Positive Externality of the American Jobs Creation Act of 2004

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Abstract

U.S. multinational enterprises repatriated over \$300 billion under the 2004 tax holiday. The repatriated funds can improve debt financing environment of nonrepatriating firms, especially those that are financially constrained. We document that such an externality of the tax holiday increases debt financing and consequently investments for financially constrained nonrepatriating firms relative to less constrained nonrepatriating firms. Using private loan market data, we further confirm a link from repatriated funds to increased debt financing for financially constrained nonrepatriating firms. Overall, the 2004 tax holiday appears to have benefited the U.S. economy through its positive externality on the debt market.

I.   Introduction

Prior to the Tax Cuts and Jobs Act (TCJA) of 2017, the U.S. government taxed multinational enterprises (MNEs) at the same rate regardless where the income was earned. However, tax on foreign income could be deferred until MNEs repatriated foreign income from their overseas subsidiaries. This deferrable repatriation tax created incentives for MNEs to hold earnings abroad (Foley, Hartzell, Titman, and Twite (2007)). As estimated by the Joint Committee on Taxation, by the end of 2015, U.S. MNEs held over \$2.6 trillion undistributed earnings overseas (JCT Response Letter (2016)). The American Jobs Creation Act (AJCA) of 2004 offered a one-time tax holiday on repatriated earnings by U.S. MNEs. As a response, U.S. MNEs repatriated \$312 billion foreign earnings under the tax holiday (Redmiles (2008)), about 5 times the average annual foreign repatriation during the 5 years before the tax holiday (Dharmapala, Foley, and Forbes (2011)).

Prior studies generally find that this tax holiday has a limited or controversial impact on repatriating firms' investments. They show that repatriated funds were largely used to pay dividends or repurchase shares (Clemons and Kinney (2008), Blouin and Krull (2009), and Dharmapala et al. (2011)). These findings have a profound impact on the public perception of the tax holiday in 2004 and the policy debate on the tax reform. For example, the Permanent Subcommittee on Investigations (2011) cites Clemons and Kinney (2008) and Dharmapala et al. (2011) as supporting evidence that the repatriation tax holiday was a failure.

Did the repatriation tax holiday benefit the U.S. economy? Our answer is yes, in an indirect way. Prior studies usually focus on the effect of the tax holiday on repatriating firms. We take a different perspective and examine whether the tax holiday has a positive externality on nonrepatriating firms in terms of debt financing and investments.

Why could the tax holiday benefit nonrepatriating firms? First of all, many U.S. MNEs tend to fund domestic operations through debt financing in the United States, which allows them to defer repatriation of foreign income and avoid repatriation tax (Altshuler and Grubert (2002), Graham, Hanlon, and Shevlin (2010), and S&P (2014)). The tax holiday temporarily relieved the constraint on repatriating firms' internal capital allocation caused by the repatriation tax. Repatriating firms' demand for domestic debt financing will thus decrease. Second, repatriating firms with limited investment opportunities can use a part of the repatriated funds to pay down domestic debt (Graham et al. (2010), Faulkender and Petersen (2012)). This in turn increases the supply of debt in the domestic market. With a decreased demand for and an increased supply of domestic debt financing due to repatriation, nonrepatriating firms face less competition in the debt market and end up raising more debt and increasing investments.

Not all nonrepatriating firms need to take advantage of such a benefit and the impact of the externality can vary across nonrepatriating firms. Specifically, financially constrained nonrepatriating firms are more likely to have unfunded positive net present value (NPV) projects and can benefit more from debt financing after the tax holiday. If the positive externality of the tax holiday exists, we expect financially constrained nonrepatriating firms to experience a greater increase in debt financing and investments after the tax holiday relative to less constrained nonrepatriating firms.

To test our prediction, we first divide U.S. incorporated firms in the Compustat database into repatriating firms and nonrepatriating firms. We then divide non-repatriating firms into two groups based on their extent of financial constraints. Among nonrepatriating firms, we define firms as financially constrained if they are domestic firms with no pretax foreign income, or if their size and age based financial constraint index (Hadlock and Pierce (2010)) is higher than the median of nonrepatriating firms in 2003. Using these classifications, we first examine the change in debt financing after the tax holiday. Consistent with our prediction, we find that relative to less constrained nonrepatriating firms, constrained nonrepatriating firms experience an increase in debt financing after the tax holiday. This effect mainly comes from long-term debt.

We then use the DealScan private loan database to ascertain causality from repatriated funds to the increase in debt financing for financially constrained nonrepatriating firms. We examine newly issued loans at the lender level. Specifically, for a lender, if its borrowers repatriated funds under the tax holiday, it faces a decreased loan demand from these repatriating firms. As a result, lending to repatriating firms will decrease and more credit will be made available to nonrepatriating firms. As financially constrained nonrepatriating firms are more likely to benefit from the increase in credit supply, lending to financially constrained nonrepatriating firms will increase. Our empirical evidence is consistent with this prediction.

We further examine whether externality of the tax holiday benefits investments. We show that relative to less constrained nonrepatriating firms, constrained nonrepatriating firms exhibit an increase in investments after the tax holiday. Within constrained nonrepatriating firms, the change in investments pre- to post-tax holiday is positively associated with the change in their debt financing, suggesting that the increase in investments for these firms is likely due to an increase in credit supply.

In sum, we document an increase in debt financing and related investments for financially constrained nonrepatriating firms relative to less constrained nonrepatriating firms after the tax holiday. This result is consistent with our argument that the tax holiday has a positive externality on nonrepatriating firms' debt financing, which largely benefits financially constrained firms.

We make the following contributions. First, our study facilitates a better understanding of the consequences of the AJCA 2004 tax holiday. While a few studies provide evidence of an increase in investments for repatriating firms (Faulkender and Petersen (2012), Hanlon, Lester, and Verdi (2015)), other studies cast doubt on the overall benefits of the tax holiday to the U.S. economy. They argue that repatriating firms are less likely to be financially constrained (Blouin and Krull (2009), Albring, Mills, and Newberry (2011)) and tend to use repatriated funds or "freed-up" cash to pay dividends or repurchase shares instead of increasing investments (Blouin and Krull (2009), Dharmapala et al. (2011)). We find a positive externality effect of the 2004 tax holiday. Financially constrained nonrepatriating firms increase their debt and investments. Therefore, the 2004 tax holiday actually benefits the U.S. economy.

Second, our study sheds lights on a cost of the tax system before TCJA 2017. Two well recognized issues associated with the pre-2017 tax system are MNEs' hoarding of cash overseas and corporate inversion. MNEs may have inefficiently invested foreign cash on less profitable projects (Hanlon et al. (2015), Edwards, Kravet, and Wilson (2016)). A more controversial issue is firms' decisions to incorporate in foreign countries with lower tax rates through inversion trading to avoid U.S. income taxes (Desai and Hines (2002), Seida and Wempe (2004), and Mider (2017)). Our results imply that the repatriation tax affects firms beyond MNEs. MNEs' strategy to defer repatriation and fund operations through debt pushes up MNEs' demand for domestic debt, crowding out financially constrained nonrepatriating firms. This effect can negatively affect the U.S. economy. AJCA 2004 can potentially serve as an invaluable one-time experiment to help us evaluate the repatriation tax exemption of TCJA 2017. Based on our finding, after

TCJA 2017, MNE's demand for domestic debt will likely diminish. Constrained firms previously crowded out from the credit market will face less competition and thus be able to issue more debt to fund investments. This can benefit the U.S. economy.

Finally, our study provides an explanation for why prior studies are not able to document an increase in investments for repatriating MNEs after the tax holiday. Though studies examining the consequences of the tax holiday differ in the construction of the control group, they essentially all use nonrepatriating firms as a benchmark. If the tax holiday positively affects nonrepatriating firms, such a comparison can attenuate the impact of the tax holiday on repatriating firms. In other words, insignificant findings in prior studies do not necessarily mean that the tax holiday has no or only a limited impact.

The rest of the paper proceeds as follows: Section II reviews the literature and develops hypotheses. Section III discusses research designs and summary statistics. Section IV presents empirical results. Section V discusses the implication for evaluating TCJA 2017. Section VI concludes the paper.

II.   Literature Review and Hypotheses Development

A.   U.S. Worldwide Tax System with Deferral and Its Impact on MNEs

Before the Tax Cuts and Jobs Act of 2017, the U.S. government taxed U.S. incorporated MNEs' domestic and foreign income at the same rate. Foreign tax credits were granted to firms to help avoid double taxation of foreign income. However, firms could defer the repatriation tax until foreign earnings were repatriated to their U.S. parents. Under TCJA 2017, the accumulated untaxed foreign earnings from foreign subsidiaries of U.S. MNEs are deemed repatriated and a transition tax is imposed on these earnings. After that, MNEs no longer need to pay tax when repatriating newly generated foreign earnings back to the United States.

Some theories argue that the repatriation tax should not affect MNEs' repatriation decision. In Hartman (1985), a firm should always invest its internal capital in projects with the highest after-tax rate of return. This is contrary to many empirical findings that the repatriation tax affects payout from firms' foreign subsidiaries (Altshuler and Newlon (1993), Grubert (1998), and Desai, Foley, and Hines (2001)). The Hartman model has two underlying assumptions. Foreign subsidiaries can only invest in operating assets and there is no real or expected change in tax rates. Extensions of the Hartman model relax these assumptions, making the repatriation tax a relevant factor in repatriation decisions. For example, an expected change in the repatriation tax rate alters a firm's repatriation decision and market value. Oler, Shevlin, and Wilson (2007) incorporate tax holidays into their model and demonstrate that the decision to repatriate or to reinvest is a function of current and future expected tax rates. De Waegenaere and Sansing (2008) show that permanently reinvested earnings in financial assets increase firm value when a tax holiday looms.

Empirical findings suggest that the repatriation tax significantly influences MNEs' repatriation decisions and the allocation of their internal capital. Foley et al. (2007) use data from the U.S. Bureau of Economic Analysis (BEA) and show

that the large amount of cash holding of U.S. MNEs can partially be explained by the repatriation tax. Specifically, MNEs hold more cash when they face a high repatriation tax and they tend to hold cash in foreign affiliates that will trigger a tax when earnings are repatriated. As a result, the repatriation tax creates a "barrier of mobility" (Graham et al. (2010)). A large amount of cash is "locked out" abroad to avoid the repatriation tax.

The repatriation tax makes MNEs' access to their foreign cash costly and pushes up their demand for domestic debt. Altshuler and Grubert (2002) show that there are alternative ways for MNEs to effectively bring their earnings back to the United States without triggering the repatriating tax. One way is to invest foreign earnings in financial assets which the parents can borrow against domestically. Graham et al. (2010) provide survey evidence consistent with this strategy. They find that 43.6% of the firms surveyed avoid the repatriation tax by raising domestic debt.

B. American Jobs Creation Act of 2004 and Its Effect on Repatriating Firms

The U.S. government was well aware of the fact that the tax system was deterring repatriations from overseas. As a response, the American Jobs Creation Act of 2004 initiated a tax holiday to induce U.S. MNEs to bring their foreign earnings back to the United States for domestic investments and job creations. Enacted on Oct. 22, 2004, the tax holiday offered a one-time reduction of 85% for extraordinary dividends received by U.S. MNEs from their controlled foreign corporations. This dividend received deduction effectively reduced the foreign dividend tax rate from 35% to 5.25% (0.15 × 35%). The tax holiday had certain specific requirements for the utilization of repatriated funds that qualified for the dividend received deduction.[1] Firms were required to prepare a detailed plan of how and when the funds would be used. Note that the 2004 tax holiday did not require the spending of repatriated funds on permitted uses to be incremental (Graham et al. (2010), Dharmapala et al. (2011)). Firms could use repatriated funds for permitted uses, such as capital expenditure or research and development (R&D), and spend "freed-up" cash on nonpermitted uses, such as dividends or stock repurchases.

This one-time dividend received deduction (DRD) encouraged U.S. MNEs to repatriate foreign earnings back, especially for those that had a large amount of cash overseas but limited foreign investment opportunities. According to

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[1]In general, the permitted use of the funds include "(1) worker hiring, training and other compensation in the United States, (2) investment of infrastructure and capital in the United States, (3) R&D expenditure in the United States, (4) financial stabilization of the corporation for purposes of job retention and creation (including the repayment of debt - United States or foreign, qualified pension plan funding, and other expenditures), (5) acquisitions of certain interests in business entities, (6) advertising and marketing expenditures in the United States, and (7) purchases of intangible property in the United States. The items specifically not permitted include: (1) executive compensation, (2) intercompany distributions, obligations, and transactions, (3) dividends and other distributions with respect to stock, (4) stock redemptions, (5) portfolio investments in business entities, of indebtedness, and (7) tax payments." For more details, see Department of the Treasury, Internal Revenue Service: Internal Revenue Cumulative Bulletin 2005-1, January-June, p. 477–480.

Redmiles (2008), $362 billion were repatriated during this period, with $312 billion qualified for the tax deduction under the tax holiday. Before the tax holiday, the average annual repatriation was $62 billion (Dharmapala et al. (2011)). Tax savings under the tax holiday was about $39 billion (Albring, Dzuranin, and Mills (2005)). Repatriations fell back to $102 billion after the holiday (Dharmapala et al. (2011)).

Many studies examine who repatriated during the tax holiday and how the repatriated funds were used. This question is important as an underlying assumption of the tax holiday is that U.S. MNEs' domestic operations are financially constrained, and they have unfunded investment opportunities (Dharmapala et al. (2011)). However, researchers have found that repatriating firms have more financial assets abroad, are less financially constrained, and have limited investment opportunities than nonrepatriating firms (Blouin and Krull (2009), Albring et al. (2011)).

Prior studies only find limited or controversial evidence that the repatriation tax holiday leads to more investments, employment, and research and development (R&D) for repatriating firms, even though the tax holiday set up restrictions on the use of the funds. A large portion of the funds is used to pay dividends and repurchase shares. Blouin and Krull (2009) show that about 20% of repatriated funds are used to repurchase shares. Dharmapala et al. (2011) estimate that about $0.60 to $0.92 of each dollar repatriated is used for shareholder payout. They fail to find an increase in investments, employment or R&D attributable to repatriated funds, even for financially constrained repatriating firms. They suggest that due to the fungible nature of the funds and the difficulty in tracing their flow, repatriating firms can use repatriated funds to finance planned projects and use the "freed-up" cash for purposes that are not allowed by the tax holiday, such as dividends and share repurchases.

Some studies question these conclusions. Brennan (2014) points out that the $0.60–$0.92 range for shareholder payout in Dharmapala et al. (2011) is too high. According to his calculation, the upper bound for shareholder payout is $0.55 per repatriated dollar. Faulkender and Petersen (2012) compare firms that actually repatriated with firms that had a similar chance to repatriate but did not do so. They find that repatriated funds under the tax holiday had little impact on shareholder payout. More importantly, repatriated funds are associated with increased investments for financially constrained repatriating firms. Hanlon et al. (2015) document that MNEs increase domestic acquisitions and decrease foreign acquisitions immediately after the 2004 tax holiday. Graham et al. (2010) provide evidence on the use of repatriated funds and the "freed-up" cash. Their survey design allows them to directly separate repatriated funds from the "freed-up" cash. They show that the most common uses of repatriated funds include capital investments, hiring and training of employees, R&D, and paying down domestic debt, and the most common uses of "freed-up" cash include paying down domestic debt, stock repurchases, capital investment, hiring and training of employees, and R&D.

