Online Appendix for "More Cash, Less Innovation: The Effect of the American Jobs Creation Act on Patent Value"

Table OA1

Matching without Growth Rate of Patent Value

This table reports the results from matching without the growth rate of patent value and related summary statistics. Panel A presents the effect of the AJCA using this matched sample. Panel B presents the summary statistics of the treated and control firms before and after the matching.

Panel A. CW method

	(1)	(2)	(3)
Dependent Variable	PATENT_VALUE	RD	CHANGE_INTANGIBLE_ASSETS
TREATMENT x EXPOSURE	-0.063**	-0.004	-0.005
	(0.025)	(0.004)	(0.014)
Constant	0.275***	0.080***	0.067***
	(0.014)	(0.003)	(0.012)
Firm FE	Y	Y	Y
Year FE	Y	Y	Y
Observations	2,536	2,536	2,536
Adjusted R-squared	0.841	0.732	0.188

Panel B: Summary statistics

	Pre-Match			Post-Match		
Variable	Mean Treated	Other	*t*-Diff	Mean Treated	Control	*t*-Diff
LEVERAGE	0.21	0.14	5.97***	0.21	0.21	0.23
CASH	0.19	0.41	-12.81***	0.19	0.16	1.77*
CASH_FLOW	0.08	-0.12	11.36***	0.08	0.07	1.61
FIRM_SIZE	7.24	5.19	16.37***	7.25	7.16	0.68
SALES_TURNOVER	0.98	0.69	7.99***	0.98	1.01	-0.65
Q	2.16	2.54	-3.13***	2.17	1.96	1.98**
CAPITAL_EXPENDITURE	0.04	0.04	0.73	0.04	0.03	2.07**
IDIO_VOLATILITY	0.03	0.04	-15.03***	0.03	0.03	-0.04

Growth Rate of PATENT VALUE	0.42	0.57	-1.50	0.42	0.35	0.75
# of Unique Firms	320	544		317	137	

Table OA2

Estimated Probability of Repatriation – the First Stage of the FP Method

This table presents the coefficients estimates of cross-sectional logits, where the dependent variable is whether the firm repatriated foreign income under the AJCA. The independent variables are measured in 2003. Standard errors are reported in the parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, based on a *t*-test.

	(1)	(2)
Dependent Variable	REPATRIATE	REPATRIATE
log(MARKET_VALUE_OF_ASSETS)	0.551***	0.317***
	(0.028)	(0.044)
MARKET_TO_BOOK	-0.453***	-0.333***
	(0.048)	(0.057)
PREINVESTMENT_EARNINGS_BVA	5.814***	4.296***
	(0.506)	(0.629)
ln(1+PERM_REINVESTED_EARN)		0.131*
		(0.068)
PERM_REINVESTED_EARN		0.654*
		(0.341)
ln(1+ FOR_EARNINGS_3YEARS)		0.121*
		(0.066)
FOREIGN_EARNINGS_3YEAR		1.194***
		(0.292)
ESTIMATED_EARNINGS_TAX_MVA		13.630
		(16.240)
TAX_LOSS_CARRYFORWARD_MVA		-1.382**
		(0.665)
R-squared	0.189	0.369
Observations	5,030	4,742

Table OA3

Market Reaction to the AJCA

This table presents estimates of the market reaction to the AJCA for treated firms relative to the control firms for three different dates: July 25, 2003 when the AJCA was introduced in the House of Representatives; September 18, 2003 when the AJCA was introduced in the Senate; and October 22, 2004 when it was signed by President Bush. *Exposure* equals one for treated firms and zero for control firms as defined in Table 1. We compute cumulative abnormal returns over the three-day event window, CAR[0,2], for these three events. The CARs are based on market-adjusted returns. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, based on a *t*-test.

