Investment and Capital Constraints:
Repatriations Under the American Jobs Creation Act

Michael Faulkender
University of Maryland

and

Mitchell Petersen
Northwestern University and NBER

Abstract

The American Jobs Creation Act (AJCA) significantly lowered the tax cost at which US firms could access their unrepatriated foreign earnings. We use this temporary shock to the cost of internal financing, and its variation across firms, to examine the role of capital constraints in the firm's investment decisions. Controlling for the ability to repatriate foreign earnings in a more tax efficient way under the AJCA, we find that for a majority of firms there was little change in domestic investment – the policy objective of the law. We do find, however, that for the subset of firms which are capital constrained, they invested a majority of the repatriated funds in approved domestic investment. We find little change in financial policy (e.g. leverage and equity payouts) once we control for the ability to repatriate funds under the AJCA. These findings point out the importance of understanding finance theory when designing optimally targeted tax incentives.

I)   Introduction

To what extent do financing frictions constrain investments that firms would otherwise make? This question is arguably one of the most important in corporate finance, and one about which there continues to be significant debate. Since Fazzari, Hubbard, and Peterson (1988) first estimated the sensitivity of investment to internal cash flow generation, the literature has argued about whether their finding that greater internal capital corresponds to greater investment was driven by the relaxing of financing constraints enabling investment that would otherwise have been forgone or whether the higher internal cash flow merely proxied for improvements in investment opportunities beyond the controls in their specification (Kaplan and Zingales, 2000, and Erickson and Whited, 2000). This literature has primarily focused on the cost of external financing, and thus assumed that all internal capital is fungible and equally cheap. Although this is a reasonable assumption for many firms, it can be flawed when firms have cash in foreign subsidiaries (Foley et al, 2007). In these cases, there can be a significant tax cost to bringing the cash home to fund domestic investment.

The American Jobs Creation Act (AJCA) was passed in 2004 with the explicit purpose of promoting domestic investment and employment. The act significantly and temporarily lowered the cost of repatriating foreign capital and thus the cost of funding domestic investments with internal foreign cash. American multinational firms had large stockpiles of unrepatriated foreign earnings. Since firms owe US tax on their foreign earnings only when they repatriate the income (i.e. bring the capital home to the US), this raises the cost of funding domestic investment with the foreign cash. Congress believed that the US tax code was distorting the domestic investment decisions of US firms by discouraging them from repatriating foreign earnings and investing this capital in the US. By temporarily reducing the tax cost of repatriating foreign earnings, Congress hoped to increase domestic investment. The capital was already inside the firm. The law only temporarily lowered the cost of using this internal capital to fund domestic investment. This paper examines whether the tax holiday in the AJCA worked: did firms that repatriated under the act significantly

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increase their domestic investment?

To analyze the effects of the American Jobs Creation Act, we examined firms' 10-K filings and collected: the amount of unrepatriated foreign earnings reported by each firm, whether the firm repatriated funds under the Act, and if so, how much they repatriated. To estimate the extent to which firms who repatriated foreign earnings under the AJCA responded to the incentives, we supplemented this data with changes in the firms' investment, financing, and equity payout decisions in the years prior to and following the repatriation. If the legislative intent of the Act was achieved, we would expect to see that investment increased for those firms that repatriated income relative to those firms that did not repatriate but which had foreign earnings that could have been repatriated.

Finance theory predicts, however, that firms with unfettered access to the capital markets would already be optimizing their investment. In other words, a crucial and unstated assumption underlying the Act is that firms were unable to raise sufficient funds from external markets at reasonable prices and were not generating sufficient internal domestic funds to finance all available domestic investment opportunities. If a firm can access external capital or generate sufficient internal domestic capital to fully fund their domestic investments, we would not expect the Act to have any effect on the firm's investment. We can test this hypothesis by examining whether firms that were least able to generate internal funds prior to the law change, or inexpensively access external capital markets, saw significantly higher increases in investment relative to the financially unconstrained firms that also repatriated foreign earnings under the Act.

We are not the first to empirically examine the American Jobs Creation Act (AJCA). Dharmapala, Foley, and Forbes (2011) and Blouin and Krull (2009), among others, examine the use of funds repatriated under the AJCA. Both papers conclude that the majority of repatriated funds were used to increase payments to shareholders (their estimates range from 50 to 90%). Dharmapala, Foley, and Forbes find no increase in investment due to repatriation. We find the opposite. We find the AJCA lead to large increases in investment, but only among the subset of firm which are capital constrained. These firms increased their investment by 11 percent investing 78 percent of the capital

they repatriated. However, they account for only 27% of the repatriated funds. We find small increases in payments to shareholders among the unconstrained firms and no increases among the constrained firms. The difference in results is attributable to differences in the empirical methods. Each of the papers uses a difference in difference regression method (DID), but the papers differ in how the firms in the sample are classified into the treated and non-treated groups in the DID regression. As we will show in the empirical section, if this classification is not done correctly, one cannot isolate the effect of repatriation from differences between firms which have unrepatriated foreign earnings and those that do not. Given the first-order nature of the investment / cash flow sensitivity question as well as the fact that Congress is considering another repatriation tax holiday, it is important that we ascertain an accurate understanding of the impact of this temporary change in tax policy.

This paper has several objectives. First, we measure how changes in the cost of internal finance affect firm's investment and financial decisions, using the repatriation provision of the AJCA as a natural experiment. The tax law change unexpectedly lowered the cost of internal financing to a subset of firms – those with a stockpile of foreign earnings - without altering forward-looking investment opportunities. We can therefore examine how this reduction in the cost of internal capital changed the firm's domestic investment and their reliance on external financing. Second, the results of the paper help us assess the effect of tax law changes as an instrument for altering corporate investment. Changes in tax rates can change the cost of different financing methods, as well as the returns on investment. However, knowing how these changes affect firms' incremental investment decisions requires us to understand the fundamental financial assumptions that the tax laws implicitly make but rarely state. In this instance, we can document the incentives provided under the Act and measure how investment responded to the tax incentives. Third, to the extent that we can document that the change in the tax incentives only benefitted capital constrained firms, we may be able to provide guidance on how future tax incentives should be targeted. Finally, we make a methodological contribution by demonstrating the importance of correctly defining the groups in

a DID regression to isolate the effect that one wants to examine.

The paper is organized as follows. We first describe the American Jobs Creation Act, how it temporarily changed the incentives to defer repatriation, and the implicit financial assumption that lies behind the law. In Section III, we explain our empirical strategy, compare our approach to the alternative applications of DID regressions used in prior papers, and explain why this leads to different empirical findings. We describe the data we collected in Section IV and the characteristics of firms which repatriated income under the AJCA in Section V. We find that the average firm that repatriated under the Act was a large, profitable firm with relatively fewer investment opportunities compared to those that did not repatriate. These are not the stereotypical capital constrained firms that would be foregoing valuable investment opportunities. In Section VI, we examine the effect of the law on the real and financial decisions of the firm. We find that the average firm that repatriated funds under the AJCA did not significantly increase their investment. However, when we focus on the subset of repatriating firms that were most likely to have underfunded investment prior to the Act, we do find a significant increase in investment, after controlling for firm characteristics including the likelihood of repatriating. These constrained firms repatriated a quarter of the total amount repatriated under the Act but spent a majority of their repatriated funds on domestic investment. Once the DID regression is correctly specified, we find little increase in payouts to shareholders, and only among the unconstrained firms. Section VII contains a brief summary and the implications of our findings.

II)   Description of Foreign Taxation and the American Jobs Creation Act

   A)   Foreign Taxation - A Simple Example

The intent of the American Jobs Creation Act was to encourage domestic investment by lowering the tax cost of repatriating income that US firms had earned abroad. To understand the incentives a firm has for repatriating foreign income and how the AJCA changes these incentives, it is useful to start with a simple example of how foreign earnings of US corporations are taxed. This will also make the underlying financial assumptions of the law clear.

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We start with a US firm that faces a marginal tax rate on domestic income of 35%. The firm has a wholly-owned foreign subsidiary in a country where the marginal corporate tax rate is 5%.[1] If the firm earns $100 in the foreign subsidiary, it pays $5 to the foreign government. If it then repatriates the remaining $95 to the US, it owes US taxes on the foreign income. To calculate the US tax, the firm grosses its repatriated dividend up by one minus the foreign tax rate. Thus, the entire $100, the pre-foreign tax income, is taxable in the US at the marginal rate of 35%. The US tax liability is $35. To avoid double taxation of the foreign income at the corporate level, the US allows the firm to take a credit for the taxes paid to the foreign government. The credit cannot reduce the US tax liability on the foreign income below zero (i.e. when if $\tau_F > \tau_D$). In our example, the net US tax liability on the foreign income is $30 if the firm repatriates the income today.

$$US\,Tax\,on\,Foreign\,Income = \tau_D \left[\frac{Dividend}{(1-\tau_F)} \right] - \tau_F Foreign\,Income$$

$$= 0.35 \left[\frac{95}{(1-0.05)} \right] - 0.05(100) = 30$$

(1)

If the firm repatriates the income, the tax rate is the same whether the income is earned domestically or abroad (35%). If instead the firm chooses to defer repatriation and reinvests the income abroad, the present value of the taxes falls and the effective marginal tax rate falls below 35%. In this case, the tax is $5 now plus the present value of the future tax payments. The longer the deferral, the lower the present value of the tax on foreign income. This creates both an incentive for deferring repatriation of foreign income, as well as an incentive to earn the income in foreign, low-tax, jurisdictions. This is the logic behind Foley et al's (2007) finding that US firms hold significant cash in their foreign subsidiaries. In a world where investment opportunities are the same in both the foreign and domestic country and there are no capital market imperfections, deferral is a dominant strategy, as it lowers the present value of tax payments and raises the after-corporate tax

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[1] The incentives for delaying the repatriation of foreign income are increasing in the difference between the US and the foreign corporate tax rate. When the foreign tax rate is higher or equal, the incentives are eliminated. There is a tax incentive, therefore, for US firms to locate their foreign operations in countries with low corporate tax rates relative to the US.

rate of returns. The AJCA was designed to change this by lowering the marginal corporate tax ($30 in our example) that was due upon repatriation.

To illustrate the magnitude of the tax deferral advantage, consider a case where the expected pre-corporate tax return on both foreign and domestic investment is ten percent. To calculate the value of the deferral, compare the present value of the foreign investment, assuming the income is repatriated in year ten, to the value of repatriating the foreign income today. The value of repatriating the income today is $65 [$100 pre-tax income minus $35 in foreign and domestic taxes].[2] To calculate the value of deferred repatriation, we first calculate the future after-domestic and foreign tax cash flow, then discount it back at the firm's after-corporate tax discount rate.

$$V_{Deferral} = \frac{100(1-\tau_F)\left[1+r(1-\tau_F)\right]^N - (\tau_D - \tau_F)\dfrac{100(1-\tau_F)\left[1+r(1-\tau_F)\right]^N}{(1-\tau_F)}}{\left[1+r(1-\tau_D)\right]^N}$$

$$= \frac{100(1-\tau_D)\left[1+r(1-\tau_F)\right]^N}{\left[1+r(1-\tau_D)\right]^N} \tag{2}$$

$$= \frac{100(1-0.35)\left[1+0.10(1-0.05)\right]^{10}}{\left[1+0.10(1-0.35)\right]^{10}} = 85.8$$

The first term in the numerator is the after-foreign tax cash flow at the end of ten years when the firm starts with $100 of pre-foreign tax income. The second term is the incremental US tax that will be due on the foreign income when it is repatriated in year ten. This calculation shows that by deferring the repatriation for ten years, the firm raises the present value of its after-tax cash flow from $65 (repatriate today) to $85.80 (delay repatriation). Instead of paying $35 in corporate taxes today, the firm pays current and future taxes that have a present value of only $14.20 [$100 pre-corporate tax income minus $85.80 present value of after-corporate tax income].

B)   Description of the American Jobs Creation Act

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[2] For our illustration, we have assumed the alternative domestic investment earns 10% pre-corporate tax and 6.5% post-domestic corporate tax. We will thus discount the after-corporate tax cash flows from delayed repatriation at 6.5% [=10%* (1-0.35)]. If the domestic investment earns 10% pre-corporate tax and is taxed at 35% each year, then it is a zero NPV investment by construction. Thus the value of the investment is its year zero value of $65.

To encourage the repatriation of foreign income and investment in the United States, the American Jobs Creation Act allowed US firms to exclude eighty-five percent of their repatriated foreign income if they elected to repatriate the income under the AJCA and abided by the law's restrictions . To demonstrate how the tax savings work and illustrate their potential magnitude, we use the numerical example from above. When repatriating foreign income without the benefit of the AJCA, the firm could bring home $95 in cash dividends from its foreign subsidiary and would owe an additional $30 in US corporate taxes today (see equation 1). If the same $95 in cash was repatriated under the AJCA, the firm would include only fifteen percent of the cash dividend in taxable income. The firm is allowed to offset part of its incremental tax with its foreign tax credits, but it may only claim 15% of the foreign tax credits. Just as 85% of the cash dividend is excluded from income, 85% of the foreign tax credits are lost. Thus, repatriating the income under the AJCA leads to a total tax liability of 9.2.[3]

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\begin{aligned}
Tax &= \tau_F(100) + \tau_D(1-0.85)(1-\tau_F)100 - (1-0.85)\tau_F(100) \\
&= 0.05(100) + 0.35(1-0.85)(1-0.05)100 - (1-0.85)0.05(100) = 9.2
\end{aligned}
\tag{3}
$$

This compares to a tax of 35 if the firm repatriated immediately under the prior law and a present value of taxes of 14.2 if the firm deferred repatriation (and thus would be taxed under the prior law in the future). The firms for which the incentive to defer repatriation is the greatest (τ_D - τ_F is the largest) also gain the most from repatriating under the AJCA.