Though not definitive, the existing literature casts doubt on the effectiveness of the 2004 tax holiday on repatriating firms. We, however, argue that a positive externality can exist. A significant portion of repatriated funds can flow from

repatriating firms to the capital market, improving external financing environment of nonrepatriating firms. Nonrepatriating firms can thus increase their debt and investments. Consequently, the 2004 tax holiday can actually have a positive impact on the U.S. economy.

C.   Externality of the Tax Holiday on Nonrepatriating Firms

Although nonrepatriating firms do not directly get the tax benefits from the 2004 tax holiday, they can indirectly benefit from it. Debt financing can become more readily available to nonrepatriating firms. First, the one-time deduction of repatriation tax under the tax holiday reduced repatriating firms' demand for domestic debt. The tax holiday temporarily relieved constraints on repatriating firms' internal capital market by allowing them to re-allocate their internal funds at a significantly lower cost. Repatriated funds reduced their need to borrow from the domestic debt market. As argued earlier, repatriating firms are generally less financially constrained. With foreign cash holding as an implicit guarantee, they have a competitive advantage in the domestic debt market. When their demand decreases due to repatriation, other firms can more easily access debt financing.

Further, credit supply can increase as an important use of repatriated funds for repatriating firms is to pay down domestic debt. Although Faulkender and Petersen (2012) do not observe a direct reduction in total debt for repatriating firms, they suggest that this can result from repatriating firms using foreign debt to replace domestic debt. Graham et al. (2010) show that paying down domestic debt is one of the most popular uses of the "freed-up" cash. Therefore, with a decreased demand for debt financing and increased debt repayment from repatriating firms, total debt capacity available to nonrepatriating firms can increase after the tax holiday.

The magnitude of the supply shock in the debt market is economically significant. Dharmapala et al. (2011) estimate that around 60% to 92% of repatriated funds are used for shareholder payout. To the extent that prior studies generally find the tax holiday to have a limited impact on repatriating firms' investments (Clemons and Kinney (2008), Blouin and Krull (2009), and Dharmapala et al. (2011)), we assume that 24% (100% – (60% + 92%)/2) of repatriated funds can potentially be made available to other borrowers, leading to investments. Note that this 24% available for other borrowers is likely conservative as the 76% paid out to investors can potentially be channeled back to the debt and equity market, reducing the cost of obtaining funds. Further, 24% of the $312 billion repatriated funds translate to a $74.88 billion supply shock to the debt market, accounting for 9.68% of newly issued corporate bonds ($773.8 billion) or 7.06% of bank loans ($1060.05 billion) in 2003.[2] As we focus on nonrepatriating firms, this shock is even more significant, accounting for 55.15% of newly issued corporate bonds ($135.78 billion) or 18.19% of bank loans ($411.73 billion) for nonrepatriating firms.

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[2]Information on the amount of newly issued corporate bonds is from the Securities Industry and Financial Market Association (SIFMA) (2018). We calculate the amount of aggregate new bank loans by summing all facilities denominated in U.S. dollars in DealScan in 2003.

The response to an increased credit supply can differ across nonrepatriating firms. Specifically, financially constrained nonrepatriating firms are more likely to benefit from an increased supply of debt financing. Firms that are not financially constrained before the tax holiday have an easier access to external financing to fund their positive NPV projects. The marginal effect of increased credit supply should be weaker for less constrained nonrepatriating firms. Financially constrained nonrepatriating firms are more likely to have unexploited investment opportunities and hence are more likely to increase debt financing when credit supply increases. There should be heterogeneous responses regarding debt financing among nonrepatriating firms. The effect should be stronger for financially constrained nonrepatriating firms. We propose our first hypothesis:

Hypothesis 1. Financially constrained nonrepatriating firms experience an increase in debt financing after the tax holiday relative to less constrained nonrepatriating firms.

As we have argued earlier, financially constrained nonrepatriating firms are more likely to have unfunded positive NPV projects before the tax holiday. After gaining more access to debt financing, they are more likely to be able to fund these projects, leading to an increase in investments. We propose our second hypothesis:

Hypothesis 2. Financially constrained nonrepatriating firms experience an increase in investments after the tax holiday relative to less constrained nonrepatriating firms.

We focus on domestic debt financing in developing our hypotheses as a popular way to effectively bringing foreign earnings back while avoiding repatriation tax is to borrow domestically against foreign earnings (Altshuler and Grubert (2002), Graham et al. (2010)). Note that there was a lot of payout, dividends and repurchases, during the tax holiday (Blouin and Krull (2009), Dharmapala et al. (2011)). Payout from repatriating firms is not necessarily bad to their shareholders if these firms lack investment opportunities (Jensen (1986)). We want to point out an added positive spill-over effect as there is a chance that these dividends and repurchases could be channeled by shareholders to the debt and equity markets. This can also contribute to enhanced debt financing of financially constrained nonrepatriating firms. However, empirically this can be difficult to test as we only have firm-level and not shareholder-level data. Therefore, directly establishing a link from the payout of repatriating firms to increased credit supply for financially constrained nonrepatriating firms is difficult.

III.   Research Design, Data, and Summary Statistics

A.   Identification and Regression Design

We estimate the following model to test our hypotheses:

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\begin{aligned}
(1) \quad Y_{it} = \ & \beta_0 + \beta_1 \text{POST} + \beta_2 \text{POST} \times \text{NON\_REP}_i \\
& + \beta_3 \text{POST} \times \text{NON\_REP}_{\text{CONSTRAINED},i} + \beta_4 \text{NON\_REP}_i \\
& + \beta_5 \text{NON\_REP}_{\text{CONSTRAINED},i} + \beta_6 \text{SIZE}_{it-1} + \beta_7 \text{MTB}_{it-1} \\
& + \beta_8 \text{CASH\_FLOW}_{it-1} + \beta_9 \text{CASH\_HOLDING}_{it-1} \\
& + \beta_{10} \text{ALTMAN\_Z\_SCORE}_{it-1} + \beta_{11} \text{GROWTH}_{it-1} \\
& + \beta_{12} \text{PROFITABILITY}_{it-1} + \beta_{13} \text{WEAK\_FINANCE}_t \\
& + \beta_{14} \text{EQUITY\_MARKET\_RETURN}_t + \beta_{15} \text{GDP\_GROWTH}_{st} + \varepsilon_{it},
\end{aligned}
$$

where the dependent variable Y_{it} represents debt financing/investments of Firm i in year t. POST is an indicator that equals 1 for fiscal years 2005–2007, and 0 for fiscal years 2001–2003.[3] NON_REP is an indicator that equals 1 for a nonrepatriating firm, and 0 for a repatriating firm. Within nonrepatriating firms, we define NON_REP$_{\text{CONSTRAINED}}$ as an indicator that equals 1 for a financially constrained nonrepatriating firm, and 0 for a less financially constrained firm, where the subscript varies according to measures of financial constraints we use. Using NON_REP and NON_REP$_{\text{CONSTRAINED}}$, we separate firms into three groups: repatriating firms, less financially constrained nonrepatriating firms, and financially constrained nonrepatriating firms.

Based on the ways POST, NON_REP, and NON_REP$_{\text{CONSTRAINED}}$ are defined, the coefficient β_1 (POST) captures the change in debt financing/investments of repatriating firms after the tax holiday and β_2 (POST $\times$ NON_REP) captures the incremental change in debt financing/investments of less constrained nonrepatriating firms relative to repatriating firms. We focus on coefficient β_3 (POST $\times$ NON_REP$_{\text{CONSTRAINED}}$) which captures the incremental change in debt/investments of financially constrained nonrepatriating firms relative to less constrained nonrepatriating firms. We expect β_3 to be positive.

We employ two measures for financially constrained nonrepatriating firms. First, among nonrepatriating firms, we define firms that do not have any foreign income (Compustat item PIFO) during the sample period as domestic firms and the rest as nonrepatriating MNEs. Dharmapala et al. (2011) find that MNEs are less financially constrained than non-MNEs based on six financial constraint measures. Compared with MNEs, domestic firms are usually smaller, younger, and less diversified. Therefore, we treat domestic firms as more constrained. We use NON_REP$_{\text{DOMESTIC}}$ as an indicator for domestic firms. The second financial constraint measure is the size and age index (SA_INDEX) developed by Hadlock and Pierce (2010). A high SA_INDEX indicates that a firm is financially constrained. We use NON_REP$_{\text{SA}}$ as an indicator that equals 1 for a financially constrained nonrepatriating firm (SA_INDEX above the industry median in 2003), and 0 for

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[3]The tax holiday took place in late 2004. It is unclear whether observations in year 2004 should be classified into the pre- or post-tax holiday period. We thus exclude observations in year 2004 from our sample.

a less constrained nonrepatriating firm (SA_INDEX below the industry median in 2003).[4]

We use a set of dependent variables to represent a firm's debt financing/investments. For debt financing, we examine a firm's net change in long-term debt (LT_DEBT), net change in short-term debt (ST_DEBT), and net change in total debt (TOTAL_DEBT) (the sum of LT_DEBT and ST_DEBT). They cover both private and public debt. For investments, we use NET_INVESTMENT (Lemmon and Roberts (2010)), expenditure (CAPITAL_EXPENDITURE), acquisitions (ACQUISITION), and other investment activities (SALE_OF_PPE). We also consider research and development (R&D). See the Appendix for detailed variable definitions.

Following prior studies, we control for a set of firm specific, market, and macro-economic variables. For firm specific characteristics, we include firm size (SIZE), market-to-book ratio (MTB), cash flow from operating activities (CASH_FLOW), cash holding (CASH_HOLDING), the extent of financial distress as measured by an updated version of the Altman Z score according to Altman (2000) (ALTMAN_Z_SCORE),[5] sales growth rate (GROWTH), and profitability (PROFITABILITY). We include macro-economic and market level variables to mitigate the impact of business cycles. WEAK_FINANCE is the percentage of domestic banks claiming that they are tightening standards for commercial and industrial loans (Erel, Julio, Kim, and Weisbach (2012)).[6] EQUITY_MARKET_RETURN is the Center for Research in Security Prices (CRSP) annual value-weighted return. GDP_GROWTH is the annual Gross Domestic Product (GDP) growth rate for the state where a firm is incorporated. Firm specific control variables are lagged for 1 year. All continuous variables except market and macro-economic variables are winsorized at the top and bottom 1% percentiles. Each model includes industry fixed effects and standard errors are adjusted for firm level clustering.

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[4]While there are multiple financial constraint measures in the literature, there is no consensus on which measure performs the best. We use the SA_INDEX for two reasons. First, the sample used in Hadlock and Pierce (2010) to estimate the coefficients is from 1995 to 2004, a period more relevant to our study. Second, the SA_INDEX is intuitive and easy to interpret. Simply put, small and young firms are more likely to be constrained according to the SA_INDEX. As a result, it is easier to figure out what types of firms benefit from the positive externality of the tax holiday. In subsequent analysis, we also use alternative measures of financial constraints and obtain qualitatively similar results.

[5]In untabulated analysis, we also use two other financial distress measures. The first, *Findis*, equals 1 if a firm's interest coverage ratio is below 1 for 2 consecutive years or is below 0.8 in any given year, and 0 otherwise (Asquith, Gertner, and Scharfstein (1994)). The coverage ratio is calculated as earnings before interest, taxes, depreciation and amortization (EBITDA) divided by interest expenses. The second, *LossFD*, is an indicator for a firm year with negative net profits in the current, the first lag, and the second lag year (DeAngelo and DeAngelo (1990)). Using these two alternative financial distress measures does not change our results.

[6]This variable is based on survey data collected from the Senior Loan Officer Opinion Survey on Bank Lending Practices of Federal Reserve. This quarterly conducted survey targets up to 80 large domestic banks and 24 U.S. branches and agencies of foreign banks. Lown, Morgan, and Rohatgi (2000) document that the survey results are strongly correlated with loan growth. When standards are shown to be tightening, there is slower loan growth.

B.   Data

We first divide U.S. firms in Compustat into repatriating and nonrepatriating firms. Following prior studies, we read through 10-K and 10-Q fillings to find firms that have repatriated foreign earnings during the tax holiday. We identify 479 firms that reported repatriation during the tax holiday. More than 70% of these firms repatriated in 2005, around 20% repatriated in 2006, and the left repatriated in 2004. A total of 437 firms reported the exact repatriated amount. The total amount of reported repatriated funds is $301 billion in our sample. Redmiles (2008) uses the Internal Revenue Service (IRS) filings data and show that $312 billion foreign earnings were repatriated to the U.S. during the tax holiday. We believe that we have identified the repatriating sample reasonably well. We further link the 479 firms to the Compustat North American File using the Central Index Key (CIK). We can link the repatriating sample to 408 of nonfinancial and nonutility firms in Compustat. We consider other U.S. incorporated firms as nonrepatriating firms.

Financial statement data come from Compustat over the period from 2001 to 2007. We keep firms that are incorporated in the U.S. Market return data are from CRSP. Information on financial tightness comes from the Federal Reserve. Information on GDP growth comes from the World Bank. We exclude financial firms (Standard Industrial Classification (SIC) codes 6000–6999) and utility firms (SIC codes 4900–4999). We exclude observations in fiscal year 2004 as well as observations with total assets lower than $1 million.

C.   Summary Statistics

Our sample sizes differ when we use different dependent variables. The number of observations when TOTAL_DEBT is the dependent variable is 24,278. We mainly use this sample for summary statistics.

Table 1 provides summary statistics for our key variables. Panel A reports results for the full sample including repatriating and nonrepatriating firms. The sample means of debt variables LT_DEBT, ST_DEBT, and TOTAL_DEBT are 2.3%, 0.3%, and 2.3%, respectively. For investment variables, the sample means of NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, SALE_OF_PPE, and R&D are 8.2%, 5.4%, 2.9%, 0.3%, and 6.8%, respectively.

As we are interested in capturing the incremental effect of the positive externality, we pay attention to firm characteristics for financially constrained and less constrained nonrepatriating firms. Panel B of Table 1 reports the comparison between domestic firms and nonrepatriating MNEs. Domestic firms account for around 60% of nonrepatriating firms. The two groups exhibit significantly different characteristics. Domestic firms are generally smaller in size, generate lower cash flow, have a higher growth rate, and exhibit a higher level of default risk compared with nonrepatriating MNEs. These findings confirm that domestic firms are more financially constrained than nonrepatriating MNEs. Panel C reports the comparison between high and low SA_INDEX nonrepatriating firms. Around 46% of the observations fall into the high SA_INDEX group. High SA_INDEX

nonrepatriating firms are smaller, have lower cash flow, higher cash holding, higher growth, and lower profitability.[7]

TABLE 1

Summary Statistics

Table 1 presents summary statistics of variables in equation (1). Panel A reports summary statistics for the full sample. Panel B compares the mean of each variable for domestic firms and nonrepatriating MNEs. Panel C compares the mean of each variable for high and low SA_INDEX nonrepatriating firms. Statistics of dependent variables are based on regression samples in which each dependent variable is used. Statistics of control variables are based on the regression sample in which TOTAL_DEBT is the dependent variable. All continuous variables are winsorized at 1% and 99% cutoff points. See the Appendix for variable definitions.

