are modeled as forward-looking rational actors.

Clearly, these alternative views are in some tension with each other. Moreover, the findings from the empirical literature summarized in Section 3 above make it clear that these different views have important implications for evaluating the welfare consequences of the TCJA. In one view, the repatriation tax causes foreign activity to be inefficiently low, and any further reduction in foreign activity after the TCJA would unambiguously cause further welfare losses. In the other view, foreign activity was excessively large prior to the TCJA, and so a TCJA-induced reduction in foreign activity could potentially (though not necessarily) be welfare-enhancing.

It is also not clear that empirical evidence alone can fully inform a choice between these alternative views, as they rest in part on differing theoretical frameworks and conceptual foundations. However, there are some relevant, though not necessarily dispositive, sources of evidence. The impact of a repatriation tax on foreign activity can be understood using evidence on what happened to foreign acquisitions after the abolition of repatriation taxes in the UK and Japan in 2009. These reforms were arguably “pure” territorial reforms, in which the repatriation tax was abolished and – unlike in the US in 2017 – no new provisions burdening foreign activity (such as the TCJA’s GILTI tax) were introduced. For instance, Feld et al. (2016) show that acquisitions by Japanese-based and UK-based MNCs rose after the reforms (by about 32% and 4%, respectively); as discussed earlier, their simulation of the abolition of the repatriation tax by the US suggests that this would increase foreign acquisitions by US MNCs by 11%. Moreover, Liu (2020) finds that UK MNCs’ investment abroad grew after the 2009 reform that abolished the UK’s repatriation tax. Post-reform increases in foreign activity suggest that the repatriation tax tends to reduce foreign activity. However, there are some contrary results in the literature, at least with respect to

capital expenditures.¹³ Note, though, that studies of acquisitions (e.g., Feld et al., 2016) – rather than studies of capital expenditures - are arguably more directly relevant to our discussion here.

More generally, however, there are various conceptual reasons why US foreign activity may have been inefficiently large prior to the TCJA. For instance, US MNCs may engage in socially excessive acquisitions if they facilitate profit shifting into lower-tax jurisdictions (from the US or from other higher-tax jurisdictions). It is not at all clear that profit shifting requires substantial acquisitions of “real” firms rather than, for instance, the creation of legal entities – without much economic substance - in tax haven jurisdictions.¹⁴ Nonetheless, in principle, profit shifting opportunities could result in socially excessive acquisitions. However, what is likely to be most important to ownership distortions in the real world is competition for assets among MNCs resident in different countries, rather than competition between US MNCs and (generally smaller) domestic-only firms. Hence, whether US MNCs over-invest abroad depends crucially on whether they have *differential* access to profit shifting opportunities, relative to non-US MNCs. When profit shifting opportunities are identical across MNCs, the effect on their bids for a given asset will be symmetrical (i.e., all MNCs will be willing to bid more when their effective tax rate is lower). Ownership patterns will then be unaffected by profit shifting opportunities.

Profit shifting is, in many circumstances, constrained by source country rules such as restrictions on the deductibility of interest paid to other affiliates of the same MNC (which limits “earnings stripping” through lending by low-tax affiliates to high-tax affiliates). Such source country rules typically apply equally to MNCs regardless of their residence and thus are unlikely to enable differential tax avoidance by US MNCs. On the other hand, residence countries may impose controlled foreign corporation (CFC) rules (which enable the residence country to directly tax passive income earned in low-tax jurisdictions) of varying strength.¹⁵ In principle, it is possible that US CFC rules are weaker in practice than those of other residence countries, enabling US MNCs to engage in more profit shifting than non-US MNCs prior to the TCJA. Such an argument might, for instance, emphasize the role of the “check-the-box” (CTB) regulations introduced in

¹³ Arena and Kutner (2015) find that UK and Japanese MNCs reduced foreign capital expenditures after the territorial reforms in 2009. Egger et al. (2015) report a decrease in capital investment by UK MNCs’ foreign affiliates after the reform. It is not clear how to reconcile these results with that of Liu (2020).

¹⁴ See Dharmapala (2014) and Beer, de Mooij and Liu (2020) for a review and discussion of profit shifting.

¹⁵ See Dharmapala (2019) for a discussion and analysis of earnings stripping and CFC rules across different countries.

1996 that are thought to have facilitated profit shifting by US MNCs from high-tax to low-tax foreign jurisdictions (e.g., Desai and Dharmapala, 2009).

However, the evidence on effective tax rates (ETRs) from financial statement data seems inconsistent with such a claim. Markle and Shackelford (2012) show that in the pre-TCJA period US-based MNCs tended to have ETRs that were generally higher (or at least no lower) than those of non-US-based MNCs (see also Allen and Morse (2019)). This evidence is difficult to reconcile with US MNCs having greater access to profit shifting opportunities (at least on balance, taking account of both the repatriation tax and the strength of CFC rules).¹⁶ Thus, it seems unlikely that US MNCs over-invested abroad prior to the TCJA due to profit shifting opportunities. Nonetheless, there is some analysis that shows lower effective tax rates for US MNCs relative to non-US MNCs. A Reuters study compared effective tax rates for US MNCs and those non-US MNCs that were identified as direct competitors by US MNCs. US MNCs' effective tax rate was 16% while their non-US competitors' effective tax rate was 24%. This, however, relates to the post-TCJA period.

In addition, the efficiency implications of the decline in the value of MNCs relative to domestic-only firms that was discussed in Section 3 may be ambiguous, in particular if MNCs were tax-favored prior to the TCJA. However, Dyreng et al. (2020, Figure 2) show that the pre-TCJA ETRs for US domestic-only firms were very similar to (and by some measures even lower than) the ETRs for US MNCs. Thus, the decline in the value of MNCs relative to domestic-only firms can perhaps be best understood as reflecting the creation or aggravation of an inefficiency rather than the correction of a prior distortion. While evidence of this type is thus helpful, there are sometimes conflicting results, and further research (both theoretical and empirical) is needed to resolve the issues surrounding the welfare consequences of the TCJA's international provisions.

5) Conclusion

The 2017 US tax reform fundamentally transformed the US system of international taxation. This paper surveys the emerging empirical evidence on the consequences of the TCJA's international provisions. Drawing on this empirical literature, the paper documents five robust

¹⁶ A strand of the tax law literature (Fleming, Peroni, and Shay, 2009) argues that the pre-TCJA system – due to favorable cost allocation rules and the ability to deduct foreign losses against US income - led to tax outcomes for US MNCs that were more favorable than they would have faced under a territorial system. While this is possible in principle, the evidence cited here also appears to contradict this claim.

findings: the TCJA led to a general decline in US MNCs' foreign acquisitions, increased US MNCs' investment in routine foreign tangible assets, led (at most) to a decline in profit shifting to the extent expected from the TCJA's tax rate reduction (suggesting no impact of its international provisions per se), reduced the market value of US MNCs relative to domestic US firms, and had little detectable impact on domestic US investment and wages. As discussed above, the welfare implications of these findings depend crucially on whether US MNCs are viewed as having engaged in too much or too little foreign activity prior to the TCJA. This depends on the choice of theoretical framework and the relevant normative benchmark, and cannot readily be resolved empirically.

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