To receive the tax subsidy on repatriated income, firms had to abide by a number of restrictions in the law. Our description here is brief. A more complete description is available in the online appendix I, in Blouin and Krull (2009), and in Graham, Hanlon, and Shevlin (2009) . First, the repatriation had to be in cash. This could create a problem for firms whose foreign earnings were invested in real assets and were thus cash poor. Among the repatriators in our sample, twenty-six

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[3] In discussions of the AJCA in the financial press, the incremental tax on repatriation was usually stated as 5.25% [(0-0.85)0.35]. In our sample, 69 percent of the repatriating firms reported both the amount of foreign income they were repatriating and a positive tax due on the repatriation. For these firms, the mean tax rate is 5.5 percent (median 5.2 percent). This number should be higher than 5.25% due to state taxes and lower due to the partial use of the foreign tax credits. Some of the firms reported negative net tax payments due upon repatriation, and are excluded from this calculation.

percent repatriated more cash than their total firm-wide cash holdings as of the end of the fiscal year prior to or following their repatriation (Graham, Hanlon, and Shevlin's (2009) survey results report similar magnitudes). Such cash poor subsidiaries could borrow to fund their repatriation. However, loans from the parent limited the amount the firm could repatriate, so it is more likely that the subsidiaries borrowed from outside markets. We found a number of cases where firms described the loans which funded the repatriation, but such disclosures were not the norm.

The amount of the repatriation was also limited by the amount of foreign earnings the firm reported it had abroad. When firms have unrepatriated foreign income, they may be required to report a deferred tax liability on their balance sheet. This is the marginal tax which will be due upon repatriation ($30 in our numerical example above). Firms are not required to report a deferred tax liability if they deem the income as "indefinitely" or "permanently" invested outside the US (APB 23 - Accounting for Income Taxes - Special Areas, see Albring, Dzuranin, and Mills, 2005). In this case, the firm reports the amount of permanently invested income ($95 in our numerical example) and/or the incremental tax that would be due upon repatriation ($30 in our numerical example) in the income tax notes of their 10-K. The AJCA used the amount of foreign earnings that are "permanently reinvested outside the United States" as reported on the firm's financial statements as a limit on the maximum allowed repatriation (e.g. the firm's 10-K).[4] In addition, only incremental repatriations were eligible for the preferred tax treatment. Firms calculated a base level of repatriations based on the five tax years prior to June 30, 2003. Only repatriated amounts above this base level were eligible for the tax subsidy. Thus in our numerical example, if the firm had repatriated 20 each of the prior five years, only 75 (95-20) would be eligible for lower tax rate under

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[4] The permanently invested foreign earnings (PIFE) number was taken from the firm's most recent financial statement filed with the SEC on or before June 30, 2003. The original effective date of the law was June 30, 2003. Due to delays in drafting, this was pushed back to June 30, 2004. However, the date for the financial statements was not changed from June 30, 2003 because the tax committee did not want to give firms the opportunity to increase the amount of income which they report as indefinitely invested abroad and thus increase the amount of qualified dividends which they could claim. If the firm did not report PIFE in their financial statements but did report the incremental tax, the maximum allowed repatriation was the incremental tax divided by 35% (e.g. 85.7 = 30/0.35 in our numerical example). If neither numbers were reported, then the maximum repatriation was $500M. This last number was used for public firms that do not report PIFE as well as private firms that do not disclose their financial statements.

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the AJCA.

The final restrictions are the focus of our paper. The legislative intent of the law was to encourage domestic investment and employment. Thus, to qualify for the lower tax rate on repatriated foreign income, the law required firms to adopt a domestic reinvestment plan that described the planned investment in the US (IRS Notice 2005-10). The list of permissible investments include expenditures on "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." (American Jobs Creation Act of 2004, Section 422: Incentives to reinvest foreign earnings in United States). The last phrase was interpreted to mean that paying down debt would be an acceptable use of the repatriated funds. Later regulations explicitly included expenditures on advertising or marketing and investment in brand names, trademarks, and other intangibles assets as permissible investments (IRS Notice 2005-10, February, 2005). The list was not meant to be exhaustive, but certain uses of the funds (e.g. distributions to the firm's shareholders) were explicitly prohibited.

C)   AJCA's Implicit Financial Assumption

In crafting the AJCA, the US government understood that US multinational firms have billions of dollars in profits that have been earned in foreign subsidiaries but not repatriated to the US. This is in part due to the incentives created by the US tax code. Higher tax rates in the US mean that repatriation leads to an incremental tax burden. The temporary tax reduction in the AJCA thus creates a strong tax incentive for US firms to repatriate their foreign income now, opposed to the near future. However, the ultimate intent of the AJCA was broader. The purpose of the AJCA's temporary tax reduction on repatriated foreign income was to encourage US firms to increase domestic investment and employment. To understand when this incentive will have real effects on investment and when it will not, we need to examine the implicit financial assumption that underlies the AJCA's temporary tax reduction.

In a world without financial frictions, firms will invest in all positive NPV projects,

independent of where the firm's projects or capital are located. If a US firm has domestic positive NPV projects, it will finance them by repatriating the foreign income, by using internal domestic cash flow, or by accessing the capital markets. In the presence of financial frictions, the choice of financing will depend upon which method is cheaper (assuming all options are available), and thus will be influenced by the tax code. Before and after the window created by the AJCA, bringing home foreign earnings from a low-tax subsidiary had a large tax cost. Under the AJCA, this tax cost was reduced dramatically. However, if the firm can access the capital markets by selling securities at the correct price, the AJCA will change only how investments are financed. It will not generate any incremental investment.

Thus the unstated financial assumption behind the AJCA is that firms' domestic operations are capital constrained. The logic of the law assumes that US multinationals have capital that is "trapped" in their foreign subsidiaries and positive NPV investment projects in the US, but firms have insufficient internal capital in the US and are unable to inexpensively raise the capital to invest in these projects. They could repatriate their foreign income, but the tax cost of this was assumed to be sufficiently high (larger than the NPV of the foregone investments) that the firms would choose not to invest domestically rather than repatriate the foreign income under the current law. This means that there are two reasons for a firm to repatriate foreign income under the AJCA. The first type are firms which are not capital constrained but who find that repatriating income under the AJCA lowers the present value of their corporate taxes, although it will raise the current year's cash taxes. The second type are firms which are capital constrained and repatriating the foreign earnings will allow them to fund investments that they would otherwise be unable to fund. If there are a significant number of firms with valuable domestic investment opportunities that have insufficient domestic internal resources and for which accessing outside capital is too costly, then the AJCA could generate the intended increase in investment, provided that these are also the types of firms that have significant earnings in their overseas subsidiaries without commensurate foreign investment opportunities. The unstated financial assumption behind the AJCA is that a significant

portion of firms with profitable overseas subsidiaries are capital constrained in their domestic operations. Thus, in our empirical work, we will focus on how repatriating income under the AJCA changed the investment and financial decisions of both capital constrained and capital unconstrained firms. Theory suggests that the increase in investment will arise only in the former set of firms.

III)   Empirical Strategy and the Prior Literature

      A)   Empirical Design: Difference in Difference Regressions (DID)

To analyze the effects of the American Jobs Creation Act on investment and financial policy, we will use a difference-in-difference (DID) regression approach. The prior literature has used the same basic method. In a DID approach, the sample is divided into a treated and an untreated group. Then the change in the response variable (e.g. investment) of the treated group is compared to the change in the response variable of the untreated group, controlling for firm characteristics including firm dummies. This method is complicated in our context because there are three groups, not the traditional two (treated and untreated). The difference between our findings and the results of prior work can be best explained by how the prior papers have combined the three groups into two, compared to our paper where they are left as three groups.

Conceptually, the sample of firms can be divided into three groups (see Table I). First, is the group of firms which have little or no foreign earnings in low tax jurisdictions. They may have no foreign operations or foreign operations which are not yet profitable. Alternatively, they may have foreign earnings but in countries where the tax rate is higher than in the US and so there would be no value of repatriating under the AJCA (see discussion in Section II-B). These firms have a low probability of repatriating under the AJCA.[5] The second group contains firms which could repatriate foreign income under the AJCA, as they have foreign income in low-tax jurisdictions, but chose not to repatriate this income. The third group also has unrepatriated income in low tax foreign

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[5] When explaining the empirical approach we describe having foreign earnings in a low tax jurisdiction (and thus repatriating under the AJCA is valuable to the firm) or not as a binary classification. This is not correct. As we will show in Section V, both the existence and the magnitude of foreign earnings predicts the probability a firm repatriates foreign income under the AJCA. Thus in the empirical work, we will use a probabilistic classification of the likelihood a firm repatriates income under the AJCA.

jurisdictions, and chose to repatriate income under the AJCA.

B)   Findings of Prior Literature

We are not the first to analyze the effect of the AJCA (see Clemons and Kinney (2007), Brennan (2008), Graham, Hanlon, and Shevlin (2009), Blouin and Krull (2009), Dharmapala, Foley, and Forbes (2011)). The two papers which are closest to our work are Blouin and Krull (2009 – henceforth BK) and Dharmapala, Foley, and Forbes (2011 – henceforth DFF). Like our work, both papers examine the use of repatriated funds. Our findings, however, are exactly opposite of the prior papers' results. BK do not examine firms' investment behavior as they assume firms are financially unconstrained.[6] DFF finds no increase in investment, even when they examine a subset of firms which are capital constrained, whereas we find large increases in investment among the subset of capital constrained firms. Both BK and DFF conclude that a majority of the repatriated funds were paid out to shareholders. BK find that 50% of the repatriated income went to increases in payments to shareholders, whereas DFF finds that over 90% of the repatriated income goes to increases in payments to shareholders. We find a small portion of the repatriated income is paid out to shareholders, and only among financially unconstrained firms. The increase in shareholder payments is not a robust finding across specifications and often is statistically insignificant.

The difference cannot be explained by differences in the sample; we are able to replicate the prior results with our data set.[7] The different results arise from the use of different empirical methods. Each of the three papers (BK, DFF and ours), use a difference in difference (DID) regression approach, but the papers differ in how the three groups discussed above are collapsed into a treated and untreated group. We will briefly explain the different approaches used in each paper, and leave a comparison of the actual findings to the empirical section.

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[6] Based on the mean value of firm characteristics in their sample, BK conclude the repatriating firms are not capital constrained and thus they did not expect to find any investment effect. We also find that the average repatriating firm is not capital constrained, but a subset of firms are. We return to this issue in Section IV-C.

[7] Our data set contains 442 firms which repatriated foreign income under the AJCA. DFF's sample contains 261 repatriating firms and BK's sample contains 357 repatriating firms.

To help understand why the results may differ across the three methods, we have constructed a hypothetical data structure to use as an illustration. In the hypothetical data structure, we assume that firms which do not have tax advantaged foreign earnings (Group 1) do not increase the response variable (Y, e.g. investment or equity payouts) on average in the second half of the sample versus the first half of the sample (see Table I). We assume that firms with tax advantaged foreign earnings increase the response variable in the second half of the sample by 2% whether they repatriate (Group 3) or not (Group 2). Thus for this illustration, we have assumed that repatriation has no effect.

BK run a standard DID regression by including a dummy variable which is equal to one in the year a firm repatriates and all years afterward, and zero otherwise.[8] Thus their coefficient measures the increase in the response variable for the firms that repatriate (Group 3) versus the increase in the response variable for firms that do not repatriate (Group 1 & 2 – see Table I). From this approach it is not possible to know if their measured effect is due to repatriation (a comparison of Group 3 to Group 2) or due to differences between firms with and without foreign earnings in low tax jurisdictions (e.g. differences between Group 1 and Groups 2 & 3). Returning to the example in Table I, their specification compares the 2% increase in Y of firms that repatriate (Group 3) to the average increase of all the non-repatriating firms. Some of these have foreign earnings and increased Y by 2% (Group 2), even though they do not repatriate their foreign earnings. Some of the non-repatriating firms have no foreign earnings and do not increase Y (Group 1). Since the first group has a higher increase in investment than the second group, the coefficient on the AJCA dummy is positive even when there is no effect. If α_i is the fraction of the sample in group i, the estimated coefficient would be:

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[8] In their initial results, BK use only the year of repatriation. In additional results, they extend the after repatriation sample to multiple years. They also do not include firms that repatriated in 2006, which is why their sample of repatriating firms is smaller than ours.