Panel A. Summary Statistics of the Full Sample

Variables	N	Mean	Std. Dev.	25%	Median	75%
LT_DEBT	22886	0.023	0.145	−0.018	0.000	0.005
ST_DEBT	12091	0.003	0.066	−0.003	0.000	0.000
TOTAL_DEBT	24278	0.023	0.148	−0.022	0.000	0.015
NET_INVESTMENT	24413	0.082	0.150	0.013	0.039	0.097
CAPITAL_EXPENDITURE	24413	0.054	0.073	0.013	0.030	0.061
ACQUISITION	24413	0.029	0.092	0.000	0.000	0.005
SALE_OF_PPE	24413	0.003	0.013	0.000	0.000	0.000
R&D	24413	0.068	0.127	0.000	0.005	0.086
$SIZE_{-1}$	24278	4.803	2.459	3.180	4.893	6.529
MTB_{-1}	24278	2.809	5.917	0.958	1.903	3.533
$CASH\_FLOW_{-1}$	24278	−0.138	0.535	−0.145	0.017	0.078
$CASH\_HOLDING_{-1}$	24278	0.218	0.240	0.030	0.119	0.339
$ALTMAN\_Z\_SCORE_{-1}$	24278	3.641	9.195	1.179	3.014	5.528
$GROWTH_{-1}$	24278	0.333	1.224	−0.040	0.089	0.280
$PROFITABILITY_{-1}$	24278	−0.067	0.354	−0.096	0.045	0.108
WEAK_FINANCE	24278	18.776	18.057	4.075	10.775	28.400
EQUITY_MARKET_RETURN	24278	0.039	0.182	−0.113	0.073	0.162
GDP_GROWTH	24278	2.131	1.756	1.000	2.000	3.100

Panel B. Summary Statistics of Domestic Firms and Nonrepatriating MNEs

	Domestic		Nonrepatriating MNEs		t-Tests		
Variables	N	Mean	N	Mean	Nonrepatriating MNES - Domestic	t-Value	p-Value
LT_DEBT	12560	0.027	8277	0.017	−0.010	−4.676	0.000
ST_DEBT	6323	0.006	4523	−0.001	−0.007	−5.395	0.000
TOTAL_DEBT	13225	0.029	8866	0.016	−0.013	−6.285	0.000
NET_INVESTMENT	13323	0.082	8902	0.081	−0.001	−0.621	0.535
CAPITAL_EXPENDITURE	13323	0.058	8902	0.048	−0.010	−10.048	0.000
ACQUISITION	13323	0.024	8902	0.034	0.010	7.887	0.000
SALE_OF_PPE	13323	0.004	8902	0.003	−0.001	−5.088	0.000
R&D	13323	0.074	8902	0.065	−0.008	−4.620	0.000
$SIZE_{-1}$	13225	3.944	8866	5.458	1.514	48.584	0.000
MTB_{-1}	13225	2.743	8866	2.732	−0.011	−0.134	0.893
$CASH\_FLOW_{-1}$	13225	−0.227	8866	−0.054	0.173	22.871	0.000
$CASH\_HOLDING_{-1}$	13225	0.224	8866	0.225	0.001	0.302	0.763
$ALTMAN\_Z\_SCORE_{-1}$	13225	2.902	8866	4.407	1.505	11.564	0.000
$GROWTH_{-1}$	13225	0.429	8866	0.240	−0.189	−10.884	0.000
$PROFITABILITY_{-1}$	13225	−0.138	8866	−0.004	0.134	27.021	0.000

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[7]Within no-repatriating MNEs or domestic firms, there is also variation in the extent of financial constraints. Within nonrepatriating MNEs, 24.09% fall into the high SA_INDEX group and 59.96% fall into the low SA_INDEX group. Within domestic firms, 46.54% fall into the high SA_INDEX group and 32.23% fall into the low SA_INDEX group. This also further justifies our using SA_INDEX as an alternative approach to divide nonrepatriating firms.

TABLE 1 (continued)
Summary Statistics

Panel C. Summary Statistics of High and Low SA_INDEX Nonrepatriating Firms

	High SA_INDEX		Low SA_INDEX		t-Tests		
Variables	N	Mean	N	Mean	Low SA_INDEX – High SA_INDEX	t-Value	p-Value
LT_DEBT	8077	0.023	9211	0.018	−0.004	−1.944	0.052
ST_DEBT	4406	0.007	4469	−0.002	−0.009	−6.317	0.000
TOTAL_DEBT	8292	0.026	9579	0.017	−0.009	−4.001	0.000
NET_INVESTMENT	8322	0.068	9602	0.090	0.022	9.866	0.000
CAPITAL_EXPENDITURE	8322	0.051	9602	0.056	0.005	4.866	0.000
ACQUISITION	8322	0.018	9602	0.035	0.016	12.391	0.000
SALE_OF_PPE	8322	0.004	9602	0.003	0.000	−1.271	0.204
R&D	8322	0.092	9602	0.053	−0.039	−19.940	0.000
SIZE$_{-1}$	8292	3.047	9579	5.971	2.925	104.456	0.000
MTB$_{-1}$	8292	2.764	9579	2.689	−0.075	−0.860	0.390
CASH_FLOW$_{-1}$	8292	−0.261	9579	−0.022	0.239	32.319	0.000
CASH_HOLDING$_{-1}$	8292	0.244	9579	0.207	−0.037	−10.152	0.000
ALTMAN_Z_SCORE$_{-1}$	8292	1.867	9579	4.875	3.008	21.466	0.000
GROWTH$_{-1}$	8292	0.404	9579	0.220	−0.184	−10.600	0.000
PROFITABILITY$_{-1}$	8292	−0.190	9579	0.028	0.218	43.345	0.000

IV. Empirical Results

A. Incremental Change in Debt Financing for Financially Constrained Nonrepatriating Firms after the Tax Holiday

1. Domestic Firms to Indicate Financial Constraints

We first use domestic firms to represent financially constrained nonrepatriating firms. Panel A of Table 2 presents regression results of equation (1). In columns 1 to 3, LT_DEBT, ST_DEBT, and TOTAL_DEBT are dependent variables, respectively. The coefficient on POST is positive and significant (0.019, $t = 3.50$ for LT_DEBT, 0.012, $t = 4.58$ for ST_DEBT, and 0.026, $t = 5.04$ for TOTAL_DEBT), suggesting an increase in debt financing for repatriating firms after the tax holiday. The coefficients on POST × NON_REP are insignificant in columns 1 to 3 (0.009, $t = 1.51$ for LT_DEBT, −0.004, $t = -1.59$ for ST_DEBT, and 0.005, $t = 0.86$ for TOTAL_DEBT). Nonrepatriating MNEs, therefore, do not incrementally increase debt financing relative to repatriating firms.

We focus on POST × NON_REP$_{DOMESTIC}$. In column 1 for LT_DEBT, the coefficient on POST × NON_REP$_{DOMESTIC}$ is positive and significant (0.013, $t = 3.07$), suggesting that domestic firms experience an incremental 1.3% increase in LT_DEBT relative to nonrepatriating MNEs after the tax holiday. This incremental increase in long-term debt is economically significant. The incremental increase in long-term debt is 48.15% (0.013/0.027) of the sample mean of LT_DEBT, or equivalent to 8.23% (0.013/0.158) of the standard deviation of LT_DEBT for domestic firms. For ST_DEBT, the coefficient on POST × NON_REP$_{DOMESTIC}$ is insignificant (−0.002, $t = -0.91$) in column 2. There is no additional increase in short-term debt for domestic firms relative to nonrepatriating MNEs. In column 3 for TOTAL_DEBT, the coefficient on POST × NON_REP$_{DOMESTIC}$ is significantly positive (0.011, $t = 2.79$). Therefore, domestic firms experience an incremental increase in total debt relative to nonrepatriating MNEs after the tax holiday. The incremental increase is 37.93% (0.011/0.029) of the sample mean of TOTAL_DEBT for domestic firms, or

equivalent to 6.75% (0.011/0.163) of the standard deviation of TOTAL_DEBT for domestic firms. Therefore, domestic firms, which are more financially constrained than nonrepatriating MNEs, experience an incremental increase in debt financing, mainly in long-term debt, after the tax holiday.

For firm specific control variables, we discuss results when TOTAL_DEBT is the dependent variable. The coefficient on $SIZE_{-1}$ is negative but insignificant (-0.001, $t = -1.52$). The coefficient on MTB_{-1} is positive and significant (0.001, $t = 2.35$). Firms with a high market-to-book ratio have more growth opportunities and use more debt financing. The coefficients on $CASH\_FLOW_{-1}$ and

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TABLE 2

Incremental Change in Debt Financing for Financially Constrained
Nonrepatriating Firms after the Tax Holiday

Table 2 presents results on the change in debt financing for financially constrained nonrepatriating firms after the tax holiday. The sample covers observations from 2001 to 2007 excluding 2004. LT_DEBT, ST_DEBT, and TOTAL_DEBT are dependent variables. All continuous variables except for the market and macroeconomic variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

Variables	LT_DEBT 1	ST_DEBT 2	TOTAL_DEBT 3
Panel A. Domestic Firms to Indicate Financial Constraints			
POST	0.019 (3.50)***	0.012 (4.58)***	0.026 (5.04)***
POST × NON_REP	0.009 (1.51)	−0.004 (−1.59)	0.005 (0.86)
POST × NON_REP$_{DOMESTIC}$	0.013 (3.07)***	−0.002 (−0.91)	0.011 (2.79)***
NON_REP	−0.013 (−3.14)***	0.002 (0.89)	−0.010 (−2.70)***
NON_REP$_{DOMESTIC}$	−0.010 (−3.56)***	0.001 (0.75)	−0.009 (−3.33)***
SIZE$_{-1}$	−0.001 (−0.79)	−0.001 (−1.52)	−0.001 (−1.52)
MTB$_{-1}$	0.001 (2.21)**	0.000 (0.49)	0.001 (2.35)**
CASH_FLOW$_{-1}$	−0.008 (−1.97)**	−0.007 (−2.24)**	−0.011 (−2.57)**
CASH_HOLDING$_{-1}$	−0.049 (−8.62)***	−0.015 (−4.76)***	−0.055 (−9.72)***
ALTMAN_Z_SCORE$_{-1}$	0.000 (2.01)**	0.000 (1.58)	0.000 (2.51)**
GROWTH$_{-1}$	0.005 (4.63)***	0.002 (2.04)**	0.006 (4.88)***
PROFITABILITY$_{-1}$	−0.063 (−8.09)***	−0.028 (−5.77)***	−0.078 (−9.68)***
WEAK_FINANCE	0.000 (3.91)***	0.000 (0.07)	0.000 (3.80)***
EQUITY_MARKET_RETURN	0.026 (3.92)***	0.008 (1.78)*	0.029 (4.49)***
GDP_GROWTH	0.001 (1.09)	0.000 (0.34)	0.001 (1.24)
Constant	0.007 (0.46)	−0.011 (−1.92)*	−0.001 (−0.04)
Industry fixed effects	Yes	Yes	Yes
N	22886	12091	24278
Adj. R^2	0.046	0.044	0.060

TABLE 2 (continued)

Incremental Change in Debt Financing for Financially Constrained
Nonrepatriating Firms after the Tax Holiday

Variables	LT_DEBT 1	ST_DEBT 2	TOTAL_DEBT 3
Panel B. SA Index to Indicate Financial Constraints			
POST	0.023 (4.05)***	0.011 (4.06)***	0.029 (5.37)***
POST × NON_REP	0.003 (0.53)	−0.004 (−1.66)*	−0.001 (−0.14)
POST × NON_REP$_{SA}$	0.020 (4.39)***	0.000 (0.13)	0.021 (4.46)***
NON_REP	−0.011 (−2.74)***	0.002 (0.88)	−0.009 (−2.24)**
NON_REP$_{SA}$	−0.026 (−7.11)***	−0.002 (−0.72)	−0.026 (−7.39)***
SIZE$_{-1}$	−0.003 (−2.92)***	−0.001 (−1.57)	−0.003 (−3.55)***
MTB$_{-1}$	0.000 (1.44)	0.000 (0.69)	0.000 (1.71)*
CASH_FLOW$_{-1}$	−0.007 (−1.33)	−0.006 (−1.41)	−0.009 (−1.73)*
CASH_HOLDING$_{-1}$	−0.050 (−7.98)***	−0.011 (−3.31)***	−0.054 (−8.57)***
ALTMAN_Z_SCORE$_{-1}$	0.000 (1.80)*	0.000 (0.82)	0.000 (1.96)*
GROWTH$_{-1}$	0.004 (3.32)***	0.002 (2.20)**	0.005 (3.72)***
PROFITABILITY$_{-1}$	−0.065 (−7.31)***	−0.028 (−5.09)***	−0.079 (−8.56)***
WEAK_FINANCE	0.001 (4.83)***	−0.000 (−0.60)	0.000 (4.35)***
EQUITY_MARKET_RETURN	0.031 (4.53)***	0.010 (1.92)*	0.035 (5.03)***
GDP_GROWTH	0.001 (1.63)	−0.000 (−1.07)	0.001 (1.32)
Constant	0.021 (1.32)	−0.007 (−1.12)	0.015 (0.89)
Industry fixed effects	Yes	Yes	Yes
N	19337	10120	20059
Adj. R^2	0.041	0.039	0.054

CASH_HOLDING$_{-1}$ are −0.011 ($t = -2.57$) and −0.055 ($t = -9.72$), indicating that firms with high cash flow or holding more cash rely less on debt financing. The coefficient on ALTMAN_Z_SCORE$_{-1}$ is positive and significant (0.000, $t = 2.51$). Firm with a high Altman Z score suggests a lower default risk and can receive more debt financing. The coefficient on GROWTH$_{-1}$ is positive and significant (0.006, $t = 4.88$). High growth firms use more debt financing. The coefficient on PROFITABILITY$_{-1}$ is negative and significant (−0.078, $t = -9.68$). Profitable firms have more accumulated internal capital and rely less on external debt financing. As for macroeconomic and market variables, the coefficient on GDP_GROWTH is positive but insignificant (0.001, $t = 1.24$), and the coefficient on EQUITY_MARKET_RETURN is positive and significant (0.029, $t = 4.49$).

The coefficient on WEAK_FINANCE is significantly positive (0.000, $t = 3.80$), inconsistent with our prediction.[8]

2.   SA Index to Indicate Financial Constraints

We next perform our analysis by dividing nonrepatriating firms into high and low SA_INDEX groups. Firms with higher SA_INDEX are more financially constrained, and we expect them to experience an incremental increase in debt financing after the tax holiday. We predict a positive coefficient on POST $\times$ NON_REP$_{SA}$.

We reestimate equation (1) and report the results in Panel B of Table 2. Similarly, the coefficients on POST are positive and significant in columns 1 to 3 (0.023, $t = 4.05$ for LT_DEBT, 0.011, $t = 4.06$ for ST_DEBT, and 0.029, $t = 5.37$ for TOTAL_DEBT). The coefficients on POST $\times$ NON_REP are insignificant in columns 1 and 3 (0.003, $t = 0.53$ for LT_DEBT, -0.001, $t = -0.14$ for TOTAL_DEBT). The coefficient on POST $\times$ NON_REP in column 2 is negative and marginally significant (-0.004, $t = -1.66$ for ST_DEBT).

For our main variable of interest, the coefficient on POST $\times$ NON_REP$_{SA}$ in column 1 for LT_DEBT is positive and significant (0.020, $t = 4.39$). Therefore, high SA_INDEX (financially constrained) nonrepatriating firms benefit more in terms of long-term debt financing relative to low SA_INDEX (less financially constrained) nonrepatriating firms. This translates into an 86.96% (0.020/0.023) increase over the sample mean of LT_DEBT for high SA_INDEX nonrepatriating firms, or is equivalent to 12.82% (0.020/0.156) of the standard deviation of LT_DEBT for high SA_INDEX nonrepatriating firms. In column 2 for ST_DEBT, the coefficient on POST $\times$ NON_REP$_{SA}$ is insignificant (0.000, $t = 0.13$). In column 3 for TOTAL_DEBT, the coefficient on POST $\times$ NON_REP$_{SA}$ is positive and significant (0.021, $t = 4.46$). That is, high SA_INDEX (financially constrained) nonrepatriating firms experience an incremental increase in total debt financing after the tax holiday relative to low SA_INDEX (less financially constrained) nonrepatriating firms. This translates into an 80.77% (0.021/0.026) increase over the sample mean for high SA_INDEX firms, or is equivalent to 12.88% (0.021/0.163) of the standard deviation of TOTAL_DEBT for low SA_INDEX nonrepatriating firms.

