Investment and Capital Constraints: Repatriations Under the AJCA

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Introduction

Two Big Questions

1. To what extent do financing frictions constrain investments that firms would otherwise make?
2. Did firm that repatriated under the American Jobs Creation Act significantly increase their domestic investment?

Previous Literature

DFF

Dharmapala, Foley, and Forbes (2011), "Watch What I Do, Not What I Say: The Unintended Consequences of the Homeland Investment Act" *JF*.

BK

Blouin and Krull (2009), "Bringing it Home: A Study of the Incentives Surrounding the Repatriation of Foreign Earnings Under the American Jobs Creation Act of 2004" *JAR*.

Previous Literature

Findings

- Examine Use of Funds repatriated under the AJCA
- Find no increase in investment due to repatriation
- Repatriated Funds were used to increase payments to shareholders
- Consistent with two research designs

Introduction

In contrast, Faulkender and Petersen find:

- AJCA led to large increases in investment among subset of firms that are capital constrained
- Experimental design of former authors did not isolate constrained firms properly

Background

- American Jobs Creation Act (AJCA) signed into law in 2004 by President George W Bush
- Encouraged domestic investment by lowering the tax costs of repatriating income US firms had sitting abroad
- Firms have an incentive to keep cash abroad
  - The longer the deferral, the lower the present value of the tax to bring cash home
  - This assumes investment opportunities are same in both countries and no capital market imperfections
- But, what if we relax the above assumption?

Background

Do the incentives align?

- In a world without financial frictions, firms will invest in all positive NPV projects
- If US has domestic high NPV projects, firms will repatriate, use domestic internal funds, or capital markets
- With financial frictions, the cheapest method wins
- Then, the AJCA assumes by design that firms are financially constrained, having no domestic internal funds or access to capital markets

Background

There are three firms:

1. Firms with little or no foreign earnings in low-tax jurisdictions
2. Firms that repatriate foreign income under AJCA and are constrained
3. Firms that repatriate foreign income under AJCA and not constrained

Empirical Musings

- Prior work by BK and DFF use a DID where sample of firms is divided into treated and untreated group controlling for firm characteristics
- But, there are THREE groups!
- Difference between findings here and previous work lies in this idea

Empirical Musings

Demonstration

- Group 1: Firms with no tax-advantage in foreign earnings, do not increase response variable
- Group 2: Firms with tax-advantaged foreign earnings increase response variable without repatriation
- Group 3: Firms with tax-advantaged foreign earnings increase response variable with repatriation

What's the Difference?

BK

- Run a standard DID by including dummy variable which is equal to 1 in year firm repatriates and zero otherwise
- Coefficient then measures increase in response variable for firms that do repatriate (Group 3) versus the increase in response variable for firms that do not repatriate (Group 1 and 2)

What's the Difference?

BK

- Cannot know if effect is due to:
  - Repatriation (comparison of group 3 to group 2)
  - Or due to differences between firms with and without foreign earnings in low-tax jurisdictions (difference between group 1 and both group 2 and 3)
- Because first group (in BK) has higher increase in investment than the second group, coefficient on AJCA dummy is positive, even when there is no effect

DID_{BK} = *Diff[Group 3] - Diff[Group 1 and 2]*

What's the Difference?

DFF

- Use instrumental variable approach
  - IV: firm's foreign tax rate is lower than US and whether firm's foreign subsidiaries are in tax havens
- Replaces AJCA dummy in BK with probability that firm repatriates
- Firms with unrepatriated income in low-tax countries have high probability of repatriation

What's the Difference?

DFF

Coefficient measures the increase in the response variable for firms with high probability of repatriation (Groups 2 and 3) independent of whether they actually repatriate income versus the increase in the response variable for firms with low probability of repatriation (Group 1)

DID_{DFF} = *Diff[Group 2 and 3] - Diff[Group 1]*

- Estimating the coefficient this way will make it larger and positive than BK finding even if effect is zero

Analogy

That's sick bro!