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$$DID_{BK} = Diff[Group\,3] - Diff[Group\,1\&2]$$

$$= \Delta Y_3 - \frac{\alpha_1 \Delta Y_1 + \alpha_2 \Delta Y_2}{\alpha_1 + \alpha_2} > 0 \tag{4}$$

$$= 2 - \frac{\alpha_1 0 + \alpha_2 2}{\alpha_1 + \alpha_2} > 0$$

When estimated this way, the coefficient can be too high, as in this example, or too low.

DFF take a different approach to collapsing the data into a treated and untreated group. They correctly note that the decision to repatriate is a decision of the firm and thus may introduce an endogeneity bias into the estimation (we discuss this in Sections III-C and VI-A-2). They thus use an instrumental variable approach, and use whether the firm's foreign tax rate is lower than the US and whether the firm's foreign subsidiaries are in tax havens as instruments. This effectively replaces the AJCA dummy variable used in BK with the probability that the firm repatriates. Firms which have unrepatriated income in low tax foreign jurisdictions will have a high probability of repatriation. When estimated this way, the coefficient measures the increase in the response variable for firms with a high probability of repatriation (Group 2 and Group 3) independent of whether they actually repatriate income versus the increase in the response variable for firms with a low probability of repatriation (Group 1). Based on the hypothetical data structure in Table I, the DFF specification would compare the 2% increase in Y of firms that have a high probability of repatriating (Groups 2 & 3) to the zero change in Y for the firms with a low probability of repatriating (Group 2). The estimated coefficient would be:

$$DID_{DFF} = Diff[Group\,2\&3] - Diff[Group\,1]$$

$$= \frac{\alpha_2 \Delta Y_2 + \alpha_3 \Delta Y_3}{\alpha_2 + \alpha_3} - \Delta Y_1 -> 0 \tag{5}$$

$$= \frac{\alpha_2 2 + \alpha_3 2}{\alpha_2 + \alpha_3} - 0 = 2 > DID_{BK} > 0$$

When estimated this way, the coefficient is positive and larger than the BK finding even though the true effect is assumed to be zero in our illustration.

An analogy may help. Take the case where we have a group of people who are healthy

(Group 1) or sick (Group 2 & 3). A subset of the sick people are given a treatment (Group 3). If we want to evaluate the performance of the treatment, we would not compare the change in health of those who received the treatment (Group 3) to those who did not (Group 1 & 2), as this would confound the effect of the treatment with the health of the population. This is the approach used in BK. Neither would we want to compare the change in the health of those that were predicted to receive the treatment (Group 2 & 3) to those who are unlikely to receive the treatment (the healthy – Group 1). This is the approach used in DFF.

Neither of the approaches used so far can answer the question we are asking. We want to know if conditional on being able to take advantage of the tax subsidy on repatriation in the AJCA, do firms invest more or increase equity payouts if they repatriated income under the AJCA? Since there are three groups among which we need to distinguish in the DID, as opposed to the typical two, we need two coefficients.[9] One coefficient to distinguish Group 1 from Group 2 & 3 and one to distinguish Group 2 from Group 3. We discuss the construction of the predicted probability of repatriation in Section V, and then we estimate the effect of the AJCA using all three approaches (BK, DFF and FP [our method]) in Section VI.

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\begin{aligned}
\text{BK} \quad & Y_{it} = \alpha AJCA_{it} + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \\
\text{DFF} \quad & Y_{it} = \alpha Pr[Repat] + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \\
\text{FP} \quad & Y_{it} = \alpha_1 Pr[Repat]_{it} + \alpha_2 \left(AJCA_{it} - Pr[Repat]_{it}\right) + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \\
& = \alpha_2 AJCA_{it} + (\alpha_1 - \alpha_2) Pr[Repat]_{it} + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it}
\end{aligned}
\tag{6}
$$

C)   Endogeneity in Investment Regressions

A potential problem with our analogy to healthy and sick people, some of whom are treated, is the choice of who receives the treatment. In a laboratory experiment, it can be random. In the case of the AJCA, firms choose to repatriate income under the AJCA. As we discussed in Section II-C, firms will choose to repatriate for one of two reasons. Financially unconstrained firms will repatriate

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[9] Once the intuition of the approach is clear, the questions arises why we don't drop Group 1 completely, and compare the response of Group 2 and Group 3. We will return to this issue in Section VI-A-3.

under the AJCA if it lowers the present value of their taxes. We would not expect these firms to increase their investment. Firms which are capital constrained will repatriate income and are expected to invest in projects since the cost of funding these projects has fallen due to the lower effective tax rate on repatriated income. This means that firms which repatriate differ from firms which do not repatriate and this raises the question of whether the repatriation coefficient estimate is biased.

To understand how the issue of endogeneity arises in our context, we need to review how endogeneity can affect how the coefficient estimate is interpreted (α in equation 7). With traditional investment/cash flow panel regressions, the question is what the coefficient on the cash flow variable is measuring. If there is no change in investment opportunities or investment opportunities have been controlled for (e.g. X in equation 7), then the cash flow coefficient measures a supply effect. Increases in cash flow relax the capital constraint and allow firms to fund projects they otherwise have been unable to fund. This is the interpretation we are testing in this paper. Does lowering the cost of repatriating capital increase the firm's investment by increasing the firm's access to lower cost capital? Alternatively, the coefficient on cash flow may be measuring changes in investment opportunities.

$$Investment_{it} = \beta X_{it} + \alpha CF_{it} + \mu_i + \lambda_t + \varepsilon_{it} \tag{7}$$

The standard solution to this problem has been to find a source of variation in cash flow which is uncorrelated with changes in investment opportunities (see for example Lamont (1997) and Rauh (2006)). In the experiments in these papers, however, all cash flow is internal to the firm and all cash flow can thus be used to fund any investment (e.g. the money is in the firm's universally accessible checking account). This is not true in our experiment. Foreign capital cannot fund domestic investments if it is not repatriated. A firm with significant foreign earnings can only use the foreign capital to fund domestic investments if the capital is repatriated.

We are asking a different question than the traditional investment-cash flow literature. We are not asking whether a firm with more foreign earnings invests more after the passage of the

AJCA, independent of repatriation (the approach used in DFF). Instead, we are asking whether repatriation under the AJCA relaxes the credit constraint for some firms and this leads to an increase in investment. Since we are asking a different question, our empirical approach must differ as well. We need to control for the presence of unrepatriated foreign earnings and then examine how behavior (e.g. investment or equity payouts) changes when there is an exogenous shock to the cost of internal funds (e.g. the tax on repatriating foreign cash falls temporarily with passage of the AJCA). This is the advantage of the AJCA experiment. The law change exogenously and significantly lowered the cost of internal capital for some firms (those firms with significant unrepatriated foreign earnings in low tax jurisdictions). For other firms the reduction in the cost of capital is zero (e.g. no foreign earnings). The change in the law did not change the firm's domestic investment opportunities.[10] Thus the coefficient we estimate (α in equation 7) can be interpreted as a supply effect as long as we convince the reader that it does not arise due to a change in investment opportunities. This is always the empirical challenge in these regressions and we return to it once we have the empirical results. At that point, we will explain what must be true for our results to be driven by changes in investment opportunities (demand for capital) as opposed to being drive by relaxation of the funding constraint (supply of capital, see Section VI-A-2).

IV)   Repatriation of Foreign Earnings: Data and Summary Statistics

A)   AJCA Repatriation Data

Information on a firm's repatriation of foreign earnings and whether the repatriations qualified under the AJCA is not available in the standard data sets (e.g. Compustat). Thus, to analyze the effects of the AJCA, we collected data directly from the firms' 10-Ks. We searched the firms' 10-Ks for discussions of the AJCA. Although the law was passed in October of 2004, and thus firms could begin repatriating under the lower tax rate immediately, many firms waited for additional

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[10] At the time of adoption, it was stated that the tax holiday would be a one time event. However, if firms expected it to be repeated in the future, it would lower the present value of taxes on foreign investments in countries with low tax rates and thus make these investment more viable. It would not change the taxation of domestic investment. We return to this issue in footnote 23.

regulations to be released by the Treasury. Additional regulations and guidance were released in February, May, and September of 2005. Thus, we searched the 2004, 2005, and 2006 10-Ks. The firms in our sample reported repatriating foreign income under the AJCA from the fourth quarter of 2004 to the fourth quarter of 2006 (the quarter of the 10-K filing). Two-thirds of the repatriations were reported in the fiscal year ending in the fourth quarter of 2005, and almost 20 percent of firms that reported repatriating income under the AJCA did so in 2006.

We found 1,246 firms that discussed the repatriation provisions of the AJCA in at least one year. In some cases, the 10-K would discuss the tax incentives introduced by the AJCA, but conclude that the firm had decided not to repatriate income that year. In the following year, the firm would either not mention the AJCA, disclose that they would not repatriate income under the AJCA, or announce that they had chosen to repatriate income under the AJCA. Based on the text of the 10-Ks, we tried to classify firms into the three groups discussed above (see Table I). 804 firms discussed the repatriation provisions of the AJCA in their 10K but did not repatriate foreign income under the AJCA (possibly Group 2) and 442 firms repatriated income under the AJCA (Group 3). The remaining firms did not mention the repatriation provisions of the AJCA in their 10Ks. All but 19 of the 442 repatriators disclosed the amount of their repatriation. The total repatriation by these 423 firms was $298B.[11]

B) Permanently Invested Foreign Earnings Data

A firm's ability to take advantage of the low tax rate in the AJCA depends upon their stock of unrepatriated foreign earnings. To measure firm's unrepatriated earnings we read the tax notes in the firms' 10-Ks from 2001 to 2005 and collected the permanently invested foreign earnings (PIFE) which they reported. Although only twenty percent of the firms in our sample report having foreign income that was permanently invested abroad, the amount of the unrepatriated foreign

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[11] According to aggregate IRS data, the total repatriations under the AJCA was $312B, or 14B more than we found (Browning, 2008). However, the IRS number includes private firms which we cannot include. Thus our sample includes the vast majority of the capital repatriated under the AJCA (95 percent). The IRS also recorded an additional $50B which was repatriated during this period but which did not qualify for the reduced tax rate under the AJCA.

earnings is large. Over the five years from 2001 to 2005, the total amount of permanently invested foreign earnings held by the firms in our sample grew from $350B in 2001 to a peak of $628B in 2004, and then fell to $546B in 2005 (see Figure 1).[12] The amount of permanently invested earnings is a useful, although imperfect, measure of unrepatriated foreign earnings. Firms with no foreign operations, or whose foreign subsidiary has not yet become profitable, will obviously not have any permanently invested foreign income. However, even after we condition on the firm having foreign operations (defined as having positive foreign income or paying foreign taxes), the probability of reporting permanently invested foreign earnings rises to only 58 percent (see Figure 1). Firms can have unrepatriated foreign earnings and not declare them as permanently invested abroad, but then they must report a deferred tax liability if the US tax rate is above the foreign rate (see Section II-A). Thus firms are more likely to classify foreign earnings as permanently invested abroad when the foreign tax rate is low and the benefits to repatriation under the AJCA are greater (Albring, Dzuranin, and Mills, 2005). This means that when we try to predict who will repatriate their foreign income under the AJCA, we will need to measure the amount of unrepatriated foreign earnings in two ways: the firm's current and recent history of foreign profits, as well as the stock of foreign profits that are classified as permanently invested abroad.

C) Characteristics of Firms that Repatriated Income under the AJCA

Since how firms allocate the repatriated capital will depend upon firm characteristics (e.g. whether they are capital constrained), it is useful to first examine which types of firm repatriated income under the AJCA. Although the firms that repatriated income come from 144 different industries (3-digit SIC), repatriation is concentrated among a smaller set of industries. First, only firms with significant foreign operations will be included in this sample. Secondly, conditional on having foreign operations the firms that repatriate are more likely to have subsidiaries located in

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[12] Not all firms which report they have foreign earnings permanently invested abroad, report the actual number. A small number of firms reported the incremental tax which would be due upon repatriation, but not the stock of foreign earnings. In this case, we divided the incremental tax by 0.35 as specified in the AJCA. The numbers we report on total permanently invested foreign income is thus based on the firms that report either the stock of permanently invested foreign earnings or the incremental tax.

low-tax jurisdictions. Thus, firms whose location decision is less restricted by business constraints are more likely to appear among these firms. The top ten industries in terms of total dollars repatriated under the AJCA are listed in Table II, along with the total amount of the repatriation and total amount of permanently invested foreign earnings by firms in that industry. At the top of the list is Drugs with more than $104.5 billion in repatriations coming from 26 companies. A large component of the earnings generated in Drugs comes from the patents on their pharmaceuticals; earnings that can be more easily located in subsidiaries in countries with lower corporate income tax rates. Other industries that similarly have a large component of their earnings arise from intellectual capital also rank high on total industry repatriations. Repatriations total $28B in the Computer and Office Equipment industry and $19B in the Computer Programming industry. Other large industries such as airlines and utilities are not on the list as they have minimal overseas operations.

