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## Corporate Responses to the Repatriation Incentives and Domestic Production Activities Deduction

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**Abstract**

The 2004 American Jobs Creation Act (AJCA or the Act) sought to encourage U.S. companies to repatriate foreign earnings and invest them domestically in an effort to increase capital spending and employment. This investigation looks at how the two tax provisions in AJCA, i.e., the repatriation tax holiday and the domestic production activities deduction (DPAD), affected domestic investment and payout behaviors. An examination of repatriating firms based on the tightness of their capital constraints shows that the tax incentives fail to induce non-constrained, repatriating firms that benefit from DPAD to reinvest the capital domestically. Only capital-constrained, repatriating firms benefitting from DPAD increase domestic investment and reduce share repurchases; however, these firms also increase their cash dividend payments. The findings should be useful to policymakers as they consider modifying the corporate tax structure to increase domestic investment by encouraging U.S. firms to repatriate foreign earnings and reinvest them domestically.

**Key Word:** Investment, Repatriation, Domestic Production Activities Deduction, Tax, Payout

**Classification:** G11, G31, G35, H25

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## **Corporate Responses to the Repatriation Incentives and Domestic Production Activities Deduction**

### **1. Introduction**

One explicit purpose of the American Jobs Creation Act of 2004 (AJCA or the Act) was to encourage companies to repatriate foreign earnings and invest them domestically to increase employment. Among the significant provisions of the act were a temporarily reduced tax rate for repatriated foreign earnings, repeal of the controversial Extraterritorial Income Exclusion (ETI), and installment of a new, permanent tax incentive called the Domestic Production Activities Deduction (DPAD). The repatriation tax incentive, a one-time, temporary tax holiday, reduced a firm's effective tax rate from 35 percent to 5.25 percent on qualified additional repatriated foreign profits. The ETI was repealed because the World Trade Organization ruled that it was an illegal export subsidy and that the EU could impose retaliatory tariffs on U.S. exports. The DPAD did not explicitly replace ETI, but it is a broader incentive for companies to increase qualified production activities and domestic employment.

Whether such tax cuts as the repatriation and DPAD tax provisions can incentivize companies to increase investment is an important and contemporary issue for policy influencers, policymakers, and academics. Finance theory suggests that firms increase investment when there are more investment opportunities, and investment opportunities increase with the emergence of higher after-tax rate-of-return projects. The repatriation tax provision under the Act reduces the cost to repatriate foreign earnings, which means repatriating companies could increase cash on hand, but it does not directly impact the after-tax rate-of-return of any investment projects. Indeed, recent studies find that the repatriation tax provision alone failed to incentivize average repatriating companies to increase domestic investment with repatriated cash (Dharmapala et al. 2011; Faulkender and Petersen 2012; henceforth FP). The DPAD provision, on the other hand, offers tax savings of up to nine percent of net income and potentially increases the after-tax rate-of-return for companies with qualified production activities. This can make a previously unprofitable project turn profitable. Thus, a company that benefitted from both tax provisions, e.g., a repatriating company with cash on hand that also claimed DPAD benefits, would be the most likely company to increase domestic investment after the AJCA took effect. This study investigates the joint effects of these two tax provisions to better understand the AJCA's impact on domestic investment. Specifically, it examines whether the companies

that benefitted from the repatriation tax holiday and derived benefits from the DPAD tax provision increased domestic investment.

Currently, the U.S. Congress is engaged in vigorous corporate tax policy debates prompted by tax rate reductions in other countries and increases in inversion activities.<sup>1</sup> Effects of tax holidays and such provisions as DPAD are likely to be scrutinized in the coming debates if they are ineffective in their intent and cost the Treasury revenue. To illustrate, it is estimated the repatriation tax holiday cost the U.S. government \$39 billion (Albring et al. 2005), and the estimated cost for DPAD is around \$77 billion over the ten-year period following implementation (Joint Committee on Taxation 2004). Examining whether the costly DPAD tax provision and the repatriation tax holiday of AJCA induced firms to increase domestic investments and achieve the objectives of the provisions provides important guidance to legislators.

Further, the pecking order theory suggests that a firm, before seeking external capital, will first invest in new capital projects using its internal capital because internal capital is the least expensive financing source (Myers and Majluf 1984). Whereas this theory may hold for domestic firms, the theory may not fit the case of U.S. multinational firms that distribute internal capital among domestic operations and foreign subsidiaries. For many U.S. multinationals, it is a significant tax burden to repatriate foreign earnings (Foley et al. 2007). Indeed, before the passage of the Act, policymakers and policy influencers argued that while ample domestic investment opportunities existed, the tax code discouraged multinational firms from repatriating and reinvesting their foreign earnings. The underlying assumption in this argument is that many U.S. multinational firms are capital-constrained in expanding domestic investment.<sup>2</sup> It implies that these firms cannot raise new domestic funds at reasonable rates and that it is too expensive to repatriate their capital overseas. This logic prevailed, and Congress passed and implemented AJCA.

However, it appears that the repatriation tax provision failed to induce domestic investment. Recent studies find that the majority of repatriating companies did not increase domestic investment (Dharmapala et al. 2011; FP); instead, they increased shareholder payouts (Clemons and Kinney 2008; Blouin and Krull 2009; and Dharmapala et

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<sup>1</sup> For instance, Pfizer took over Allergan and shifted their headquarters to Ireland to avoid U.S. corporate taxes. In addition, a number of bills have been introduced in recent years to promote a second repatriation tax holiday for specific industries. An example is the Life Sciences Jobs and Investment Act, S. 1410, sponsored by Senator Robert Casey (D-PA) in July 2011 for pharmaceutical companies.

<sup>2</sup> Capital-constrained firms are firms with internal cash flow insufficient to finance their investment opportunities and unable to acquire external funds at a reasonable price (FP).

al. 2011).<sup>3</sup> The DPAD tax provision, although it received little attention from researchers, provides tax savings for companies with qualified production activities, and in turn, potentially increases investment opportunities. Even if the repatriation tax holiday failed to stimulate domestic investment, the DPAD tax provision could motivate companies to increase their domestic investment. Evidence of the effectiveness of these two tax provisions working together would more accurately reflect the overall effect of AJCA and provide important additional information to legislators and academics.

Of course, the repatriation tax holiday and DPAD target different firms and incentivize different behaviors. Only U.S.-based multinational companies benefit from the tax holiday. The DPAD benefit, however, is available to a variety of domestic companies and entity types, including C corporations, S corporations, partnerships, sole proprietorships, cooperatives, estates, and trusts. It is designed to encourage investment in “qualified domestic production activities.” On the other hand, there is a set of repatriating firms that benefit from both provisions of the Act, and studying these firms facilitates insights about the incremental effects of each provision.

To investigate the joint effect of the repatriating tax holiday and the DPAD tax provision, the study uses a hand-collected sample of 2,174 firms that mentioned repatriation in their 10-Ks or 10-Qs. The study also uses hand-collected information on the magnitude and timing of their repatriations, discussions on DPAD and disclosed DPAD benefits from 2000 to 2010. Among these companies, 373 firms repatriated foreign earnings under the Act.

The 373 firms repatriated approximately \$283 billion. Repatriating firms that also benefit from the DPAD provision repatriated a similar percentage of their foreign earnings as other repatriating firms did. Of these, only capital-constrained firms that also benefitted from DPAD increased their domestic investment. Firms claiming DPAD benefits that are not capital-constrained maintain similar shareholder payouts as those repatriating firms not claiming DPAD. However, capital-constrained firms that benefitted from DPAD do reduce their share repurchases, but they also increase cash dividend payouts. In addition, non-constrained, DPAD-claiming firms increase their debt compared with other repatriating firms. Capital -constrained firms that benefitted from DPAD reduce their debt. Lastly, no evidence supports the expectation that repatriating firms benefitting from DPAD increase their employment. The results are robust across various sampling periods and different empirical methods.

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<sup>3</sup> FP finds that a small group of capital-constrained, repatriating firms increased domestic investment.

Based on these results, the joint impact of the repatriation tax holiday and DPAD tax provision of AJCA is limited. Only the small portion of capital-constrained repatriating firms that benefitted from DPAD increase their domestic investment and reduce their debt using repatriated foreign earnings.

This study contributes to the literature in several ways. First, prior literature on AJCA focuses only on the repatriation tax provision and finds that, on average, repatriating firms do not increase domestic investment compared with non-repatriating companies (Dharmapala et al. 2011; and FP), and they increase share repurchases (Blouin and Krull 2009). To the best of our knowledge, this is the first study that links both repatriation and DPAD provisions to study the joint effect of these provisions on companies' investment behavior. Blouin et al. (2014) test and find that repatriating firms that benefit more from DPAD than from ETI reduce share repurchases.<sup>4</sup> However, this study not only applies a two-stage regression design, and a precise sample classification (three groups of firms), but also actually tests the investment, payout, debt payback, and employment behaviors of firms that benefit from both repatriating tax holiday and DPAD provisions. We focus on a group of firms that have the highest incentives to increase domestic investments with their repatriated foreign earnings. The findings show that the companies that benefit from both tax provisions do not increase domestic investment compared with other repatriating companies. They also indicate that both tax provisions, individually or jointly, fail to incentivize more domestic investment.

The companies that repatriate and claim the DPAD benefits are the most likely and capable candidates to increase domestic investment because repatriation provides them "inexpensive" cash. However, there is little evidence supporting the conclusion that the tax incentives caused the repatriating firms to increase investment. Thus, using tax cuts such as repatriating tax reductions and DPAD to encourage investment is not as effective as policymakers perceived it to be.

Second, the results of this study complement and expand the line of research on the repatriating firms' investment and payout behaviors post-repatriation using an independently hand-collected sample set. Third, by examining the joint effect of the DPAD and repatriation tax holidays on firms' investment and payout behaviors, this study evaluates the effects of AJCA in a comprehensive fashion and sheds insight on firms' behavior in light of both short-term and long-term tax incentives. Although the conclusion is similar to FP, there are fundamental differences between this study and FP. This study tests the joint effects of repatriation and DPAD tax provisions on

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<sup>4</sup> Blouin et al. (2014) focus on repatriating firms that either benefit more from DPAD or benefit more from ETI. They suggest that the reduction of share repurchases infers increase of investment without testing the investment.

the domestic investment and other behaviors of firms that benefit from both provisions while FP tests only the effect of the repatriation tax provision. These results also can be generalized to a wider environment. The DPAD is not only beneficial to repatriating companies, but it also is beneficial to a wider set of domestic companies such as non-traditional manufacturing companies. Last, results of this study provide important evidence for the on-going corporate tax policy debate.