- Group 1 - People that are healthy
- Group 2 and 3 - People that are sick
- Group 3 - Sick people given a treatment
- If you wanted to evaluate the performance of a treatment, you would not compare change in health of those who received the treatment (3) to those who did not (1 and 2) - as BK do.
- You would not compare the change in the health of those that were predicted to receive the treatment (the sick 2 and 3) to those who are unlikely to receive the treatment (1). This is approach of DFF.

Empirics

Goal

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 under the AJCA.

- Three groups $\Longrightarrow$ two coefficients, not 1, in DID

$$\text{BK} \quad Y_{it} = \alpha \text{AJCA}_{it} + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

$$\text{DFF} \quad Y_{it} = \alpha \Pr[\text{Repat}] + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

$$\begin{aligned}\text{FP} \quad Y_{it} &= \alpha_1 \Pr[\text{Repat}]_{it} + \alpha_2 (\text{AJCA}_{it} - \Pr[\text{Repat}]_{it}) + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it} \\ &= \alpha_2 \text{AJCA}_{it} + (\alpha_1 - \alpha_2) \Pr[\text{Repat}]_{it} + \beta X_{it} + \mu_i + \lambda_t + \varepsilon_{it}\end{aligned}$$

Data

- Collect AJCA data from firms' 10-ks
- Searched using Perl script for AJCA from 2004 - 2006
  - 804 that discussed repatriation, did not repatriate
  - 442 firms repatriated income ($298 billion repatriated)
  - Remaining sample of firms from this period did not disclose
- Need to measure both firm's current and recent history of foreign profits, and stock of foreign profits that are classified as permanently reinvested abroad

Characterisitcs of firms that repatriated income under the AJCA

Table 2
Industries with greatest repatriation activities

Industry	Total Foreign Income Repatriated	Number of Firms Repatriating	Permanently Reinvested 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

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 (in $M) and the number of firms that repatriated income in that industry, respectively. The fourth column is the total amount of permanently reinvested earnings (PRE) that were disclosed by firms in the industry as of 2003, that is, the year prior to passage of the American Jobs Creation Act (in $M).

Characterisitcs of firms that repatriated income under the AJCA

Table 3
Summary statistics of firm characteristics

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

Empirical Analysis

1. Examine which firm characteristics are associated with likelihood of repatriating under AJCA
   - Estimate cross-sectional model of who repatriates using M/B, size, preinvestment profitability
2. Use these variables to predict whether firms repatriate or not
3. Use second set of variables to measure firm's stock of unrepatriated earnings
   - log of one plus firm's permanently reinvested foreign earnings - use dummy = 1 if greater than zero.
4. Measure tax benefit of repatriation
   - compare taxes that would have been paid on the foreign income had it been taxed in US at 35% to the actual foreign taxes paid. Scale by market value of assets

Empirical Analysis

Result

- Increasing firm size from 25th to 75th percentile raises probability of repatriation by 3.5% (profits 2.8%)
- Most powerful predictor is supply of unrepatriated foreign earnings
- Increase in tax wedge from 25th to 75th percentile raises probability of repatriation by 1.1%
- Large tax loss carryforwards increase (25th to 75th percentile) lowers probability of repatriation by 3.4%
- Average rise in investment across repatriating firms is 0.17% and 1.85% when isolated to capital constrained firms! Accounts for 78% of the total $78.3 billion invested
  - Yet capital constrained firms are only 27% of the sample