Firms which repatriated income under the AJCA are different from those that did not on several dimensions (see Table III). The first thing to notice is that the firms that repatriate income have higher market-to-book ratios than the other firms (and the differences are statistically significant). This is consistent with them having greater investment opportunities (a traditional interpretation of this variable in the corporate finance literature). It is also consistent with these firms relying predominantly on intangible assets, which is what we saw in the industry results in Table II. Firms which repatriate are also larger (as measured by assets, sales, or employment), more profitable (higher EBIT to asset ratios), have significantly lower cash positions (consistent with them having greater access to capital markets (Opler, Pinkowitz, Stulz, and Williamson, 1999)), and make greater payments to shareholders (dividends and repurchases). These are not characteristics normally associated with capital constrained firms. Instead, these results suggest that the firms that took advantage of the Act are exactly the ones that would theoretically generate the least incremental domestic investment. The kind of firms that are able to establish and sustain profitable foreign subsidiaries on average generate more internal funds and have better access to external funds. These

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are the results that lead Blouin and Krull to conclude that the average repatriating firm is not capital constrained. However, this is also why we must examine both the response of the average firm as well as the response of firms we expect to be most constrained in the empirical work which follows. The averages do not tell the whole story.

V)   Who Repatriates Foreign Income under the AJCA

       A)   Firm Characteristics and Unrepatriated Foreign Income

Before examining how repatriation of foreign income under the AJCA alters the real and financial decisions of the firm, we first consider which firms are likely to repatriate income. Since theory predicts a different reaction among constrained and unconstrained firms, we are interested in the characteristics of firms which repatriate under the AJCA. In addition, we need to partition the sample into those firms which are likely to repatriate income under the AJCA versus those that are unlikely (i.e. partition Group 2 & 3 from Group 1). To do this, we estimate a cross-sectional model of who repatriates foreign income under the AJCA (in 2004 to 2006) based on firm level data from 2003 and before. We use three sets of variables to predict repatriation. We first include firm characteristics such as a firm's size (market value of assets), the firm's market-to-book ratio, and the firm's pre-investment profitability.[13] There are two reasons to include these variables. First, since these variables will be included in later regressions (e.g. investment), we want to include them in the regression that predicts repatriation as well. This way the coefficient on predicted repatriation in the investment regression will measure variation in the ability to, and benefit of, repatriating under the AJCA (i.e. variation in the supply of foreign income in low tax jurisdictions). Secondly, we are interested in how these variables, which are correlated with a firm's access to capital, predict the firm's decision to repatriate income. Remember, the implicit financial assumption of the AJCA is that some firms are capital constrained, and the tax subsidy embedded in the AJCA will lower the

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[13] In the investment regressions which follow, we define our measure of profits as prior to investment expenditure. Prior research examined investment in property, plant, and equipment, so EBIT or EBITDA was used. Since the AJCA list of acceptable investment includes R&D and advertising, we define our pre-investment profits as EBITDA plus advertising and R&D.

cost of internal funds (from their foreign subsidiary), enabling them to take projects that they otherwise would not.

The second set of explanatory variables measures the firm's stock of unrepatriated foreign earnings. These are the funds that the Congress was targeting with the AJCA. This analysis will help us distinguish between the supply of foreign funds and the demand by firms to repatriate foreign income under the new tax regime, given they did not repatriate the income under the prior tax regime. We use two measures of unrepatriated foreign earnings. First, we include the log of one plus the firm's permanently invested foreign earnings which we hand collected from their 10Ks . Firms may have unrepatriated foreign earnings which they do not classify as PIFE (see Section IV-B). To account for the unrepatriated foreign earnings of these firms, we also calculate the sum of foreign earnings for the last three years and include the log of one plus this sum in the analysis. Using a two or four year average produces economically similar but statistically weaker results. This variable has the advantage of including the stock of foreign earnings which are not classified as permanently invested abroad. The disadvantage is the stock of foreign earnings may have come from years prior to our three year window, or these earnings may have already been repatriated, a problem which does not arise with our measure of permanently invested foreign earnings. Since neither variable is perfect, but their flaws are non-overlapping, we will include both in our analysis (the correlation of the two measures is 0.70). For both measures of unrepatriated earnings, we also include a dummy variable which is equal to one if the variable is greater than zero, and zero otherwise. This allows for a discontinuity at zero.

The final set of variables measure the tax benefit of repatriation. As we discussed in Section II-A, the smaller the foreign tax rate relative to the US tax rate, the greater the incentive to postpone repatriation of foreign earnings (Desai, Foley, and Hines, 2007) and the greater the tax benefit of repatriating under the AJCA. To measure the relative tax incentive for repatriating under the AJCA, we compared the taxes that would have been paid on the foreign income had it been taxed in the US at 35 percent to the actual foreign taxes paid. This is the dollar tax that would be due upon

repatriation for the current year's (2003) foreign earnings.[14] We then scale this number by the market value of assets. This variable captures both the difference in the foreign and domestic tax rate, and also the magnitude of foreign income. If the foreign income is very small, then the actual tax savings will be small even if the tax rates differ appreciably. This is the same tax variable that is used in Foley et. al. (2007). They find that firms with a large tax wedge, measured this way, keep a larger fraction of their cash in foreign subsidiaries. We also include the firm's unused tax loss carry forwards as this would reduce the tax cost of repatriation under the original law. Some firms choose not to repatriate their income under the AJCA due to their tax loss carry forwards.[15]

B)   Repatriation Decision: Empirical Results

We report the results of which firms choose to repatriate foreign income under the AJCA in Table IV, and there are several results worth noting. The first set of variables we examine are the firm characteristics. The firms which repatriate are the largest firms with the greatest sources of internal cash flow (as measured by pre-investment profits/assets) and the smallest investment opportunities (as measured by the market-to-book ratio). Based on the literature on capital rationing (Whited (1992), Kashyap, Lamont, and Stein (1994), Gilchrist and Himmelberg (1995), Almeida, Campello, and Weisbach (2004), and Faulkender and Petersen (2006)), these are the firms that we would expect to be the least capital constrained (see Table IV – column I). In addition to being statistically significant, the economic magnitude of these effects is large. For example, increasing firm size from the 25th to the 75th percentile (e.g. from $110M to $2.0B) raises the probability of

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[14] As Unocal Corp noted in their December, 2005 10-K, when the foreign tax rate is equal or higher than the domestic tax rate, the marginal advantage of repatriation under the AJCA is zero. "Because we incur a foreign tax rate in excess of the 35 percent U.S. federal income tax rate, we do not pay incremental federal income tax on our foreign earnings due to excess foreign tax credits. Therefore, we do not anticipate repatriating higher amounts of foreign earnings under the Act since any such repatriations do not reduce federal income taxes."

[15] "Under the Act, net operating loss carry forwards could not be used to offset the repatriated income subject to U.S. tax, consequently we did not utilize this one-time incentive." [Navistar International Corp, October, 2005 10-K]. "Due to the availability of net operating loss (NOL) carry forwards in the U.S., we have not and do not intend to avail ourselves of the provisions of the AJCA for any repatriations of accumulated income. While it has been our historical practice to permanently reinvest all foreign earnings into our foreign operations, in 2005 we repatriated approximately $48 million from our foreign subsidiaries. Repatriation of these earnings did not result in any significant incremental charge to our income tax provision as a result of utilizing U.S. NOL carry forwards for which we had previously maintained a full valuation allowance." Parametric Technology Corp, September, 2005, 10-K]. Parametric repatriated income but not under the AJCA. Thus their repatriation is coded as zero in our analysis.

repatriation by 3.5 percent, while increasing pre-investment profits from the 25th to the 75th percentile raises the probability of repatriation by 2.8 percent. Given that the base line probability is 8 percent, these are large effects.

The most powerful predictors of whether a firm repatriates foreign earnings under the AJCA is their supply of unrepatriated foreign earnings. Firms with the largest stock of permanently invested foreign earnings are the most likely to repatriate those earnings under the AJCA. Both the presence of PIFE and the actual magnitude of these earnings predict repatriation behavior. Comparing a firm that has zero permanently invested foreign earnings to one that has a positive, but very small PIFE, the second firm's probability of repatriating under the AJCA is 12.6% higher (see Table IV, column II). If we then raise the amount of permanently invested foreign earnings by one standard deviation, the probability of repatriation rises by an additional 2.1 percent.

Not all firms with unrepatriated foreign earnings report them as PIFE (see Section IV-B). Our second measure of unrepatriated foreign earnings (the sum of the last three years of foreign earnings) has incremental explanatory power in the model. Increasing this measure of unrepatriated earnings by one standard deviation raises the probability of repatriation by 1.1 percent.[16] It makes sense that the explanatory power of PIFE should be greater, since firms are more likely to classify foreign earnings as permanently invested abroad if the foreign tax rate is low (Collins, Hand, and Shackelford, 2001, Krull, 2004). In this way, they can avoid declaring a deferred tax liability.

The last set of variables in our model measure the relative tax advantage of repatriating income under the AJCA versus the prior law. The variable Estimated Repatriation Tax estimates the marginal tax payment that would be due upon repatriation of the foreign income to the US. For firms with no foreign earnings, this variable is zero.[17] An increase in the tax wedge from the 25th to the 75th

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[16] We also tried specification where the foreign income variables were standardized by the book value or the market value of assets. The predicted probability of repatriation across the different models have correlations of at least 0.98.

[17] For firms with foreign earnings, this variable is defined as 35% (the statutory corporate tax rate) times the firm's foreign earnings in 2003 minus their foreign taxes paid in 2003. We divide this number by the market value of assets to standardize for firm size. Alternatively, we could have used the effective marginal tax rates from Graham (1996), opposed to 35%, as the marginal tax rate on domestic income. This approach could be more accurate as it

percentile of the distribution, conditional on the tax wedge being positive, raises the probability of repatriation by 1.1 percent (Table IV, column II). We also find that firms with larger tax loss carry forwards (scaled by the market value of assets) are significantly less like to repatriate income. Moving the size of the carry forwards from the 25th to the 75th percentile lowers the probability of repatriation by 3.4 percent.

C) Alternative Specifications of the Repatriation Decision

In addition, to the logit model, we also estimated a tobit model using the actual repatriation amount (Table IV, column III). The economic effect of the variables is very similar across the two specifications. A simple way to compare the models is to compare the index that underlies both the logit and tobit model (e.g. $X\beta$ where $Pr[Repatriation] = 1/[1+\exp(-X\ \beta)]$ in the case of the logit model). The correlation of the two indexes is 0.98. We lose some of the observations when we use the tobit model (4 percent of the repatriating firms do not report the actual repatriation amount). Given the loss of data and the high correlation in the underlying indexes, we will use the binary choice results to partitioning the sample between Group 1 and Group 2 & 3 in the next section.

The key to our empirical strategy is to partition the sample into the three groups described in Section III and Table I. When we hand collected the data from a firm's 10-Ks, we tried to classify it into one of three groups: firms that repatriated foreign income under the AJCA, firms that considered repatriating foreign income under the AJCA but chose not to, and firms that did not consider the AJCA (i.e. do not mention the law's repatriation provisions in their 10-Ks). To test the accuracy of our classification, we estimated an ordered logit model based on our three way classification. The results are reported in column IV of Table IV. Although most of the results are similar (the coefficient on the market-to-book ratio does switch signs and loses statistical

accounts for variation in the marginal domestic tax rate across firms. It may also be less accurate, as some of the variation in the estimated marginal tax rates is due to variation in the firm's tax rate on foreign income and whether it has foreign income. Since we want to measure the difference between domestic and foreign tax rate for the firm, we do not want to include this variation in the domestic tax rate. To check the explanatory power of this alternative measure, we calculated the estimated repatriation tax using both Graham's before- and after-interest expense marginal tax rates. The predicted probabilities across the three measures are highly correlated (greater than 0.99) and the results which follow in later tables are essentially identical.

significance), many of the coefficients are smaller and the explanatory power of the ordered logit model is significantly lower (the pseudo-R drops from 0.45 to 0.37). We think the problem lies with the second group of firms: those which we classified as considering repatriation under the AJCA but did not. Some firms with unrepatriated earnings in low tax jurisdictions do not discuss the AJCA in their 10-Ks. Other firm may include a discussion of the AJCA in their 10-K as part of a boiler plate disclosure instead of a serious consideration of the law. For example, Compudyne Corporation, which reports no foreign earnings in Compustat during our sample period, discussed the AJCA and the associated accounting treatment, then state that these provisions "...will have no effect on the financial position, results of operations, or cash flows of the Company." In the subsequent empirical work, we will therefore rely on the data (e.g. firm's stock of unrepatriated foreign earnings, the estimated probability of repatriation from Table IV, and the firm's repatriation decisions) to classify firms into the three groups.

VI) The Real and Financial Impact of Repatriating Income under the AJCA

    A) Effect on Approved Investment

        1) Difference-in-Difference Estimation

We begin by examining the AJCA's effect on firm investment. The dependent variable in the regression is approved investment under the AJCA divided by the book value of assets. To match the limits of the law as closely as possible (see Section II-B), we include domestic capital expenditure, domestic research and development expenditure, total advertising expense, and acquisitions in our measure of investment. The geographic segment files allow us to observe domestic capital expenditure and advertising expense. For the other components, we only observe firm totals (e.g. research and development and acquisitions).