	(1)	(2)	(3)
Dependent Variable	AJCA_INTRODUCED_IN_THE_HOUSE	AJCA_INTRODUCED_IN_THE_SENATE	AJCA_SIGNED_BY_PRESIDENT_BUSH
EXPOSURE	-0.004	0.005	0.002
	(0.005)	(0.004)	(0.004)
Constant	0.007	-0.008**	-0.010***
	(0.005)	(0.004)	(0.003)
Observations	634	634	634
Adjusted R-squared	0.001	0.003	0.000

Table OA4

The Effects of the AJCA on Average Exploitative Patent Value

This table presents estimates of the effects of the AJCA on the average value of exploitative patents for the matched sample using the CW method following equation (1), and for the full sample using the FP method following equation (2). We classify each patent as exploitative based on its new citation score developed by Katila and Ahuja (2002). Patents with a Katila score below 80% are classified as exploitative. The patent value is estimated by the market reaction to patent grant news following Kogan et al. (2017). In Column 1, the sample is restricted to 2002-2003 and 2005-2006. In Columns 2 and 3, the sample is from 2000 to 2007. All explanatory variables and control variables are defined as in Table 2 and the Appendix. All variables are winsorized at the 1% and 99% levels each year. Standard errors clustered at the firm level are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, based on a *t*-test.

	(1)	(2)	(3)
Method	CW	FP	FP
Dependent Variable	AVERAGE_EXPLOITATIVE_PATENT_VALUE	AVERAGE_EXPLOITATIVE_PATENT_VALUE	AVERAGE_EXPLOITATIVE_PATENT_VALUE
TREATMENT x EXPOSURE	-0.038		
	(0.180)		
RESIDUAL_FIRM_REPATRIATES (AJCA-PR_FIRM_REPATRIATES)		-1.580	-1.784
		(1.625)	(1.654)
PR_FIRM REPATRIATES		-9.808*	-9.908*
		(5.048)	(5.065)
Controls		Y	
Firm FE	Y	Y	Y
Year FE	Y		

Industry-Year FE		Y	Y
Observations	2,495	5,946	5,983
Adjusted R-squared	0.844	0.856	0.853

Table OA5

Patent Value Estimation: Comparison with Kogan et al. (2017)

This table presents summary statistics of our patent value estimation and those in Kogan et al. (2017). The sample includes patents granted from 1976 to 2010. The table reports the number of patent value estimates, the correlation of patent value between the two samples, and the percentile of patent value for these two samples. P1 refers to the 1th percentile, and so on.

Patent Value ($M)	Kogan et al. (2017)	Our Estimation
# of Patent Value Estimates	1,289,833	1,289,833
Patent Grant Year	1976-2010	1976-2010
Correlation	0.9977	
Mean	12.03	12.04
Std. Dev.	36.65	36.73
Percentiles		
p1	0.01	0.01
p5	0.03	0.03
p10	0.07	0.07
p25	0.58	0.58
p50	3.62	3.60
p75	10.34	10.33
p90	25.88	25.88
p95	45.90	45.97
p99	145.45	145.94

Table OA6

Placebo Tests

This table presents the estimates of the effects of a hypothetical shock in alternative years on patent value using matched sample (Column 1) and full sample using the FP method (Columns 2 and 3). Panel A present the case where the hypothetical shock occurs in 1998. Following Cohn and Wardlaw (2016, CW), in Column 1, the sample is restricted to 1996-1997 and 1999-2000. TREATMENT is one for post-1998 observations and zero for pre-1998 observations. EXPOSURE equals one if a firm has cumulative foreign income during the pre-shock period above 1% of total assets and zero otherwise. Treated firms are matched with untreated firms using propensity score matching in the same industry (with replacement). Same set of covariates are used in the matching as in Table 1. For the post-1998 observations, we scale patent value by total assets in 1997. In Columns 2 and 3, the sample period is from 1994 to 2001, and the tests follow Faulkender and Petersen (2012, FP). Panel B reports the coefficients on treatment x exposure in Column 1 and coefficient on Residual in Column (2) where the hypothetical shock occurs in 1982-1998. All variables are winsorized at the 1% and 99% levels each year. Standard errors are clustered at the firm level and reported in the parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively, based on a *t*-test.

