Made in the USA? A Study of Firm Responses to Domestic Production Incentives

by

Rebecca C. Lester

B.S., University of Tennessee (2001)
M.S., University of Tennessee (2002)

Submitted to the MIT Sloan School of Management
in partial fulfillment of the requirements for the degree of

Doctor of Philosophy in Management

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 2015

Author . Signature redacted ....
MIT Sloan School of Management
May 1, 2015

Certified by. Signature redacted ....
Michelle Hanlon
Howard W. Johnson Professor
Professor of Accounting
Thesis Supervisor

Accepted by . . Signature redacted ....
Ezra Zuckerman Sivan
Alvin J. Siteman (1948) Professor of Entrepreneurship and Strategy
Professor of Technological Innovation,
Entrepreneurship, and Strategic Management
Chair, MIT Sloan School of Management Ph.D. Program

Made in the USA? A Study of Firm Responses to Domestic Production Incentives

by

Rebecca C. Lester

Submitted to the MIT Sloan School of Management
on May 1, 2015, in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy in Management

Abstract

How do U.S. companies respond to incentives intended to encourage domestic production and manufacturing? I study this question in the context of the Domestic Production Activities Deduction (DPAD), which was enacted in the American Jobs Creation Act of 2004 and is currently the third largest U.S. corporate tax expenditure. Specifically, I examine 1) whether and to what extent firms shift income to maximize the domestic manufacturing benefit, and 2) the extent that firms actually increase domestic investment and employment, measured using confidential data from the U.S. Bureau of Economic Analysis. While I find a positive effect of DPAD on domestic investment, I also find that DPAD firms shift income across time and (to a lesser extent) across borders to maximize the tax benefit. These results show that changes in firm reporting are an important and economically significant response that has not been studied previously in this context. Additionally, these findings inform the ongoing policy debate on the possible extension or repeal of this tax incentive.

Thesis Supervisor: Michelle Hanlon
Title: Howard W. Johnson Professor
Professor of Accounting

Acknowledgments

First, I am incredibly grateful for the training, advice, and counsel of my dissertation committee: Michelle Hanlon, S.P. Kothari, and Rodrigo Verdi. I appreciate the enormous amount of time that they have spent with me during my study at MIT. To Michelle, thank you for accepting me as your student at MIT and for the countless hours you have spent training me, teaching me, and setting an outstanding example of the type of researcher, teacher, colleague, and mother that I strive to be. To S.P., thank you for always finding time to talk with me and for your wise perspective on both research and life. To Rodrigo, thank you for the countless hours that you spent with me, talking about research and providing advice for success in the PhD program and in academia. I cannot adequately express my appreciation and my gratitude for all that the three of you have done.

I also appreciate the guidance and training from the other Accounting faculty. Thank you to John Core for all of the time and investment you have made in the PhD program. Thank you to Joe Weber for your support and for always helping me to keep perspective in times when I most needed it. I appreciate the time that Eric So and Joao Granja spent to help me prepare for the job market. Finally, I am grateful for all of the time that Anna Costello and Nemit Shroff spent with me in their offices, providing feedback, guidance, and wise counsel.

In addition, I would like to thank my peers in the PhD program and other friends for their support and friendship along the way. I am glad to have met Brian Akins, Lynn Lei, Luo Zuo, Daniel Saavedra, Zawadi Lemayian, Kexin Zheng, Ben Yost, Nick Guest, Heidi Packard, Will Powley, Inna Lobanova, and Jinhwan Kim in the PhD program. I appreciate all of the help and advice that Patricia Naranjo and Joshua Anderson gave to me throughout the program and am grateful that they have also become my close friends. Thank you to my co-author, Dominika Langenmayr, for all of your work and persistence and for a wonderful working relationship.

For this paper, I also appreciate insightful comments from seminar participants at MIT, Harvard Business School, the Office of Tax Analysis at the U.S. Treasury, Stanford University, the University of Chicago, the University of Illinois, the University of Michigan, the University of Notre Dame, and the University of Pennsylvania. I thank Jeff Hoopes for help with data collection, and I appreciate institutional insight from Harry Moser of the Reshoring Initiative, Joanne Bonfiglio, Jeff Cote, David Hoffman, Anne-Marie Petersen, Larry Salus, Ryan Stecz, and Todd Videbeck. I gratefully acknowledge financial support from the Sloan School of Management and the Deloitte Foundation.

I would like to thank my friends and family who have tirelessly supported me in this journey. My sincere gratitude to my parents for your love and for teaching me to always reach for the next goal. You have set the example of happy and successful academics, and I am grateful for all of the opportunities that you have given me in life. I also am incredibly appreciative of all of the extra support this past year and for helping me to reach this finish line. Thank you also to all of the Knights and the Lesters for your continual support and encouragement along the way. In particular, thank you to Emily for your extra help this year and for traveling into town frequently this fall so that I could finish this paper! A special thank you to Kelly Fanning and Reed Bundy for welcoming us to Cambridge with open arms and for becoming our New England family.

Finally, I would like to thank Ben, Catherine, and Cash. To my husband, I cannot show enough gratitude for your endless support of me. Thank you for being willing to move from Chicago to Boston and now to move to California. Thank you for seeing me through the ups and downs of this program, for always providing calm and thoughtful advice, and for making me laugh when I need it the most. Most importantly, thank you for going on this adventure with me and for loving me through it all. And to our daughter Catherine, you are the light in our lives and the most perfect addition to our family. I am grateful every single day for you. May all of your dreams come true.

Table of Contents

1.	Introduction	8
2.	Institutional Details	13
3.	Prior Literature and Hypotheses	16
3.1.	Inter-temporal Shifting	16
3.2.	Cross-border accounting re-characterization	17
3.3.	Real investment and employment	19
4.	Research Design and Sample	22
4.1.	Test of inter-temporal shifting	22
4.2.	Test of cross-border accounting re-characterization	24
4.3.	Test of real effects	25
4.4.	Sample	27
4.5.	Descriptive statistics	30
5.	Empirical Results	32
5.1.	Tests of H1: Inter-temporal shifting	32
5.2.	Tests of H2: Cross-border shifting	33
5.3.	Tests of H3: Real Activity	33
5.4.	Additional Analyses	35
5.4.1.	Responses across 2005, 2007, and 2010	35
5.4.2.	Analysis of Real Inter-temporal Shifting	36
5.4.3.	Cross-sectional Analyses of Investment	37
5.4.4.	Analyses for Firms <$100M Assets	38
6.	Conclusion	38
7.	References	40