The empirical challenge is to compare the level of investment when a firm repatriated income under the law to the level of investment the firm would have made in the absence of the law change. In this paper, and in the prior literature, a difference in difference (DID) regression approach is used. We measure the effect of the law on investment by comparing changes in the repatriating firm's

investment following their repatriation (treated group) to changes in the investment by other firms (untreated group). The regressions include both a firm dummy (μ_i) and a time dummy (λ_t). By including firm dummies, we are comparing the change in investment of firms which repatriated foreign income (before versus after) relative to the change in investment of the firms that did not repatriate. We are effectively using each firm as a control for itself. As additional controls, we also included the firm's size (log of market value of assets), the market-to-book ratio, and the pre-investment profits (EBITDA plus advertising and R&D expenditure over assets) and a set of time dummies in the regressions. These are the variables that were commonly used in prior investment regressions (Fazarri, Hubbard, and Peterson (1988), Kaplan and Zingales (2000), Baker, Stein, and Wurgler (2003), and Rauh (2006) for example).

We estimate the three versions of the DID regression discussed in Section III (see equation 6). The method used in Clemons and Kinney (2007), Brennan (2008), and Blouin and Krull (2009), including an AJCA dummy variable, is reported in Table V, column I. The estimated increase in investment using this method is small, 0.2 percent, and statistically insignificant (p-value =0.63).[18] The method used by Dharmapala, Foley, and Forbes (2011) is reported in column II of Table V. In this case, the AJCA dummy variable is replaced by the predicted probability of repatriation for each firm in the years 2004 and after (based on the coefficient estimate from Table IV, column II). Prior to 2004, the effective date of the law, the probability of repatriation under the AJCA is zero and thus we set our predicted probability to zero. The estimated increase in investment is now slightly negative, -0.5 percent, and still statistically insignificant (p-value=0.27).

As we explained in Section III, neither of these approaches measures the change in investment among the firms which repatriated under the AJCA versus those that did not holding

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[18] We report standard errors clustered by firm in Table V. We also calculated White standard errors and standard errors clustered by year and by both firm and year to better understand the data. When the regression is run without firm dummies (the coefficient estimate is 2.4 percent), the standard error of the repatriation dummy is 31 percent larger when clustered by firm compared to White standard errors (results available from the authors). This is evidence of an unobserved and unaccounted for firm effect (see Petersen (2009) for details) and one reason the firm dummies are required. Once firm dummies are included (e.g. Table V – column I), standard errors clustered by firm are only slightly larger than the White standard errors (3 percent). Clustering by time reduces the standard errors slightly. Thus, once firm and time dummies are included, there is very little unobserved firm or time effects remaining in the residuals.

foreign earnings in low tax jurisdictions (i.e. the probability of repatriation) constant. The method in column I (the BK method) cannot determine whether the measured effect arises due to repatriation or due to the presence of tax advantaged foreign earnings. The method in column II (the DFF method) assumes that the change in investment, conditional on the probability of repatriation is the same whether the firm repatriates or not. This makes it impossible to estimate the effect of repatriation since it is assumed to be zero. This is why we need to estimate the model with both the predicted probability of repatriation as well as the residual.[19] The results are reported in Table V, column III. The coefficient on the predicted probability (α_1) measures the difference in the change in domestic investment between group 1 (e.g. no foreign earnings) and group 2 and 3 combined (e.g. a large stock of foreign earnings). The coefficient on the residual (α_2) is the one we are interested in. This coefficient measures the incremental increase in investment for firms that did repatriate relative to those that did not, holding firm characteristics and the probability of repatriation constant.[20] Repatriation under the AJCA, holding the probability of repatriation constant, increases domestic investment by a statistically insignificant 0.37 percent of assets. For the average firm, there is essentially no increase in investment due to repatriating income under the AJCA.

2) Effects of Capital Constraints

According to finance theory, the law should only increase the investment of firms which are capital constrained. Unconstrained firms have already optimized their investment decision. For these

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[19] Both the BK and DFF method can be viewed as a restricted version of our model (see equation 6). The BK model effectively assumes that the coefficient on the predicted probability of repatriation and the residual are equal ($\alpha_1 = \alpha_2$). The DFF model effectively assumes that the coefficient on residual or the AJCA dummy variable is zero once the predicted probability of repatriation is included in the regression (see equation 6). As we will see both of these assumed coefficient restrictions are rejected by the data.

[20] To convince oneself that the coefficient on the residual is the correct metric, compare two firms. Assume they have the same value for the independent variables and the same predicted probability of repatriation. The regression will account for these difference when this is not true. The first firm repatriates foreign income under the AJCA (first line of the equation), and the second does not (second line of the equation). The increase in investment due to repatriation, holding both firm characteristics and the predicted probability of repatriation constant is α_2.

$$\text{Investment}\left[\text{Repatriating firm}\right]_{it} = \alpha_1 \Pr\left[\text{Repat}\right]_{it} + \alpha_2 \left(1 - \Pr\left[\text{Repat}\right]_{it}\right) + \beta X_{it}$$

$$\text{Investment}\left[\text{Non-repatriating firm}\right]_{it} = \alpha_1 \Pr\left[\text{Repat}\right]_{it} + \alpha_2 \left(0 - \Pr\left[\text{Repat}\right]_{it}\right) + \beta X_{it} \qquad \textbf{(8)}$$

$$\Delta \text{Investment}_{it} = \alpha_2 \left[\left(1 - \Pr\left[\text{Repat}\right]_{it}\right) - \left(0 - \Pr\left[\text{Repat}\right]_{it}\right)\right] = \alpha_2$$

firms, the AJCA provides a reduction in the repatriation tax, but should not alter their investment behavior. This is why we need to examine not just the behavioral response of the average firm, but the change in investment behavior of those firms which are capital constrained.

To calculate a simple measure of capital constraints by which we can classify firms prior to the passage of the AJCA (e.g. 2000 to 2003), we calculate the percent of years during which each firm's internal cash flow was insufficient to finance their investment. We defined this as earnings after taxes (which will also be after advertising and R&D) but prior to interest minus capital expenditures. The percentage of the fiscal years over the four year period that the firm is constrained ranges from zero to one hundred percent in our sample. We then interacted this percentage with the residual. This allows us to compare how constrained and unconstrained firm's investment responds when they repatriate foreign income, holding the unrepatriated foreign earnings (probability of repatriation) constant.

The results are reported in Table V – column IV. We now find a large difference in the investment rates among the firms. Firms whose internal cash flow was always sufficient to fund their investments, decrease their investment slightly (-0.4 percent) following their decision to repatriate their foreign income. The change is not statistically significant (p-value = 0.22). Firms whose internal cash flow was never sufficient to fund their investment increase their investment significantly. Their investment rate rises by 2.6 percent of book assets more per year than the unconstrained firms. This is much larger than the effects we found above, is large relative to the average investment rate in our sample (7.2 percent), and is statistically significant (t=2.7).[21]

Firms that are unable to fund their investments internally can in theory turn to the external capital markets. Firms without a bond rating have less credit market access according to prior research (see Faulkender and Petersen, 2006). A second version of our test is to interact the variable

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[21] Since the logit specification we used in Table IV is a non-linear function of the independent variables in Table IV, we checked the importance of this functional form assumption. Using a linear probability model to predict the probability of repatriation, raises the predicted investment response of constrained firms from the 2.6% found in Table V (column IV) to 3.1% (t-statistics = 3.3, results available from authors). Since a linear probability model can, and in our case does, generate negative predicted probabilities and our current estimate of the impact of repatriation on the investment of capital constrained firms is conservative, we use a logit first stage in our reported results.

that measures the fraction of years in which a firm was unable to fund its investment internally with a dummy variable that equals one if the firm does not have a bond rating.[22] This measures a possible shortage of both internal and external capital to fund positive NPV projects. A smaller number of firms are capital rationed by this measure, but the magnitude of the effect is larger. The investment rate for firms that are rationed and repatriate income rises by 3.7 percent more than unconstrained firms (t=2.1, see Table V, column V).[23] These results indicate that while the average repatriating firm did not significantly increase domestic investment, the repatriating firms who were most likely constrained did significantly increase investment.[24]

Before proceeding, we want to revisit the endogeneity discussion in Section III-C and explain under what conditions our results could be misleading. Consider what must be true about the world for us to get a positive coefficient on the residual times capital constrained variable, and yet constrained firms are not increasing their investment as a result of repatriation. Our results do not arise because the constrained repatriators have higher average investment rates. This effect would be absorbed by the firm dummies. Our results do not arise because average investment rates are higher in the latter half of the sample than the first when repatriation under the AJCA becomes feasible. This effect would be absorbed by the time dummies. Our results do not arise because the investment rate of firms with foreign earnings or capital constrained firms increases in the latter half of the sample relative to the first half, but independently of the firm's decision to repatriate. The first

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[22] We tried a number of alternative measures of whether a firm was capital constrained and interacted each with our cash flow deficit variable (i.e. the firm is below the median size, the firm does not pay a dividend, or the value of the Whited-Wu measure of financial constraints is above the median). The estimated coefficients were uniformly large and statistically significant. Absent the interaction with our cash flow deficit variable, the coefficients are not always statistically significant. This points out the importance of controlling for whether firms are able to generate sufficient internal funds to finance their investment. Results are available in the online appendix.

[23] The capital constrained firms do not offset foreign investment with domestic investment. Constrained firms reduce their foreign investment by less than 0.1% of assets and the coefficient is statistically insignificant. Graham, Hanlon, and Shevlin (2009) survey results do not find that firms liquidate foreign assets to fund repatriations.

[24] When estimated in first differences, we still find a significant increase in investment for capital constrained firms, although the coefficients are smaller. The coefficient shrinks from 0.0257 to 0.0214 (t=1.9, Table V, column IV) and from 0.0374 to 0.0281(t=1.7, Table V, column V) when estimated in first differences. The smaller coefficient should be expected when it takes more than a year to deploy the repatriated capital. In this case, the first difference coefficient should be biased toward zero (see the online appendix).

effect is controlled for by including the predicted probability of repatriation (which is positive only after 2003) in the regression. As we will see in Section VI-D this variable explains the changes in payout policy that prior work incorrectly attributed to the repatriation decision. The second effect is controlled for by including a variable which is zero prior to 2004 and equal to our measure of capital constraints after 2003. This variable will control for any change in investment rates of capital constrained firms relative to unconstrained firms post 2003 relative to pre-2004.[25] By including this elaborate set of controls, our measured increase in investment occurs only in firms who are capital constrained, have unrepatriated foreign earnings and only if they repatriate. Are these firms which had greater unfunded domestic investments and is this why they repatriated? Yes. The fact that some firms with unrepatriated foreign earnings had greater investment opportunities isn't a problem for the empirical method, it is a requirement. Given only capital constrained firms should increase investment when a capital constraint is relaxed, finance theory argues this is the only way in which the law could increase the level of domestic investment.

3) Estimation on a Restricted Sample

Our empirical strategy has been driven by the need to compare the investment changes in firms which do and do not repatriate, controlling for their ability and likelihood of repatriating. An alternative estimation strategy would be to drop firms which are unlikely to repatriate income (i.e. zero foreign earnings). By focusing only on those firms that are able to participate in the repatriation provisions of the AJCA (e.g. Group 2 & 3 from Table I), one can directly examine the difference in investment between those that repatriate (Group 3) and those that do not (Group 2). Among firms able to take advantage of the AJCA tax subsidy, did those that actually repatriated increase investment more than those that did not?

We proceed by first demonstrating that our earlier results are not driven by those firms for whom the AJCA tax subsidies are not valuable. First, we drop observations where the probability of

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[25] Including this variable does effect the estimated investment response. Dropping the post-2003 capital constrained variable increases the coefficient on the residual times capital constrained from 2.57% to 3.21% (Table V, column IV) and from 3.74% to 4.13% (Table V, column V).

repatriation is less than the median probability. In Table VI, column II we report the regression from Table V for this sub-sample (column I is the result from Table V and is reported for comparison). In the second sub-sample, we included only observations where the firm had positive foreign earnings by either of our measures (see column III). Our results are little changed from those of the full sample. Capital constrained firms increase their investment by 2.4 to 2.5% per year in the years following repatriation (versus 2.6% in the full sample). The standard errors change very little as well. The results do not change across samples when we define capital constrained firms as those who are cash flow poor and do not have a bond rating (see columns IV & V).

In the last two columns of Table VI, we examine the two restricted samples, but instead of including the predicted probability of repatriation and the residual, we include only the repatriation dummy variable plus the dummy variable interacted with our measure of capital constraints. These estimates thus do not depend upon the probability model in Table IV. We again find very consistent results. The increase in investment due to repatriation is concentrated among the capital constrained firms, and the magnitude of the increase is very similar (2.3% and 2.9% in the sub-samples versus 2.6% in the full sample).[26] Across a set of different specifications and samples, we find a consistent increase in investment among firms that repatriate, but only among the firms which are capital constrained.