To sum, using two measures to identify financially constrained nonrepatriating firms, we document that financially constrained nonrepatriating firms experience an additional increase in debt financing after the tax holiday relative to less constrained nonrepatriating firms. We attribute this observed incremental increase in debt financing to the externality of the tax holiday.

B.   Borrower Repatriation and Bank Lending

To further establish causality from repatriated funds to increased debt financing of nonrepatriating firms, we examine the private debt market using the

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[8]The value for WEAK_FINANCE is relatively high in the pretax holiday period but remains low in the post-tax holiday period. This is consistent with our hypothesis that the externality of the tax holiday improves the debt financing environment of nonrepatriating firms. When we estimate equation (1) without POST, POST $\times$ NON_REP, and POST $\times$ NON_REP$_{DOMESTIC}$, the coefficient on WEAK_FINANCE is significantly negative.

DealScan database. When U.S. MNEs repatriated funds under the tax holiday, they could either pay down domestic debt or borrow less domestically in the future. Banks with existing loan relationships with repatriating firms are more likely to receive debt repayment from or grant fewer new loans to these firms. These two effects can increase these banks' loan supply to nonrepatriating firms. Thus, we expect these banks to lend less (more) to repatriating (nonrepatriating) firms after the tax holiday. We estimate the following equation to test this prediction:

$$
\begin{aligned}
(2) \qquad \text{LOAN}_{it} \quad = \quad & \beta_0 + \beta_1 \text{BRF}_{it} + \beta_2 \text{LN\_OUT\_STANDING}_{it-1} \\
& + \beta_3 \text{OUT\_PERCENTAGE}_{it-1} + \beta_4 \text{ISSUE\_PERCENTAGE}_{it-1} \\
& + \beta_5 \text{W\_MATURITY}_{it-1} + \beta_6 \text{W\_SECURE}_{it-1} \\
& + \beta_7 \text{W\_TLB}_{it-1} + \beta_8 \text{W\_LEADBANK}_{it-1} + \varepsilon_{it},
\end{aligned}
$$

where the dependent variable LOAN_{it} refers to Bank i's lending to a specific group of borrowers in year t, weighted by the bank's total outstanding loans in DealScan at the beginning of year t.[9] BRF_{it} is the total amount of existing borrowers' proportioned repatriated funds during the tax holiday for Bank i in year t, weighted by the bank's total outstanding loans at the beginning of year t.[10] Most funds were repatriated in calendar years 2005 and 2006.[11] As a result, BRF_{it} equals 0 for all banks from years 2001 to 2004. For years 2005 and 2006, BRF_{it} is positive for banks whose existing borrowers repatriated during the tax holiday but zero for other banks. The coefficient on BRF_{it} captures the impact of repatriated funds from existing borrowers of Bank i on its lending to a specific group of borrowers after the tax holiday.

We examine bank lending to repatriating firms, nonrepatriating MNEs, and domestic firms, respectively. We estimate equation (2) for the three groups separately. We expect the coefficient on BRF_{it} to be negative for repatriating firms but positive for nonrepatriating firms. We control for the following bank characteristics. $\text{LN\_OUT\_STANDING}_{it-1}$ is the natural logarithm of outstanding

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[9]If the loan is syndicated, DealScan provides the variable *bankallocation* to indicate each lender's share of the total loan amount. We use this variable to decide Lender i's lending amount in each facility. If its value is missing, we estimate each lender's share of the facility according to the lender's role in the syndicated loan. If *bankallocation* is missing for all lenders in a syndicated loan and all lenders are lead banks (defined following Bharath, Dahiya, Saunders, and Srinivasan (2011)), we assume that all lenders divide the loan equally. If *bankallocation* is missing for all lenders in a syndicated loan and all lenders are nonlead banks, we assume that all lenders divide the loan equally. If *bankallocation* is missing for all lenders in a syndicated loan and there exists both lead and nonlead banks, we assume that lead banks altogether hold 58.88% of the loan and nonlead banks hold the remaining 41.12% (Bharath et al. (2011)). We assume that lead and nonlead banks divide loan shares equally within their respective group. If *bankallocation* is missing for some of the lenders in a syndicated loan, we first calculate the sum of *bankallocation* for lenders with this information and then assign undistributed shares to all other lenders equally. Finally, we use the DealScan variable *Facilityamt*, the total amount of a loan, and multiply it with *bankallcation*, to obtain each lender's holding amount in a loan.

[10]A bank is defined as an existing relationship bank of a repatriating firm if the firm has ongoing loans with the bank obtained before repatriation. As a repatriating firm can have multiple relationship banks, we split its repatriated fund proportionally to its relationship banks based on its loan amount with these banks. A bank also has multiple repatriating firms as borrowers. Therefore, at the bank level, we aggregate repatriating firms' proportioned repatriated fund to that bank. We scale this sum by Bank i's total outstanding loans to form BRF_{it}.

[11]For a few cases that took place in 2004, we treat them as if they happened in 2005.

loans of Bank i at the end of year $t-1$. OUT_PERCENTAGE$_{it-1}$ is the percentage of Bank i's outstanding loans to total outstanding loans in the DealScan in year $t-1$. ISSUE_PERCENTAGE$_{it-1}$ is Bank i's new-issued loans to total new issued loans in DealScan in year $t-1$. W_MATURITY$_{it-1}$ is Bank i's loan-size weighted average maturities for loans issued in year $t-1$. W_TLB$_{it-1}$ is Bank i's loan-size weighted average percentage of issued loans that are labeled "Term Loan B" for Loan Type in the DealScan in year $t-1$. Prior studies suggest that loan securitization in the U.S. market grew fast during our sample period (Benmelech, Dlugosz, and Ivashina (2012), Wang and Xia (2014)). As most of the securitized loans are Term Loan B, we use this variable to control for banks' preference for securitization. W_SECURE$_{it-1}$ is Bank i's loan-size weighted average percentage of issued loans that are secured in year $t-1$. W_LEADBANK$_{it-1}$ is Bank i's loan-size weighted average percentage of issued loans in which Band i is a lead bank in year $t-1$. We include bank fixed effects to control for time invariant bank features.

Table 3 presents results for equation (2). The sample period is from years 2001–2006. We only examine U.S. banks in DealScan. We further exclude observations where a bank does not issue loans to any of the three groups of firms during the sample period. Finally, we require a balanced panel.[12] The sample contains 887 banks and 5,322 observations for lending to each group of borrowers. In column 1, the dependent variable is lending to repatriating firms. The coefficient on BRF$_{it}$ is significantly negative $(-1.164, t = -2.50)$, suggesting that banks significantly reduce lending to repatriating firms after the tax holiday if their borrowers repatriate more during the tax holiday. In column 2, we examine lending to nonrepatriating MNEs. The coefficient on BRF$_{it}$ is positive but insignificant $(0.533, t = 1.21)$. In column 3, we examine lending to domestic firms. The coefficient on BRF$_{it}$ is significantly positive $(1.701, t = 2.58)$. Chi-square tests confirm that the coefficients on BRF$_{it}$ are significantly different between each 2 columns $(\chi^2 = 15.99, p = 0.000$ for columns 1 and 3, $\chi^2 = 7.73, p = 0.005$ for columns 1 and 2, and $\chi^2 = 2.75, p = 0.098$ for columns 2 and 3). When a bank's borrowers repatriate more, its lending to domestic firms increases significantly while lending to nonrepatriating MNEs does not significantly change during the post-tax holiday period. The coefficient on BRF$_{it}$ is also economically significant. Given a 1 standard deviation increase in BRF$_{it}$, lending to domestic firms increases by 0.009, which is about 3.1% of the sample standard deviation, and lending to repatriating firms decreases by 0.006, which is about 4.7% of the sample standard deviation. The above finding is consistent with our prior results that debt financing of domestic firms increased more significantly relative to nonrepatriating MNEs after the tax holiday.

We also use an indicator variable to replace BRF$_{it}$ as the independent variable. BRF_INDICATOR$_{it}$ is an indicator that equals 1 when BRF$_{it}$ is positive and 0 otherwise. Results are presented in columns 4 to 6 of Table 3. The coefficient on BRF_INDICATOR$_{it}$ is significantly negative for repatriating firms $(-0.015, t = -2.33)$, is positive but not significant for nonrepatriating MNEs $(0.000, t = 0.05)$, and is significantly positive for domestic firms $(0.028, t = 2.23)$.

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[12]Results are qualitatively unchanged when we use an unbalanced panel.

TABLE 3

Borrower Repatriation and Bank Lending

Table 3 presents results on the impact of borrowers' repatriation on banks' lending to repatriating firms, nonrepatriating MNEs, and domestic firms. The sample covers observations from 2001 to 2006. LOAN is the dependent variable. All continuous variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by banks. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

| | $LOAN_{it}$ | | | | | |
| | Repatriating Firms | Nonrepatriating MNEs | Domestic Firms | Repatriating Firms | Nonrepatriating MNEs | Domestic Firms |
Variables	1	2	3	4	5	6
BRF	−1.164	0.533	1.701			
	(−2.50)**	(1.21)	(2.58)***			
BRF_INDICATOR				−0.015	0.000	0.028
				(−2.33)**	(0.05)	(2.23)**
LN_OUT_STANDING$_{-1}$	−0.028	−0.074	−0.145	−0.028	−0.074	−0.146
	(−5.71)***	(−9.13)***	(−15.96)***	(−5.58)***	(−9.04)***	(−16.00)***
OUT_PERCENTAGE$_{-1}$	−24.919	−20.360	13.173	−25.670	−19.933	14.196
	(−1.61)	(−1.57)	(1.13)	(−1.65)*	(−1.55)	(1.23)
ISSUE_PERCENTAGE$_{-1}$	−5.032	6.647	10.090	−5.051	6.553	10.208
	(−0.64)	(0.79)	(1.41)	(−0.64)	(0.78)	(1.42)
W_MATURITY$_{-1}$	0.000	0.000	0.000	0.000	0.000	0.000
	(0.78)	(1.38)	(1.19)	(0.67)	(1.42)	(1.25)
W_TLB$_{-1}$	−0.002	0.010	−0.000	−0.001	0.010	−0.001
	(−0.20)	(0.57)	(−0.02)	(−0.14)	(0.55)	(−0.05)
W_SECURE$_{-1}$	−0.003	−0.009	0.006	−0.002	−0.009	0.006
	(−0.33)	(−0.75)	(0.36)	(−0.29)	(−0.76)	(0.32)
W_LEADBANK$_{-1}$	−0.001	−0.029	0.034	−0.001	−0.029	0.033
	(−0.11)	(−1.76)*	(1.32)	(−0.09)	(−1.75)*	(1.30)
Constant	0.184	0.454	0.865	0.182	0.453	0.869
	(7.07)***	(11.67)***	(19.96)***	(6.94)***	(11.53)***	(19.89)***
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	5322	5322	5322	5322	5322	5322
Adj. R^2	0.181	0.188	0.286	0.180	0.188	0.285
χ^2 tests for the coefficients on BRF (BRF_INDICATOR)	Columns 1 and 2: $\chi^2 = 7.73$, $p = 0.005$ Columns 2 and 3: $\chi^2 = 2.75$, $p = 0.098$ Columns 1 and 3: $\chi^2 = 15.99$, $p = 0.000$			Columns 4 and 5: $\chi^2 = 2.57$, $p = 0.109$ Columns 5 and 6: $\chi^2 = 4.12$, $p = 0.042$ Columns 4 and 6: $\chi^2 = 12.11$, $p = 0.001$		

The coefficients on BRF_INDICATORS$_{it}$ are statistically different between columns 4 and 6 ($\chi^2 = 12.11$, $p = 0.001$) and between columns 5 and 6 ($\chi^2 = 4.12$, $p = 0.042$).

Bank-level lending analysis, combined with firm-level debt financing analysis, further confirms that the tax holiday has a positive externality on nonrepatriating firms by improving their debt financing.

C.   Incremental Changes in Investments for Financially Constrained Nonrepatriating Firms after the Tax Holiday

We have shown that the tax holiday has a positive externality on debt financing of financially constrained nonrepatriating firms. Whether these firms also increase investments due to increased debt financing is an important issue. We estimate equation (1) using investment variables to examine this issue.

In Table 4, NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, SALE_OF_PPE, and R&D are dependent variables. We first divide nonrepatriating firms into domestic firms and nonrepatriating MNEs and report results in columns 1 to 5. In column 1, the coefficient on POST × NON_REP$_{DOMESTIC}$ is

TABLE 4

Incremental Changes in Investments for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Table 4 presents results on changes in investments for financially constrained nonrepatriating firms after the tax holiday. The sample covers observations from 2001 to 2007 excluding 2004. NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, SALE_OF_PPE, and R&D are dependent variables. All continuous variables except for the market and macroeconomic variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

Variables	NET_ INVESTMENT	CAPITAL_ EXPENDITURE	ACQUISITION	SALE_OF_ PPE	R&D	NET_ INVESTMENT	CAPITAL_ EXPENDITURE	ACQUISITION	SALE_OF_ PPE	R&D
	1	2	3	4	5	6	7	8	9	10
POST	0.010 (1.96)*	0.007 (3.78)***	0.010 (2.61)***	0.000 (0.58)	0.000 (0.00)	0.013 (2.45)**	0.009 (4.58)***	0.011 (2.72)***	0.000 (0.51)	0.001 (0.67)
POST × NON_REP	0.015 (2.55)**	0.002 (0.77)	0.008 (1.81)*	0.000 (0.54)	0.005 (1.94)*	0.002 (0.29)	−0.001 (−0.61)	0.001 (0.27)	0.000 (0.77)	0.004 (1.65)*
POST × NON_REP$_{DOMESTIC}$	0.012 (2.97)***	0.009 (4.69)***	0.001 (0.32)	0.000 (0.16)	0.007 (2.46)**					
POST × NON_REP$_{SA}$						0.027 (5.94)***	0.010 (4.96)***	0.007 (2.53)**	0.000 (0.20)	0.010 (3.19)***
NON_REP	−0.009 (−1.91)*	0.000 (0.16)	−0.005 (−1.60)	0.000 (0.56)	0.001 (0.35)	−0.002 (−0.44)	0.003 (1.42)	−0.003 (−1.01)	0.000 (0.76)	0.000 (0.06)
NON_REP$_{DOMESTIC}$	−0.004 (−1.41)	0.001 (0.74)	−0.005 (−2.69)***	0.000 (0.65)	−0.006 (−2.39)**					
NON_REP$_{SA}$						−0.029 (−7.68)***	−0.010 (−4.44)***	−0.015 (−7.05)***	−0.000 (−1.32)	−0.003 (−0.83)
SIZE$_{-1}$	0.002 (2.92)***	0.001 (1.45)	0.002 (4.78)***	−0.000 (−1.91)*	−0.001 (−2.01)**	−0.001 (−1.15)	−0.001 (−1.44)	0.000 (0.19)	−0.000 (−2.43)**	−0.001 (−0.75)
MTB$_{-1}$	0.002 (6.95)***	0.001 (5.96)***	0.000 (3.59)***	−0.000 (−0.80)	0.001 (6.20)***	0.001 (5.78)***	0.001 (5.02)***	0.000 (3.26)***	−0.000 (−0.17)	0.001 (5.59)***
CASH_FLOW$_{-1}$	0.000 (0.00)	0.001 (0.79)	−0.001 (−0.58)	0.001 (3.68)***	0.001 (0.43)	0.004 (1.29)	0.002 (1.16)	0.001 (0.71)	0.001 (3.28)***	0.001 (0.23)