Appendices

A.	Summary of DISC, FSC, and ETI Regimes	44
B.	Search Terms to Identify DPAD Firms	46
C.	Variable Definitions	47

Tables

1.	Sample Selection	49
2.	Descriptive Statistics	51
3.	Inter-temporal Shifting	53
4.	Cross-border Shifting	54
5.	Real Effects: Investment & Employment	56
6.	Analysis of DPAD Effects in 2005, 2007, and 2010	59

1. Introduction

This paper studies how U.S. companies respond to domestic production incentives. The American Jobs Creation Act of 2004 ("AJCA") included the Domestic Production Activities Deduction (Section 199 deduction or hereafter "DPAD"), a U.S. tax incentive intended to increase domestic manufacturing investment and employment (H. Rept. 108-393).[1] Firms have claimed over $60B in DPAD benefits since enactment, with an additional $65.6B expected from 2013-2017, making DPAD the third largest corporate tax expenditure (Joint Committee on Taxation, 2013). However, because the law did not require firms to commit to new domestic investment or employment, firms could claim the deduction with few, if any, operational changes. In addition, firms may choose other less costly channels, such as shifting income across time and across countries, to increase the amount of qualifying domestic income. In this paper, I examine 1) whether and to what extent firms shift income to maximize the domestic manufacturing benefit, and 2) the extent of real effects, e.g., increases in domestic investment and employment.

As a brief overview, the DPAD incentive allows firms to deduct a portion of income related to domestic production activities when determining their U.S. income tax liability. To calculate the amount of the deduction, firms identify domestic production gross receipts and the associated direct and indirect domestic expenses. The deduction is equal to net domestic production income (revenues minus expenses), times the statutory deduction percentage of 3% (2005-2006), 6% (2007-2009), or 9% (2010 and thereafter). Thus, when fully phased in, the deduction effectively lowers the corporate tax rate on qualifying income by 3.15% (35% x 9% = 3.15%). Section 2

[1] Specifically, H. Rept. 108-393 states that "The Committee [on Ways and Means] believes that a reduced tax burden on domestic manufacturers will improve the cash flow of domestic manufacturers and make investments in domestic manufacturing facilities more attractive. Such investment will create and preserve U.S. manufacturing jobs."

provides a detailed discussion of this benefit.

Prior literature (Kemsley, 1998) and concurrent working papers that study DPAD (Blouin et al., 2014; Ohrn 2014) suggest that firms will respond to a domestic tax incentive by increasing domestic production. However, Slemrod (1992) states that taxpayers often take less costly actions first. The least costly response is for firms to shift transactions in time (*inter-temporal shifting*). Second, firms may use accounting discretion to re-characterize transactions within the firm (*accounting re-characterization*). Finally, the most costly alternative is to make real operational changes (*real changes*). I test the extent to which firms claiming the DPAD tax benefit ("DPAD firms") engage in each of these activities, and I compare these responses to a set of matched control firms that never disclose claiming the benefit.[2]

My first hypothesis tests whether DPAD firms engage in inter-temporal income shifting to maximize the amount of the tax benefit. Prior literature shows that firms will shift the timing of transactions to recognize income in lower tax rate periods, thereby reducing the associated cash tax payments (Scholes et al., 1992; Guenther, 1994; Maydew, 1997). DPAD provides similar incentives for shifting because income related to domestic production activities is effectively subject to a lower tax rate after 2004 when firms can claim the tax benefit. Therefore, I predict that firms claiming the benefit shift more income into the post-DPAD period, relative to the matched sample of control firms. However, I may not observe inter-temporal shifting because this action is not costless; the firm may have capital market, debt contracting, or other tax incentives that mitigate shifting activity.

My second hypothesis tests whether DPAD firms re-characterize internal transactions to increase the amount of the tax benefit. One way that this can occur is for firms to re-characterize

[2] Note that the Slemrod (1992) framework refers to actions by taxpayers. In this setting, the firm is the taxpayer. I assume that the managerial actions I study are made on behalf of the firm and that managers likely respond to the tax incentive according to the same three-stage hierarchy.

foreign income as domestic using internal transfer pricing, as transfer pricing is one way that firms can shift income across jurisdictions. For example, a firm's U.S. divisions could pay a lower price to foreign subsidiaries for input parts used in domestic manufacturing, thereby shifting less income into the foreign jurisdiction and increasing total domestic income that qualifies for DPAD. My second hypothesis predicts that DPAD firms shift less income out of the U.S. post-DPAD to increase the amount of qualifying domestic revenue, relative to a matched sample of control firms. However, I may observe no effect because increasing the amount of domestic-sourced income results in transfer pricing adjustment costs (De Simone et al., 2014) and cash tax and financial reporting costs otherwise deferred by retaining foreign earnings offshore (Foley et al., 2007; Graham et al., 2011; Blouin et al., 2012).

My third hypothesis tests if DPAD firms increase real domestic activity, measured with domestic investment and employment. Prior literature studying U.S. export subsidies (Kemsley, 1998; Desai and Hines, 2001) and concurrent work related to DPAD (Blouin et al., 2014; Ohrn, 2014) motivate a positive relation between DPAD firms and the amount of domestic investment and employment in the post-DPAD period. However, firms will forego domestic opportunities if U.S. labor and input costs exceed the tax benefit (Serrato and Zidar, 2014).[3] Currently, U.S. companies are lobbying for a 10-15% reduction in the corporate tax rate, arguing that this change is necessary to remain competitive with foreign firms. This lobby effort suggests that the (at most) effective 3.15% DPAD corporate tax benefit may not be sufficient to induce real location effects.

I identify DPAD firms from companies' 2004-2013 annual financial statements using several search terms (listed in Appendix B). For each DPAD firm, I obtain public data from Compustat

[3] Serrato and Zidar (2014) show that firm responses to tax incentives will be reduced if firms have greater productivity and lower factor costs in other jurisdictions. While they use state-level tax changes, the implication is that variation in rates across borders (states or countries) may not induce location changes if other factors dominate.

to construct key variables. I also obtain confidential data from the Bureau of Economic Analysis (BEA) to precisely measure domestic investment and employment, which are otherwise publicly unobservable. I then match the sample of DPAD firms with a control sample of firms that are similar in size, performance, and industry affiliation as of the year prior to the DPAD firm's first disclosure of the tax benefit. The final sample includes 767 DPAD firms and 767 matched control firms (5,288 firm-years).

Results from testing my first hypothesis show that DPAD firms shift income into the post-DPAD period. Specifically, the DPAD benefit is associated with greater gross margin and operating income shifting equal to 0.198% and 0.221% of firms' total assets, relative to the matched sample of control firms. This is equivalent to shifting \$8.7-\$9.8M of income for the average DPAD firm in the sample. Additional tests show that this shifting occurs in the first quarter of 2005 when a 3% DPAD benefit was available, as well as in 2007 and 2010 when the DPAD benefit increased to 6% and 9%, respectively. I interpret this result as evidence that inter-temporal shifting is an important mechanism by which firms increase the amount of income that qualifies for the tax benefit.