4) Magnitude of the Investment Response

For each firm that repatriated, we estimate the increase in the investment rate due to repatriation based on the coefficient estimates in Table V, column IV (see equation 9).

$$\text{Investment}\left[\text{Repatriating firm}\right]_{it} = \alpha_1 \Pr\left[\text{Repat}\right]_{it} + \alpha_2 \left(1 - \Pr\left[\text{Repat}\right]_{it}\right) + \alpha_3 \left(1 - \Pr\left[\text{Repat}\right]_{it}\right)\text{Constrained}_{it} + \beta X_{it}$$
$$\text{Investment}\left[\text{Non-repatriating firm}\right]_{it} = \alpha_1 \Pr\left[\text{Repat}\right]_{it} + \alpha_2 \left(0 - \Pr\left[\text{Repat}\right]_{it}\right) + \alpha_3 \left(0 - \Pr\left[\text{Repat}\right]_{it}\right)\text{Constrained}_{it} + \beta X_{it} \quad \textbf{(9)}$$
$$= \alpha_2 + \alpha_3 \text{Constrained}_{it}$$

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[26] Our two measures of unrepatriated foreign earnings are good but not perfect. Among firms which have zero unrepatriated foreign earnings by both measures, the probability of repatriation is very low, but not zero (0.4%). In addition, since the likelihood of repatriation is a continuous function of the tax advantages of repatriation as well as the presence of foreign earnings (see Table IV), the division between likely and unlikely to repatriate is not discrete. We thus use the probability model to account for this continuity.

The average rise in investment across the repatriating firms is 0.17%. When we restrict this calculation to the sample of firms which are capital constrained, the average rise in the investment rate is 1.85%. To convert this investment rate to a dollar amount, we multiplied the predicted increase in the investment rate by the firm's book value of assets and sum across all the post repatriation years. Firms classified as capital constrained increased their domestic approved investment by $61.5B, which is 78 percent of the amount that these firms repatriated ($78.3B). The constrained firms, however, accounted for only 27% percent of the total amount repatriated in our sample. For the unconstrained firms, the predicted change in the investment rate is slightly negative and not statistically different from zero (see Table V, column IV). Using the estimates from column V of Table V, the results are similar.

B)   Effect on Employment

As the name suggests, the American Jobs Creation Act was intended to create incentives for firms to increase employment or increase expenditure on hiring and training as well as domestic investment. While we have documented that constrained firms increased their investment following repatriation under the act, and clearly Congress intended greater employment to accompany greater levels of investment, the potential substitutability of labor and capital does not mean that higher employment will necessarily result, even at the constrained firms. It is therefore an empirical question. Using our method, we find reductions in employment among both the constrained and unconstrained firms (see online appendix). Neither of these effects is statistically significant. We also find reductions in employment which are statistically insignificant using the BK and DFF methods as well. The data is unable to provide a precise answer.

C)   Effect on Financial Structure: Leverage

The last set of firm responses to the AJCA we examine are financial: leverage and payout policy. As with investment, we estimate all three DID regression models (BK, DFF, and ours) and examine the effect on both capital constrained and unconstrained firms. The results for leverage are reported in Table VII. When we examine both leverage (debt to the market value of assets) and net debt (debt minus cash to the market value of assets), we find that neither constrained nor unconstrained

firms change their leverage or cash levels due to repatriation (see columns IV-VI). Given firms only publicly disclose firm-wide figures, we are unable to track the location of the debt and cash. Thus it is possible, and likely, that the firms moved cash home from foreign subsidiaries and in some cases moved domestic debt abroad (the foreign subsidiary can borrow and repatriate the cash which is then used to pay down the domestic debt of the parent). This would be consistent with our results that repatriation did not change the firm-wide level of debt or net debt.

The coefficient on the predicted probability of repatriation is large and statistically significant (t=3.2 in column II). As we explained in Section III-B, this coefficient does not measure the effect of repatriation, but the change in leverage (pre- versus post-2004) for firms with a high probability of repatriation relative to those with a low probability. In the case of leverage, this variable is measuring a trend in leverage that is different for firms with and without unrepatriated foreign earnings.[27]

D)   Effect on Financial Structure: Payout Policy

Payments to equity holders have been the focus of the prior work on the AJCA. Blouin and Krull (2009) found that firms spent 50 percent of their repatriations on payments to shareholders, while Dharmapala, Foley, and Forbes (2011) found that firms spent over 90% of their repatriation on payments to shareholders. We are able to replicate their methods in Table VIII. The BK method (column I) shows an increase in equity payouts (β=0.0063) which is statistically significant (t=3.3). Using the DFF method (i.e. replacing the AJCA dummy with the probability of repatriation) leads to an even larger coefficient (β = 0.0193, t=6.8). The problem is neither of these methods examine the effect of repatriation on a firm's payout policy (see Section III-B). To examine the effect of repatriation, we must include both the probability of repatriation and the residual (see column III).

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[27] To demonstrate the coefficient on the probability of repatriation is due to a different trend, we replace this variable with a set of year dummies interacted with the probability of repatriation. The standard set of year dummies are still included. In this way, we can estimate different non-parametric trends for the two groups of firms (high and low probability of repatriation). The coefficients on the second set of year dummies, the difference in the trends, is plotted in Figure 2. From the figure, it is clear that the decline in leverage of the firms with a high probability versus a low probability of repatriation occurs over the entire sample period and is unrelated to the passage of the AJCA or to a firm's decision to repatriate income under the law. If we estimate the model using first differences, the coefficient on the probability of repatriation drops from -0.199 (Table VII, column II) to -0.0071 (p-value=0.11), which makes sense given the figure. A more complete discussion of different trends and DID regressions is contained in the online appendix.

From this result, it is clear that firms with a greater probability of repatriation (e.g. a larger stock of unrepatriated foreign earnings in low tax jurisdictions) increase their equity payouts after 2003. However, after conditioning on the probability of repatriation, actually repatriating earnings under the AJCA has almost no effect on payout. The coefficient is small (β=0.0015) and implies that only 9.6% of the repatriated funds went to dividends and repurchases. This increase is not statistically different from zero.[28]

To demonstrate that the increases in equity payouts found in prior work is not a result of repatriation, a picture may help. We re-estimated the DID model in column III by including three sets of time dummies. In addition to the standard time dummies which are already included, we added a set of time dummies multiplied by the probability of repatriation and a set of time dummies multiplied by whether the firm repatriated income under the AJCA. These variables replace the probability of repatriation and the residual in column III, and let us see the time pattern of equity payouts for the three sets of firms (effectively Group 1, 2, and 3 from Table I). The results are graphed in Figure 3. The data show an increase in equity payouts among firms with a high probability of repatriation following 2004 that did not repatriate (Group 2) and for firms that did repatriate (Group 3). There is no significant difference in the payout policy arising from repatriation. Among the firms with a high probability of repatriation (Groups 2 and 3), repatriators do not increase their equity payouts more than non-repatriators as we found in Table VIII, column III. Figure 3 also makes it clear why the other methods would incorrectly attribute the increase in equity payouts to repatriation and why the DFF (comparing Groups 2&3 to Group 1) method will lead to a greater overestimate than the BK method (comparing Group 3 to Groups 1&2 – see Section III-B, equations 4 and 5).

When we examine capital constrained and unconstrained firms separately, we find that unconstrained firms increase their equity payouts but this results is small and not always statistically

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[28] A way to verify that the coefficient on the probability of repatriation does not inform us about the effects of repatriation, is to re-run the regression in column II dropping the observations for firms which repatriated income under the AJCA (i.e. Group 3). If we run the regression using only data on firms that did not repatriate, the coefficient on the probability of repatriation is essentially unchanged: 0.0193 (full sample) versus 0.0195 (only non-repatriating firms).

significant (see Table VIII, columns IV-VI). Constrained firms increase their payouts by less or in several specifications decrease their equity payouts, but again the magnitudes are small and not statistically different from zero. When we examine only repurchases (Table VIII, column VI), the increase in payouts for unconstrained firms is statistically significant (p-value=0.041), but the coefficient of 0.43 percent of the equity value is small relative to the size of the repatriation (mean of 8.5 percent of the equity value, median of 3.8 percent). Once we restrict the sample to only firms with a probability of repatriation above the median or with positive reported foreign earnings (as we did with investment in Table VI), there is no statistically significant change in equity payouts whether the firm is constrained or not (see Table IX, columns II, III, and V). When we estimate the BK model (AJCA dummy and AJCA dummy interacted with our measure of capital constraints) on the restricted samples, we find no significant change in equity payouts due to repatriation (see Table IX, columns VI and VII).

VII)   Conclusion and Implications

In response to the tax incentives introduced by the American Jobs Creation Act, US corporations moved over $300B from their foreign subsidiaries to the US. For the average firm we find little increase in investment as a response. For the subset of firms, however, which are capital constrained, we do find a significant increase in investment. These firms are responsible for only a quarter of the total repatriation and according to our estimates spend a majority of their repatriated funds on increasing domestic investment. These findings are the results we should expect in the presence of financial frictions, and thus demonstrate the empirical importance of capital constraints. In addition, the significant difference between our findings and other examinations of the American Jobs Creation Act point to the importance of appropriately specifying the difference-in-difference (DID) regression for the setting being examined.

A large academic literature already exists examining the effect of external capital constraints when firms are short of internal funds. We are one of the first to examine changes in the costs of funds which are already internal to the firm. The American Jobs Creation Act temporarily lowered the cost of accessing a portion of the firm's internal capital for domestic investment, the portion stockpiled in

low tax foreign jurisdictions. When the cost of internal capital is not identical for all internal capital, it is important to understand the frictions that prevent a firm from allocating its internal capital in the most efficient way. Our results point to this previously unappreciated source of capital constraints: the US tax code. The relatively high marginal tax rate on corporate profits relative to the rate in foreign countries has not only incentivized firms to generate cash stock piles in their foreign subsidiaries (Foley et al, 2007), but it appears to have also led some firms to forgo domestic investment opportunities that they otherwise would have taken.

Our paper also points out the importance of financial theory in the design of tax incentives. Changes in tax rates and rules, can change the relative cost of funding sources. Depending upon what one assumes about the frictions which cause the perfect market assumption to fail, these changes can affect the investment decisions of the firm or only change the source of capital used to fund those investments. This is the case with the American Jobs Creation Act. While we found an increase in investment among the capital constrained firms, most firms that have foreign operations with significant permanently reinvested foreign income are not capital constrained. This is why we find that most firms which repatriated under the act did not subsequently increase investment. Since finance theory demonstrates that only capital constrained firms will forgo positive investment opportunities, government policy that attempts to increase investment must target incentives towards capital constrained firms.

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Table I: Hypothetical Data Structure

	Group	Before	After	Change
1	No Tax Adv Foreign Earnings (do not repatriate under the AJCA)	Y_1	Y_1	0%
2	Positive Tax Adv Foreign Earnings (do not repatriate under the AJCA)	Y_2	$Y_2+2\%$	2%
3	Positive Tax Adv Foreign Earnings (repatriate under the AJCA)	Y_3	$Y_3+2\%$	2%

Notes:

The table describes a hypothetical data structure to which we could apply a difference-in-difference regression. For illustrative purposes, we have assumed that firms which do not have tax advantaged foreign earnings (Group 1) do not increase the response variable Y (e.g. investment or equity payouts) in the second half of the sample (post 2003) versus the first half of the sample (pre-2004). We have assumed that firms with tax advantaged foreign earnings increase the response variable in the second half of the sample by 2% whether they repatriate (Group 3) or not (Group 2). Thus for this illustration, we have assumed that repatriation has no effect on the response variable.

There are three ways in which to collapse the data into a treated and untreated group when applying the DID regression. The first method used by Blouin and Krull (2009) uses a dummy variable which is equal to one for firms that repatriate in the year they repatriated and subsequent years, and zero otherwise. Thus the coefficient estimate measures the change in the response variable for Group 3 relative to Group 1 and 2. In our illustration, even through repatriation has no effect (by assumption), the coefficient will be positive (see Section III-B and equation 4 for details).

The second method is used by Dharmapala, Foley, and Forbes (2011) effectively replaces the dummy variable used in BK with the predicted probability of repatriation from a prior regression. Thus the coefficient estimate measures the change in the response variable for Group 2 and 3 relative to Group 1. In our illustration, even through repatriation has no effect (by assumption), the coefficient will be positive and larger than estimated using the BK method (see Section III-B and equation 5 for details).

The third approached, used in this paper, includes both the predicted probability of repatriation (as in DFF) and the residual which is the dummy variable used in BK minus the predicted probability of repatriation. The coefficient on the predicted probability of repatriation measures the change in the response variable for Group 2 and 3 relative to Group 1 and would be 2% in this example. The coefficient on the residual measures the change in the response variable for Group 3 relative to Group 2 and would be zero in this example since repatriation is assumed to have no effect in our illustration.

Table II: Industries with Greatest Repatriation Activities

Industry	Total Foreign Income Repatriated ($M)	Number of Firms Repatriating	Total Permanently Invested Foreign Earnings
Drugs	104,516	26	107,764
Computer and Office Equipment	27,699	17	15,869
Computer Programming and Data Processing	19,167	30	32,575
Beverages	15,698	6	17,891
Electronic Components and Accessories	12,586	25	17,919
Plastics Materials and Synthetic Resins	9,904	6	19,753
Soap, Detergents, Perfumes, and Cosmetics	8,831	8	16,713
Surgical, Medical, And Dental Instruments	6,533	17	10,761
Cigarettes	6,076	2	8,600
Communications Equipment	5,862	6	9,426
Remaining Industries	216,872	288	219,809

Note:

The table lists the top ten industries (3 digit SIC) in terms of total amounts repatriated under the AJCA. The second and third columns are the total amount of foreign earnings repatriated under the AJCA by firms in the industry and the number of firms that repatriated income in that industry, respectively. The fourth column is the total amount of permanently invested foreign earnings that were disclosed by firms in the industry as of 2003, i.e. the year prior to passage of the American Jobs Creation Act.