(continued on next page)

TABLE 4 (continued)

Incremental Changes in Investments for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Variables	NET_ INVESTMENT 1	CAPITAL_ EXPENDITURE 2	ACQUISITION 3	SALE_OF_ PPE 4	R&D 5	NET_ INVESTMENT 6	CAPITAL_ EXPENDITURE 7	ACQUISITION 8	SALE_OF_ PPE 9	R&D 10
CASH HOLDING$_{-1}$	−0.014 (−2.37)**	−0.018 (−6.02)***	0.000 (0.11)	−0.003 (−8.25)***	0.158 (23.77)***	−0.017 (−2.55)**	−0.022 (−6.36)***	0.001 (0.29)	−0.004 (−7.55)***	0.151 (19.72)***
ALTMAN_Z_SCORE$_{-1}$	0.001 (7.71)***	0.001 (7.28)***	0.000 (1.24)	−0.000 (−2.40)**	−0.001 (−4.28)***	0.001 (5.85)***	0.000 (5.52)***	0.000 (0.12)	−0.000 (−2.51)**	−0.001 (−3.55)***
GROWTH$_{-1}$	0.005 (5.16)***	0.003 (6.24)***	0.002 (3.33)***	−0.000 (−0.35)	−0.001 (−1.71)*	0.004 (3.43)***	0.003 (4.94)***	0.001 (1.87)*	−0.000 (−0.56)	−0.000 (−0.51)
PROFITABILITY$_{-1}$	0.015 (2.75)***	0.002 (0.84)	0.015 (6.19)***	−0.001 (−2.89)***	−0.113 (−15.35)***	0.017 (3.04)***	0.002 (0.82)	0.017 (6.67)***	−0.001 (−2.82)***	−0.124 (−14.06)***
WEAK_FINANCE	0.000 (4.34)***	0.000 (8.06)***	0.000 (1.49)	0.000 (1.35)	0.000 (4.75)***	0.000 (4.59)***	0.000 (8.57)***	0.000 (1.29)	0.000 (1.01)	0.000 (5.45)***
EQUITY_MARKET_RETURN	0.020 (3.48)***	0.011 (5.04)***	0.003 (0.93)	0.000 (0.10)	0.021 (6.69)***	0.019 (3.07)***	0.010 (4.44)***	0.002 (0.54)	−0.000 (−0.35)	0.021 (6.24)***
GDP_GROWTH	0.001 (1.09)	0.001 (3.29)***	−0.000 (−0.51)	0.000 (0.26)	−0.000 (−0.06)	0.001 (1.01)	0.001 (3.64)***	−0.000 (−0.54)	0.000 (0.55)	0.000 (0.20)
Constant	0.019 (1.43)	0.026 (2.62)***	0.003 (0.35)	0.005 (2.39)**	0.006 (0.53)	0.044 (2.70)***	0.038 (3.16)***	0.018 (1.66)*	0.006 (2.78)***	0.001 (0.07)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	24413	24413	24413	24413	24413	20113	20113	20113	20113	20113
Adj. R^2	0.107	0.299	0.029	0.086	0.453	0.103	0.303	0.028	0.087	0.458

significantly positive (0.012, $t = 2.97$), suggesting that NET_INVESTMENT is 1.2% higher for domestic firms than nonrepatriating MNEs after the tax holiday. For domestic firms, the incremental increase is 14.63% (0.012/0.082) of the sample mean of NET_INVESTMENT, or equivalent to 7.59% (0.012/0.158) of the standard deviation of NET_INVESTMENT. Therefore, the incremental increase in NET_INVESTMENT is economically significant. In columns 2 and 5, the coefficients on POST $\times$ NON_REP$_{DOMESTIC}$ are significantly positive for CAPITAL_EXPENDITURE (0.009, $t = 4.69$) and R&D (0.007, $t = 2.46$). After the tax holiday, domestic firms' CAPITAL_EXPENDITURE and R&D increase 0.9% and 0.7% more than nonrepatriating MNEs, respectively. The increase in CAPITAL_EXPENDITURE is equivalent to a 15.52% (0.009/0.058) increase of the sample mean of CAPITAL_EXPENDITURE for domestic firms, or 10.71% (0.009/0.084) increase of the standard deviation of CAPITAL_EXPENDITURE for domestic firms. The increase in R&D is equivalent to a 9.46% (0.007/0.074) increase of sample mean of R&D for domestic firms, or 4.70% (0.007/0.149) increase of the standard deviation of R&D for domestic firms. The coefficients on POST $\times$ NON_REP$_{DOMESTIC}$ are positive but insignificant in columns 3 and 4 (0.001, $t = 0.32$ for ACQUISITION, 0.000, $t = 0.16$ for SALE_OF_PPE). For domestic firms, the incremental increase in investment is mainly driven by the increase in capital expenditure and R&D after the tax holiday. There is no incremental increase in ACQUISITION or SALE_OF_PPE for domestic firms after the tax holiday.

Similarly, we also divide nonrepatriating firms into high and low SA_INDEX groups. Results are reported in columns 6 to 10. The coefficients on POST $\times$ NON_REP$_{SA}$ suggest that after the tax holiday, high SA_INDEX nonrepatriating firms have an increase in NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, and R&D relative to low SA_INDEX nonrepatriating firms (0.027, $t = 5.94$ for NET_INVESTMENT, 0.010, $t = 4.96$ for CAPITAL_EXPENDITURE, 0.007, $t = 2.53$ for ACQUISITION, and 0.010, $t = 3.19$ for R&D).

To sum, the above results indicate that financially constrained nonrepatriating firms significantly increase investments after the tax holiday relative to less constrained nonrepatriating firms. We attribute this incremental increase in investments for financially constrained firms to the externality of the tax holiday.

D.   Increased Debt Financing to Increased Investments

We have argued that increased debt financing for financially constrained nonrepatriating firms help them finance unexploited projects. However, documenting an increase in debt financing and investments for domestic (high SA_INDEX) firms separately is insufficient to establish whether increased debt financing leads to increased investments. To establish the link between increased debt financing and increased investments, we restrict our sample to financially constrained nonrepatriating firms (domestic or high SA_INDEX firms). To the extent that increased debt financing is used to fund increased investments, we expect a positive association between the change in debt financing and the change in investments from the pretax holiday period to the post-tax holiday period. We estimate the

following regression to test our prediction:

$$
\begin{aligned}
\text{(3)} \quad \text{CHG\_INVESTMENT}_i ={} & \beta_0 + \beta_1 \text{CHG\_LT\_DEBT}_i + \beta_2 \text{CHG\_SIZE}_i \\
& + \beta_3 \text{CHG\_MTB}_i + \beta_4 \text{CHG\_CASH\_FLOW}_i + \beta_5 \text{CHG\_CASH\_HOLDING}_i \\
& + \beta_6 \text{CHG\_ALTMAN\_Z\_SCORE}_i + \beta_7 \text{CHG\_GROWTH}_i \\
& + \beta_8 \text{CHG\_PROFITABILITY}_i + \varepsilon_i.
\end{aligned}
$$

We focus on LT_DEBT as the increase in debt financing mainly comes from long-term debt. CHG_LT_DEBT is the change in the 3-year average of LT_DEBT from the pre-period (years 2001–2003) to the post-period (years 2005–2007) and CHG_INVESTMENT is the changes in the 3-year average of investment variables from the pre-period (years 2001–2003) to the post-period (years 2005–2007). CHG_NET_INVESTMENT, CHG_CAPITAL_EXPENDITURE, CHG_ACQUISITION, CHG_SALE_OF_PPE, and CHG_R&D are the changes in the 3-year averages of NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, SALE_OF_PPE, and R&D from the pre-period (years 2001–2003) to the post-period (years 2005–2007), respectively. We also include changes in firm specific control variables in equation (3).[13] A positive coefficient on CHG_LT_DEBT suggests that the increase in long-term debt likely leads to the increase in investments.

The results are reported in Table 5. Panels A and B present findings for domestic and high SA_INDEX firms, respectively. In Panel A, coefficients on CHG_LT_DEBT are positive and significant for CHG_NET_INVESTMENT (0.366, $t = 9.52$), CHG_CAPITAL_EXPENDITURE (0.097, $t = 6.95$), and CHG_ACQUISITION (0.173, $t = 7.03$). The coefficient on CHG_LT_DEBT is negative and significant for CHG_SALE_OF PPE (-0.010, $t = -3.48$). The coefficient on CHG_R&D is positive but insignificant (0.045, $t = 1.64$). Results are similar for Panel B. Coefficients on CHG_LT_DEBT are positive and significant for CHG_NET_INVESTMENT (0.312, $t = 7.41$), CHG_CAPITAL_EXPENDITURE (0.104, $t = 9.03$), CHG_ACQUISITION (0.137, $t = 10.67$), and CHG_R&D (0.047, $t = 2.69$). The coefficient on CHG_LT_DEBT is negative and significant for CHG_SALE_OF_PPE (-0.009, $t = -3.53$). Overall, we document a positive association between the increase in long-term debt and the increase in investments, suggesting that the positive impact of the tax holiday on domestic (high SA_INDEX) firms' debt financing leads to investments.

E.   Impact of Domestic Product Activity Deduction (DPAD) of the American Jobs Creation Act of 2004

In addition to the tax holiday, AJCA 2004 also contains several other provisions which may confound our findings. Most provisions under AJCA target very specific groups of businesses or entities, such as small business, restaurants, filming, etc. However, Section 199 of AJCA, the Domestic Product Activity Deduction (DPAD) provision, has a general impact. DPAD allows firms to deduct eligible net domestic income multiplies a statuary deduction rate from the income

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[13]Changes in macroeconomic and stock market variables are omitted as they are the same for each firm. Industry fixed effects are also excluded as they are canceled out when we take changes.

TABLE 5

Increased Debt Financing to Increased Investments

Table 5 presents results on the association between increased debt financing and increased investments of financially constrained nonrepatriating firms in the pre- and post-periods of the tax holiday. Panels A and B report results for domestic firms and high SA_INDEX nonrepatriating firms, respectively. CHG_NET_INVESTMENT, CHG_CAPITAL_EXPENDITURE, CHG_ACQUISITION, CHG_SALE_OF_PPE, and CHG_R&D are dependent variables. All continuous variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

Variables	CHG_NET_ INVESTMENT 1	CHG_CAPITAL_ EXPENDITURE 2	CHG_ ACQUISITION 3	CHG_SALE_ OF_PPE 4	CHG_R&D 5
Panel A. Domestic Firms					
CHG_LT_DEBT	0.366	0.097	0.173	−0.010	0.045
	(9.52)***	(6.95)***	(7.03)***	(−3.48)***	(1.64)
CHG_SIZE	0.010	0.004	0.002	−0.000	−0.006
	(2.15)**	(1.81)*	(0.93)	(−0.94)	(−1.61)
CHG_MTB	0.000	0.000	0.000	0.000	0.001
	(0.30)	(1.49)	(0.98)	(0.95)	(1.44)
CHG_CASH_FLOW	−0.025	−0.009	−0.008	0.002	−0.015
	(−2.02)**	(−1.93)*	(−1.41)	(1.85)*	(−1.31)
CHG_CASH_HOLDING	0.051	0.017	0.018	−0.002	0.004
	(2.23)**	(1.71)*	(1.41)	(−1.19)	(0.17)
CHG_ALTMAN_Z_SCORE	0.001	0.000	−0.000	−0.000	−0.000
	(1.24)	(1.09)	(−0.07)	(−1.27)	(−0.88)
CHG_GROWTH	0.001	0.002	0.003	−0.000	0.002
	(0.36)	(1.22)	(2.31)**	(−0.06)	(0.84)
CHG_PROFITABILITY	0.058	0.013	0.032	−0.003	−0.108
	(2.95)***	(1.94)*	(3.17)***	(−1.63)	(−5.53)***
Constant	0.006	0.003	0.007	0.001	0.009
	(1.87)*	(1.72)*	(4.48)***	(1.75)*	(3.30)***
N	1782	1782	1782	1782	1782
Adj. R^2	0.167	0.060	0.117	0.017	0.200
Panel B. High SA_INDEX Nonrepatriating Firms					
CHG_LT_DEBT	0.312	0.104	0.137	−0.009	0.047
	(7.41)***	(9.03)***	(10.67)***	(−3.53)***	(2.69)***
CHG_SIZE	0.011	0.005	0.001	0.000	−0.010
	(2.31)**	(2.45)**	(0.59)	(0.01)	(−3.36)***
CHG_MTB	0.001	0.000	0.000	−0.000	0.001
	(1.29)	(1.69)*	(1.40)	(−0.20)	(1.99)**
CHG_CASH_FLOW	−0.033	−0.013	−0.008	0.002	−0.009
	(−2.88)***	(−3.52)***	(−1.99)**	(2.34)**	(−1.59)
CHG_CASH_HOLDING	0.038	0.011	0.014	−0.002	−0.022
	(1.65)*	(1.04)	(1.19)	(−0.97)	(−1.33)
CHG_ALTMAN_Z_SCORE	0.001	0.000	0.000	−0.000	−0.001
	(1.17)	(0.57)	(0.05)	(−0.77)	(−2.19)**
CHG_GROWTH	0.001	0.001	0.003	−0.000	0.001
	(0.23)	(0.66)	(2.58)***	(−0.19)	(0.65)
CHG_PROFITABILITY	0.064	0.018	0.034	−0.004	−0.091
	(3.59)***	(2.69)***	(4.53)***	(−2.44)**	(−8.93)***
Constant	0.012	0.003	0.010	0.001	0.013
	(3.35)***	(1.43)	(4.66)***	(1.71)*	(4.56)***
N	1,326	1,326	1,326	1,326	1,326
Adj. R^2	0.150	0.069	0.094	0.012	0.185

tax (Lester and Rector (2016)).[14] The deduction rate started at 5% in 2005 and 2006, increased to 6 % in 2007, and then to 9 % in 2010 and thereafter.

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[14]The type of income eligible for the deduction is defined as qualified production activities income (QPAI). QPAI, in general, is calculated as receipts from the sale of domestically produced goods – (cost of goods sold attributable to domestic production + other expenses allocable to domestic production).

DPAD may also increase the financing and investments of financially constrained nonrepatriating firms relative to less financially constrained nonrepatriating firms. Tax savings from claimed DPAD income directly add to firms' retained earnings and thus internal funds. These increased internal funds can benefit financially constrained firms' investments. Further, when retained earnings increase, firms' leverage decreases, leaving room for further debt financing. Increased debt financing can also benefit investments. Finally, given tax savings from DPAD, financially constrained nonrepatriating firms likely have a greater incentive than less constrained firms to claim domestic income under DPAD to get the benefits.

We perform several tests to determine whether DPAD plays a deciding role in driving the increases in debt financing and investments for financially constrained nonrepatriating firms. Specifically, we exclude firms that are more likely to be affected by DPAD and use the remaining observations to perform our tests. If it is DPAD that plays a major role, the magnitude and economic significance of the coefficients on POST × NON_REP$_{DOMESTIC}$ and POST × NON_REP$_{SA}$ should drop significantly.