Second, I find some evidence that DPAD firms engage in accounting re-characterization by shifting less income out of the U.S. once the largest DPAD benefit is available in 2010. The DPAD benefit is associated with an increase in domestic return on sales (a proxy for domestic income shifting) of 2.8%, relative to the matched sample of control firms. This result is consistent with firms using accounting to re-characterize certain transactions to increase the amount of domestic income reported to taxing authorities, thereby maximizing the U.S. tax benefit.

Finally, I find that domestic investment by DPAD firms increases relative to the matched sample of control firms. Specifically, DPAD firms are associated with greater capital expenditure spending equivalent to 2.2% of total plant, property, and equipment, or approximately $41.8M by the average DPAD firm. Additional analyses show that this result is most pronounced for small and financially constrained firms, suggesting that the DPAD provided necessary cash to fund domestic investment projects for those companies. I find no effect of the DPAD on the level of domestic employment.

This study contributes to the literature in several ways. Prior research on domestic production incentives (Kemsley, 1998) and on the DPAD benefit (Ohrn, 2014; Blouin et al., 2014) find that these incentives are associated with higher investment levels or higher firm cash holdings (assumed to be used for future investment). However, Blouin et al. (2014) test this relation for a small sample of multinational firms in the two years immediately following the AJCA, and Ohrn (2014) tests investment responses using worldwide (not domestic) capital expenditures. Neither study considers employment effects, even though greater domestic employment was a key policy objective of the AJCA. My paper advances the study of the DPAD incentive in three ways. First, I test several outcomes, including reporting and real effects, to provide a more comprehensive analysis of alternative channels that firms use to claim production incentives. I demonstrate that changes in corporate reporting are an important and economically significant firm response that the literature had not previously considered in this context. Second, I examine these responses on a larger sample of firms over a longer time window to more completely measure the DPAD effects. Finally, I use location-specific confidential data to construct more precise measures of both domestic investment and employment. These measures permit me to accurately estimate the real effects and to evaluate the effectiveness of the policy to increase domestic activity.

The paper also contributes to an emerging line of literature in economics and operations that studies potential determinants of the recent increase in U.S. manufacturing activity (Sirken et al., 2012; Celasun et al., 2014; Clark, 2014). The academic literature has identified factors such as falling costs of key inputs, increasing offshore wages, and technological innovation as key determinants of this trend. However, the tax effects have not been studied, even though the government explicitly encourages this type of activity through targeted manufacturing tax incentives. I test one specific tax incentive and show that DPAD has played some role in this trend. In short, DPAD is a factor that should be considered when studying macroeconomic changes in domestic production.

Furthermore, these results inform the recent policy debate related to increasing (Nitti, 2013) or repealing (House Ways and Means, 2014) the tax incentive. To date, little evidence exists to document whether DPAD has been successful in inducing greater domestic investment and employment. Legislators have proposed amending or repealing the benefit in 2005, 2007, 2011, and 2014. However, because the underlying objectives are consistent with the goal of President Obama's administration to increase domestic manufacturing activity (Cenksy, 2012), it is a politically difficult provision to cut. To that end, the Administration has proposed increasing the allowable deduction to 18% (Shapiro, 2013). My study provides direct evidence to policymakers by showing that firms have responded with some real changes in corporate investment, but that unintended accounting effects are also both statistically and economically significant as well.

The paper proceeds as follows. Section 2 provides an overview of DPAD. Section 3 discusses prior literature and outlines the hypotheses. Section 4 discusses the research design and sample; Section 5 includes the empirical results. Section 6 concludes.

2. Institutional Details

To address competitiveness concerns related to the high U.S. corporate tax rate, U.S. law previously provided special tax breaks to domestic exporters. These tax incentives, which included the Domestic International Sales Corporation ("DISC") rules (1971-1984), the Foreign Sales Corporation (FSC) rules (1984-2000), and the Extraterritorial Income Exclusion ("ETI," effective 2000-2004), allowed domestic firms to defer or exempt some portion of foreign income from U.S. taxation. Appendix A includes a discussion of these regimes.

The international community challenged all three of these regimes as illegal export subsidies.[4] In response, the U.S. passed the American Jobs Creation Act in 2004, which included the Domestic Production Activities Deduction.[5] This deduction replaced the ETI.[6] Unlike the ETI, the DPAD is a tax benefit tied to domestic (not foreign) income and thus is available to a greater number of firms. The deduction is equal to a percentage of qualified production activities income (QPAI). QPAI is calculated as follows:

Revenues (for tax purposes) from the sale of domestically produced goods
Less: COGS (for tax purposes) attributable to domestic production
<u>Less: Other expenses (for tax purposes) allocable to domestic production</u>
QPAI

A firm then multiplies QPAI by the statutory deduction percentage, which is 3% (2005-2006), 6% (2007-2009), and 9% (2010 and thereafter). The deduction is limited by two statutory rules. First, the deduction cannot be greater than 50% of the firm's W-2 wages related to

[4] In 2002, a World Trade Organization ("WTO") panel found that the European Union was entitled to a $4 billion countermeasure against the U.S., an amount equal to the total worldwide FSC benefit claimed by all U.S. companies in 2000 and three times larger than the estimated trade harm inflicted on the E.U. (Hufbauer, 2002). In 2004, the WTO also assessed and collected retaliatory customs penalties ranging from 5-12 percent of the imported price on over 1,600 U.S. exported goods (Clausing, 2005).

[5] Another important part of the AJCA is IRC Sec. 965, which allowed a one-time repatriation of foreign earnings at effectively low U.S. tax rate of 5.25% (technically, the law allowed for a deduction (like DPAD); this deduction was a portion (85%) of foreign earnings repatriated). Prior studies test the investment and payout implications of this holiday (see Blouin and Krull, 2009; Dharmapala et al., 2011; Graham et al., 2011; and Faulkender and Petersen, 2012).

[6] Legislative history confirms that the DPAD was intended to provide relief in response to the ETI repeal. For example, H. Rept. 108-548, Part 1 states, "The Committee [on Ways and Means] believes that it is important to use the opportunity afforded by the repeal of the ETI regime to reform the U.S. tax system in a manner that makes U.S. businesses and workers more productive and competitive than they are today. To this end, the Committee believes that it is important to provide tax cuts to U.S. domestic manufacturers and to update the U.S. international tax rules, which are over 40 years old and make U.S. companies uncompetitive in the United States and abroad."

domestic revenues; this limitation is a direct incentive for firms to employ U.S. workers. Second, QPAI cannot exceed taxable income, where taxable income is calculated excluding the DPAD deduction for purposes of determining this limitation. In practice, this latter limitation means that firms that have \$0 taxable income (due to use of a prior year's net operating loss) or firms with negative taxable income (due to a current year tax loss) are ineligible from claiming the deduction in that tax year.