Table III: Summary Statistics of Firm Characteristics

	Firm Repatriated	Firm Did Not Repatriated
Log(Market Value of Assets)	8.48[1] [8.41[1]]	6.01 [6.03]
Log(Sales)	7.64[1] [7.57[1]]	4.92 [4.92]
Log(Employment in M)	8.92[1] [8.95[1]]	6.36 [6.23]
Market Value of Assets/ Book Value of Assets	2.18[1] [1.66[1]]	2.02 [1.32]
EBIT/BVA (%)	10.43[1] [9.66[1]]	-1.41 [3.23]
Cash Flow/BVA (%)	11.85[1] [11.72][1]	-4.10 [7.11]
Approved Investment/BVA (%)	11.71[1] [9.53[1]]	12.52 [7.38]
Repatriation Amt/BVA (%)	7.82[1] [5.30[1]]	
Debt/MVA	15.11[1] [12.12[1]]	17.24 [10.74]
Cash/MVA	7.06[1] [4.46[1]]	12.21 [5.50]
Dividend & Net Repurch/MVE (%)	3.55[1] [2.38[1]]	2.61 [0.24]
Effective Marginal Tax Rate (%) [Graham's after-interest tax rate]	22.68[1] [34.70[1]]	18.22 [19.41]
Foreign pre-tax income/ Total pre-tax income (%)	30.70[1] [19.87[1]]	4.86 [0.00]
Perm Invested Foreign Earnings / BVA	8.53[1] [3.92[1]]	0.72 [0.00]

Notes:

The table contains summary statistics (means and medians) for our sample of firms. The firms have been divided into those that repatriated foreign earnings under the AJCA and those that did not. The sample runs from 2000 to 2007, except for the data on permanently invested foreign earnings, which runs only through 2005. The superscripts in the first column denote whether the mean or median in column one is statistically different from the mean (median) in column two at the 1, 5, or 10% level.

Table IV: Estimated Probability of Repatriation

	I	II	III	IV
Dependent Variable:	Repatriate Yes/No	Repatriate Yes/No	Repatriate Amount	Repatriate Consider
Log(Market Value of Assets)	0.5724[1] (0.0277)	0.2709[1] (0.0463)	0.0104[1] (0.0034)	0.1552[1] (0.0272)
Market Value of Assets/ Book Value of Assets	-0.2246[1] (0.0426)	-0.2149[1] (0.0657)	-0.0055 (0.0042)	0.0198 (0.0307)
Pre-investment earnings/BVA	6.6233[1] (0.4565)	4.2053[1] (0.7262)	0.3262[1] (0.0533)	1.3151[1] (0.4294)
Domestic Pre-investment earnings/BVA				
Foreign Pre-investment earnings/BVA				
Ln[1+Perm Invest For Earn]		0.1177[1] (0.0320)	0.0127[1] (0.0026)	0.1533[1] (0.0282)
Perm Invested For Earn>0 (=1 if yes)		3.0042[1] (0.2665)	0.2014[1] (0.0195)	2.5132[1] (0.1180)
Ln[1+For Earnings (3 yrs)]		0.1239[5] (0.0604)	0.0159[1] (0.0044)	0.1050[5] (0.0445)
Foreign Earnings (3 years)>0 (=1 if yes)		0.1375 (0.2886)	-0.0114 (0.0206)	0.6936[1] (0.1742)
Estimated Repatriation Tax/ MVA		61.5837[1] (21.5557)	8.2719[1] (1.9611)	38.3484[5] (18.3477)
Tax Loss Carryforward/MVA		-1.4411[5] (0.6513)	-0.0948[5] (0.0419)	-0.2623[10] (0.1477)
Pseudo-R2	0.2106	0.4472	0.7520	0.3719
Number of Observations	5272	4950	4933	4950

Notes:
    The table contains cross-sectional logits, where the dependent variable is whether the firm repatriated foreign income under the American Jobs Creation Act in 2004 or later (columns I and II). The independent variables are based on values for the firm in 2003 and some cases prior years. A tobit model is estimated in column III and the dependent variable is the amount of the repatriation standardized by the market value of assets or zero. Column IV contains an ordered logit estimation where the dependent variable is 2 if the firm repatriated foreign income under the AJCA, 1 if it discussed repatriation of foreign income under the AJCA in their 10-K but did not repatriate (e.g. considered), and 0 otherwise. White standard errors are reported in parenthesis.

Table V: Investment Incentives of the AJCA

	I	II	III	IV	V
Firm Repatriated under AJCA =1 if yes	0.0015 (0.0030)				
Pr[Firm Repatriates]		-0.0054 (0.0049)	-0.0042 (0.0051)	-0.0082[10] (0.0048)	-0.0056 (0.0054)
Residual[Firm Repatriates]			0.0037 (0.0032)	-0.0044 (0.0036)	-0.0012 (0.0036)
Residual*Capital Constrained				0.0257[1] (0.0097)	0.0374[5] (0.0179)
Log(Market Value of Assets)	-0.0084[1] (0.0023)	-0.0084[1] (0.0023)	-0.0084[1] (0.0023)	-0.0090[1] (0.0023)	-0.0101[1] (0.0024)
Market Value of Assets/ Book Value of Assets	0.0070[1] (0.0011)	0.0069[1] (0.0011)	0.0069[1] (0.0011)	0.0071[1] (0.0011)	0.0065[1] (0.0011)
Pre-investment earnings/BVA	0.0120 (0.0114)	0.0118 (0.0114)	0.0118 (0.0114)	0.0167 (0.0115)	0.0135 (0.0114)
Credit Constrained if Year > 2003, 0 otherwise				-0.0138[1] (0.0030)	-0.0157[1] (0.0030)
R2	0.7205	0.7206	0.7206	0.7210	0.7343
Number of Observations	37294	37294	37294	37294	34209

Notes:
The table contains panel regressions of approved domestic investment to book value of assets on firm characteristics and controls for whether the firm was likely to repatriated as well as whether it did. Column I contains a dummy variable equal to one in the year the firm repatriated and following years, and zero other wise. In column II, the dummy variable is replaced by the probability that the firm repatriates under the AJCA in years 2004 and beyond, and zero otherwise. The probability of repatriation is based on the coefficient estimates from Table IV, column II. In column III, both the probability of repatriation and the residual (the dummy variable from column I minus the probability of repatriation) are included. In columns IV and V, the residual is interacted with a measure of capital constraints. In column IV, capital constrained is measured as the percentage of the fiscal years during 2000 to 2003 in which the firm's investment expenditures exceeded its internal cash flow. In column V, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating, and zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parenthesis. The sample runs from 2000 to 2007.

Table VI: Investment Incentives of the AJCA
High Probability of Repatriation Sub-sample

	I	II	III	IV	V	VI	VII
Pr[Firm Repatriates]	-0.0082[10] (0.0048)	-0.0030 (0.0050)	-0.0044 (0.0069)	-0.0056 (0.0054)	-0.0034 (0.0055)		
Residual[Firm Repatriates]	-0.0044 (0.0036)	-0.0024 (0.0036)	-0.0042 (0.0039)	-0.0012 (0.0036)	0.0004 (0.0036)		
Residual * Capital Constrained	0.0257[1] (0.0097)	0.0241[5] (0.0097)	0.0246[5] (0.0107)	0.0374[5] (0.0179)	0.0346[10] (0.0183)		
Firm Repatriated under AJCA						-0.0035 (0.0034)	-0.0066[10] (0.0040)
Firm Repatriated under AJCA *Capital Constrained						0.0229[5] (0.0095)	0.0293[1] (0.0103)
Log(Market Value of Assets)	-0.0090[1] (0.0023)	0.0089[1] (0.0028)	-0.0044 (0.0035)	-0.0101[1] (0.0024)	0.0078[5] (0.0032)	0.0089[1] (0.0028)	-0.0046 (0.0035)
Market Value of Assets/ Book Value of Assets	0.0071[1] (0.0011)	-0.0008 (0.0014)	0.0014 (0.0013)	0.0065[1] (0.0011)	-0.0006 (0.0015)	-0.0008 (0.0014)	0.0015 (0.0013)
Pre-investment earnings/BVA	0.0167 (0.0115)	0.0519[1] (0.0166)	0.0557[1] (0.0177)	0.0135 (0.0114)	0.0440[5] (0.0173)	0.0520[1] (0.0166)	0.0566[1] (0.0178)
Credit Constrained if Year > 2003, 0 otherwise	-0.0138[1] (0.0030)	-0.0162[1] (0.0034)	-0.0198[1] (0.0047)	-0.0157[1] (0.0030)	-0.0181[1] (0.0035)	-0.0191[1] (0.0034)	-0.0252[1] (0.0047)
R2	0.7210	0.6546	0.6099	0.7343	0.6667	0.6546	0.6100
Number of Observations	37294	20264	12616	34209	18373	20264	12616
Capital Constrained	CF	CF	CF	CF&NR	CF&NR	CF	CF
Sample	Full	High Pr	For Earn	Full	High Pr	High Pr	For Earn

Notes:

The table contains panel regressions of approved domestic investment to book value of assets on firm characteristics, the probability of repatriation, the residual, and the residual interacted with a measure of capital constraints (as in Table V). Columns I and IV are estimated for the full sample and are the same as reported in Table V, columns IV and V. Columns II, V, and VI are estimated using only the sub-sample of firms whose estimated probability of repatriating (based on the estimates from Table IV) are above the median. Columns III and VII are estimated using only the sub-sample of firms that have a positive amount of unrepatriated foreign income by either of the measures used in Table IV. In columns I, II, III, VI, and VII capital constrained is measured as the percentage of the fiscal years during 2000 to 2003 in which the firm's investment expenditures exceeded its internal cash flow. In columns IV and V, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating, and zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parenthesis. The sample runs from 2000 to 2007.

Table VII: Leverage Effects of the AJCA

	I	II	III	IV	V	VI
Dependent Variable	D/MVA	D/MVA	D/MVA	D/MVA	D/MVA	ND/MVA
Firm Repatriated under AJCA =1 if yes	-0.0055 (0.0041)					
Pr[Firm Repatriates]		-0.0199[1] (0.0063)	-0.0199[1] (0.0066)	-0.0179[1] (0.0066)	0.0091 (0.0067)	-0.0483[1] (0.0092)
Residual[Firm Repatriates]			-0.0000 (0.0044)	0.0002 (0.0052)	0.0058 (0.0046)	-0.0036 (0.0072)
Residual*Capital Constrained				0.0009 (0.0116)	0.0025 (0.0157)	0.0217 (0.0164)
Log(Market Value of Assets)	0.0056[5] (0.0028)	0.0056[5] (0.0028)	0.0056[5] (0.0028)	0.0059[5] (0.0028)	-0.0004 (0.0029)	0.0510[1] (0.0042)
Market Value of Assets/ Book Value of Assets	-0.0182[1] (0.0010)	-0.0183[1] (0.0010)	-0.0183[1] (0.0010)	-0.0183[1] (0.0010)	-0.0162[1] (0.0011)	0.0038[5] (0.0016)
ROA (EBIT/BVA)	-0.1043[1] (0.0094)	-0.1048[1] (0.0094)	-0.1048[1] (0.0094)	-0.1068[1] (0.0093)	-0.1005[1] (0.0096)	-0.0470[1] (0.0171)
Credit Constrained if Year > 2003, 0 otherwise				0.0061[10] (0.0034)	0.0029 (0.0035)	0.0343[1] (0.0055)
R2	0.8462	0.8463	0.8463	0.8463	0.8588	0.8360
Number of Observations	37157	37157	37157	37157	34086	37155

Notes:

The table contains panel regressions of the debt to market value of asset ratio (columns I-V) or the net debt (debt minus cash) to market value of assets (column VI) on firm characteristics, the probability of repatriation, the residual, and the residual interacted with a measure of capital constraints. Column I contains a dummy variable equal to one in the year the firm repatriated and following years, and zero other wise. In column II, the dummy variable is replaced by the probability that the firm repatriates under the AJCA in years 2004 and beyond, and zero otherwise. The probability of repatriation is based on the coefficient estimates from Table IV, column II. In column III, both the probability of repatriation and the residual (the dummy variable from column I minus the probability of repatriation) are included. In columns IV-VI, the residual is interacted with a measure of capital constraints. In column IV and VI, capital constrained is measured as the percentage of the fiscal years during 2000 to 2003 in which the firm's investment expenditures exceeded its internal cash flow. In column V, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating, and zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parenthesis. The sample runs from 2000 to 2007.