We use 3 different ways to identify firms that are more likely to be affected by DPAD and exclude them from our analyses. First, we use the keyword list provided by Lester (2019) to identify firms that reported claiming DPAD in their 10-K filings. We exclude these firms from our sample and reestimate equation (1). Second, the income tax deduction under DPAD cannot exceed 50% of a firm's W-2 wage (Lester (2019)). Therefore, more labor-intensive firms benefit more from DPAD as they have more wages to deduct against. Accordingly, we exclude firms whose number of employees scaled by total sales was above the industry median in 2003 from our sample and reestimate equation (1). Finally, tax deduction under DPAD is not eligible for firms with negative taxable income. Therefore, we keep firms whose tax loss carryforwards scaled by pretax income in 2003 were above the industry median in our sample, or firms which reported negative pretax income in all the sample years and reestimate equation (1).[15]

We report results using the 3 new samples in Table 6. Our findings are qualitatively and quantitatively unchanged. Therefore, we only discuss results in Panels A1 and A2 where DPAD claiming firms are excluded. In Panel A1, the coefficients on POST × NON_REP$_{DOMESTIC}$are positive and significant for LT_DEBT (0.012, $t = 2.55$), TOTAL_DEBT (0.010, $t = 2.03$), CAPITAL_EXPENDITURE (0.005, $t = 2.59$), and R&D (0.007, $t = 2.12$). We document a similar result for high SA_INDEX nonrepatriating firms in Panel A2. Overall, these results confirm that DPAD does not play a deciding role in our findings.

F.   Additional Tests

1.   Extending the Sample Until 2010

In this section, we extend the sample to 2010 to show a longer-horizon picture of the post-tax holiday period. The tax holiday under AJCA 2004 was a one-time event and the U.S. MNEs continued to build cash overseas afterward

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The lesser of taxable income without Section 199 deduction or QPAI is then multiplied by the statuary deduction percentage.

[15]Scaled tax loss carryforwards are only calculated for firms with positive pretax income.

TABLE 6

Impact of Domestic Product Activity Deduction (DPAD) of the
American Jobs Creation Act of 2004

Table 6 presents results using samples where firms that are more likely to be affected by DPAD are excluded. LT_DEBT, ST_DEBT, TOTAL_DEBT, NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, SALE_OF_PPE, and R&D are dependent variables. Control variables of equation (1) and industry fixed effects are included. All continuous variables except the market and macroeconomic variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

	Debt Financing			Investments				
Variables	LT_ DEBT	ST_ DEBT	TOTAL_ DEBT	NET_ INVESTMENT	CAPITAL_ EXPENDITURE	ACQUISITION	SALE_ OF_PPE	R&D
	1	2	3	4	5	6	7	8
Panel A1. Exclude DPAD Claiming Firms – Domestic Firms to Indicate Financial Constraints								
POST	0.024 (3.45)***	0.011 (3.24)***	0.030 (4.48)***	0.017 (2.26)**	0.004 (1.69)*	0.015 (2.82)***	0.001 (1.31)	−0.002 (−0.55)
POST × NON_REP	0.002 (0.20)	−0.002 (−0.54)	−0.001 (−0.08)	0.010 (1.22)	0.004 (1.64)	0.002 (0.37)	−0.001 (−0.85)	0.006 (1.70)*
POST × NON_ REP$_{DOMESTIC}$	0.012 (2.55)**	−0.004 (−1.41)	0.010 (2.03)**	0.006 (1.33)	0.005 (2.59)***	0.001 (0.28)	0.000 (0.81)	0.007 (2.12)**
Panel A2. Exclude DPAD Claiming Firms – SA Index to Indicate Financial Constraints								
POST	0.028 (3.85)***	0.009 (2.61)***	0.032 (4.61)***	0.020 (2.62)***	0.005 (2.34)**	0.016 (2.87)***	0.001 (1.16)	0.000 (0.07)
POST × NON_REP	−0.004 (−0.58)	−0.004 (−1.20)	−0.007 (−0.99)	−0.009 (−1.15)	−0.002 (−0.97)	−0.005 (−0.79)	−0.000 (−0.36)	0.005 (1.78)*
POST × NON_REP$_{SA}$	0.020 (3.75)***	0.002 (0.72)	0.021 (3.95)***	0.013 (5.36)***	0.013 (5.67)***	0.006 (2.03)**	0.000 (0.06)	0.009 (2.43)**
Panel B1. Exclude Labor Intensive Firms – Domestic Firms to Indicate Financial Constraints								
POST	0.018 (2.53)**	0.012 (3.50)***	0.025 (3.60)***	0.008 (1.04)	0.004 (2.28)**	0.014 (2.60)***	−0.000 (−0.05)	−0.000 (−0.04)
POST × NON_REP	0.010 (1.29)	−0.003 (−0.88)	0.007 (0.91)	0.019 (2.32)**	0.006 (2.76)***	0.005 (0.76)	0.000 (0.87)	−0.000 (−0.07)
POST × NON_ REP$_{DOMESTIC}$	0.014 (2.57)**	−0.004 (−1.08)	0.012 (2.23)**	0.014 (2.42)**	0.009 (3.63)***	0.003 (0.81)	0.000 (0.34)	0.007 (1.80)*
Panel B2. Exclude Labor Intensive Firms – SA Index to Indicate Financial Constraints								
POST	0.023 (3.08)***	0.011 (3.14)***	0.029 (4.02)***	0.013 (1.66)*	0.006 (3.08)***	0.016 (2.80)***	−0.000 (−0.27)	0.000 (0.17)
POST × NON_REP	0.002 (0.23)	−0.003 (−0.95)	−0.001 (−0.14)	0.003 (0.31)	0.003 (1.39)	−0.004 (−0.60)	0.001 (1.56)	−0.002 (−0.52)
POST × NON_REP$_{SA}$	0.028 (4.27)***	0.003 (0.65)	0.029 (4.38)***	0.025 (3.85)***	0.007 (2.39)**	0.007 (1.70)*	0.000 (0.25)	0.003 (0.66)
Panel C1. Exclude Firms with High Taxable Income – Domestic Firms to Indicate Financial Constraints								
POST	0.020 (2.08)**	0.022 (5.06)***	0.032 (3.59)***	0.015 (1.91)*	0.007 (2.83)***	0.006 (1.08)	−0.001 (−1.59)	0.002 (0.56)
POST × NON_REP	0.014 (1.29)	−0.011 (−2.24)**	0.007 (0.66)	0.013 (1.47)	−0.001 (−0.33)	0.014 (2.10)**	0.001 (1.64)	0.005 (1.08)
POST × NON_ REP$_{DOMESTIC}$	0.017 (2.01)**	0.001 (0.22)	0.018 (2.20)**	0.019 (2.67)***	0.015 (4.59)***	−0.003 (−0.82)	−0.000 (−0.75)	0.018 (2.86)***
Panel C2. Exclude Firms with High Taxable Income – SA Index to Indicate Financial Constraints								
POST	0.025 (2.60)***	0.022 (4.88)***	0.036 (4.02)***	0.021 (2.66)***	0.010 (3.88)***	0.008 (1.29)	−0.001 (−1.60)	0.004 (0.93)
POST × NON_REP	0.004 (0.36)	−0.009 (−2.30)**	−0.003 (−0.27)	−0.001 (−0.11)	−0.004 (−1.41)	0.007 (1.00)	0.001 (1.32)	0.005 (1.12)
POST × NON_REP$_{SA}$	0.032 (3.39)***	0.001 (0.11)	0.032 (3.36)***	0.033 (4.07)***	0.017 (4.50)***	0.005 (1.18)	0.000 (0.19)	0.019 (2.61)***

(Dharmapala et al. (2011)). As a result, the positive impact on debt financing may exist only for a short period of time. In addition, after the 2008 financial crisis, the U.S. governments formulated further stimulus policies to help improve the economy. As such, during the period after 2007, changes in debt financing/investments for financially constrained nonrepatriating firms can be confounded by the

financial crisis and the ensuing stimulus policies. Therefore, the interpretation of the incremental change post-2007 can be complicated.

To determine the longer period effect, we define 2 indicators. POST1 equals 1 for fiscal years 2005–2007, and 0 otherwise. POST2 equals 1 for fiscal years 2008–2010, and 0 otherwise. We perform tests using the extended sample and the results are presented in Table 7. In Panel A, the coefficients on POST1 × NON_REP$_{DOMESTIC}$ are positive and significant for LT_DEBT (0.012, $t = 3.12$), TOTAL_DEBT (0.011, $t = 2.82$), NET_INVESTMENT (0.013, $t = 3.21$), CAPITAL_ EXPENDITURE (0.009, $t = 4.77$), and R&D (0.007, $t = 2.44$). The coefficients on POST2 × NON_REP$_{DOMESTIC}$ are insignificant in columns 1 to 8. There is no additional increase in debt financing and investments for domestic firms in the second post-tax holiday period relative to nonrepatriating MNEs.

In Panel B of Table 7, the coefficients on POST1 × NON_REP$_{SA}$ are positive and significant for LT_DEBT (0.019, $t = 4.32$), TOTAL_DEBT (0.019, $t = 4.39$), NET_INVESTMENT (0.026, $t = 6.11$), CAPITAL_EXPENDITURE (0.010, $t = 5.07$), ACQUISITION (0.007, $t = 2.54$), and R&D (0.011, $t = 3.32$). The coefficients on POST2 × NON_REP$_{SA}$ are significant over columns 1 to 6 (0.018, $t = 4.31$ for LT_DEBT, 0.007, $t = 2.28$ for ST_DEBT, 0.022, $t = 5.12$

TABLE 7

Extending the Sample Until 2010

Table 7 presents results using an extended sample. The sample covers observations from 2001 to 2010 excluding 2004. LT_DEBT, ST_DEBT, TOTAL_DEBT, NET_INVESTMENT, CAPITAL_EXPENDITURE, ACQUISITION, SALE_OF_PPE, and R&D are dependent variables. Control variables of equation (1) and industry fixed effects are included. All continuous variables except the market and macroeconomic variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

	Debt Financing			Investments				
Variables	LT_DEBT	ST_DEBT	TOTAL_DEBT	NET_INVESTMENT	CAPITAL_EXPENDITURE	ACQUISITION	SALE_OF_PPE	R&D
	1	2	3	4	5	6	7	8
POST1	0.015	0.013	0.023	0.004	0.005	0.008	0.000	−0.001
	(2.99)***	(5.31)***	(4.67)***	(0.88)	(3.06)***	(2.10)**	(0.55)	(−0.57)
POST2	0.000	0.008	0.006	−0.012	−0.005	−0.005	−0.001	−0.006
	(0.11)	(3.62)***	(1.39)	(−2.52)**	(−3.39)***	(−1.47)	(−2.05)**	(−2.86)***
POST1 × NON_REP	0.009	−0.004	0.005	0.014	0.002	0.008	0.000	0.005
	(1.49)	(−1.65)*	(0.83)	(2.52)**	(0.81)	(1.83)*	(0.63)	(2.12)**
POST2 × NON_REP	0.005	−0.003	0.003	0.011	0.002	0.006	−0.000	0.006
	(1.07)	(−1.02)	(0.58)	(2.11)**	(1.27)	(1.63)	(−0.66)	(2.08)**
POST1 × NON_REP$_{DOMESTIC}$	0.012	−0.002	0.011	0.013	0.009	0.001	0.000	0.007
	(3.12)***	(−0.92)	(2.82)***	(3.21)***	(4.77)***	(0.34)	(0.05)	(2.44)**
POST2 × NON_REP$_{DOMESTIC}$	0.005	0.001	0.006	0.004	0.003	0.002	0.000	0.003
	(1.49)	(0.23)	(1.58)	(1.14)	(1.44)	(1.04)	(0.59)	(1.03)
Panel B. SA Index to Indicate Financial Constraints								
POST1	0.018	0.013	0.025	0.007	0.007	0.009	0.000	−0.000
	(3.40)***	(5.09)***	(5.02)***	(1.41)	(3.78)***	(2.41)**	(0.54)	(−0.23)
POST2	0.001	0.007	0.006	−0.011	−0.005	−0.005	−0.001	−0.006
	(0.26)	(3.09)***	(1.41)	(−2.35)**	(−2.96)***	(−1.37)	(−1.83)*	(−2.75)***
POST1 × NON_REP	0.003	−0.005	−0.001	0.002	−0.001	0.001	0.000	0.004
	(0.53)	(−1.80)*	(−0.18)	(0.28)	(−0.61)	(0.29)	(0.79)	(1.66)*
POST2 × NON_REP	−0.003	−0.004	−0.006	−0.003	−0.004	0.002	−0.000	0.006
	(−0.54)	(−1.79)*	(−1.21)	(−0.62)	(−2.29)**	(0.39)	(−0.55)	(2.22)**
POST1 × NON_REP$_{SA}$	0.019	0.000	0.019	0.026	0.010	0.007	0.000	0.011
	(4.32)***	(0.12)	(4.39)***	(6.11)***	(5.07)***	(2.54)**	(0.19)	(3.32)***
POST2 × NON_REP$_{SA}$	0.018	0.007	0.022	0.023	0.010	0.010	0.000	0.001
	(4.31)***	(2.28)**	(5.12)***	(5.52)***	(4.71)***	(4.04)***	(0.14)	(0.34)

for TOTAL_DEBT, 0.023, $t = 5.52$ for NET_INVESTMENT, 0.010, $t = 4.71$ for CAPITAL_EXPENDITURE, and 0.010, $t = 4.04$ for ACQUISITION). High SA_INDEX nonrepatriating firms appear to continue to issue more long-term debt and invest more in the second post-tax holiday period.

2. Incremental Change in Equity Financing for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Here, we test the change in equity financing of financially constrained non-repatriating firms after the tax holiday. Several prior studies document that repatriating firms significantly increase their share repurchases or dividend payout after the tax holiday (Blouin and Krull (2009), Dharmapala et al. (2011), and Brennan (2014)). The increased total payout from repatriating firms can add to the supply of capital in the equity market. This can potentially increase equity financing of financially constrained nonrepatriating firms. However, such a link is less than clear. First, shareholders who receive additional payout can choose to keep the funds in their personal savings accounts (Blouin and Krull (2009)). Second, even if shareholders reinvest the funds in the equity market, they can go to the secondary market instead of improving equity financing of nonrepatriating firms. Therefore, we make no prediction on whether the tax holiday leads to an increase in equity financing for financially constrained nonrepatriating firms.

Results are reported in Panel A of Table 8. The dependent variable EQUITY is defined as sales of common and preferred shares minus purchases of common and preferred shares divided by lagged total assets. The coefficients on POST $\times$ NON_REP$_{DOMESTIC}$ and POST $\times$ NON_REP$_{SA}$ are 0.030 ($t = 5.42$) and 0.056 ($t = 8.64$). Therefore, domestic (high SA_INDEX) firms appear to significantly increase equity financing relative to nonrepatriating MNEs (low SA_INDEX firms) after the tax holiday.

3. Incremental Change in Payout for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Although financially constrained nonrepatriating firms experience an increase in debt financing relative to less constrained nonrepatriating firms, it is unlikely that they would use such funds for payout as they have unexploited investment opportunities. We empirically test this issue. We first examine total payout (TOTAL_PAYOUT) and then share repurchases (REPURCHASE) and dividends (DIVIDENDS) separately. Panel B of Table 8 presents the results. The coefficients on POST $\times$ NON_REP$_{DOMESTIC}$ are significantly negative in columns 1 and 2 (-0.005, $t = -2.34$ for TOTAL_PAYOUT and -0.006, $t = -4.19$ for RE-PURCHASE), but insignificant in column 3 (0.001, $t = 1.39$ for DIVIDENDS). Results are qualitatively similar when we use SA_INDEX to indicate financial constraints.