A large number of firms claim DPAD, and the aggregate amount of the benefit is economically significant. Specifically, approximately 115,000 corporations filed a DPAD tax form (Form 8903) in 2010, and these corporations reported almost \$4 trillion of domestic production gross receipts (IRS Statistics of Income, 2011).[7] Although Congress intended the tax incentive to help the manufacturing sector, the enacted law permits many other types of income to qualify for the benefit. Specifically, Section 199 states that qualifying gross receipts relate to any item "manufactured, produced, grown, or extracted by the taxpayer in whole or in significant part within the United States" (Section 199(c)(4)(A)(i)(I)), as well as revenue related to qualified film production; electricity, natural gas, and water production; and engineering and architectural services. Revenues related to retail, food/beverage, financial services, education, health care, and non-engineering services are generally not eligible for the deduction.[8] Given the size, scope, and complexity of this incentive, the IRS has identified DPAD as a key issue to examine when

[7] These numbers reflect returns filed by both S corporations and C corporations, as the IRS does not separately report gross receipts by type of entity (S vs. C). Note that the sample used in this study only includes publicly traded C corporations due to data limitations.

[8] However, firms in these industries may claim some benefit if they identify certain qualifying income within their business. For example, Starbucks is permitted to claim the deduction for gross receipts related to the sale of coffee beans that it roasts and packages, whereas receipts from the sale of brewed coffee qualify only to the extent of the value of the roasted beans used in the brewing process (H. Rept. 108-755). Discussions with practitioners reveal that the financial services industry has also recently claimed deductions for internally-developed software programs.

auditing firms.[9]

3. Prior Literature and Hypotheses

3.1 Inter-temporal shifting

Prior literature finds that firms engage in inter-temporal income shifting around tax rate changes to minimize cash taxes, subject to constraints imposed by non-tax costs. Guenther (1994) shows that firms shift income into lower tax rate periods following the Tax Reform Act of 1986 (TRA86). Maydew (1997) also tests shifting around the TRA86, focusing specifically on loss firms. Maydew finds firms with net operating losses shifted income and expenses to increase the magnitude of the firm's net operating loss to be carried back to the pre-TRA86 period, thereby increasing the refund of prior year's taxes (paid at relatively higher rates).

The DPAD provides incentives to shift income because it effectively reduces the corporate tax rate for firms with qualifying income. After 2004, DPAD firms could deduct 3% (2005-2006), 6% (2007-2009), or 9% (2010 and later) of their qualified production income from taxable income; for firms subject to the 35% U.S. corporate tax rate, this deduction results in an effective corporate tax rate reduction on qualified income of 1.05%-3.15% (35% x 3%-9%). Therefore, *ceteris paribus*, DPAD firms should prefer to report more income in 2005 when the DPAD benefit is available, as compared to 2004. Furthermore, as the deduction percentage increased in 2007 and in 2010, DPAD firms should also prefer to shift income into 2007 and 2010 from 2006 and 2009, respectively.[10] I predict the following:

H1: DPAD firms shift more income into the first quarter of 2005, 2007, and 2010, relative to a matched sample of control firms.

---

[9] Prior to 2014, the IRS identified the DPAD as a "Tier 1" audit issue, meaning that it was of top priority for its audit examiners. In 2014, the IRS eliminated the tiering categorization and instead started Issue Practice Groups (IPGs) that focus on examining particular topics. DPAD issues are now reviewed by the specialists within the "Corporate Income and Loss" IPG.

[10] One practitioner indicated that shifting can occur because managerial discretion determines how much of certain multi-year expenses (pension, stock option, and warranty expenses) relate to the pre- and post-DPAD period.

There is a valid null to this hypothesis. First, the AJCA included several other tax law changes that also affected firms' incentives to shift income. For example, the DPAD replaced the ETI tax benefit (discussed in Section 2 and in Appendix A), which was phased-out in 2005 and 2006; if the ETI provided greater benefits to firms, firms may have shifted income back to 2004 (instead of forward into 2005). Second, shifting may not be low-cost, as it could cause the firm to miss capital market targets or violate debt covenants, and firms may prefer to forego the benefit rather than incur these costs (Scholes et al., 1992; Maydew, 1997). Finally, the law did not require that firms report any incremental domestic income over their existing (pre-DPAD) level of domestic activity to qualify for the deduction. Firms could receive the DPAD regardless of shifting at little or no associated cost.

3.2 Cross-border accounting re-characterization

Slemrod (1992) states that another response to tax incentives that is less costly than real changes is for firms to re-characterize income by altering accounting practices. In my setting, firms can use managerial cost allocations and/or intra-firm transfer prices to i) increase qualifying domestic income and/or ii) decrease domestic expenses, thereby increasing QPAI. To calculate the domestic production expenses that reduce QPAI, firms first specifically allocate expenses to the qualifying activities and then ratably apportion remaining expenses among domestic production lines, other domestic divisions, and foreign divisions. Firms can adjust this latter allocation of expenses by changing internal methods (such as overhead allocations) that affect both direct and indirect costs. As written, the law uses an allocation method that gives "taxpayers flexibility and the ability to use judgment in making allocations of costs and deductions" (Kehl, 2005), such that it is expected to do "little to achieve its intended goal and a lot to encourage creative relabeling of existing activities" (CRFB, 2013). Goldberg et al. (2007)

state the following:

> "The accounting to comply with the deduction is challenging...Some of the accounting issues businesses have to consider are: 1) implementing accounting systems allocating gross receipts among qualifying property and non-qualifying property and services for purposes of identifying domestic production gross receipts; 2) modifying existing accounting systems to allocate and apportion costs specifically identifiable to qualified production activities; 3) modifying accounting systems in order to comply with the tracking of wages method for purposes of the wage limitation on the Sec. 199 deduction; 4) setting-up separate profit centers in order to compute the appropriate gross profit stemming from goods manufactured, produced, grown, or extracted in the U.S....larger businesses may have to substantially modify their accounting information systems and the way they record daily activity transactions in order to capture specific activities related to domestic production."

Firms can also accomplish this re-characterization by decreasing intercompany transfer prices on transactions with foreign affiliates. These prices apply to input parts manufactured overseas and purchased by U.S. divisions for domestic production use, as well as to payments made for services and intellectual property housed offshore.[11, 12] Changing internal allocation methods and transfer prices lowers domestic COGS, increases QPAI, and increases the DPAD.