Empirical Analysis

Table 4
Estimated probability of repatriation

	1	2	3	4
Dependent Variable:	Repatriate Yes/No	Repatriate Yes/No	Repatriate Amount	Repatriate Consider
Log(Market Value of Assets)	0.5724[1]	0.2709[1]	0.0104[1]	0.1552[1]
	(0.0277)	(0.0463)	(0.0034)	(0.0272)
Market Value of Assets/Book Value of Assets	−0.2246[1]	−0.2149[1]	−0.0055	0.0198
	(0.0426)	(0.0657)	(0.0042)	(0.0307)
Preinvestment earnings/BVA	6.6233[1]	4.2053[1]	0.3262[1]	1.3151[1]
	(0.4565)	(0.7262)	(0.0533)	(0.4294)
Ln[1+Perm Reinvested Earn]		0.1177[1]	0.0127[1]	0.1533[1]
		(0.0320)	(0.0026)	(0.0282)
Perm Reinvested Earn>0 (=1 if yes)		3.0042[1]	0.2014[1]	2.5132[1]
		(0.2665)	(0.0195)	(0.1180)
Ln[1+For Earnings (3 yrs)]		0.1239[5]	0.0159[1]	0.1050[5]
		(0.0604)	(0.0044)	(0.0445)
Foreign Earnings (3 years)>0 (=1 if yes)		0.1375	−0.0114	0.6936[1]
		(0.2886)	(0.0206)	(0.1742)
Estimated Repatriation Tax/ MVA		61.5837[1]	8.2719[1]	38.3484[5]
		(21.5557)	(1.9611)	(18.3477)
Tax Loss Carryforward/MVA		−1.4411[5]	−0.0948[5]	−0.2623[10]
		(0.6513)	(0.0419)	(0.1477)
Pseudo-R^2	0.2106	0.4472	0.7520	0.3719
Number of Observations	5272	4950	4933	4950

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 1 and 2). The independent variables are based on values for the firm in 2003 and in some cases prior years. A tobit model is estimated in column 3, and the dependent variable is the amount of the repatriation standardized by the market value of assets or zero. Column 4 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 parentheses.

Empirical Analysis

Table 5
Investment incentives of the AJCA

	1	2	3	4	5
Firm Repatriated under AJCA =1 if yes	0.0015				
	(0.0030)				
Pr[Firm Repatriates]		−0.0054	−0.0042	−0.0082[10]	−0.0056
		(0.0049)	(0.0051)	(0.0048)	(0.0054)
Residual[Firm Repatriates]			0.0037	−0.0044	−0.0012
			(0.0032)	(0.0036)	(0.0036)
Residual*Capital Constrained				0.0257[1]	0.0374[5]
				(0.0097)	(0.0179)
Log(Market Value of Assets)	−0.0084[1]	−0.0084[1]	−0.0084[1]	−0.0090[1]	−0.0101[1]
	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0024)
Market Value of Assets/Book Value of Assets	0.0070[1]	0.0069[1]	0.0069[1]	0.0071[1]	0.0065[1]
	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Preinvestment earnings/BVA	0.0120	0.0118	0.0118	0.0167	0.0135
	(0.0114)	(0.0114)	(0.0114)	(0.0115)	(0.0114)
Capital Constrained if Year > 2003, 0 otherwise				−0.0138[1]	−0.0157[1]
				(0.0030)	(0.0030)
R^2	0.7205	0.7206	0.7206	0.7210	0.7343
Number of Observations	37294	37294	37294	37294	34209

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 repatriate as well as whether it did. Column 1 contains a dummy variable equal to one in the year the firm repatriated and following years and zero otherwise (BK method). In Column 2, the dummy variable is replaced by the probability that the firm repatriates under the AJCA in years 2004 and beyond and is zero otherwise (DFF method). The probability of repatriation is based on the coefficient estimates from Table 4, Column 2. In Column 3, both the probability of repatriation and the residual (the dummy variable from Column 1 minus the probability of repatriation) are included. In Columns 4 and 5, the residual is interacted with a measure of capital constraints. In Column 4, 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 5, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating and is zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parentheses. The sample runs from 2000 to 2007.

Empirical Analysis

Should we call Endogeneity Police?

Can you get a positive coeff. on residual times capital-constrained variable, without constrained firms increasing investment due to AJCA?

- Constrained repatriators have higher than average investment rates - controlled by firm dummies
- Investment opportunity higher in the latter half of the sample than the first - controlled by time dummies

Empirical Analysis

Should we call Endogeneity Police?

- Investment opportunities for firms with foreign earnings or capital constrained firms increase independently of repatriation - controlled by predicted probability of repatriation
  - and dummy=0 prior to 2004 and equal to constraint measure after 2003
  - Controls for any change in investment rates of constrained firms relative to unconstrained post-2003 relative to pre-2004

Empirical Analysis

Restricted Sample

- Drop firms unlikely (Pr less than median Pr) to repatriate income (focus on groups 2 and 3).
- Among firms able to take advantage of the AJCA tax subsidy, did those who repatriated invest more?