The remainder of the paper is organized as follows: section 2 provides background on the repatriation tax provision and DPAD, and develops predictions. Section 3 presents research methods and design. Section 4 presents sample selection and descriptive statistics. Section 5 provides results of empirical analyses and robustness tests. Section 6 concludes the study.

## **2. Background and Hypotheses Development**

### **2.1. Background and Literature Review**

Upon repatriation of foreign earnings, U.S. corporations pay the difference between the foreign and U.S. income tax rates on pretax repatriated foreign earnings.<sup>5</sup> The AJCA, a temporary tax holiday, provided an 85 percent reduction to a firm's potential maximum effective tax rate on qualified repatriated foreign profits. To claim this reduced rate, firms must spend the repatriated funds on such permitted uses as "...worker hiring and training, infrastructure, research and development, capital investments, or the financial stabilization of the corporation for the purposes of job retention or creation" (U.S. Congress 2004, 99). A subsequent IRS Notice disallows use of the repatriated funds for executive compensation, dividends, stock redemptions, tax payments, purchases of debt instruments, and other uses (IRS 2005, Section 6). However, the Act does not require firms to demonstrate that repatriated funds are used for the purpose stated in the approved investment plan.

The DPAD tax provision, included in the AJCA, is not intended to offset benefits provided by the ETI.<sup>6</sup> Instead, the DPAD is a broad and permanent tax provision that is designed to encourage "qualified production

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<sup>5</sup> For instance, if a firm earns \$100 in foreign country A that has a 5% income tax rate, the firm would pay \$5 tax to Country A. Then, upon repatriating the after-tax foreign profits of \$95, the firm would pay \$30 ( $\$100 \times 35\% - \$5$ ) to the U.S. (U.S. tax rate is 35%).

<sup>6</sup> Since the 1970s Congress has established several export tax incentives, such as Domestic International Sales Corporations (DISC), Foreign Sales Corporations (FSC), and ETI, to encourage the export of domestically manufactured goods. Like all earlier export tax incentives, the most recent tax incentive, ETI, was ruled by the World Trade Organization (WTO) to be a prohibited export subsidy, and the European Union threatened to impose a

activities,” and it extends to a wide range of industries and firms, including traditional manufacturing, engineering, architectural services, film production, software development, real property construction and renovation services for activities that occur in the U.S. The amount of DPAD for an eligible firm in 2005 was the lesser of: 1) three percent of the taxpayer’s qualified production activities income (QPAI), 2) three percent of the taxpayer’s taxable income, or 3) 50 percent of W-2 wages paid by the taxpayer. The percentage of QPAI and taxable income increased to six percent from 2007 to 2009, and increased again to nine percent in 2010 and after. If a taxpayer’s statutory income tax rate is 35 percent, those rates could potentially translate to one percent, two percent, or three percent statutory rate reductions in 2005, 2007, and 2010, respectively.

Prior studies on AJCA focus only on the impact of the repatriation tax holiday provision. The Internal Revenue Service estimates that qualified foreign earnings repatriated under the Act amounted to \$312 billion (Redmiles 2008). Albring et al. (2005) estimate that repatriating firms saved companies \$39 billion of income taxes based on an analysis of a sample of 282 corporations that reported permanently reinvested foreign earnings and a foreign tax rate lower than 35 percent. Based on a hand-collected sample of 364 repatriating firms, Clemons and Kinney (2008) find that firms repatriated \$283 billion, but an increase in stock repurchases was the only significant change in expenditures. Based on a sample of 357 repatriating firms, Blouin and Krull (2009) find that repatriating firms had fewer investment opportunities and higher free cash flows than non-repatriating firms, and they increased share repurchases post-Act by approximately \$60 billion, which was almost 20 percent of the total repatriated foreign earnings. On the investment side, FP find that only capital-constrained firms allocated repatriated foreign earnings to domestic investment and that repatriating firms, on average, did not increase domestic investment.

## 2.2. Theory and Hypotheses Development

Finance theory suggests that firms increase investment when there are more investment opportunities and reduce investment (or increase shareholder payout) when fewer investment opportunities exist. The pecking order theory (Myers and Majluf 1984) suggests that the cost of financing increases with information asymmetry, so firms would fund domestic investment in the order of internal funds, new debt, and new equity. The implicit assumption is that all types and sources of internal funds are equally affordable and fungible. For U.S. multinationals, internal funds are not equal in cost nor fungible (Foley et al. 2007). For instance, foreign earnings of overseas subsidiaries

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high import tariff on U.S. products to retaliate. Under this circumstance, in 2004, Congress repealed the ETI as a part of AJCA and phased out the ETI benefits completely in 2006.

are likely more expensive than domestic earnings due to the repatriation tax. Hence, capital-constrained international firms may be unable to invest domestically because their domestic operations are capital constrained, i.e., either it is too expensive to finance externally through debt or equity, or it is too costly to repatriate their foreign earnings.

Assuming that domestic and foreign tax rates and after-tax rates-of-return are constant, in an n-period setting, a U.S. firm will repatriate foreign funds if the domestic return on the investment is greater than that of the foreign return (Blouin and Krull 2009):

$$r_d > (1 + r_f) \left[ \frac{(1-t_d)}{(1-t_{d0})} \right]^{\frac{1}{n}} - 1 \quad (1)$$

where,  $t_{d0}$  is the U.S. tax rate on repatriations that is substantially lower during the AJCA tax holiday;  $t_d$  is the normal statutory U.S. tax rate;  $r_d$  is the domestic risk-adjusted after-tax rate of return; and  $r_f$  is the foreign risk-adjusted after-tax rate of return.

This relation can be simplified to  $r_d > r_f$  if  $t_{d0} = t_d$  (i.e., if there is no repatriation tax holiday). An implicit assumption is that the foreign tax rate is lower than the domestic tax rate; otherwise, the repatriation tax holiday would have no effect on repatriations. As the investment horizon lengthens (i.e.,  $1/n$  is close to zero), the effect of the tax holiday on the investment decision diminishes. It is reasonable to infer that before the Act,  $r_f$  is greater than  $r_d$  since most firms repatriating under the Act did not do so prior to the tax holiday that set  $t_{d0}$  equal to  $t_d$ .

Clausing (2005) argues that the repatriation tax relief encourages multinational corporations to repatriate. However, the tax holiday does not fundamentally change the investment environment of the U.S. because the repatriation tax holiday does not make  $r_d$  greater than  $r_f$ . On the other hand, the DPAD provision of the Act does alter the attractiveness of investing repatriated funds in the U.S. Specifically, the phase-in of DPAD reduces the tax burden of qualifying firms (approximately one percent in 2005 and three percent in and after 2010), and this increases their  $r_d$  from the pre-Act to the post-Act period. With the beneficial tax effect, marginally unattractive investment projects under the pre-Act condition may become attractive post-Act. Equation (1) can be modified as follows if substituting the post-Act domestic after-tax rate-of-return for firms that benefit from the DPAD:

$$r_{dPA} > (1 + r_f) \left[ \frac{(1-t_d)}{(1-t_{d0})} \right]^{\frac{1}{n}} - 1 \quad (2)$$

where,  $r_{dPA}$  = the post-Act domestic-after tax rate of return.

The  $r_{dPA}$  of a repatriating firm that benefits from DPAD may exceed  $r_d$ . Due to the phase-out of the ETI, a repatriating firm that benefits from ETI may have  $r_{dPA}$  drop below  $r_d$  after the phase-out. For repatriating firms that

do not benefit from DPAD or ETI,  $r_{dPA}$  will not change from pre-Act to post-Act. Thus, a repatriating firm benefitting from DPAD, in theory, has the incentive to extract more benefits from the DPAD tax provision by repatriating over a broader range of values of  $r_f$ ,  $t_d$ , and  $t_{d0}$  than a firm that benefits only from ETI or a firm that benefits from neither DPAD or ETI.

A capital-constrained firm that benefits from DPAD would have more incentive to repatriate foreign earnings than firms that do not benefit from DPAD. This is because the DPAD increases a firm's  $r_d$ , possibly to a level greater than  $r_f$ . Also, the more a firm repatriates from eligible foreign earnings, the more that firm can invest domestically and increase amount of DPAD tax benefit the firm can potentially claim. Hence, assuming the repatriation tax holiday and DPAD provision are jointly effective, the first set of hypotheses are:

**H1a: A firm that benefits from DPAD repatriates a larger portion of its foreign earnings under the Act than other repatriating firms.**

**H1b: A capital-constrained firm that benefits from DPAD repatriates a larger portion of its foreign earnings under the Act than other repatriating firms.**

To claim more DPAD benefits, a firm must increase the lesser of its qualified production income, its taxable income, or its total W-2 wages paid, or all of them.<sup>7</sup> There are two ways a company can increase these three items. They can either increase productivity or expand operations, or do both. However, no company can immediately increase its productivity because of the Act. Still, a repatriating firm has the option to use repatriated cash to expand its operations and employ more people. Holding everything else constant, a repatriating firm may claim more DPAD benefits by increasing its qualified production income, taxable income, or total W-2 wages paid by investing its repatriated cash domestically. Similarly, a capital-constrained firm can increase its domestic investment as soon as the repatriated foreign earnings are available. Thus, the second set of hypotheses address expected changes in domestic investment if the repatriation tax holiday and DPAD provision are effective.

**H2a: Following repatriation, a repatriating firm that benefits from DPAD increases its domestic investment;**

**H2b: Following repatriation, a capital-constrained, repatriating firm that benefits from DPAD increases its domestic investment.**

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<sup>7</sup> All firms in the sample repatriated their foreign earnings. Thus, firm and repatriating firm are used interchangeably throughout the entire paper.

With extra cash available, firms can increase shareholder payouts through dividends and/or share repurchases. On one hand, Dittmar and Dittmar (2002) suggest that "...the change in dividends paid is not related to transitory earnings but rather only permanent shifts in earnings that result from changes in the macro-economy." Similarly, Brav et al. (2005) indicate that managers of firms that pay dividends regard maintaining historical dividend levels as a "nearly untouchable" goal. Survey results from Brav et al. (2005) also show that managers agree that they would sacrifice some positive-NPV investment projects to maintain their dividend, but they would generally decide on the amount of share repurchases only after determining investment decisions.

On the other hand, share repurchases are closely associated with transitory earnings (Guay and Harford 2000; Dittmar and Dittmar 2002). Once a firm repurchases, it is not expected to continue the repurchases on a regular basis. Jagannathan et al. (2000) report that firms that repurchase their stock tend to have higher temporary non-operating cash flows than do non-repurchasing firms. Managers prefer to distribute earnings to shareholders by repurchasing stock over cash dividends because share repurchases are more flexible and can be used to time the equity market (Brav et al. 2005). In addition, individual investors prefer stock repurchases because the shareholders can defer taxes until the stock is sold, even though the tax rate on dividends and capital gains are the same (15 percent). Repatriated foreign cash is not a permanent shift in earnings, but a temporary non-operating cash windfall. Hence, if a firm chooses to increase shareholder payouts using repatriated foreign earnings, it most likely will increase share repurchases.