I focus on the transfer pricing effects, as these are estimable for a large sample of firms, and prior literature shows that firms will alter this internal pricing to minimize worldwide taxes (Harris et al., 1993; Klassen et al., 1993; Collins et al., 1998; Klassen and Laplante, 2012). For example, Harris et al. (1993) find that U.S. multinational firms shift income into and out of the U.S. based on the relative tax rate in other countries in which the firms operated. Klassen et al. (1993) also find evidence that firms shifted income into the U.S. from Canada when the U.S. had lower rates prior to the Tax Reform Act of 1986.

To examine the accounting re-characterization by DPAD firms through changes to

[11] A common transfer pricing strategy is for firms to move intellectual property offshore to facilitate income shifting out of the U.S. After the intellectual property is relocated, U.S. and other higher-taxed foreign jurisdictions pay a royalty fee to the low-tax jurisdiction for use of the IP. This structure creates deductions in high-tax jurisdictions and income in low-tax jurisdictions. In response to DPAD, firms may decrease royalties or other payments to the foreign jurisdictions, thereby increasing domestic production revenue.

[12] One transfer pricing practitioner stated that a client had recently changed certain transfer pricing activities of a business unit to ensure that they could increase their overall domestic production gross receipts; additionally, a tax director noted that his company had altered transfer pricing to maximize DPAD and the effective tax rate benefit.

intercompany pricing, I predict the following:

H2: DPAD firms shift less income out of the U.S. post-DPAD, relative to a matched sample of control firms.

I may observe no positive increase in shifted domestic income for several reasons. First, firms likely made several other changes to their transfer pricing policies since 2004 to optimize worldwide tax planning, and these changes may subsume or negate any effects related to the Sec. 199 deduction. Second, the adjustment cost of changing transfer pricing policies, including the cost to document and implement the new policy, as well as the cost to manage changes in tax audit risk, may outweigh the associated benefits (De Simone et al., 2014). Third, sourcing more income to the U.S. is costly in that the firm must forego cash tax and financial reporting benefits, such as the ability to designate foreign earnings as permanently reinvested and the ability to defer U.S. cash taxes due on the foreign earnings. Prior literature shows that firms value these benefits (Foley et al., 2007; Graham et al. 2011; Blouin et al., 2012).

3.3 Real investment and employment

Empirical evidence shows that tax rate decreases are associated with increases in aggregate corporate investment (see Hassett and Hubbard (2002) and Hassett and Newmark (2008) for a review of this literature). This result occurs because the tax rate reduction lowers a firm's cost of capital and increases the number of positive net present value projects, relative to the pre-DPAD period. Specific to firm investment location decisions, Grubert and Mutti (2000) show that real capital within a foreign jurisdiction increases with a decline in the after-tax cost of capital. These findings suggest that the DPAD benefit should result in an increase in domestic investment and employment.

Studies on the previous U.S. export subsidies further support the negative relation between tax rates and domestic activity. Kemsley (1998) studies the effect of the FSC export tax incentives from 1984 to 1992 on firms' choice of production location in either the U.S. or offshore. He finds that the proportion of U.S. export sales to foreign production sales increases with the export tax incentive. Kemsley (1998) concludes that increasing real U.S. production to claim export benefits is less costly for firms than pursuing other tax planning strategies, such as changing internal transfer pricing practices. Desai and Hines (2001) also examine prior export subsidies and find that these tax benefits have important effects on the extent of domestic activity. For example, U.S. manufacturing exports declined by 3.1 percent when the U.S. switched from the more favorable DISC regime to the FSC regime in 1984.[13]

Two working papers test the investment effects of DPAD and find results consistent with the predictions from prior literature. Specifically, Blouin et al. (2014) examine a sample of 101 firms that disclosed both repatriations under the 2004 AJCA tax holiday and a DPAD benefit in the financial statements. They first find that these repatriating/DPAD firms increased shareholder payout, consistent with the results of Blouin and Krull (2009). For a smaller subsample of 41 repatriating firms that disclose both DPAD and ETI benefits, they find that firms that received a greater DPAD benefit relative to the ETI benefit paid out less than firms with a greater ETI benefit (relative to DPAD). This result is interpreted as preliminary evidence that DPAD firms retained more repatriated foreign cash for the purpose of future investment, although the paper does not explicitly test this outcome. Ohrn (2014) tests the relation between worldwide capital expenditures and the amount of qualifying DPAD income estimated for each firm using industry-

[13] Gupta (1995) also examines the DISC export subsidy for firms from 1972-1974. The DISC export subsidy permitted firms to defer recording tax expense and an associated deferred tax liability related to tax due on DISC earnings that had not yet been repatriated (similar to the deferral currently available to firms to avoid recording tax on permanently reinvested earnings under APB 23, now ASC 740-10-25). He finds that managers opportunistically avoid recording tax expense on their financial statements to avoid debt covenant violations, political scrutiny, or mask poor performance. His paper focuses on earnings management using tax expense reporting in firm financial statements, whereas I focus on income shifting that affects the amount of DPAD tax benefits that firms claim.

level statistics from the IRS Statistics of Income. He finds that the average public firm increases investment by approximately 12% once the tax benefit is fully phased-in and concludes that the DPAD is superior to other recent tax incentives, such as bonus depreciation.

My study differs from these prior papers in three ways. First, unlike these prior papers, I study several different types of firm responses, including both changes in corporate reporting as well as real effects, to provide a more comprehensive analysis of how firms claim production incentives. Second, Blouin et al. (2014) test this relation for a small sample of multinational firms in the two years immediately following the AJCA, and Ohrn (2014) tests investment responses using worldwide (not domestic) capital expenditures. I use location-specific data for a large sample through 2013 to construct more precise measures of domestic investment and domestic employment over a longer window. Furthermore, I also test domestic employment effects, which have not been considered in either of these other two concurrent studies.

Based on the findings of prior and concurrent literature, I predict the following:

H3a: DPAD firms invest more in the U.S. post-DPAD, relative to a matched sample of control firms.

H3b: DPAD firms employ more workers in the U.S. post-DPAD, relative to a matched sample of control firms.

A separate literature suggests that DPAD firms will not necessarily increase domestic investment and employment. Goolsbee (1998) shows that investment tax incentives do not necessarily result in greater investment but that instead higher prices for the same capital goods. Furthermore, the cost of increasing domestic manufacturing may exceed the benefit provided by DPAD, which is (at most) 3.15% of qualified income when fully phased-in. For multinational firms, the tax and non-tax costs of operating offshore are often low relative to the costs of in-sourcing manufacturing (e.g., labor costs). These lower costs encourage firms to retain and grow their foreign operations rather than domestically produce. While tax incentives are one important mechanism to reduce the relatively higher tax cost of domestic production, other business considerations – such as greater productivity and lower factor costs – will mitigate firms' responsiveness to such location incentives (Serrato and Zidar, 2014).