Results

- Results consistent with full sample: only residual*capital constrained matters
- Looking at only firms with positive foreign earnings also yields consistent results
- Consistent with different definitions of capital constraint (CF and bond ratings)

Empirical Analysis

Other Results

- No significant effect of AJCA on employment
- Neither constrained nor unconstrained firms change their leverage or cash levels because of repatriation

Empirical Analysis

Payout Policy

- Similar Regressions as before, but use Dividend + Repurchases / MVE as dependent variable
- BK method shows increase in equity payout
- DFF shows even larger increase in equity payout
  - Recall, neither method shows effect of repatriation

Empirical Analysis

Payout Policy

- Including both probability of repatriation and residual, firms with greater probability of repatriation increase equity payouts after 2003
- But, conditioning on the probability of repatriation, actual repatriating earnings under the AJCA have no effect on payout
- Reestimate DID with three sets of time dummies, including time dummies $\times$ probability of repatriation and time dummies $\times$ whether firm repatriated income under AJCA (Figure 3)

Empirical Analysis

Table 8
Equity payout effects of the AJCA

	1	2	3	4	5	6
Dependent Variable	D+R/MVE	D+R/MVE	D+R/MVE	D+R/MVE	D+R/MVE	R/MVE
Firm Repatriated under AJCA =1 if yes	0.0063[1]					
	(0.0019)					
Pr[Firm Repatriates]		0.0193[1]	0.0198[1]	0.0190[1]	0.0197[1]	0.0195[1]
		(0.0028)	(0.0030)	(0.0030)	(0.0033)	(0.0025)
Residual[Firm Repatriates]			0.0015	0.0032	0.0046[5]	0.0043[5]
			(0.0020)	(0.0024)	(0.0022)	(0.0021)
Residual*Capital Constrained				−0.0069	−0.0042	−0.0065
				(0.0049)	(0.0076)	(0.0045)
Log(Market Value of Assets)	−0.0062[1]	−0.0063[1]	−0.0063[1]	−0.0063[1]	−0.0063[1]	−0.0039[1]
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0010)	(0.0006)
Market Value of Assets /Book Value of Assets	−0.0015[1]	−0.0014[1]	−0.0014[1]	−0.0014[1]	−0.0013[1]	−0.0013[1]
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0002)
Preinvestment earnings/BVA	0.0125[1]	0.0130[1]	0.0130[1]	0.0134[1]	0.0123[1]	0.0134[1]
	(0.0038)	(0.0038)	(0.0038)	(0.0038)	(0.0040)	(0.0027)
Capital Constrained if Year > 2003, 0 otherwise				−0.0016[1]	0.0004[1]	−0.0023[5]
				(0.0015)	(0.0016)	(0.0011)
R^2	0.4769	0.4777	0.4777	0.4788	0.4918	0.3671
Number of Observations	31098	31098	31098	31098	28429	31606

The table contains panel regressions of the dividend and repurchases to market value of equity ratio (Columns 1–5) or repurchase to the market value of equity (Column 6) on firm characteristics, the probability of repatriation, the residual, and the residual interacted with a measure of capital constraints. Column 1 contains a dummy variable equal to one in the year the firm repatriated and following years and zero otherwise (BK method). In Column 2, the dummy variable is replaced by the probability that the firm repatriates under the AJCA in years 2004 and beyond and zero otherwise (DFF method). The probability of repatriation is based on the coefficient estimates from Table 4, Column 2. In Column 3, both the probability of repatriation and the residual (the dummy variable from Column 1 minus the probability of repatriation) are included. In Columns 4–6, the residual is interacted with a measure of capital constraints. In Columns 4 and 6, 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 5, capital constrained is measured the same way if the firm does not have an S&P long-term debt or commercial paper rating and is zero otherwise. Each regression contains a dummy variable for each firm and each year. Standard errors clustered by firm are reported in parentheses. The sample runs from 2000 to 2007.