The phasing-in of the DPAD tax provision may increase the domestic after-tax returns and induce higher earnings for firms that benefit from DPAD. To claim more DPAD benefits, firms must increase domestic investment. Thus, it is less likely that firms benefiting from DPAD would increase shareholder payouts. In addition, firms may reduce their payouts when their growth rates increase based on flexibility considerations (Lee et al. 2011). However, firms benefiting from DPAD may use the repatriated funds to maintain or increase cash dividends, probably not due only to a perceived, permanent increase of earnings, but also due to demands from diverse shareholders (Jain and Chu 2014).

The  $r_{dPA}$  of a repatriating firm that does not benefit from DPAD will not change in comparison with  $r_d$ . Similarly, without a permanent shift in earnings, these firms may increase share repurchases if they decide to use the repatriated foreign earnings to increase shareholder payouts. In fact, on average, studies find repatriating firms increase shareholder payouts via share repurchases post-Act (Clemons and Kinney 2008; Blouin and Krull 2009),

even when this is disallowed by the Act. However, these studies did not measure DPAD benefits based on the type of repatriating firms that increase share repurchases.

The third set of hypotheses state expectations regarding shareholder payouts including both share repurchases and cash dividends. Incentives of capital-constrained firms are discussed above except that they have less available capital for new investment. It is more likely that these firms have available projects in which to invest and that they will invest foreign earnings repatriated under the AJCA.

**H3a: Following repatriation, a repatriating firm that benefits from DPAD will reduce its share repurchases.**

**H3b: Following repatriation, a capital-constrained, repatriating firm that benefits from DPAD will reduce its share repurchases.**

**H3c: Following repatriation, a repatriating firm that benefits from DPAD will not reduce its cash dividends.**

**H3d: Following repatriation, a capital-constrained, repatriating firm that benefits from DPAD will not reduce its cash dividends.**

The hypotheses may not be supported for several reasons. First, it is possible that the Act is not effective in its stated purposes. This could be true, for instance, if firms perceive that the DPAD benefit is insufficient to induce a change in their domestic investment. It also is possible that DPAD firms' domestic after-tax rates-of-return, after taking advantage of the DPAD, may still be lower than their foreign after-tax rates of return. Second, the firms may increase both investment and shareholder payouts if they have extra cash and only limited investment opportunities, regardless of DPAD benefit. Third, firms may choose not to increase their investments or shareholder payouts in order to increase domestic cash holdings for more financial flexibility (Arslan-Ayaydin et al. 2013).

### **3. Research Design**

Various studies use a difference-in-difference regression method (DID) to investigate the impact the repatriation tax holiday in AJCA had on repatriating firms' behaviors, and they reach mixed results (FP; Dharmapala et al. 2011; Blouin and Krull 2009). FP argue that firms, in regard to repatriation, should be grouped by their circumstances: (1) firms that have no foreign operations, or those that have foreign operations but no foreign earnings to repatriate (Group 1, no repatriation); (2) firms that have foreign earnings but do not repatriate (Group 2, no repatriation); and (3) firms that have foreign earnings and repatriate (Group 3, repatriating firms). FP indicated that methods used by Blouin and Krull (2009) and Dharmapala et al. (2011) cannot distinguish behaviors of those

groups clearly. For instance, Blouin and Krull (2009) uses a dummy variable that is equal to one in the year of repatriation and thereafter (same as FP Group 3), and it is equal to zero otherwise (firm years for FP Groups 1 and 2 are also coded 0). Thus, the variable of interest measures the difference between Group 3, and Groups 1 and 2 combined. This method makes it difficult to know whether the measured difference exists because of repatriation (difference between Group 3 and Group 2) or because of the availability of foreign earnings (difference between Groups 2 and 3 combined and Group 1). In addition, Dharmapala et al. (2011) use the predicted probability of repatriation to identify repatriating firms. Thus, the variable of interest measures the difference between FP's Groups 2 and 3 combined (firms with foreign earnings, i.e., high probability to repatriate) and FP's Group 1 (firms without foreign earnings, i.e., low probability to repatriate).

The decision to claim DPAD is similar to the decision regarding repatriation.<sup>8</sup> Therefore, the sample firms are sorted into three groups: repatriating firms that claim DPAD (benefit from DPAD), repatriating firms that discuss DPAD in their SEC filings but do not claim it, and repatriating firms that never discuss DPAD in their SEC filings and do not claim DPAD.<sup>9</sup>

### 3.1 The Decision to Claim DPAD

In this study, the companies decide to claim the DPAD benefits. Thus, the results potentially suffer from endogeneity. To handle the case where the potential endogeneity is in the form of selection bias, the research design includes a two-stage regression procedure (Heckman 1979). The probability that a firm claims DPAD is estimated using a logistic regression, and the model includes such variables as *DiscussDPAD*, *FCF* (free cashflow), and *TotalETR* (total effective tax rate) as instrumental variables. These variables are not used in later regressions. The regression model follows:

$$\begin{aligned}
 ClaimDPAD_{i,t} = & a_0 + \beta_1 DiscussDPAD_i + \beta_2 ROA_{i,t} + \beta_3 Debt_{i,t} + \beta_4 FCF_{i,t} + \beta_5 Size_{i,t} + \beta_6 MTB_{i,t} + \\
 & \beta_7 TotalETR_{i,t} + e_{i,t}
 \end{aligned}
 \tag{3}$$

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<sup>8</sup> FSP FAS 109-1 requires firms claiming DPAD as special deductions. Thus, firms should disclose in their K/Q filings if they claim these deductions. It is possible that a firm claims DPAD benefits but does not report them. In this instance, we assume the benefits are sufficiently immaterial that they require no specific mention in the financial reports. Following this logic, we assume firms not reporting DPAD benefits either realize no benefits or realize benefits that are substantially lower than the benefits realized by firms who explicitly report DPAD benefits in their financial reports.

<sup>9</sup> We use the method developed by FP to investigate our research questions. Refer to pp. 3359-3364 of FP for discussions on reasons of categorizing sample firms into three groups, and the endogeneity issue embedded in the repatriating and investment decisions of repatriating firms. Refer to pp. 3371-3373 of FP for discussions on research methods used to handle the related endogeneity issue.

where *ClaimDPAD* equals one if firm *i* claims the DPAD tax benefit in year *t*, and it equals zero otherwise. Since the DPAD tax provision took effect in 2005, *ClaimDPAD* equals zero for all firm-years before 2005. *DiscussDPAD* equals one if a firm discusses the DPAD tax provision at least once in their 10-K/10-Q filings during the period from 2004 to 2007, and it equals zero otherwise. *ROA* represents return-on-assets, and it equals the ratio of net income to total assets. *Debt* is the ratio of long-term debt plus debt included in current liabilities to total assets of year *t*. *FCF* is free cash flow (the difference between operating cash flow and capital expenditures) deflated by total assets of year *t*. *Size* is the natural log of total assets (AT) of year *t*. *MTB* represents the firm's market-to-book (MTB) ratio, and it equals the ratio of market value of equity to book value of equity. *TotalETR* is a firm's total effective tax rate, calculated as the total income tax expense divided by pre-tax income of year *t*. Using results of this regression, we calculate and collect the residuals of this regression (i.e., the Inverse Mills Ratio) and the predicted probability of a firm claiming DPAD, and they are used in second stage regressions.

### 3.2 Repatriation

The first set of hypotheses state expectations that firms benefitting from DPAD repatriate a larger portion of their foreign earnings. To test these hypotheses, the study uses the following tobit regression model:

$$\begin{aligned} \text{RepatRatio}_{i,t} = & a_0 + \beta_1 \text{Residual}(\text{ClaimDPAD})_{i,t} + \beta_2 \text{Residual} \times \text{CapConstrained}_{i,t} + \beta_3 \text{Pr}(\text{ClaimDPAD})_{i,t} + \\ & \beta_4 \text{CapConstrained}_{i,t} + \beta_5 \text{Size}_{i,t-1} + \beta_6 \text{ROA}_{i,t-1} + \beta_7 \Delta \text{Cash}_{i,t} + \beta_8 \Delta \text{MTB}_{i,t} + \beta_9 \Delta \text{CapEx}_{i,t} + \\ & \beta_{10} \text{TotalETR}_{i,t} + \gamma \text{Industry}_k + e_{i,t} \end{aligned} \quad (4)$$

where *RepatRatio* is specified as the dollar value of total repatriation over dollar value of total foreign sales.<sup>10</sup>

*Residual(ClaimDPAD)* represents the residual of the regression Eq. (3). *ResidualxCapConstrained* is the interaction between *Residual(ClaimDPAD)* and *CapConstrained*. *CapConstrained* (Capital-Constrained) equals the percent of years during which a firm's internal cash flow was insufficient to finance its investment. Following FP, *CapConstrained* is defined as the percentage of the fiscal years from 2000 to 2003 in which the firm's earnings after taxes (prior to interest) is less than its capital expenditures. *Pr(ClaimDPAD)* is the probability that a firm would claim DPAD benefits, calculated from regression results of Eq. (3). *Size<sub>t-1</sub>* is the natural log of total assets (AT) in year *t-1*. *ROA<sub>t-1</sub>* equals net income in year *t-1* scaled by total assets in year *t-1*. *ΔCash<sub>t</sub>* is change in cash scaled by total assets from year *t-1* to year *t*, where cash equals cash and cash equivalents. *ΔMTB<sub>t</sub>* equals the change in the

<sup>10</sup> Ideally, we should use firms' permanently re-invested foreign earnings to deflate the dollar value of repatriations. However, our hand-collection efforts to obtain this variable were not sufficiently successful to preserve our sample.

firm's market-to-book (MTB) ratio from year t-1 to year t.  $\Delta CapEx_t$  equals change in capital expenditures scaled by total assets from year t-1 to year t.  $TotalETR_t$  is a firm's total effective tax rate, calculated as the total income tax expense deflated by pre-tax income of year t.  $Industry_t$  is industry fixed effect.