4. Research Design and Sample

4.1 Test of inter-temporal shifting

To test my first hypothesis, I calculate the amount of shifting by DPAD firms in the first quarter of 2005, 2007, and 2010, when the DPAD percentage increased from 0% to 3%, to 6%, and to 9%, respectively. I compare these amounts of shifted income for DPAD firms to the amount of shifted income by a matched sample of control firms and estimate the following OLS regression:

$$TimeShift_{i,t} = \alpha + \beta_1 DPADFirm_i + Controls_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where $TimeShift_{i,t}$ is the amount of shifted gross margin (*ΔGross_Margin*) or shifted operating income (*ΔOp_Inc*), calculated following Maydew (1997) and discussed further below; $DPADFirm_i$ is an indicator equal to one for firms that claim and discuss DPAD in their annual financial statements and zero otherwise; and $Controls_{i,t}$ is a set of control variables (discussed below). I include quarter and industry fixed effects to account for aggregate differences in shifting over time and across industries, and standard errors are clustered by firm.[14] I predict the coefficient β_1 to be positive.

Following Maydew (1997), I calculate a firm's gross margin and operating income using quarterly data for the fourth quarter of the year preceding the statutory increase in the DPAD

[14] I cluster standard errors only by firm, and not also by quarter, as Eq. (1) is estimated on only three periods. Estimation with too few clusters can result in inaccurate standard errors (Petersen, 2009).

benefit (for example, the 4th quarter of 2004) and for the first quarter immediately following the increase (for example, the 1st quarter of 2005). Gross margin is equal to the firm's total sales (SALEQ), less total cost of goods sold (COGSQ). I calculate operating income as the firm's gross margin, less discretionary expenses, including SG&A expense (XSGAQ) and R&D expense (XRDQ).[15] I use the amount of third quarter gross margin/operating income prior to the expected shifting quarter as the "baseline" amount of income. I then measure the amount of shifted income by separately comparing the following two quarters of earnings to this baseline. The overall estimate of the shifted gross margin and shifted operating income is one half of the negative of the fourth-quarter shift, plus the first quarter reversal, scaled by the prior year's total assets.[16] I multiply these values by 100 for ease of interpretation and use the scaled variables (*ΔGross_Margin%* and *ΔOp_Inc%*) when estimating Eq. (1).

I control for *Size,* calculated as the natural logarithm of total assets (AT) in year *t-1,* and *MTB,* which is the ratio of the market value of equity (PRCC_F*CSHO) to the book value of equity (SEQ) in year *t-1*, to account for systematic variation in shifting related to size and growth opportunities. *ROA* is calculated as operating income (OIADP) scaled by the firm's assets in year *t-1*, and *Sales_Growth* is the percentage change in sales from year *t-1* to year *t.* These two variables control for firm performance that may affect operating income and gross margin, as well as the firm's taxable income. *Leverage*, calculated as total firm debt (DLTT + DLC) scaled by the market value of equity in year *t-1*, captures the cost of violating debt covenants through

---

[15] Maydew (1997) includes only SG&A expense when calculating operating income, but Roychowdhury (2006), in his study of real earnings management, also includes R&D and advertising expenses as discretionary items that can be managed. Therefore, I also include R&D expense in calculating operating income because I expect shifting could be accomplished through this discretionary account as well. Quarterly data for advertising expense is not available in Compustat.

[16] Following Maydew, Gross Margin $\text{Shift}^{G4} = G_{0,4} - G_{0,3}$, where the first term is the amount of shifted/managed gross margin in the 4th quarter of the year prior to the statutory change, and the second term is the unshifted income in the third quarter of the year prior to the change ("benchmark" quarter). $\text{Shift}^{G1} = G_{1,1} - G_{0,3}$ is the total shifted income in the first quarter following the statutory change, less the benchmark gross margin. Total Shifted income is $(-\text{Shift}^{G4} + \text{Shift}^{G1})/2 = (G_{1,1} - G_{0,4})/2$.

shifting activities.

4.2 Test of cross-border accounting re-characterization

I test my second hypothesis using a difference-in-difference specification in which I compare the amount of accounting re-characterization, accomplished through cross-country income shifting, by DPAD firms to a matched sample of control firms, pre- and post-DPAD. I estimate the following OLS regression:

$$DomROS_{i,t} = \alpha + \beta_1 DPADFirm_i + \beta_2 PostDPAD_{i,t} + \beta_3 DPADFirm_i * PostDPAD_{i,t} + Controls_{i,t} + \varepsilon \tag{2}$$

where $DomROS_{i,t}$ and $Controls_{i,t}$ are discussed below; $DPADFirm_i$ is as defined previously; and $PostDPAD_{i,t}$ is a firm-specific indicator equal to one for both a DPAD firm and its matched control firm beginning in the year in which the DPAD firm first discloses the DPAD benefit.[17] The term $DPADFirm_i * PostDPAD_{i,t}$ is the interaction of the prior two terms. Because $PostDPAD_{i,t}$ is a firm-specific term (and not a cross-sectional constant), I also include year fixed effects to account for varying levels of shifting over time. Additionally, I include industry fixed effects, and I report standard errors that are clustered by firm and by year. The coefficient β_3 captures the difference-in-differences estimate and is predicted to be positive.

I measure the amount of cross-border shifting using a firm's domestic return on sales, ($DomROS_{i,t}$), following Collins et al. (1998). This measure is equal to total pre-tax domestic

[17] For example, if a DPAD firm first discloses the DPAD benefit in 2006, then $PostDPAD_{it}$ is equal to one for 2006-2013 for both the DPAD firm and its matched control. While the law permitted firms to begin claiming DPAD in 2005, firms may not actually begin to take the deduction until a later year due to lack of qualifying revenue, net operating loss position, or other statutory limitations. Therefore, I define *PostDPAD* based on the initial year in which the firm discloses the benefit. Note that this definition likely results in measurement error because firms could be claiming the benefit in an earlier period, but they do not disclose this in their financial statements; that is, firms can choose if and when to disclose the benefit. However, no other publicly available data permit better identification of a firm's initial DPAD year, and use of IRS data that may more precisely identify a firm's first DPAD year would preclude use of the confidential detailed investment and employment data available from the BEA to test H3. This measurement error may bias away from finding results because I may inadvertently define some years as "pre-DPAD" even though, in fact, the firm claimed the DPAD in that year.

income (PIDOM), divided by total domestic segment sales. The implicit assumption with this measure is that the amount of pre-tax domestic income should increase relative to the total amount of domestic sales when tax rates decrease because firms have greater incentives to report income in the reduced-tax jurisdiction (as compared to before the tax rate reduction). Note that this is an estimation of cross-border income shifting based on sales. Even though the location of sales does not determine the appropriate income taxing jurisdiction, I use this measure because I assume that sales are a valid benchmark for the location of the firm's economic activity.