	I	II	III	IV	V	VI
Firm Repatriated under AJCA =1 if yes	0.0063[1] (0.0019)					
Pr[Firm Repatriates]		0.0193[1] (0.0028)	0.0198[1] (0.0030)	0.0190[1] (0.0030)	0.0197[1] (0.0033)	0.0195[1] (0.0025)
Residual[Firm Repatriates]			0.0015 (0.0020)	0.0032 (0.0024)	0.0046[5] (0.0022)	0.0043[5] (0.0021)
Residual*Capital Constrained				-0.0069 (0.0049)	-0.0042 (0.0076)	-0.0065 (0.0045)
Log(Market Value of Assets)	-0.0062[1] (0.0009)	-0.0063[1] (0.0009)	-0.0063[1] (0.0009)	-0.0063[1] (0.0009)	-0.0063[1] (0.0010)	-0.0039[1] (0.0006)
Market Value of Assets/ Book Value of Assets	-0.0015[1] (0.0003)	-0.0014[1] (0.0003)	-0.0014[1] (0.0003)	-0.0014[1] (0.0003)	-0.0013[1] (0.0003)	-0.0013[1] (0.0002)
ROA (EBIT/BVA)	0.0125[1] (0.0038)	0.0130[1] (0.0038)	0.0130[1] (0.0038)	0.0134[1] (0.0038)	0.0123[1] (0.0040)	0.0134[1] (0.0027)
Credit Constrained if Year > 2003, 0 otherwise				-0.0016[1] (0.0015)	0.0004[1] (0.0016)	-0.0023[5] (0.0011)
R2	0.4769	0.4777	0.4777	0.4788	0.4918	0.3671
Number of Observations	31098	31098	31098	31098	28429	31606

Table VIII: Equity Payout Effects of the AJCA

Notes:

        The table contains panel regressions of the dividend and repurchases to market value of equity ratio (columns I-V) or repurchase to the market value of equity (column VI) on firm characteristics, the probability of repatriation, the residual, and the residual interacted with a measure of capital constraints. Column I contains a dummy variable equal to one in the year the firm repatriated and following years, and zero otherwise. In column II, the dummy variable is replaced by the probability that the firm repatriates under the AJCA in years 2004 and beyond, and zero otherwise. The probability of repatriation is based on the coefficient estimates from Table IV, column II. In column III, both the probability of repatriation and the residual (the dummy variable from column I minus the probability of repatriation) are included. In columns IV-VI, the residual is interacted with a measure of capital constraints. In column IV and VI, capital constrained is measured as the percentage of the fiscal years during 2000 to 2003 in which the firm's investment expenditures exceeded its internal cash flow. In column V, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating, and zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parenthesis. The sample runs from 2000 to 2007.

Table IX: Equity Payout Effects of the AJCA
High Probability of Repatriation Sub-sample

	I	II	III	IV	V	VI	VII
Pr[Firm Repatriates]	0.0190[1] (0.0030)	0.0105[1] (0.0033)	0.0177[1] (0.0038)	0.0197[1] (0.0033)	0.0133[1] (0.0034)		
Residual[Firm Repatriates]	0.0032 (0.0024)	0.0005 (0.0024)	0.0028 (0.0025)	0.0046[5] (0.0022)	0.0022 (0.0022)		
Residual * Capital Constrained	-0.0069 (0.0049)	-0.0052 (0.0049)	-0.0070 (0.0050)	-0.0042 (0.0076)	-0.0013 (0.0077)		
Firm Repatriated under AJCA						0.0025 (0.0023)	0.0040 (0.0025)
Firm Repatriated under AJCA *Capital Constrained						-0.0028 (0.0048)	-0.0014 (0.0051)
Log(Market Value of Assets)	-0.0063[1] (0.0009)	-0.0085[1] (0.0014)	-0.0090[1] (0.0016)	-0.0063[1] (0.0010)	-0.0075[1] (0.0014)	-0.0086[1] (0.0014)	-0.0090[1] (0.0016)
Market Value of Assets/ Book Value of Assets	-0.0014[1] (0.0003)	-0.0027[1] (0.0005)	-0.0021[1] (0.0005)	-0.0013[1] (0.0003)	-0.0026[1] (0.0005)	-0.0028[1] (0.0006)	-0.0022[1] (0.0006)
Pre-investment earnings/BVA	0.0134[1] (0.0038)	0.0433[1] (0.0065)	0.0344[1] (0.0073)	0.0123[1] (0.0040)	0.0419[1] (0.0066)	0.0434[1] (0.0065)	0.0342[1] (0.0074)
Credit Constrained if Year > 2003, 0 otherwise	-0.0016 (0.0015)	-0.0013 (0.0019)	-0.0027 (0.0024)	0.0004 (0.0016)	-0.0001 (0.0019)	-0.0012 (0.0020)	-0.0034 (0.0025)
R2	0.4778	0.4298	0.3856	0.4918	0.4410	0.4293	0.3839
Number of Observations	31098	17500	11331	28429	15778	17500	11331
Capital Constrained	CF	CF	CF	CF&NR	CF&NR	CF	CF
Sample	Full	High Pr	For Earn	Full	High Pr	High Pr	For Earn

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Notes:

The table contains panel regressions of the dividend and repurchases to market value of equity ratio on firm characteristics, the probability of repatriation, the residual, and the residual interacted with a measure of capital constraints. Columns I and IV are estimated for the full sample and are the same as reported in Table VIII, columns IV and V. Columns II, V, and VI are estimated using only the sub-sample of firms whose estimated probability of repatriating (based on the estimates from Table III) are above the median. Columns III and VII are estimated using only the sub-sample of firms that have a positive amount of unrepatriated foreign income by either of the measures used in Table IV. In columns I, II, III, VI, and VII capital constrained is measured as the percentage of the fiscal years during 2000 to 2003 in which the firm's investment expenditures exceeded its internal cash flow. In columns IV and V, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating, and zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parenthesis. The sample runs from 2000 to 2007.

Figure 1: Permanently Invested Foreign Income
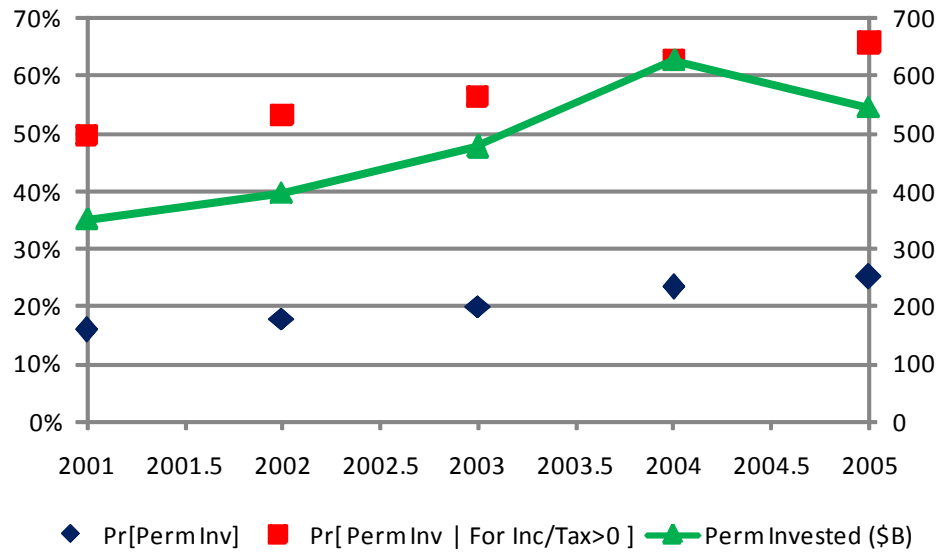
Notes:
Firms with foreign income must report the incremental tax that is due upon repatriation as a deferred tax liability if they do not repatriate the income. An exception arises if the firm deems the foreign income to be permanently or indefinitely invested abroad. In this case, the firm is not required to recognize the future tax liability on their balance sheet but is required to disclose the amount of permanently invested foreign income or the tax which would be due upon repatriation (see Section II-B). The figure reports the unconditional probability that a firm in our sample reports having permanently invested foreign income (diamonds) as well as this probability conditional on the firm reporting positive foreign income or foreign taxes in the same year (squares). Along the right axis, the figure reports the total amount of permanently invested foreign income (triangles).

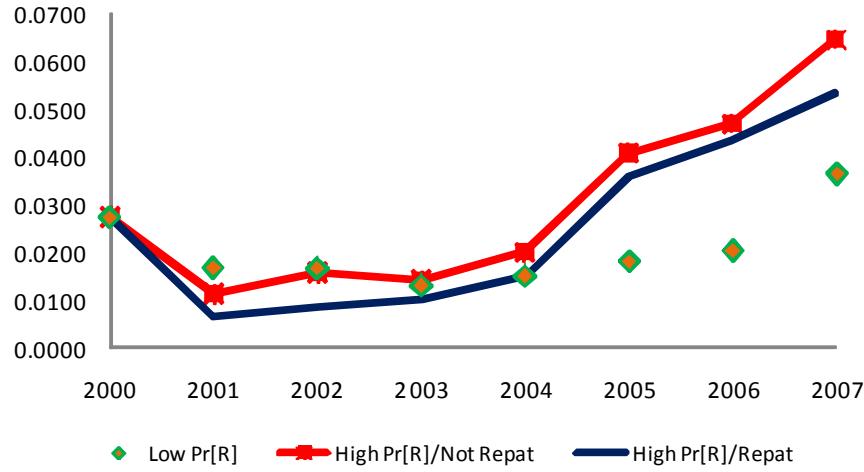Figure 2: Leverage of Treatment Firms versus Non-Treatment Firms
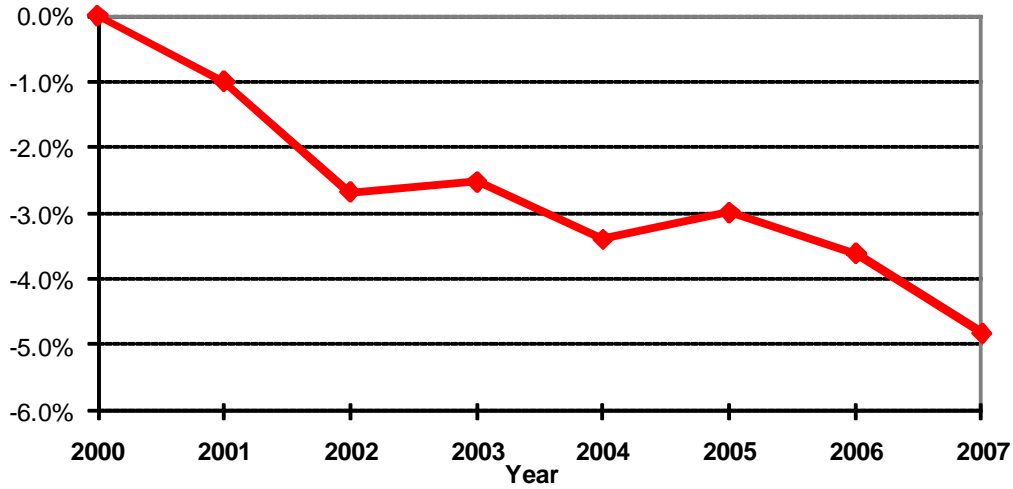
Notes:
The figure is based on the data from Table VII. We started with the regression in column II which includes year dummies (λ_t), and then replace the probability of repatriation with a set of year dummies times the probability of repatriation (see equation ??9). The coefficients on these interaction variables (γ) measure the difference in leverage between the high probability of repatriation (Group 2 & 3) and low probability of repatriation firms (Group 1) after controlling for the independent variables (X) and firm dummies (μ). These coefficients (γ) are graphed here. They show that the leverage of the high Pr[Repat] firms relative to the low Pr[Repat] firms is declining over the sample period, not just in the year following the passage of the AJCA or in the year a firm repatriates.

$$\text{Leverage}_{it} = \beta X_{it} + \mu_i + \lambda_t + \gamma_t \Pr\left[\text{Repat}_{it}\right] + \varepsilon_{it} \tag{10}$$

Figure 3: Annual Equity Payout Across the Three Groups

Notes:

The figure is based on the data from Table VIII. We started with the regression in column III, which includes year dummies (λ_t), and then replace the probability of repatriation and the residual with a set of year dummies times the probability of repatriation and another set of year dummies times a dummy variable for whether the firm repatriated income under the AJCA (see equation ??10). Estimated payout ratios based on these coefficient estimates are graphed in the above figure where each of the three groups is assumed to have the same payout ratio (the sample mean) in 2000. Group 1 (low probability of repatriation) is graphed as diamonds, Group 2 (high probability of repatriation, but did not repatriate) is graphed as squares connected by a line, and Group 3 (repatriating firms) is graphed as a line. The picture shows an increase in payouts for Group 2 and 3 following 2004, but no difference between the firms that repatriate (Group 3) and those with a high probability of repatriating who do not (Group 2).

$$\frac{\text{Payout}_{it}}{\text{MVEquity}_{it}} = \beta X_{it} + \mu_i + \lambda_t + \lambda_t \Pr[\text{Repat}_{it}] + \lambda_t \text{AJCA}_{it} + \varepsilon_{it} \qquad \textbf{(11)}$$