There are three groups of repatriating firms: repatriating firms that claim DPAD (Group 1), repatriating firms that discuss DPAD but do not claim it (Group 2), and repatriating firms that do not discuss DPAD (Group 3). The coefficient on  $Residual(ClaimDPAD)$ ,  $\beta_1$ , measures the incremental increase in repatriation ratio for firms that claim DPAD (Group 1) relative to those that discuss DPAD but do not claim DPAD (Group 2). This holds the firm characteristics and the probability of claiming DPAD constant.  $ResidualxCapConstrained$  measures the incremental increase in repatriation ratio for capital-constrained, repatriating firms that claim DPAD relative to non-capital-constrained repatriating firm claiming DPAD. Everything else is constant. Thus, coefficients  $\beta_1$  and  $\beta_2$  are variables of interest and both are predicted to be positive if the first set of hypotheses is supported. The coefficient on  $Pr(ClaimDPAD)$ , ( $\beta_3$ ), measures the difference of repatriation ratios between Groups 1 and 2 combined (firms discuss DPAD in their SEC filings, i.e., higher probability of claiming DPAD) and Group 3 (firms that never discuss DPAD in their SEC filings, i.e., lower probability of claiming DPAD).

*Size* controls for the size of repatriating firms. A larger firm, in general, should have greater foreign earnings; thus, this coefficient should be positive. Higher profitability indicates that a firm would have more cash to repatriate; thus,  $ROA$  should be positive.  $\Delta Cash$  also should be positive because a repatriating firm with more cash can repatriate a greater portion of its eligible foreign earnings, especially during the repatriating tax holiday.  $\Delta MTB$  measures changes in firm's investment opportunities. Since the repatriation tax holiday reduces the cost of repatriation but does not affect firms' future investment opportunities, the sign of  $\Delta MTB$  is not predicted.  $\Delta CapEx$  captures changes in the firm's investment activities. A negative coefficient is predicted for  $\Delta CapEx$  because repatriating firms experience decreases in investment activities in the years leading up to the Act.  $TotalETR$  should be positive because firms with larger tax burdens should benefit more from the repatriation tax holiday if they repatriate more foreign earnings.

### 3.3 Investment

The second set of hypotheses suggests that the combination of repatriation tax incentives and DPAD should encourage firms that benefit from DPAD to increase domestic investment, especially for capital-constrained firms.

A modified version of the investment model used in FP (Table 6) investigates whether firms that benefit from DPAD increase domestic investment.

$$\begin{aligned} \Delta DomesticInvest_t = & a_0 + \beta_1 Residual(ClaimDPAD)_t + \beta_2 ResidualxCapConstrained_t + \beta_3 Pr(ClaimDPAD)_t + \\ & \beta_4 CapConstrained_t + \beta_5 Size_{t-1} + \beta_6 MTB_{t-1} + \beta_7 Debt_{t-1} + \beta_8 \Delta Cash_t + \beta_9 ROA_{t-1} + \gamma Industry_k + \\ & \phi Year + \varepsilon_t \end{aligned} \quad (5)$$

where  $\Delta DomesticInvest$  represents the change in domestic investment from year t-1 to year t, and domestic investment equals the summation of domestic capital expenditures, domestic R&D expenses, advertising expenses, and acquisitions divided by total assets.<sup>11</sup>  $MTB_{t-1}$ , and  $Debt_{t-1}$  are defined as in Eq. (3) except they are for year t-1.  $\Delta Cash$  is the change in cash from year t-1 to year t, and cash equals cash plus cash equivalents divided by total assets.  $Year$  is time fixed effect. The remaining variables are the same as defined in Eq. (4).

The coefficient on  $Residual(ClaimDPAD)$ ,  $\beta_1$ , measures the incremental increase in investment for firms that claim DPAD (Group 1) relative to those companies that discuss DPAD but do not claim it (Group 2).  $ResidualxCapConstrained$  measures the incremental increase in domestic investment for capital-constrained, repatriating firms that claim DPAD relative to non-capital-constrained repatriating firms that claim DPAD. Thus, coefficients  $\beta_1$  and  $\beta_2$  are predicted to be positive if the second set of hypotheses is supported. The coefficient on  $Pr(ClaimDPAD)$ ,  $\beta_3$ , measures the difference of changes in investment between repatriating firms that never discuss DPAD (Group 3) and the changes in investment for Groups 1 and 2 combined.

$Size$  controls for the size of repatriating firms. The sign is not predicted because in terms of investment, a certain magnitude of investment could be large for a small firm but small for a large firm.  $MTB$  and  $ROA$  capture return on investment. Only firms with higher investor expectations for returns on the firm's investment (measured by  $MTB$ ) and profitable investment (measured by  $ROA$ ) are expected to, and be able to, invest more. Both coefficients are expected to be positive. When investment opportunities are limited and the expected returns are lower, i.e. during earlier years of DPAD phasing-in, firms may use repatriated cash to pay off debt instead of investing in low return projects. Thus,  $Debt$  should be negative.  $\Delta Cash$  is predicted to be positive because repatriating firms that are not cash constrained would not repatriate a large amount of cash if their cash reserves were not decreasing.

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<sup>11</sup> Similarly to FP, we find that firms rarely report domestic advertising expenses and domestic acquisitions; hence, we use total advertising expenses and total acquisition instead.

Eq. (5) explains the mitigation strategies for the potential endogeneity issue. First, the residual of the first stage regression (Eq. 3),  $Residual(ClaimDPAD)$ , serves as the Inverse Mills Ratio in the second stage regression, Eq. (5), and controls for the potential selection bias. Second, it is possible that only profitable companies can claim DPAD benefits, and these companies also may have more free cash flow to invest. The potential bias caused by endogeneity can be in the form of correlated omitted variables. To mitigate this potential concern, the difference-in-difference empirical methodology reduces the correlated omitted variable bias. This design also eliminates the potential concern that capital-constrained firms have higher relative new investment than other firms because those firms serve as their own control. In addition, dummy time variables act in regressions to absorb the potential concern that investment opportunities are higher for the later time period (after AJCA took effect) than for the earlier time period (before AJCA took effect). Furthermore, the predicted probability of claiming DPAD controls for the potential concern that firms claiming DPAD experience an increase in investment opportunities after AJCA, relative to the period before AJCA took effect, but the firm's decision to claim DPAD was independent of the opportunities. Lastly, the  $Residual \times CapConstrained$  controls for the potential concern that investment opportunities of capital-constrained firms increase after AJCA took effect, relative to the period before AJCA took effect, but that the company's decision to claim DPAD was made independently of the opportunities.

In sum, by applying difference-in-difference and two-stage regression procedures, and including an elaborate set of control variables, we mitigate potential concerns about endogeneity issues related to the correlated omitted variable and selection bias. However, the results should be interpreted with caution because the strength of mitigation relies, at least partially, on the quality of the set of instrumental variables used.

### 3.4 Shareholder Payouts

The third set of hypotheses suggests that if the repatriation tax incentive and DPAD work jointly, then a repatriating firm benefiting from DPAD would reduce share repurchases but not cash dividends, especially for capital-constrained firms. Hence, the following multivariate regression investigates this set of hypotheses.

$$\begin{aligned} \Delta Payout_t = & a_0 + \beta_1 Residual(ClaimDPAD)_t + \beta_2 Residual \times CapConstrained_t + \beta_3 Pr(ClaimDPAD)_t + \\ & \beta_4 CapConstrained_t + \beta_5 Size_{t-1} + \beta_6 MTB_{t-1} + \beta_7 Debt_{t-1} + \beta_8 \Delta Cash_t + \beta_9 ROA_{t-1} + \beta_{10} \Delta ROA_t + \\ & \beta_{11} \Delta CapEx_t + \beta_{12} DivYield_{t-1} + \beta_{13} \Delta Payout_{t-1} + \gamma_i Industry_k + \phi Year + \varepsilon_t \end{aligned}$$

(6)

where  $\Delta Payout$  equals change in shareholder payouts divided by total assets from year t-1 to year t. Two variables,  $\Delta Repurchase$  and  $\Delta Dividend$ , capture both ways to return cash to shareholders.  $\Delta Repurchase$  equals the change in the ratio of share repurchases to total assets from year t-1 to year t.  $\Delta Dividend$  equals the change in the ratio of dividends to total assets from year t-1 to year t.  $DivYield$  (dividend yield) equals dividend per share divided by stock price at the end of year t-1.

The coefficient on  $Residual(ClaimDPAD)$ ,  $\beta_1$ , measures the incremental changes in shareholder payouts for firms claiming DPAD (Group 1) relative to those companies that discuss DPAD but do not claim it (Group 2).  $ResidualxCapConstrained$  measures the incremental increase in shareholder payouts for capital-constrained, repatriating firms that claim DPAD relative to non-capital-constrained repatriating firm that claim DPAD. Coefficients  $\beta_1$  and  $\beta_2$  are predicted to be negative for the share repurchase model if the third set of hypotheses is supported. The coefficient on  $Pr(ClaimDPAD)$ ,  $\beta_3$ , measures the difference of changes in shareholder payouts between the repatriating firms never discussing DPAD (Group 3) and the combination of Groups 1 and 2. However, firms that pay dividends are likely to maintain historical dividend levels as a “nearly untouchable” goal (Brav et al. 2005). Managers of those firms may either maintain their current dividend level, or increase dividends using repatriated funds. Thus, the dividend model does not predict the signs of  $\beta_1$  and  $\beta_2$ .

The tests include several control variables that prior studies find significant when associated with share repurchases and dividends. Vermaelen (1981) suggests that smaller firms have higher share repurchases because information asymmetry is higher for smaller firms. Managers of those firms repurchase shares to convey insider information to the market to reduce information asymmetry. However, recent literature finds a positive relation between firm size and share repurchases (Dittmar 2000; Core et al. 2006). In addition, Barclay et al. (1995) find a positive relation between dividends and size. Therefore, a positive relation should exist between shareholder payout and size. We include  $MTB$ ,  $ROA$ , and  $\Delta ROA$  to control for profitability and the ability to pay dividends. Since only profitable companies can afford to increase shareholder payouts, all three variables are expected to be positive. Consistent with Dittmar (2000) and Core et al. (2006), the model includes  $Debt$  and  $\Delta CapEx$  as controls and expects both variables to be negative. Repatriation is in the form of cash, and therefore, firms with more cash can increase payouts to a greater extent. Thus,  $ACash$  is expected to be positive.  $DivYield$  controls for a firm’s payout trend and capability to increase dividends. The model does not predict the sign of  $DivYield$  because this variable could either

represent a constraint on dividend increases or a trend of increasing dividends. The model includes the lagged value of  $\Delta Payout$  because current payouts are influenced by past payouts.