Following Collins et al. (1998) and Klassen and LaPlante (2012), I control for a firm's worldwide return on sales (*WW_ROS*) in year *t,* calculated as total pretax income (PI) divided by a firm's total sales (SALE). As a consolidated measure of return on sales, it controls for the firm's overall profit margin. I control for *Size*, because larger firms with more foreign operations likely have more opportunities and channels to engage in cross-border shifting, and *Leverage*, as financially constrained firms have different incentives to shift income in and out of the U.S. (Dyreng and Markle, 2014). Following Dyreng and Markle (2014), I also control for the level of R&D *(RD)*, the level of cash holdings *(Cash),* and the percentage of domestic sales (*%Dom_Sales*). *RD* is calculated as R&D expense (XRD), divided by the firm's total assets in year *t-1,* and is included to control for a firm's ability to shift income using intercompany transfer pricing strategies related to placement of intellectual property (created through R&D activity) in foreign jurisdictions. *Cash* is total cash holdings (CHE), divided by the firm's total assets in year *t-1*, and *%Dom_Sales*, which accounts for the level of domestic sales, is calculated as the amount of domestic segment sales to total worldwide sales in year *t*.

4.3 Test of real effects

I estimate the following OLS regression for domestic investment and employment:

$$Dom\_Activity_{i,t} = \alpha + \beta_1 DPADFirm_i + \beta_2 PostDPAD_{i,t} + \beta_3 DPADFirm_i * PostDPAD_{i,t} + Controls_{i,t} + \varepsilon \quad (3)$$

where $DomActivity_{i,t}$ is measured in the following two ways: i) $DomInv_{i,t}$, the ratio of domestic capital expenditures to total plant, property, and equipment (PPE) in year *t-1* (Almeida and Campello, 2010), and ii) $DomEmp_{i,t}$, the log of the number of domestic employees, both of which are discussed further below; $DPADFirm_i$ and $PostDPAD_{i,t}$ are as previously defined; and $Controls_{i,t}$, also discussed further below in additional detail. I include year and industry fixed effects and cluster standard errors by firm and by year. The coefficient β_3 captures the difference-in-differences estimate and is predicted to be positive.

I use Compustat and data from the Bureau of Economic Analysis (BEA) to construct the measures of $DomInv_{i,t}$ and $DomEmp_{i,t}$. For firms with only domestic operations, I use Compustat data on capital expenditures (CAPX), PPE (PPENT), and employees (EMP) to measure *DomInv* and *DomEmp.* For multinational firms, jurisdiction-specific data on domestic investment and employment are not available in Compustat, and therefore, I use confidential firm-level panel data from the BEA Benchmark Survey of U.S. Direct Investment Abroad.[18] These surveys provide financial, trade, and intercompany transaction data on U.S. parent companies' domestic activity, as well as the activity of all foreign affiliates in which the U.S. parent entity owns at least 10%.[19] Using these data, I construct measures of the U.S. parent's domestic capital expenditures, PPE, and employment for the multinational firms in the sample. I identify firms as "domestic-only" if they report less than 10% of income, sales, or assets as foreign following

[18] The BEA data are collected for the purpose of producing publicly available aggregate statistics on the operations of U.S. multinational companies.
[19] Due to penalties for failure to file, the BEA believes that the data coverage is substantially complete and accurate. The most comprehensive data are collected every five years in "benchmark" surveys. In a typical benchmark year, the survey accounts for over 99% of affiliate activity. For example, in 1994, participating affiliates accounted for an estimated 99.8% of total assets, 99.7% of total sales, and 99.9% of total U.S. foreign direct investment (Bilir, 2014). See Foley et al. (2007) and Blouin et al. (2012) for additional discussion of the BEA data.

Creal et al. (2013) or if they do not list a material foreign subsidiary in Exhibit 21 to the firm's financial statements (Dyreng and Lindsay, 2009).

I select control variables for investment and employment following McNichols and Stubben (2008), Biddle et al. (2009), and Edgerton (2010). For control variables, I include *Size* and *ROA* to capture differences in investment and employment based on size and performance of the firm. *Sales_Growth* and *MTB* (as a proxy for Tobin's Q) control for a firm's investment opportunity set. *Cash_Flow*, calculated as a firm's operating cash flows (OANCF) divided by total assets in year *t-1,* captures a firm's ability to finance investment and hire employees out of operating cash flows. I also include *Leverage* and *Cash* as additional variables to control for investment financing. The employment tests include *Inventory* and *Tangibility*, calculated as total inventory (INVT) or equipment (PPENT) scaled by total assets in year *t-1*, to capture the labor intensity of the firm.

4.4 Sample

I identify firms claiming the DPAD by first obtaining text disclosures that contain key search terms from firms' 2004-2013 annual financial statements (see Appendix B for a list of search terms). I read each excerpt that contains the matching text and identify a firm as a "DPAD Firm" if it discusses/discloses DPAD in its financial statements (n=5,473 firm-years for 1,663 firms). Using CIK numbers for identification, I then obtain Compustat data for this sample of firms. For each sample, I retain only U.S.-incorporated firms, as this study examines how the DPAD affected U.S. companies' investment and employment decisions. I also require firm-years to have positive total assets, positive total sales, positive pre-tax income, and non-missing data for construction of control variables and the inter-temporal shifting variables used to test H1 (n=3,140 firm-years; 948 firms).[20] I further require DPAD firms to have at least $100M of assets in the first year that the DPAD firm discloses the benefit to ensure that the sample is comprised of firms with similar incentives and opportunities to shift/re-characterize income and to invest. Statistics provided by the Center for Budget and Policy Priorities show that 93% of the 2009 aggregate deduction was reported by firms with over $100 million of assets, further validating this sample requirement (Mazerov and Mai, 2013).[21] These restrictions result in 767 distinct DPAD firms and 2,508 DPAD firm-years from 2004 to 2013.

I then identify the sample of control firms. I start with all firm-years in Compustat from 2004 to 2013 and retain firm-years with the same data restrictions as those listed for DPAD firms (US-incorporated, data for key variables, $100M of assets). I exclude any firm from this sample if it ever discloses the DPAD during the period 2004-2013.[22] I then match (without replacement) DPAD firms to control firms on *Size*, *ROA*, and industry in the year prior to a DPAD firm's first disclosure of the tax benefit. The matching procedure results in a sample of 767 distinct control firms and 2,780 control firm-years. The final sample includes 5,288 matched DPAD and control firm-years. Table 1, Panel A provides a summary of this sample by year. See additional discussion of the control firms in Section 4.5.