Empirical Analysis

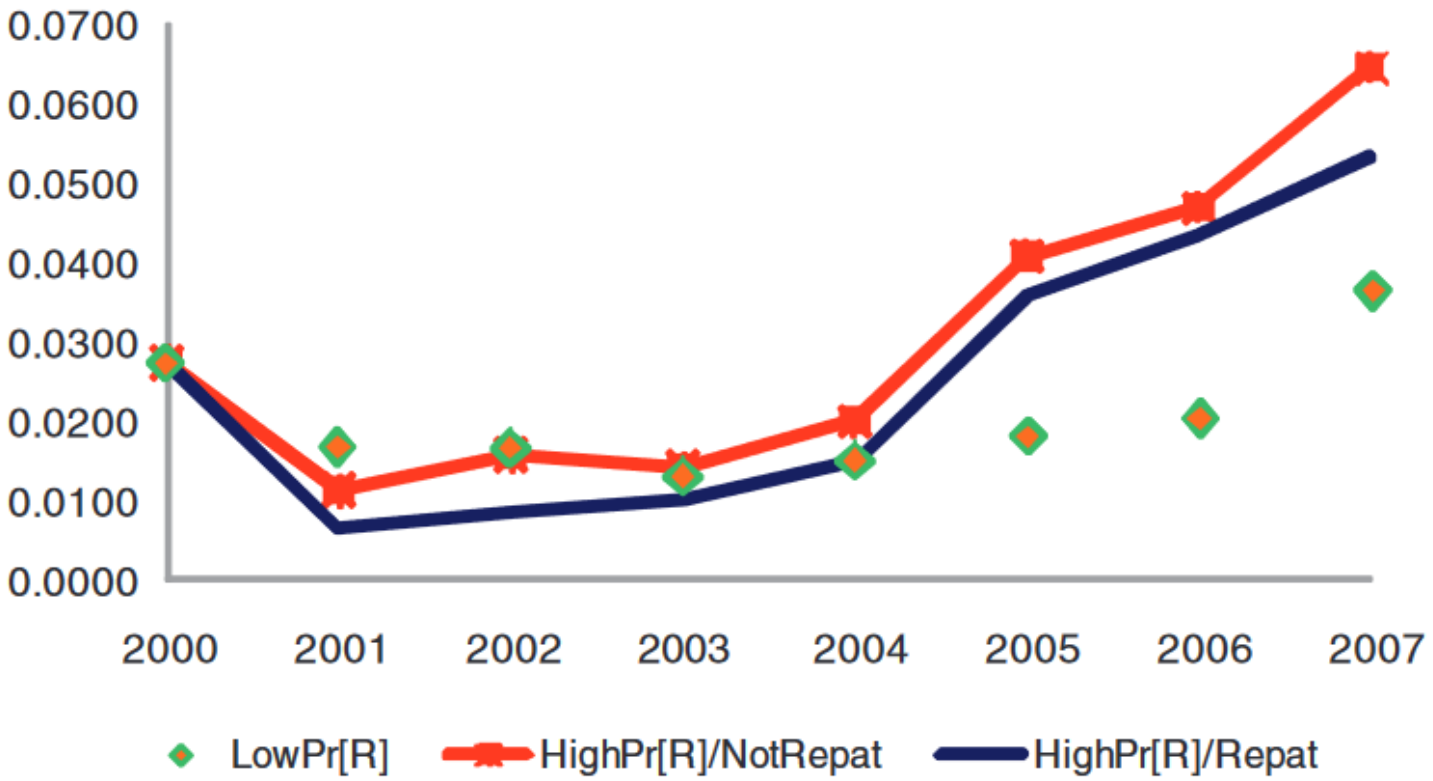

Figure 3

Conclusion

- For the average firm, little increase in investment post AJCA
- Significant increase in investment for subset of capital constrained firms (quarter of total repatriating firms)
- Consistent with expectations of financial frictions
- No effect on payout
- Incentives should be aligned with all firms for future policy, not just capital constrained firms