#### 4. Sample Collection and Descriptive Statistics

Information on repatriation status and repatriation amounts as well as the timing and amounts of firms' DPAD benefits are not readily available in such standard datasets as Compustat. The research sample was constructed by searching firms' 10-Ks via google.com and 10kwizard.com using such search strings as: "repatriat\*," "repatriation," "domestic manufactur\*," "manufacturers' deduction," "domestic product\*," "qualified produc\*," "manufacturing deduc\*," "domestic production activities deductions," and "domestic manufacturing deductions." Once the Act was passed in October 2004 and became effective in January 2005, a small number of firms immediately repatriated. Most firms waited for additional guidance from the FASB and other regulators. FASB issued FSP 109-1 to specify how firms report DPAD as "special deductions," and FSP 109-2 to specify how firms report remitted income tax in December 2004. Various agencies issued additional guidance and instructions throughout 2005. Examining firms' 10-Ks and 10-Qs from June 2004 to July 2008 identified about 5,000 firms. The selection eliminated firms not listed in Compustat as well as firms that incorporated outside of the U.S., insurance and financial services firms and those firms that do not discuss the repatriation decision. Firms that did not have foreign operations in the years 2001 to 2004 also were eliminated to create a list of 2,174 firms that discussed repatriation and DPAD.

We identified 373 firms that actually repatriated under the Act, collected repatriation status, amount, and year, determined whether firms discussed DPAD under the Act, and calculated the magnitude of the DPAD benefit by period. This created a dataset of firms that reported repatriation under the Act from the fourth calendar quarter of 2004 to fiscal quarters of 2006. The 373 firms repatriated approximately \$283 billion under the Act, and this amount is comparable to most previous studies (Clemons and Kinney 2008; Redmiles 2008; Blouin and Krull 2009; FP). Among the 373 repatriating firms, 202 firms discussed DPAD in their 10-Ks and/or 10-Qs, and 80 firms reported DPAD benefits in dollar amounts or percentage effects on effective tax rates. Among the 80 firms that claim DPAD, five firms repatriated in fiscal year 2004 while the majority of firms completed and reported repatriations in fiscal year 2005. Nine firms repatriated in their 2006 fiscal year. Almost all firms that report DPAD benefits elected to report them on an annual basis.

We use 2000 to 2007 as the main sample period. First, this period covers the patterns of firms' behaviors before and after repatriation. Second, the latest financial crisis started in mid-2008, and firms may alter their investment and payout behaviors because of the financial crisis. Table 1 lists descriptive statistics and compares the means of firms that claim DPAD and the means of firms not claiming DPAD from 2000 to 2007. In general, firms that claim DPAD are fairly similar to those repatriating firms that do not claim DPAD. However, the firms that claim DPAD have a lower repatriation ratio than the other repatriating firms. This is contrary to the expectations expressed in the first set of hypotheses. In addition, firms claiming DPAD are larger and more profitable, and they have smaller changes in their market-to-book ratio than repatriating firms that do not claim DPAD. Combining these two samples yields a sample similar to that of Blouin and Krull (2009, 1039). For instance, the means of *ROA*, *MTB*, and *TotalETR* are very similar in these two samples.

(Insert Table 1 here)

Table 2 lists the sample industry distribution based on two-digit SIC codes for repatriating firms. Firms that benefit from DPAD (Column 1) are concentrated in the industries most likely to serve domestic markets, including oil and gas extraction; chemicals and allied products; measuring, analyzing, and controlling instruments; and business services. Repatriating firms in such industries as textile mill products, lumber and wood products, petroleum refining, and apparel and accessory stores tend not to claim DPAD benefits (Column 2). Column (3) presents the number of companies that discussed DPAD in their K/Q filings in each industry. Results in this table support the parsing of the sample companies into three categories rather than two.

(Insert Table 2 here)

Table 3 presents the Pearson and Spearman correlations for key variables in the study. *RepatRatio* shows significant correlations with *ROA* and  $\Delta Debt$ , while  $\Delta DomesticInvest$ ,  $\Delta Repurchase$ , and  $\Delta Dividend$  show significant correlations with most control variables. For instance,  $\Delta Repurchase$ , and  $\Delta Dividend$  correlate positively with *ROA*,  $\Delta ROA$ , *MTB*, and  $\Delta MTB$ , indicating that firms with higher levels of profitability and higher market-to-book ratios tend to remit more earnings to their shareholders.

(Insert Table 3 here)

## 5. Multivariate Results

### 5.1 Repatriation

The first set of hypotheses suggests that if the repatriation tax holiday and the DPAD tax provision evoke the behaviors intended by policymakers, then repatriating firms that benefit from DPAD would repatriate a larger portion of their foreign earnings. This is most strongly expected for capital-constrained firms. Table 4 presents multivariate regression results of testing these hypotheses using Eq. (4). All regression variables are winsorized at the top and bottom one percent. The coefficient on *Residual(ClaimDPAD)* distinguishes DPAD claiming firms from firms that discuss DPAD but do not claim DPAD, and the coefficient on *Pr(ClaimDPAD)* distinguishes the repatriating firms that discuss DPAD in their SEC filings but do not claim DPAD and the firms claiming DPAD from firms that never discuss DPAD.

Results in column (1), Table 4 include only *Residual(ClaimDPAD)*. The coefficient on *Residual(ClaimDPAD)* is negative, but insignificant (-0.029,  $t = -1.05$ ). This suggests that the repatriation ratio of repatriating firms that claim DPAD is statistically indifferent from those of the firms that discuss DPAD but do not claim it and the firms that do not discuss DPAD combined. Column (2) presents results including both *Residual(ClaimDPAD)* and *ResidualxCapConstrained*, and *Residual(ClaimDPAD)* remains negative and insignificant (-0.021,  $t = -0.73$ ). *ResidualxCapConstrained* also is negative and insignificant (-0.160,  $t = -0.72$ ), suggesting that capital-constrained repatriating firms benefitting from the DPAD provision do not repatriate a larger portion of their foreign earnings than other types of firms in the sample repatriate. Column (3) includes *Pr(ClaimDPAD)* into the regression. Coefficients on *Residual(ClaimDPAD)* and *ResidualxCapConstrained* remain negative and insignificant. The coefficient on *Pr(ClaimDPAD)* is negative and significant (-0.106,  $t = -2.14$ ), indicating that repatriating firms that discuss DPAD but do not claim it and firms that discuss and claim DPAD both repatriate a smaller portion of their foreign earnings relative to repatriating firms that do not discuss DPAD.

Control variables results show general consistency with the predictions. For instance,  $\Delta Cash$  is positive and marginally significant or significant across all three columns. Coefficients for *ROA* and  $\Delta CapEx$  are consistent with predicted signs.

(Insert Table 4 here)

*RepatRatio* is measured as the dollar value of total repatriations over the dollar value of total foreign sales before the repatriation year. We also use other specifications to verify the results. First, total foreign revenues in year  $t$  serves as an alternative deflator. Results are very similar to those reported in Table 5. Second, the natural logarithm of the repatriation dollar value under the Act is also used as a dependent variable. Coefficients (significance) of

*Residual(ClaimDPAD)*, *ResidualxCapConstrained*, and *Pr(ClaimDPAD)* equal -0.562 (t = -0.51), 0.784 (t = 1.60), and -0.300 (t = -1.44), respectively (un-tabulated results). In this test, those firms that benefitted from DPAD and the firms that discussed DPAD but did not claim DPAD did not repatriate significantly more or less than the firms that did not discuss DPAD.<sup>12</sup> Lastly, we re-run Eq. (4) using truncated regression and the results are similar to those of Table 5, and coefficients on the three key variables of Eq. (4) are -0.019 (t=-0.97), -0.232 (t=-1.36), and -0.107 (t=-2.40).

In summary, there is little support for the first set of hypotheses. The DPAD tax provision combined with the repatriation tax holiday does not appear to incentivize companies that can benefit from DPAD to repatriate a larger portion of their foreign earnings. Even the capital-constrained firms, those firms that have the most incentive to repatriate more cash, fail to do so.

## 5.2 Domestic Investment

The hypothesis states that an effective repatriation tax holiday and DPAD tax provision of AJCA will incentivize repatriating firms that benefit from DPAD to invest more domestically relative to other repatriating firms, especially the capital-constrained firms. Table 5 presents regression results of Eq. (5). The regression variables are winsorized at the top and bottom one percent, and the model calculates t-statistics using clustered standard errors (clustered on firms) to control for firm effects. Similar to the approach in Table 4, *Residual(ClaimDPAD)*, *ResidualxCapConstrained*, and *Pr(ClaimDPAD)* operate in three models, and they operate in a progressive manner.

In Column (1), the coefficient for *Residual(ClaimDPAD)* is negative and insignificant (-0.008, t = -1.27). This suggests that changes in the domestic investment of firms claiming DPAD are indifferent from those firms that discuss DPAD but do not claim it and those firms that do not discuss DPAD combined. *ResidualxCapConstrained* is included with *Residual(ClaimDPAD)* in Column (2). The coefficient on *Residual(ClaimDPAD)* is negative and marginally significant (-0.012, t = -1.80), indicating firms claiming DPAD reduce domestic investment when they are compared to those firms that discuss DPAD but do not claim it and those firms that do not discuss it. However, the positive and significant *ResidualxCapConstrained* (0.081, t = 2.26) suggests that capital-constrained firms

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<sup>12</sup> One way to measure the proportion of repatriation over a company's foreign earnings is to employ the cumulative permanently re-invested foreign earnings as the deflator. This amount is not readily available in an electronic database so it was hand-collected successfully for only 97 companies using their SEC filings. Coefficients of the three key variables of Eq. (4) are -0.16 (t = -0.47), -1.628 (t = -0.72), and 0.987 (t=0.80), respectively.

claiming DPAD increased domestic investment following repatriation. All three variables are in Column (3), and *Residual(ClaimDPAD)* remains negative and marginally significant (-0.012,  $t = -1.81$ ). This indicates that firms claiming DPAD reduce domestic investment compared with those firms that discuss DPAD but do not claim it. *ResidualxCapConstrained* remains positive and significant (0.081,  $t=2.28$ ), which suggests that the capital-constrained firms that claimed DPAD increased domestic investment following repatriation. *Pr(ClaimDPAD)* is negative, but insignificant (-0.009,  $t = -0.72$ ), indicating that the domestic investment behaviors of the firms that discuss DPAD but do not claim it and the firms claiming DPAD combined are indifferent from firms that do not even discuss DPAD.