These results suggest that while financially constrained nonrepatriating firms obtain more debt financing after the tax holiday relative to less constrained nonrepatriating firms, their payout is reduced after the tax holiday relative to less constrained nonrepatriating firms, further supporting that financially constrained firms have unexploited investment opportunities.

TABLE 8

Incremental Changes in Equity Financing and Payout for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Table 8 presents results on changes in equity financing and payout for financially constrained nonrepatriating firms after the tax holiday. The sample covers observations from 2001 to 2007 excluding 2004. EQUITY is the dependent variable in Panel A. TOTAL_PAYOUT, REPURCHASE, and DIVIDENDS are dependent variables in Panel B. Control variables of equation (1) and industry fixed effects are included. All continuous variables except for the market and macroeconomic variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

Panel A. Change in Equity Financing for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Variables	EQUITY 1	EQUITY 2
POST	−0.027 (−6.45)***	−0.025 (−5.84)***
POST × NON_REP	0.031 (6.50)***	0.013 (2.95)***
POST × NON_REP$_{DOMESTIC}$	0.030 (5.42)***	
POST × NON_REP$_{SA}$		0.056 (8.64)***

Panel B. Change in Payout for Financially Constrained Nonrepatriating Firms after the Tax Holiday

Variables	TOTAL_PAYOUT 1	REPURCHASE 2	DIVIDENDS 3	TOTAL_PAYOUT 4	REPURCHASE 5	DIVIDENDS 6
POST	0.038 (8.37)***	0.028 (9.27)***	0.003 (3.95)***	0.038 (8.33)***	0.028 (9.30)***	0.003 (3.80)***
POST × NON_REP	−0.022 (−4.62)***	−0.017 (−5.44)***	−0.001 (−1.26)	−0.016 (−3.32)***	−0.013 (−4.18)***	0.000 (0.30)
POST × NON_REP$_{DOMESTIC}$	−0.005 (−2.34)**	−0.006 (−4.19)***	0.001 (1.39)			
POST × NON_REP$_{SA}$				−0.018 (−6.95)***	−0.014 (−9.25)***	−0.001 (−2.50)**

G. Robustness Tests

1. Parallel Trend

Debt financing and investment activities of financially constrained and less constrained nonrepatriating firms should follow a similar trend before the tax holiday. Otherwise, our results can be attributed to the difference in trend instead of a positive externality of the tax holiday. To validate our empirical design and test the parallel trend assumption, we estimate the following regression:

$$
\begin{aligned}
(4) \quad Y_{it} = {} & \alpha + \beta_{2002}\text{YEAR}_{2002} + \ldots + \beta_{2007}\text{YEAR}_{2007} \\
& + \gamma_{2001}\text{YEAR}_{2001} \times \text{NON\_REP}_i + \ldots + \gamma_{2007}\text{YEAR}_{2007} \times \text{NON\_REP}_i \\
& + \eta_{2001}\text{YEAR}_{2001} \times \text{NON\_REP}_{\text{CONSTRAINED},i} \\
& + \ldots \eta_{2007}\text{YEAR}_{2007} \times \text{NON\_REP}_{\text{CONSTRAINED},i} + \varepsilon_{it},
\end{aligned}
$$

where Y_{it} equals TOTAL_DEBT_{it}, $\text{NET\_INVESTMENT}_{it}$ or $\text{R\&D}_{it}$. YEAR_t equals 1 if the observation is in year t, and 0 otherwise. We drop POST and use YEAR_t to interact with NON_REP_i and $\text{NON\_REP}_{\text{CONSTRAINED},i}$. η_t captures the difference in debt financing/investments between financially constrained and less constrained nonrepatriating firms in year t. We draw η_t along with its 95 percentile confidence interval in Figures 1 to 6. If constrained and less constrained

FIGURE 1

Parallel Trend of TOTAL_DEBT between Domestic Firms and Nonrepatriating MNEs

Figure 1 presents the estimated η_t and their 95 percent confidence intervals for equation (4), where the dependent variable is TOTAL_DEBT. We use domestic firms to indicate financial constraint. The vertical axis represents the magnitude of estimated η_t. Year is indicated in the horizontal axis. F-tests of the differences among estimated η_{2001}, η_{2002}, and η_{2003} are reported.

	$\eta_{2002} - \eta_{2001} = 0$	$\eta_{2003} - \eta_{2002} = 0$	$\eta_{2003} - \eta_{2001} = 0$
F-tests	2.52	0.43	0.65
	(0.112)	(0.512)	(0.419)
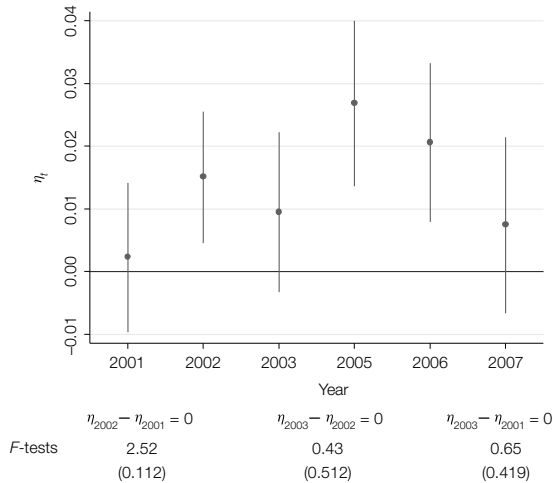
nonrepatriating firms follow a similar trend before the tax holiday, η_{2001}, η_{2002}, and η_{2003} should be insignificantly different from each other.

For TOTAL_DEBT, we do not document different trends for domestic firms (high SA_INDEX nonrepatriating firms) relative to the nonrepatriating MNEs (low SA_INDEX nonrepatriating firms) before the tax holiday. In Figures 1 and 2, η_{2001}, η_{2002}, and η_{2003} are insignificantly different from 0 except for η_{2002} in Figure 1. F-tests in both figures show that η_{2001}, η_{2002}, and η_{2003} are insignificantly different from each other.

For NET_INVESTMENT, the parallel trend assumption holds for domestic and nonrepatriating MNEs. Figure 3 shows that η_{2001}, η_{2002}, and η_{2003} are insignificantly different from 0. F-tests show that η_{2001}, η_{2002}, and η_{2003} are insignificantly different from each other. For high and low SA_INDEX nonrepatriating firms, η_{2001}, η_{2002}, and η_{2003} are negative and significant as shown in Figure 4, suggesting a significantly lower investment level for high SA_INDEX nonrepatriating firms before the tax holiday. The difference significantly shrinks after the tax holiday as η_{2005}, η_{2006}, and η_{2007} become insignificantly different from 0. Of the 3 pairs of comparison, only η_{2001} and η_{2002} are significantly different from each other. The parallel trend assumption generally holds for the high and low SA_INDEX nonrepatriating firms.

For R&D, Figures 5 and 6 show that η_{2001}, η_{2002}, and η_{2003} are significantly positive, suggesting a significantly higher R&D for domestic firms (high SA_INDEX nonrepatriating firms) relative to nonrepatriating MNEs (low SA_INDEX nonrepatriating firms) before the tax holiday. F-tests show that η_{2001}, η_{2002}, and η_{2003} are insignificantly different from each other in Figure 5.

FIGURE 2

Parallel Trend of TOTAL_DEBT between High and Low SA_INDEX Nonrepatriating Firms

Figure 2 presents the estimated η_t and their 95 percent confidence intervals for equation (4), where the dependent variable is TOTAL_DEBT. We use SA_INDEX to indicate financial constraint. The vertical axis represents the magnitude of estimated η_t. Year is indicated in the horizontal axis. F-tests of the differences among estimated η_{2001}, η_{2002}, and η_{2003} are reported.

	$\eta_{2002} - \eta_{2001} = 0$	$\eta_{2003} - \eta_{2002} = 0$	$\eta_{2003} - \eta_{2001} = 0$
F-tests	0.52	0.05	0.21
	(0.471)	(0.827)	(0.650)

FIGURE 3

Parallel Trend of NET_INVESTMENT between Domestic Firms and Nonrepatriating MNEs

Figure 3 presents the estimated η_t and their 95 percent confidence intervals for equation (4), where the dependent variable is NET_INVESTMENT. We use domestic firms to indicate financial constraint. The vertical axis represents the magnitude of estimated η_t. Year is indicated in the horizontal axis. F-tests of the differences among estimated η_{2001}, η_{2002}, and η_{2003} are reported.

	$\eta_{2002} - \eta_{2001} = 0$	$\eta_{2003} - \eta_{2002} = 0$	$\eta_{2003} - \eta_{2001} = 0$
F-tests	0.10	0.30	2.18
	(0.294)	(0.583)	(0.140)

FIGURE 4

Parallel Trend of NET_INVESTMENT Between High and Low SA_INDEX
Nonrepatriating Firms

Figure 4 presents the estimated η_t and their 95 percent confidence intervals for equation (4), where the dependent variable is NET_INVESTMENT. We use SA_INDEX to indicate financial constraint. The vertical axis represents the magnitude of estimated η_t. Year is indicated in the horizontal axis. F-tests of the differences among estimated η_{2001}, η_{2002}, and η_{2003} are reported.
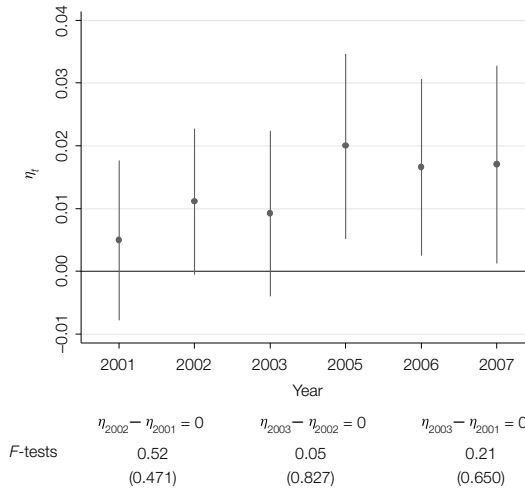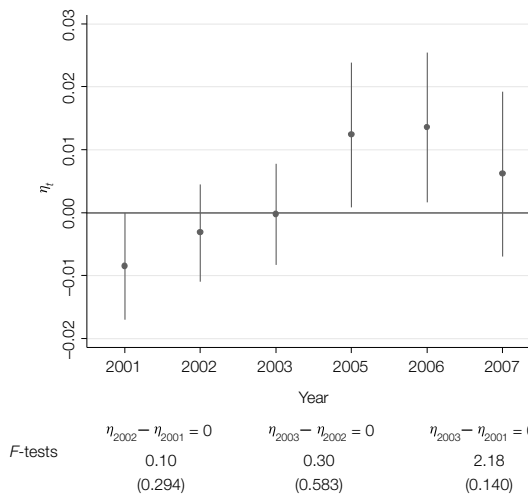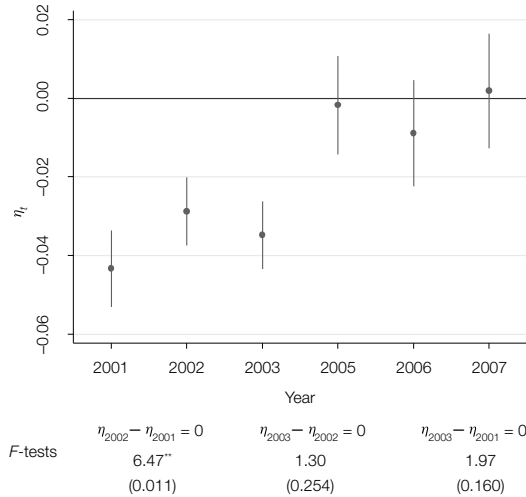

	$\eta_{2002} - \eta_{2001} = 0$	$\eta_{2003} - \eta_{2002} = 0$	$\eta_{2003} - \eta_{2001} = 0$
F-tests	6.47**	1.30	1.97
	(0.011)	(0.254)	(0.160)

The parallel trend assumption holds for domestic and nonrepatriating MNEs. For high and low SA_INDEX nonrepatriating firms, among the 3 pairs of comparison, only η_{2001} and η_{2003} are significantly different from each other. Again, the parallel trend assumption generally holds for the high and low SA_INDEX nonrepatriating firms.

2.   Alternative Measures of Financial Constraints

We use two alternative measures of financial constraints to divide nonrepatriating firms. We first use credit rating as a proxy for the extent of financial constraint. Firms with a credit rating can more easily access public financing and are less likely to face financial constraints. We define an indicator variable NON_REP$_{\text{NON\_RATING}}$ that equals 1 if a nonrepatriating firm has no issuer credit rating, and 0 otherwise. Qualitatively similar results are reported in Panel A of Table 9.

We next use a textual-based financial constraint measure developed by Hoberg and Maksimovic (2014). This measure is based on the similarity of a firm's 10-K to a sample of firms that report a delay in investments due to specific liquidity issues. A firm is more likely to be financially constrained if its 10-K filing is more comparable to those of the sample firms. As we are mainly interested in debt financing, we use their measure *Debtdelaycon*, which captures a firm's financial constraints related to debt issuance. For nonrepatriating firms, NON_REP$_{\text{HM}}$ is an indicator that equals 1 if *Debtdelaycon* of a firm is above the sample median

FIGURE 5

Parallel Trend of R&D between Domestic Firms and Nonrepatriating MNEs

Figure 5 presents the estimated η_t and their 95 percent confidence intervals for equation (4), where the dependent variable is R&D. We use domestic firms to indicate financial constraint. The vertical axis represents the magnitude of estimated η_t. Year is indicated in the horizontal axis. F-tests of the differences among estimated η_{2001}, η_{2002}, and η_{2003} are reported.

	$\eta_{2002} - \eta_{2001} = 0$	$\eta_{2003} - \eta_{2002} = 0$	$\eta_{2003} - \eta_{2001} = 0$
F-tests	1.09	0.11	0.29
	(0.296)	(0.742)	(0.592)

FIGURE 6

Parallel Trend of R&D between High and Low SA_INDEX Nonrepatriating Firms

Figure 6 presents the estimated η_t and their 95 percent confidence intervals for equation (4), where the dependent variable is R&D. We use SA_INDEX to indicate financial constraint. The vertical axis represents the magnitude of estimated η_t. Year is indicated in the horizontal axis. F-tests of the differences among estimated η_{2001}, η_{2002}, and η_{2003} are reported.
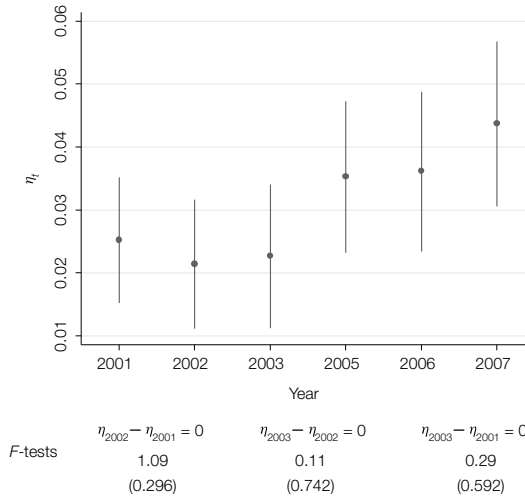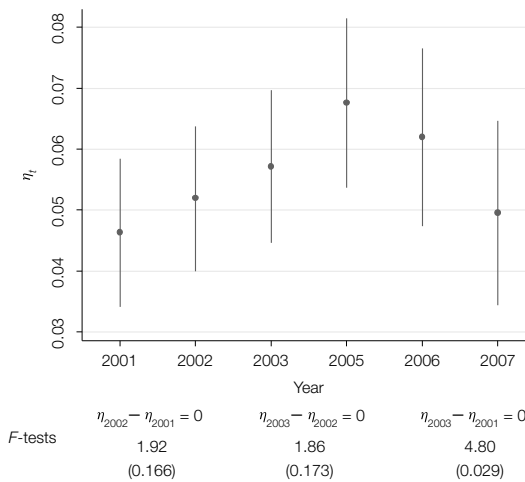

	$\eta_{2002} - \eta_{2001} = 0$	$\eta_{2003} - \eta_{2002} = 0$	$\eta_{2003} - \eta_{2001} = 0$
F-tests	1.92	1.86	4.80
	(0.166)	(0.173)	(0.029)

each year from 1997 to 2003, and 0 otherwise. Qualitatively similar results are reported in Panel B of Table 9.