Panel A:

	(1)	(2)	(3)
Method	CW	FP	FP
Dependent Variable	Patent Value	Patent Value	Patent Value
TREATMENT x EXPOSURE	-0.038		
	(0.180)		
RESIDUAL_FIRM_REPATRIATES		-0.044	-0.073
(AJCA-PR_FIRM_REPATRIATES)		(0.075)	(0.083)

PR_FIRM_REPATRIATES		-0.503***	-0.605***
		(0.154)	(0.186)
Controls		Y	
Firm FE	Y	Y	Y
Year FE	Y		
Industry-Year FE		Y	Y
Observations	2,176	5,391	5,508
Adjusted R-squared	0.734	0.572	0.550

Panel B

Dependent Variable	PATENT_VALUE					
Placebo Year	1982	1983	1984	1985	1986	1987
TREATMENT x EXPOSURE (CW)	0.025	0.008	0.029	0.008	0.004	0.000
	(0.022)	(0.031)	(0.022)	(0.018)	(0.014)	(0.023)
RESIDUAL_FIRM_REPATRIATES (FP)	-0.013	-0.010	-0.004	0.004	0.011	0.009
	(0.010)	(0.011)	(0.010)	(0.009)	(0.009)	(0.011)
Placebo Year	1988	1989	1990	1991	1992	1993
TREATMENT x EXPOSURE (CW)	0.011	0.085**	0.098***	0.107	0.114	0.398**
	(0.029)	(0.038)	(0.036)	(0.079)	(0.147)	(0.200)
RESIDUAL_FIRM_REPATRIATES (FP)	0.011	0.008	0.018	0.049*	0.066*	0.126**
	(0.012)	(0.014)	(0.016)	(0.027)	(0.037)	(0.061)
Placebo Year	1994	1995	1996	1997	1998	Average
TREATMENT x EXPOSURE (CW)	0.308	0.841*	0.408	0.119	-0.038	0.149
	(0.225)	(0.453)	(0.391)	(0.209)	(0.180)	
RESIDUAL_FIRM_REPATRIATES (FP)	0.141*	0.250**	0.198**	0.165*	-0.044	0.058
	(0.084)	(0.110)	(0.097)	(0.086)	(0.075)	

Table OA7

The Effects of the AJCA on Leverage and Payout

This table presents estimates of the effects of the AJCA on leverage and payout for the matched sample following equation (1) in Panel A, and for the full sample following equation (2) in Panel B. We define leverage (LEVERAGE) as the book value of debt divided by total assets. Payout ratio (PAYOUT) is defined as the sum of dividends and share repurchase divided by total assets. In Panel A, both models include firm and year fixed effects. The sample is restricted to 2002-2003 and 2005-2006. In Panel B, the sample is from 2000 to 2007. All explanatory variables and control variables are defined as in Table 2 and the Appendix. All variables are winsorized at the 1% and 99% levels each year. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: The CW method

	(1)	(2)
Dependent Variable	LEVERAGE	PAYOUT
TREATMENT x EXPOSURE	0.010	0.013
	(0.019)	(0.010)
Constant	0.206***	0.067***
	(0.015)	(0.007)
Firm FE	Y	Y
Year FE	Y	Y
Observations	2,536	2,330
Adjusted R-squared	0.755	0.640

Panel B: The FP method

	(1)	(2)	(3)	(4)
Dependent Variable	LEVERAGE	LEVERAGE	PAYOUT	PAYOUT
RESIDUAL_FIRM_REPATRIATES	-0.015	-0.015	0.018***	0.019***

(AJCA-PR_FIRM_REPATRIATES)	(0.009)	(0.010)	(0.006)	(0.007)
PR_FIRM_REPATRIATES	-0.049***	-0.040**	0.034***	0.033***
	(0.015)	(0.016)	(0.010)	(0.010)
Controls	Y		Y	
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observations	6,661	6,720	5,697	5,748
Adjusted R-squared	0.666	0.647	0.483	0.472