Accordingly, results in Column (3) do not support H2a, but they do support H2b. The combination of the repatriation tax holiday and the DPAD tax provision did not induce non-capital-constrained firms that benefitted from DPAD to increase their domestic investment; however, capital-constrained firms that benefitted from DPAD increase their domestic investment. This result is inconsistent with the result of Dharmapala et al. (2011), but they are consistent with that of FP, i.e., only capital-constrained firms increase domestic investment while unconstrained, repatriating firms do not increase investment. The result is also consistent with the finding in Huang-Meier et al. (2016) that managers like to hoard cash for future growth opportunities and in adverse conditions, especially when domestic investment opportunities in the U.S. are limited as they were around 2005 (Blouin and Krull 2009). Most of control variables are consistent with prior predictions. *ROA* is positive and significant across all three models, and *Debt* is negative and significant across all three models.

(Insert Table 5 here)

### 5.3 Shareholder Payout

Table 6 presents the results of regression Eq. (6) that investigates the third set of hypotheses. All regression variables are winsorized at the top and bottom one percent. T-statistics are calculated using clustered standard errors (clustered on firms) to control for firm effects. The variables of interests, *Residual(ClaimDPAD)*, *ResidualxCapConstrained*, and *Pr(ClaimDPAD)*, apply in three progressive models. A test for payouts uses share repurchases and cash dividends separately, and there are six columns in Table 6. Columns (1), (2), and (3) report results for  $\Delta Repurchase$ , while Columns (4), (5), and (6) report results for  $\Delta Dividend$ .

In the first three columns *Residual(ClaimDPAD)* is negative and insignificant. These results fail to support H3a, and suggest that in firms that benefit from DPAD, the changes in share repurchases are not different from firms

that do not benefit from DPAD. However, *ResidualxCapConstrained* is negative and significant in two later columns, (-2.921, t = -2.28) and (-2.934, t = -2.30), respectively. This indicates that the capital-constrained firms that claim DPAD reduce share repurchases. This result supports H3b. *Pr(ClaimDPAD)* is negative and insignificant in Column (3).

In Columns (4), (5), and (6), coefficients for *Residual(ClaimDPAD)* are positive and insignificant. These results support H3c, and they suggest that, no matter the probability of a repatriating firm claiming DPAD, its cash dividend behavior does not change and is indifferent to other repatriating firms. *ResidualxCapConstrained* is positive and marginally significant in both Columns (5) and (6), indicating that the capital-constrained firms benefitting from DPAD somehow increase cash dividends to shareholders. This result supports H3d to some extent. The coefficient on *Pr(ClaimDPAD)* is positive but insignificant (0.020, t = 0.34). In summary, the insignificant *Residual(ClaimDPAD)* across all six columns does not support H3a, but it does support H3c. The negative and significant *ResidualxCapConstrained* in Columns (2) and (3) supports H3b, while the positive and marginally significant *ResidualxCapConstrained* in Columns (5) and (6) supports H3d. Combining the negative coefficient on share repurchase and positive coefficient on cash dividends indicates that capital-constrained firms do not necessarily reduce shareholder payouts. Overall, the combination of the repatriation tax holiday and DPAD tax provision did not induce repatriating firms that benefitted from DPAD to reduce shareholder payouts.

As for other control variables, changes in shareholder payouts associate positively with *Size*, *ROA*, and  $\Delta ROA$ , and they associate negatively with *Debt*, and *DivYld*, which is consistent with expectations. Specifically, larger firms (measured by *Size*) and firms with greater profitability (measured by *ROA*) and increasing profitability (measured by  $\Delta ROA$ ) increase share repurchases and cash dividends. Firms with a high level of debt reduce share repurchases. The negative *DivYld* supports the hypothesis that repurchases and cash dividends are substitutes.

(Insert Table 6 here)

Regression results shown in Tables 5 and 6 represent the main sample period from 2000 to 2007. To verify the results, we also test the hypotheses using various sample periods from 2000 to 2005, from 2000 to 2006, from 2000 to 2008, from 2000 to 2009, and from 2000 to 2010. Results are similar.

#### 5.4 Additional Tests

There could be several explanations for the relative ineffectiveness of the repatriation tax holiday and DPAD to stimulate domestic investment. First, one implicit assumption of the model is that firms have limited cash

that can either be invested or paid to shareholders. However, after repatriation, firms have an abnormally large amount of cash they may disgorge by increasing investment, paying down debt, or hiring more workers without reducing shareholder payouts. Second, at the beginning of the phase-in of the DPAD, the amount of benefit provided by the DPAD is limited (three percent of QPAI or one percent of the statutory rate). It is possible that DPAD firms' domestic after-tax rates of return may still be lower than their foreign after-tax rates of return after the DPAD effect is included during the sample period. Thus, companies may increase their foreign investment using un-repatriated foreign earnings, and, despite the additional DPAD benefits, distribute the repatriated funds to shareholders. Third, other than the repatriation tax holiday and DPAD incentive, the Act also provided such tax benefits as longer windows for foreign tax credit carryforwards to reduce firms' U.S. tax burdens on foreign income. These tax provisions effectively increase firms' foreign after-tax rates of return, which may encourage the firms to expand abroad.

To evaluate alternative explanations, the study investigates whether firms benefiting from DPAD reduce their debt or increase employment. Table 7 presents the test results on changes in debt for six different time periods. All regression variables are winsorized at +/- one percent. T-statistics are calculated using clustered standard errors (clustered on firms) to control for firm effects. Industry and year dummy variables control for fixed effects.

As presented in Table 7, *Residual(ClaimDPAD)* is positive across all six time periods and statistically significant in the first three columns. It is marginally significant in the columns of 2000 to 2009 and 2000 to 2010, indicating that repatriating firms benefiting from DPAD increased their debt. Contrary to the expectation that firms would use repatriated cash to retire their debt, many repatriating firms actually borrow money to meet the deadline of the repatriation tax holiday and repay their debt later when they convert operating assets to cash. An alternative explanation is that these firms hold the repatriated cash and borrow more debt to prepare for better investment opportunities in the future, consistent with Brick and Liao (2017). *Pr(ClaimDPAD)* is negative across all six time periods, and it remains statistically insignificant.

The two-way interaction term, *ResidualxCapConstrained*, is negative across all six time periods, and its coefficients during 2000 to 2006 and 2000 to 2007 are statistically significant. This indicates capital-constrained firms use the repatriated cash to pay off some of their debt. Capital-constrained firms do not have enough internal cash to pursue available profitable projects, so they may use more debt to finance capital spending. With repatriated cash, they can repay some debt. However, the results indicate that the combination of the repatriation tax holiday

and DPAD did not induce repatriating firms that claimed DPAD to reduce debt. In contrast, on average, non-constrained firms increase their debt levels, and only capital-constrained firms that also claimed DPAD reduce their debt levels.

(Insert Table 7 here)

We also test whether the firms claiming DPAD benefits increase employment. The untabulated results show that among the same six time periods, all coefficients on  $Pr(ClaimDPAD)$  and  $Residual(ClaimDPAD)$  remain negative and statistically insignificant. The only exception is that  $Pr(ClaimDPAD)$  from 2000 to 2005 is marginally significant.  $ResidualxCapConstrained$  remains statistically insignificant across all six time periods and has an inconsistent sign. This result suggests that repatriating firms that benefit from DPAD did not increase domestic employment. Results are similar for capital-constrained firms.

## 6. Conclusion

Congress enacted the American Jobs Creation Act in 2004 as a way to incentivize companies to increase domestic investment and domestic employment. Two key tax provisions of AJCA are the repatriation tax holiday and the domestic production activities deduction. We examine whether these provisions operated jointly to encourage repatriating firms that benefitted from DPAD to repatriate more earnings back to the U.S., increase domestic investment, and reduce shareholder payouts. We hand-collected firms' repatriation amounts, DPAD benefits and other related data from companies' 10-Ks and 10-Qs from 2000 to 2007.

The results show that repatriating firms that benefitted from DPAD repatriated a similar portion of their foreign earnings as compared to other repatriating firms. The increase in domestic investment of non-constrained repatriating firms that benefitted from DPAD is lower than repatriating firms that did not benefit from DPAD. Only the small portion of capital-constrained firms that also benefitted from DPAD increased their domestic investment. The study also finds that non-constrained, DPAD-claiming firms' shareholder payout is similar to those repatriating firms not claiming DPAD. However, capital-constrained firms that benefitted from DPAD reduced their share repurchases and increased cash dividend payouts. In addition, we find that non-constrained, DPAD claiming firms increased their debt while capital-constrained firms that benefitted from DPAD reduced their debt. Lastly, there is no evidence supporting the expectation that the repatriating firms that benefitted from DPAD increased employment. The results are robust across various sampling periods. Based on these results, the joint impact of the repatriation tax

holiday and DPAD tax provision of AJCA is very limited, e.g., only the small portion of capital-constrained repatriating firms that benefited from DPAD increased their domestic investment and reduced their debt using repatriated foreign earnings. Overall, the combination of the repatriation tax holiday and DPAD tax provision did not induce repatriating firms to increase domestic investment, reduce shareholder payouts, reduce debt, or increase employment. This study contributes to the literature in several ways. First, prior research on the effects of AJCA focuses on the repatriation tax provision of the Act, and these studies find that repatriating firms increased their shareholder payouts after the Act (Blouin and Krull 2009; Dharmapala et al. 2011) and the majority of repatriating firms did not increase domestic investment except for capital-constrained firms (FP). However, research on other key elements of the Act, e.g., the DPAD provision, and the joint effect of different tax provisions on firms' behavior is sparse. This study links the DPAD incentive to the repatriation tax holiday and sheds light on their joint effects on firms' behaviors.

This study also documents the effect of a more complicated interaction between the repatriation tax holiday and the DPAD tax provision. Results of this study verify prior studies that show that repatriating firms did not increase investment. Only a small portion of repatriating firms that benefited from DPAD, i.e. capital-constrained firms, increase domestic investment and reduce their debt levels. Thus, even jointly, the expensive tax provisions did not cause average repatriating firms to increase domestic investment and employment. Further, the results of this study may be of interest to policy setters during the current deficit debate. Some law makers in Congress advocate additional tax cuts and repatriation tax holidays to encourage investment, boost the general economy, increase corporate tax collections, and reduce federal deficits.

However, there are alternative explanations regarding the ineffectual impact of the repatriation tax holiday and DPAD in stimulating incremental investment. First, at the phase-in of the DPAD (corresponds with the sample period), the amount of the DPAD benefit was only one-third of the benefit that was available in later years. Thus, it is possible that the DPAD benefit initially was not large enough to attract more investment or that the DPAD benefit may be countered by the benefit management gets from increasing shareholder payouts. Also, the Act provides other tax provisions that reduce U.S. taxes on foreign income. These provisions may increase firms' foreign after-tax rates-of-return more than DPAD increases the domestic after-tax rates of return. Thus, firms may choose not to increase their domestic investment.