3. Alternative Definition for Domestic Firms

We apply a different definition for domestic firms and perform a sensitivity test. Specifically, DOMESTIC_ALT equals 1 if a firm has never reported pretax foreign income, foreign income tax or a foreign segment from fiscal years 2001–2007, or a foreign subsidiary in their Exhibit-21 from fiscal years 2003–2007, and 0 otherwise. We reexamine our main analyses using DOMESTIC_ALT. Qualitatively similar results are reported in Panel C of Table 9.

TABLE 9
Robustness Tests

Table 9 presents results of robustness tests. Panel A presents results using the bond rating as the financial constraint measure. Panel B presents results using a textual-based financial constraint measure developed by Hoberg and Maksimovic (2014). Panel C presents results using an alternative definition for domestic firms. The sample covers observations from 2001 to 2007 excluding 2004. Control variables of equation (1) and industry fixed effects are included. All continuous variables except for the market and macroeconomic variables are winsorized at 1% and 99% cutoff points. Standard errors are corrected for clustering of errors by firm. Adjusted t-statistics are presented in parentheses. *, **, *** indicate statistical significance at the 10%, 5%, and 1% level using 2-sided t-tests, respectively. See the Appendix for variable definitions.

	Debt Financing			Investments				
	LT_DEBT	ST_DEBT	TOTAL_DEBT	NET_INVESTMENT	CAPITAL_EXPENDITURE	ACQUISITION	SALE_OF_PPE	R&D
Variables	1	2	3	4	5	6	7	8
Panel A. Bond Rating to Indicate Financial Constraint								
POST	0.021	0.011	0.027	0.012	0.007	0.011	0.000	0.001
	(3.79)***	(4.24)***	(5.23)***	(2.29)**	(3.96)***	(2.76)***	(0.62)	(0.42)
POST × NON_REP	−0.003	0.004	−0.004	0.008	0.004	0.000	0.000	0.003
	(−0.44)	(1.18)	(−0.62)	(1.18)	(1.45)	(0.04)	(0.60)	(1.25)
POST × NON_REP$_{NON\_RATING}$	0.022	−0.010	0.018	0.014	0.002	0.009	−0.000	0.007
	(4.31)***	(−3.53)***	(3.69)***	(2.89)***	(1.13)	(2.45)**	(−0.19)	(3.18)***
Panel B. The Textual-Based Financial Constraint Measure								
POST	0.021	0.010	0.026	0.015	0.009	0.010	0.000	0.001
	(3.60)***	(3.40)***	(4.79)***	(2.65)***	(4.90)***	(2.50)**	(0.54)	(0.61)
POST × NON_REP	0.006	−0.003	0.003	0.013	0.003	0.004	0.000	0.004
	(0.95)	(−0.97)	(0.49)	(2.12)**	(1.48)	(0.91)	(0.88)	(1.25)
POST × NON_REP$_{HM}$	0.017	−0.001	0.014	0.013	0.008	0.007	0.001	−0.003
	(2.20)**	(−0.11)	(1.89)*	(1.73)*	(1.96)*	(1.33)	(0.68)	(−0.89)
Panel C. An Alternative Definition for Domestic Firms								
POST	0.019	0.012	0.026	0.011	0.007	0.010	0.000	0.000
	(3.50)***	(4.54)***	(5.03)***	(2.01)**	(3.78)***	(2.65)***	(0.59)	(0.24)
POST × NON_REP	0.012	−0.003	0.009	0.019	0.004	0.008	0.000	0.006
	(2.19)**	(−1.16)	(1.63)	(3.32)***	(2.04)**	(2.10)**	(0.65)	(2.66)***
POST × NON_REP$_{DOMESTIC\_ALT}$	0.013	−0.008	0.009	0.010	0.009	−0.001	−0.000	0.007
	(2.65)***	(−2.57)**	(1.83)*	(2.25)**	(3.67)***	(−0.42)	(−0.15)	(2.00)**

V. Implication for Evaluating the Tax Cuts and Jobs Act of 2017

Our study potentially offers insights for evaluating TCJA 2017. This tax reform significantly changes how foreign earnings are treated and will profoundly influence multinational firms' behaviors. As a transition, TCJA 2017 imposes a one-time tax on untaxed foreign earnings of foreign subsidiaries of U.S. MNEs

accumulated post-1986, deeming those earnings to be repatriated. Moving forward, repatriation of foreign earnings will no longer be taxed.

Faulkender, Hankins, and Petersen (2019) argue that repatriation tax cost is the major reason that MNEs hoard cash abroad. With the repatriation tax gone, the incentive for delaying repatriation and holding cash abroad will be eliminated. Moody (2018) reports that overseas cash holding has already receded. Before TCJA 2017, MNEs' strategy to defer repatriation and fund operations through debt pushes up MNEs' demand for domestic debt, crowding out financially constrained nonrepatriating firms. As a result, the repatriation tax affects firms beyond MNEs by worsening the financing environment of financially constrained nonrepatriating firms. This effect can negatively affect the U.S. economy. After TCJA 2017, MNE's demand for domestic debt will likely diminish. Constrained firms previously crowded out from the credit market will face less competition and will thus be able to issue more debt to fund investments. This can benefit the U.S. economy. Therefore, AJCA 2004 that we examine can potentially serve as an invaluable one-time experiment to help us partially evaluate the effectiveness of TCJA 2017.[16]

VI.   Conclusion

U.S. MNEs repatriated more than $300 billion during the tax holiday under the American Jobs Creation Act of 2004. Researchers have examined the consequences of the tax holiday by studying its impact on repatriating firms. In general, findings are inconclusive. We take a different perspective by testing the externality of the tax holiday on nonrepatriating firms. This provides us with a new angle to assess the effectiveness of the tax holiday.

We find that, financially constrained nonrepatriating firms experience a significant increase in debt financing relative to less constrained nonrepatriating firms. Using DealScan data, we also show that, banks lend significantly more to domestic firms after the tax holiday if their borrowers repatriated more during the tax holiday. These results confirm that the tax holiday has a positive impact on financially constrained nonrepatriating firms by improving their debt financing accessibility.

We further document an increase in investments of financially constrained nonrepatriating firms relative to less constrained nonrepatriating firms after the tax holiday. This increase in investments is positively associated with the increase in debt financing, suggesting constrained nonrepatriating firms likely use increased debt financing to fund unexploited investment projects.

Our study potentially provides insights for evaluating TCJA 2017. Under the new tax regime, MNEs no longer need to pay repatriation tax when repatriating earnings from foreign subsidiaries. Their overseas cash holding is likely to decrease and demand for domestic borrowing will decrease. As a result, financially

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[16]The implication of our findings can potentially help us understand the impact of the repatriation tax exemption under TCJA 2017, though not other changes, such as tax rate cut, interest deduction limitation, global intangible low-taxed income, base erosion and anti-abuse tax, and foreign-derived intangible income.

constrained firms' debt financing environment can improve, leading to higher domestic investments and benefiting the U.S. economy.

Appendix. Variable Definitions

LT_DEBT: Net change in long-term debt. Long-term debt issuance minus long-term debt reductions, divided by lagged total assets.

ST_DEBT: Net change in short-term debt. Current debt changes divided by lagged total assets.

TOTAL_DEBT: Net change in total debt. Sum of LT_DEBT and ST_DEBT.

NET_INVESTMENT: (capital expenditure + acquisition + increase in investment – sale of PPE – sale of investments)/lagged total assets.

CAPITAL_EXPENDITURE: Capital expenditure divided by lagged total assets.

ACQUISITION: Acquisition divided by lagged total assets.

SALE_OF_PPE: Sale of PPE divided by lagged total assets.

R&D: Research and development expenditure divided by lagged total assets.

REPURCHASE: Purchase of common and preferred stock divided by lagged total assets.

DIVIDENDS: Dividend payout. Cash dividends divided by lagged total assets.

TOTAL_PAYOUT: Sum of REPURCHASE and DIVIDENDS.

EQUITY: Net change in equity financing. Sales of common and preferred shares minus purchases of common and preferred shares divided by lagged total assets.

POST: Post-tax holiday period. An indicator that equals 1 for years 2005, 2006, and 2007, and 0 for years 2001, 2002, and 2003.

NON_REP: An indicator that equals 1 for a nonrepatriating firm, and 0 for a repatriating firm.

NON_REP$_{DOMESTIC}$:   An indicator for domestic firms, defined as a firm that never has foreign earnings during our sample period.

NON_REP$_{DOMESTIC\_ALT}$:   Alternative domestic firm definition, an indicator that equals 1 if a firm has never reported any pretax foreign income, foreign income tax, or a foreign segment from fiscal 2001–2007, or a foreign subsidiary in their Exhibit-21 from fiscal 2003 to 2007, and 0 otherwise.

SA_INDEX: $-0.737 \times$ ln(inflation adjusted assets/1000) $+ 0.043 \times$ ln(inflation adjusted assets/1000)^2 $-0.040 \times$ age, where age is the difference between current year and the first year that the firm has a nonmissing stock price in Compustat.

NON_REP$_{SA}$:   High SA_INDEX nonrepatriating firms. An indicator that equals 1 for a financially constrained nonrepatriating firm (SA_INDEX above the industry median in 2003), and 0 for a less constrained nonrepatriating firm (SA_INDEX below the industry median in 2003).

NON_REP$_{NON\_RATING}$:   Nonrepatriating firms without issuer credit rating. An indicator that equals 1 if a nonrepatriating firm has no issuer credit rating, and 0 otherwise.

NON_REP$_{HM}$:   Financially constrained nonrepatriating firms based on Hoberg and Maksimovic (2014) measure. An indicator that equals 1 if *Debtdelaycon* (Hoberg and Maksimovic (2014)) of a firm is above the sample median each year from 1997 to 2003, 0 otherwise.

SIZE$_{-1}$:   Lagged firm size. Natural logarithm of sales.

MTB$_{-1}$:   Lagged market to book ratio. Ratio of market value of assets to book value of assets.

CASH_FLOW$_{-1}$:   Lagged cash flow. Income before extraordinary items divided by lagged total assets.

CASH_HOLDING$_{-1}$:   Lagged cash holding. Cash and short-term investments divided by total assets.

ALTMAN_Z_SCORE$_{-1}$:   Lagged Altman Z score. ($1.2\times$(current assets – current liabilities) + $1.4\times$retained earnings + $3.3\times$operating income after depreciation + sales) /book assets + $0.6\times$(fiscal year end stock price×common shares outstanding)/total liabilities.

GROWTH$_{-1}$:   Lagged sales growth rate. Sale of current year minus sale from last year, divided by sale from last year.

PROFITABILITY$_{-1}$:   Lagged profitability. Earnings before interest and tax divided by total assets.

WEAK_FINANCE: Tightness of finance. Net percentage of domestic respondents claiming that they are tightening standard for commercial and industrial loans, based on survey data collected from the Senior Loan Officer Opinion Survey on Bank Lending Practices of Federal Reserve.

EQUITY_MARKET_RETURN: Equity market return. CRSP annual value-weighted return.

GDP_GROWTH: State GDP growth rate. Annual GDP growth rate of the state where a firm's headquarter is located.

LOAN$_{it}$:   Bank i's loan issue in year t to repatriating firms, nonrepatriating MNEs or domestic firms. Bank i's lending to a specific group of borrowers in year t, weighted by the its total outstanding loans at the beginning of year t.

BRF$_{it}$:   Borrowers' proportioned repatriated funds of Bank i in year t. Total amount of existing borrowers' proportioned repatriated funds during the tax holiday for Bank i in year t, weighted by the bank's total outstanding loans at the beginning of year t.

BRF_INDICATOR$_{it}$:   Indicator of positive BRF$_{it}$. An indicator that equals 1 if BRF$_{it}$ is positive, and 0 otherwise.

LN_OUT_STANDING$_{-1}$:   Lagged bank loan size. Natural logarithm of each bank's outstanding loans.

OUT_PERCENTAGE$_{-1}$:   Lagged market share of outstanding loans. Bank's outstanding loans divided by total outstanding loans in DealScan.

ISSUE_PERCENTAGE$_{-1}$:   Lagged market share of new issued loans. Bank's newly issued loans divided by total newly issued loans in DealScan.

W_MATURITY$_{-1}$:   Lagged weighted average maturity of loans. Bank's loan size weighted average maturities for loans issued.

W_TLB$_{-1}$:   Lagged percentage of term loan B loans. Bank's loan size weighted average percentage of issued loans that are labeled "Term Loan B."

W_SECURE$_{-1}$:   Lagged percentage of secured loans. Bank's loan size weighted average percentage of issued loans that are secured.

W_LEADBANK$_{-1}$:   Lagged percentage of being a lead bank. Bank's loan size weighted average percentage of issued loans in which the bank is a lead bank.

CHG_INVESTMENT: Change in investments from pre- to post-tax holiday period. Change in the 3-year average of investment variables from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_NET_INVESTMENT: Change in the 3-year average of NET_INVESTMENT from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_CAPITAL_EXPENDITURE: Change in the 3-year average of CAPITAL_EXPENDITURE from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_ACQUISITION: Change in the 3-year average of ACQUISITION from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_ SALE_OF_PPE: Change in the 3-year average of SALE_OF_PPE from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_ R&D: Change in the 3-year average of R&D from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_LT_DEBT: Change in LT_DEBT from pre- to post-tax holiday period. Change in the 3-year average of LT_DEBT from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_SIZE: Change in SIZE from pre- to post-tax holiday period. Change in the 3-year average of SIZE from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_MTB: Change in MTB from pre- to post-tax holiday period. Change in the 3-year average of MTB from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_CASH_FLOW: Change in CASH_FLOW from pre- to post-tax holiday period. Change in the 3-year average of CASH_FLOW from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_CASH_HOLDING: Change in CASH_HOLDING from pre- to post-tax holiday period. Change in the 3-year average of CASH_HOLDING from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_ALTMAN_Z_SCORE: Change in ALTMAN_Z_SCORE from pre- to post-tax holiday period. Change in the 3-year average of ALTMAN_Z_SCORE from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_GROWTH: Change in GROWTH from pre- to post-tax holiday period. Change in the 3-year average of GROWTH from the pre-period (2001–2003) to the post-period (2005–2007).

CHG_PROFITABILITY: Change in PROFITABILITY from pre- to post-tax holiday period. Change in the 3-year average of PROFITABILITY from the pre-period (2001–2003) to the post-period (2005–2007).

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