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## Appendix A. Variable definitions

*CapConstrained*, equals the percentage of the fiscal years during 2000 to 2003 in which the firm's earnings after taxes (prior to interest) is less than its capital expenditures.

$\Delta CapEx$  equals the change in capital expenditures scaled by total assets from year t-1 to year t.

$\Delta Cash$  is change in cash from year t-1 to year t where cash equals cash plus cash equivalents divided by total assets.

*ClaimDPAD* equals one if a firm claims DPAD tax benefit in year t, and zero otherwise.

*Debt* is the ratio of long-term debt plus debt included in current liabilities to total assets of year t.

$\Delta Dividend$  equals the change in the ratio of dividends to total assets from year t-1 to year t.

*DivYield* (dividend yield) equals dividends per share divided by stock price at the end of the year t-1.

$\Delta DomesticInvest$  is change in domestic investment from year t-1 to year t where domestic investment equals the summation of domestic capital expenditure, domestic R&D expenses, advertising expenses, and acquisition divided by total assets.

*FCF* is the free cash flow (the difference between operating cash flow and capital expenditures) deflated by total assets of year t.

*MentionDPAD* equals one if a firm discusses DPAD tax provision at least once in their 10-K/10-Q filings from 2004 to 2007, and zero otherwise.

*MTB* is the firm's market-to-book (MTB) ratio, and it equals the ratio of market value of equity and book value of equity.

$\Delta MTB$  equals the change in the firm's market-to-book (MTB) ratio from year t-1 to year t.

$\Delta Payout$  equals the change in shareholder payouts divided by total assets from year t-1 to year t.

$Pr(ClaimDPAD)$  is the probability a firm would claim DPAD benefit, calculated from regression results of Eq. (3).

*RepatRatio* is specified as the dollar value of total repatriation over dollar value of total foreign sales.

$\Delta Repurchase$  equals the change in the ratio of share repurchases to total assets from year t-1 to year t. Repurchase is the purchase of common and preferred stock minus decreases in preferred stock, scaled by total assets at the beginning of year t, and multiplied by 100.

*Residual(ClaimDPAD)* is the residual of regression results of Eq. (3).

*ResidualxCapConstrained* is the product of *Residual(ClaimDPAD)* and *CapConstrained*.

*ROA* equals the net income scaled by total assets at year t-1.

$\Delta ROA$  equals the changes of ROA from year t-1 to year t.

*Size* is the natural log of total assets (AT) of year t.

*TotalETR* is a firm's total effective tax rate, calculated as the total income tax expense divided by pre-tax income of year t.

**Table 1. Descriptive statistics of firms that claimed DPAD and other repatriating firms**

Firms That Claimed DPAD					
	N	Mean	Q1	Median	Q3
RepatRatio	61	0.081†	0.026	0.050	0.089
ΔDomesticInvest	623	-0.010	-0.036	0.001	0.030
ΔRepurchase	627	0.129	-0.645	0.000	0.983
ΔDividend	614	0.039	-0.059	0.000	0.091
ΔDebt	615	-0.008	-0.048	-0.009	0.019
Size	630	7.914‡	6.577	7.917	9.132
ROA	630	0.068‡	0.033	0.065	0.104
ΔROA	627	0.002	-0.015	0.004	0.022
MTB	615	3.529	1.840	2.801	4.212
ΔMTB	610	-0.075*	-0.485	0.024	0.532
Debt	622	0.265	0.104	0.245	0.360
ΔCash	623	0.003	-0.015	0.002	0.026
ΔCapex	623	-0.001	-0.010	-0.001	0.007
ΔFCF	623	0.001	-0.030	0.000	0.034
Divyld	616	0.014	0.000	0.010	0.021
TotalETR	630	0.324	0.275	0.321	0.360
Other Repatriating Firms					
	N	Mean	Q1	Median	Q3
RepatRatio	232	0.118†	0.034	0.073	0.127
ΔDomesticInvest	2269	-0.006	-0.030	-0.001	0.026
ΔRepurchase	2286	0.374	-0.441	0.000	1.152
ΔDividend	2241	0.021	-0.005	0.000	0.053
ΔDebt	2256	-0.009	-0.053	-0.007	0.022
Size	2285	7.722‡	6.739	7.647	8.771
ROA	2284	0.058‡	0.025	0.056	0.096
ΔROA	2276	-0.001	-0.022	0.001	0.022
MTB	2244	3.664	1.683	2.622	4.382
ΔMTB	2228	-0.297*	-0.616	-0.032	0.454
Debt	2270	0.256	0.099	0.237	0.360
ΔCash	2267	-0.002	-0.026	0.003	0.036
ΔCapex	2269	-0.003	-0.011	-0.001	0.007
ΔFCF	2263	0.001	-0.036	0.001	0.034
Divyld	2246	0.013	0.000	0.004	0.018
TotalETR	2284	0.297	0.233	0.312	0.368

\*, †, and ‡ indicate two-tailed statistical significance of comparing means of the variables between repatriating firms that claimed DPAD and other repatriating firms at 10%, 5%, and 1% levels, respectively.

**Table 2. Industry distribution of repatriating firms**

SIC	Industry	Firms Claimed DPAD (1)	Other Repatriating Firms (2)	Firms Discussed DPAD (3)
1	Agricultural Production-Crops		2	1
13	Oil and Gas Extraction	4	6	7
14	Mining and Quarrying of Nonmetallic Minerals, Except Fuels		2	1
15	Building Construction General Contractors and Operative Builders		1	1
16	Heavy Construction Other Than Building Construction Contractors	1		1
20	Food and Kindred Products	3	10	8
21	Tobacco Products	2		2
22	Textile Mill Products		3	1
23	Apparel and Other Finished Products Made from Fabrics and Similar Materials		4	2
24	Lumber and Wood Products, Except Furniture		3	1
25	Furniture and Fixtures	2	4	4
26	Paper and Allied Products	3	7	6
27	Printing, Publishing, and Allied Industries	1	4	1
28	Chemicals and Allied Products	11	40	31
29	Petroleum Refining and Related Industries		3	3
30	Rubber and Miscellaneous Plastics Products	3	4	6
31	Leather and Leather Products	1	4	1
32	Stone, Clay, Glass, and Concrete Products	1	2	3
33	Primary Metal Industries	3	4	6
34	Fabricated Metal Products, Except Machinery and Transportation Equipment	2	6	4
35	Industrial and Commercial Machinery and Computer Equipment	5	33	20
36	Electronic and Other Electrical Equipment and Components, Except Computer Equip.	6	37	25
37	Transportation Equipment	5	10	10
38	Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks	12	26	23
39	Miscellaneous Manufacturing Industries		5	0
44	Water Transportation		1	0
45	Transportation by Air		1	1
47	Transportation Services		1	0
48	Communications		3	0
49	Electric, Gas, and Sanitary Services	4	7	8
50	Wholesale Trade-durable Goods	1	4	5
51	Wholesale Trade-non-durable Goods		2	0
54	Food Stores		2	1
55	Automotive Dealers and Gasoline Service Stations		1	0
56	Apparel and Accessory Stores		6	0
57	Home Furniture, Furnishings, and Equipment Stores		2	0
58	Eating and Drinking Places		2	0
59	Miscellaneous Retail	1	4	1
70	Hotels, Rooming Houses, Camps, and Other Lodging Places		1	0
73	Business Services	7	24	14
79	Amusement and Recreation Services	1		1
80	Health Services		1	0
87	Engineering, Accounting, Research, Management, and Related Services		10	1
99	Nonclassifiable Establishments	1	1	2
Total		80	293	202

**Table 3. Pearson and Spearman correlations**

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
LogRepat (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$\Delta$ DomesticInvest (2)	0.067	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$\Delta$ Repurchase (3)	0.071	0.067	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$\Delta$ Dividend (4)	0.011	0.071	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-
$\Delta$ Debt (5)	<b>0.202</b>	<b>0.052</b>	<b>0.133</b>	<b>0.588</b>	-	-	-	-	-	-	-	-	-	-	-	-
Size (6)	0.008	0.013	0.011	0.024	0.017	-	-	-	-	-	-	-	-	-	-	-
ROA (7)	<b>0.123</b>	0.030	<b>0.072</b>	<b>0.117</b>	<b>0.121</b>	<b>0.103</b>	-	-	-	-	-	-	-	-	-	-
$\Delta$ ROA (8)	0.073	0.030	0.020	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
MTB (9)	0.002	0.020	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
$\Delta$ MTB (10)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
Debt (11)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
$\Delta$ Cash (12)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
$\Delta$ Capex (13)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
$\Delta$ FCF (14)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
Divyld (15)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-
TotalETR (16)	0.025	0.022	<b>0.394</b>	<b>0.154</b>	<b>0.114</b>	<b>0.111</b>	0.027	<b>0.114</b>	0.015	0.004	0.008	0.001	-	-	-	-

\*Pearson (Spearman) coefficients are above (below) the diagonal.

\*Bolted coefficients are significant at  $p < 0.05$  (two-tailed test).



**Table 4. Multivariate tests of repatriation**

$$\begin{aligned}
 \text{RepatRatio}_t = & a_0 + \beta_1 \text{Residual}(\text{ClaimDPAD})_t + \beta_2 \text{ResidualxCapConstrained}_t + \beta_3 \text{Pr}(\text{ClaimDPAD})_t + \\
 & \beta_4 \text{CapConstrained}_t + \beta_5 \text{Size}_{t-1} + \beta_6 \text{ROA}_{t-1} + \beta_7 \text{Cash}_{t-1} + \beta_8 \Delta \text{MTB}_t + \beta_9 \Delta \text{CapEx}_t + \\
 & \beta_{10} \text{TotalETR}_t + \gamma \text{Industry}_k + e
 \end{aligned}
 \tag{4}$$

	Predicted Signs	(1)	(2)	(3)
Intercept	?	0.136 (0.83)	0.055 (0.33)	0.124 (0.72)
Residual(ClaimDPAD) <sub>t</sub>	+	-0.029 (-1.05)	-0.021 (-0.73)	-0.019 (-0.66)
ResidualxCapConstrained <sub>t</sub>	+		-0.160 (-0.72)	-0.207 (-0.93)
CapConstrained <sub>t</sub>	?		0.048 (0.59)	0.046 (0.57)
Pr(ClaimDPAD) <sub>t</sub>	+			-0.106‡ (-2.14)
Size <sub>t-1</sub>	+	-0.007 (-1.06)	-0.006 (-0.88)	-0.005 (-0.77)
ROA <sub>t-1</sub>	+	0.278* (1.66)	0.284* (1.69)	0.335‡ (1.98)
ΔCash <sub>t</sub>	+	0.174* (1.84)	0.185* (1.94)	0.207‡ (2.17)
ΔMTB <sub>t</sub>	?	-0.001 (-0.14)	-0.001 (-0.16)	-0.001 (-0.32)
ΔCapEx <sub>t</sub>	-	-1.245‡ (-2.34)	-1.213‡ (-2.27)	-1.312‡ (-2.46)
TotalETR <sub>t</sub>	+	0.011 (0.51)	0.010 (0.45)	0.015 (0.71)
Industry Fixed Effect		Yes	Yes	Yes
N		291	291	291
Log Pseudolikelihood		153.9	154.5	157.2

\*, †, and ‡ indicate two-tailed statistical significance at 10%, 5%, and 1% levels, respectively, with t-value reported in parentheses.

All variables are defined in Appendix A.

**Table 5. Multivariate tests of domestic investment**

$$\Delta DomesticInvest_t = a_0 + \beta_1 Residual(ClaimDPAD)_t + \beta_2 Residual \times CapConstrained_t + \beta_3 Pr(ClaimDPAD)_t + \beta_4 CapConstrained_t + \beta_5 Size_{t-1} + \beta_6 MTB_{t-1} + \beta_7 Debt_{t-1} + \beta_8 \Delta Cash_t + \beta_9 ROA_{t-1} + \gamma Industry_k + \phi Year + \varepsilon_t \quad (5)$$

	Predicted Signs	(1)	(2)	(3)
Intercept	?	0.078‡ (3.53)	0.081‡ (3.59)	0.082‡ (3.69)
Residual(ClaimDPAD) <sub>t</sub>	+	-0.008 (-1.27)	-0.012* (-1.80)	-0.012* (-1.81)
Residual×CapConstrained <sub>t</sub>	+		0.081† (2.26)	0.081† (2.28)
CapConstrained <sub>t</sub>	?		-0.034* (-1.85)	-0.034* (-1.86)
Pr(ClaimDPAD) <sub>t</sub>	+			-0.009 (-0.72)
Size <sub>t-1</sub>	?	-0.002 (-0.84)	-0.002 (-1.06)	-0.002 (-1.00)
MTB <sub>t-1</sub>	+	-0.001 (-1.49)	-0.001 (-1.44)	-0.001 (-1.46)
Debt <sub>t-1</sub>	-	-0.243‡ (-8.58)	-0.246‡ (-8.67)	-0.246‡ (-8.67)
ΔCash <sub>t</sub>	+	-0.007 (-0.13)	-0.011 (-0.19)	-0.010 (-0.18)
ROA <sub>t-1</sub>	+	0.161‡ (2.60)	0.147† (2.32)	0.150† (2.36)
Industry Fixed Effect		Yes	Yes	Yes
Year Fixed Effect		Yes	Yes	Yes
N		2,817	2,817	2,817
Adj. R2		0.0847	0.0852	0.0850

\*, †, and ‡ indicate two-tailed statistical significance at 10%, 5%, and 1% levels, respectively, with t-value reported in parentheses.

All variables are defined in Appendix A.

**Table 6. Multivariate tests of shareholder payout**

$$\begin{aligned} \Delta Payout_t = & a_0 + \beta_1 Pr(ClaimDPAD)_t + \beta_2 Residual(ClaimDPAD)_t + \beta_3 ResidualxCapConstrained_t \\ & + \beta_4 CapConstrained_t + \beta_5 Size_{t-1} + \beta_6 MTB_{t-1} + \beta_7 Debt_{t-1} + \beta_8 \Delta Cash_t + \beta_9 ROA_{t-1} + \beta_{10} \Delta ROA_t \\ & + \beta_{11} \Delta CapEx_t + \beta_{12} DivYield_{t-1} + \beta_{13} \Delta Payout_{t-1} + \gamma_i Industry_k + \phi Year + \varepsilon_t \end{aligned} \quad (6)$$

	Predicted Signs	$\Delta Repurchase_t$			$\Delta Dividend_t$		
		(1)	(2)	(3)	(4)	(5)	(6)
Intercept		-0.860*	-1.012†	-0.966*	0.108	0.115	0.113
		(-1.66)	(-1.99)	(-1.88)	(1.15)	(1.26)	(1.26)
Residual(ClaimDPAD) <sub>t</sub>	-	-0.326	-0.182	-0.184	0.035	0.017	0.017
		(-1.57)	(-0.90)	(-0.91)	(1.22)	(0.58)	(0.59)
ResidualxCapConstrained <sub>t</sub>	-		-2.921†	-2.934†		0.345*	0.346*
			(-2.28)	(-2.30)		(1.92)	(1.92)
CapConstrained <sub>t</sub>	?		1.530‡	1.540‡		-0.073	-0.074
			(2.79)	(2.82)		(-1.20)	(-1.21)
Pr(ClaimDPAD) <sub>t</sub>				-0.373			0.020
				(-0.78)			(0.34)
Size <sub>t-1</sub>	+	0.138†	0.152†	0.156‡	0.016†	0.015†	0.015†
		(2.27)	(2.55)	(2.63)	(2.27)	(2.15)	(2.12)
MTB <sub>t-1</sub>	+	-0.034	-0.038	-0.039	-0.001	-0.001	-0.001
		(-0.85)	(-0.91)	(-0.94)	(-0.41)	(-0.37)	(-0.35)
Debt <sub>t-1</sub>	-	-2.835‡	-2.724‡	-2.714‡	-0.392‡	-0.399‡	-0.400‡
		(-4.01)	(-3.85)	(-3.84)	(-6.32)	(-6.43)	(-6.44)
$\Delta Cash_t$	+	-9.874‡	-9.777‡	-9.764‡	0.103	0.097	0.097
		(-5.92)	(-5.84)	(-5.84)	(0.86)	(0.81)	(0.80)
ROA <sub>t-1</sub>	+	8.606‡	9.386‡	9.582‡	0.419†	0.383*	0.373*
		(3.84)	(4.06)	(4.01)	(2.17)	(1.92)	(1.86)
$\Delta ROA_t$	+	16.760‡	17.100‡	17.255‡	0.419*	0.404*	0.396*
		(5.42)	(5.51)	(5.46)	(1.94)	(1.87)	(1.83)
$\Delta CapEx_t$	-	-6.624*	-6.127*	-6.135*	1.576‡	1.545‡	1.546‡
		(-1.95)	(-1.80)	(-1.80)	(3.25)	(3.18)	(3.17)
Divyld <sub>t-1</sub>	?/-	-16.506†	-14.424†	-13.767†	-7.795‡	-7.922‡	-7.958‡
		(-2.58)	(-2.28)	(-2.14)	(-6.07)	(-6.05)	(-6.08)
$\Delta Repurchase_{t-1}$	?	-0.230‡	-0.231‡	-0.231‡			
		(-5.05)	(-5.04)	(-5.04)			
$\Delta Dividend_{t-1}$	?				-0.018‡	-0.018‡	-0.018‡
					(-3.05)	(-3.05)	(-3.05)
Industry Fixed Effect		Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect		Yes	Yes	Yes	Yes	Yes	Yes
N		2,817	2,817	2,817	2,789	2,789	2,789
Adj. R2		0.1634	0.1642	0.1640	0.0972	0.0978	0.0975

\*, †, and ‡ indicate two-tailed statistical significance at 10%, 5%, and 1% levels, respectively, with t-value reported in parentheses.

All variables are defined in Appendix A.

**Table 7. Additional tests of debt**

$$\Delta Debt_t = a_0 + \beta_1 Residual(ClaimDPAD)_t + \beta_2 Residual \times CapConstrained_t + \beta_3 Pr(ClaimDPAD)_t \\ + \beta_4 CapConstrained_t + \beta_5 Size_{t-1} + \beta_6 MTB_{t-1} + \beta_7 \Delta Cash_t + \beta_8 ROA_{t-1} + \beta_9 \Delta ROA_t \\ + \beta_{10} \Delta CapEx_t + \gamma Industry_k + \phi Year + \varepsilon_t$$

	2000- 2005	2000- 2006	2000- 2007	2000- 2008	2000- 2009	2000- 2010
Intercept	0.082‡ (4.23)	0.060‡ (2.81)	0.056‡ (2.67)	0.058‡ (2.69)	0.044† (2.03)	0.042† (2.27)
Residual(ClaimDPAD) <sub>t</sub>	0.012† (2.00)	0.012† (2.19)	0.012‡ (2.64)	0.007 (1.53)	0.006* (1.66)	0.007* (1.80)
ResidualxCapConstrained <sub>t</sub>	-0.056 (1.46)	-0.081* (1.73)	-0.067† (2.13)	-0.036 (1.31)	-0.03 (1.20)	-0.035 (1.42)
CapConstrained <sub>t</sub>	0.033 (1.25)	0.058† (2.30)	0.037† (2.36)	0.031† (2.06)	0.028† (2.04)	0.028† (2.10)
Pr(ClaimDPAD) <sub>t</sub>	-0.012 (0.91)	-0.002 (0.13)	-0.011 (1.16)	-0.007 (0.76)	-0.002 (0.20)	-0.003 (0.44)
Size <sub>t-1</sub>	-0.006‡ (3.74)	-0.005‡ (3.03)	-0.005‡ (3.26)	-0.006‡ (4.04)	-0.004‡ (3.38)	-0.004‡ (3.66)
MTB <sub>t-1</sub>	0.001 (0.97)	0.001 (1.25)	0.001 (1.15)	0.001 (1.15)	0.001 (1.31)	0.001 (1.37)
ΔCash <sub>t</sub>	0.207‡ (3.41)	0.204‡ (3.69)	0.207‡ (3.94)	0.198‡ (4.11)	0.214‡ (4.76)	0.223‡ (5.11)
ROA <sub>t-1</sub>	0.026 (0.38)	0.019 (0.30)	0.03 (0.55)	0.042 (0.84)	0.031 (0.71)	0.015 (0.39)
ΔROA <sub>t</sub>	-0.258‡ (3.63)	-0.266‡ (3.86)	-0.269‡ (4.11)	-0.263‡ (4.68)	-0.244‡ (5.14)	-0.239‡ (5.34)
ΔCapEx <sub>t</sub>	1.045‡ (5.03)	1.046‡ (5.32)	1.036‡ (5.37)	0.994‡ (5.49)	0.949‡ (5.58)	0.963‡ (6.01)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
N	2,144	2,486	2,817	3,138	3,449	3,752
Adj. R2	0.0641	0.0623	0.0651	0.0641	0.0658	0.069

\*, †, and ‡ indicate two-tailed statistical significance at 10%, 5%, and 1% levels, respectively, with t-value reported in parentheses.

All variables are defined in Appendix A.