My first hypothesis tests inter-temporal shifting in tax years 2005, 2007, and 2010, the three periods in which the statutory DPAD percentage increased. Thus, I retain 1,826 firm-year

[20] Specifically, the calculation of the shifting measures, as well as *Size, ROA*, and *Sales Growth* require non-zero values for total assets and sales. Furthermore, firms with net operating losses cannot claim the DPAD; to proxy for this limitation, I restrict firm-years to those with positive pre-tax income.
[21] Section 5.4.4 discusses results of estimation on the sample of DPAD firms and the matched control firms with less than $100M of assets.
[22] While I attempt to identify all DPAD firms by searching firm financial statements with many different search terms, I acknowledge that this method of identification results in a sample selection bias because I only observe firms that choose to disclose the benefit in their financial statements. As a result, the control sample of firms that I identify may be contaminated in that some of the control firms may actually claim DPAD, but I would not observe this due to the failure to disclose. Because my tests are conducted as difference-in-difference specifications comparing DPAD firms to the contaminated control sample, this contamination is likely to bias against finding results for the DPAD firms, although the actual sign or magnitude of the bias is not estimable.

observations to estimate Eq. (1).[23] Tests of H2, H3a, and H3b require data to construct variables for cross-border re-characterization, investment, and employment in both the pre- and post-DPAD periods. I drop 2,721 firm-years (3,252 and 3,287) for H2 (H3a and H3b) that do not have requisite data to calculate the corresponding dependent variables. To measure firm activity in the pre-DPAD period for purposes of calculating the difference-in-difference estimates, I then obtain firm-year observations for the firms in the sample beginning in 2003 (1,216, 1,539, and 1,474 firm-years for H2, H3a, and H3b, respectively). The final samples are comprised of 3,783, 3,575, and 3,475 firm-year observations, respectively. Table 1, Panel B provides a summary of these steps.

Table 1, Panel C includes statistics on the industry distribution of the DPAD firms. Consistent with the intended recipients of the tax benefit, the majority of firms that claim the deduction are in manufacturing industries (SIC = 2 or 3; 66.36% of the sample). The other industries with a significant proportion of firms are Mining and Construction (SIC = 1; 11.6%) and Services (SIC = 7 or 8; 13.4%,). I compare this industry distribution to the 2005 sample of firms in Compustat that meet the same data restrictions as above (Col. (3)-(4)). The data show that the industry distribution of firms on Compustat is quite different from that of my sample; this is expected because the DPAD was targeted to domestic manufacturers. However, the final column of Panel C presents the industry distribution of DPAD firms as computed by the IRS; the industry representation in the IRS data is similar to that of the sample I constructed from searching firm financial statements. This similarity helps to validate that the sample

[23] Note that the number of firm years does not equal the number of 2005, 2007, and 2010 firm-years in Panel A because a firm's tax year may be different from the firm's fiscal year. For example, a firm may have a 2005 fiscal year that begins in October 2004, but the tax year for this firm will be 2004. DPAD only applies to *tax* years beginning in 2005. Thus, the sample for the test of H1 includes some fiscal years in 2006, 2008, and 2011 that correspond to 2005, 2007, and 2010 tax years.

identification and selection steps result in a representative population of DPAD firms.[24]

4.5 Descriptive Statistics

Table 2 presents descriptive statistics; Panel A includes statistics for the full sample, and Panel B compares values for DPAD and control firms. In Panel A, the average amounts of shifted gross margin (*ΔGrossMargin%)* and shifted operating income (*ΔOpInc%)* as a percentage of the firm's assets are -0.11% and 0.06%, respectively. Due to sample construction, the firms in the sample are large (*Size* = 7.15 or average total assets of $5.4 billion) and are profitable (*ROA* = 13%). The firms have an average market-to-book ratio of 3.10 and sales growth of 11%; spend an amount equivalent to 4% of total assets on R&D activity; hold 20% of assets in cash; and have large amounts of inventory and fixed assets (14% and 31% of total assets, respectively).

Because the empirical tests compare responses by DPAD firms to matched control firms, it is important to validate that the control firms are, in fact, similar *except for* claiming the DPAD benefit. The matching procedure should produce control firms that are similar in size, performance, and industry affiliation. The issue is then to determine why these control firms do not claim the tax incentive and if this reason implies that the control firms are inherently different from the DPAD firms (and therefore, possibly poor matches). Fortunately, Section 199 includes a statutory rule that creates a natural control sample; as discussed in Section 2, firms that have zero taxable income due to utilization of a prior year net operating loss are precluded from claiming the benefit.[25] Thus, the sample of control firms should exhibit similar characteristics as DPAD firms– including that they have positive operating performance in the

[24] Unfortunately, the IRS does not provide many additional statistics regarding DPAD firms; thus, it is not possible to compare statistics of the key variables from my sample to those of the IRS population.

[25] Note also that firms that have negative taxable income (i.e., are generating a tax loss) cannot claim DPAD in that tax year. However, I attempt to exclude both DPAD and control firm loss years from the sample by requiring that all firm years have positive pre-tax financial statement income. I acknowledge that firms could have positive pre-tax income and negative taxable income in the same year due to book/tax differences, but given that taxable income is unobservable, I assume that financial statement income is a reasonable proxy for the firm's taxable income.

current year – but for the fact that they are using a prior year loss carryforward. Prior literature shows that a large number of firms report some form of tax loss carryforward at some point in a firm's history (Cooper and Knittel, 2010; Edgerton, 2011); thus, the existence and utilization of a loss carryforward should not imply that the DPAD firms and control firms are inherently different. Instead, this difference suggests that the DPAD and control firms have just incurred and utilized loss carryforwards at different points in time.

I conduct several tests to validate that the control firms are similar to the DPAD firms. First, tests of differences in *Size* and *ROA* for the DPAD and control samples of firms in Panel B show that the samples are not significantly different on these characteristics (t=-0.56 for *Size*; t=1.58 for *ROA*). Additional tests also show that the two sub-samples have similar *MTB*, *Sales_Growth*, *Cash_Flow*, *Inventory*, *Tangibility*, as well as the degree of multinational operations (*MNC*). Thus, on these major characteristics, the sub-samples of firms appear to be similar.

To then validate that use of an NOL is the reason that firms are in the control sample, I use NOL data from Compustat. I create an indicator variable *NOL_Ind* equal to one if the firm has an NOL carryforward, and zero otherwise. I find that the control firms have a greater proportion of firms with a loss carryforward and that this difference is significant (t=2.04). This evidence helps to validate that the primary difference across the samples hinges on the statutory difference in loss carryforward utilization, which otherwise precludes control firms from claiming the DPAD incentive.[26]

Panel B provides other details of the DPAD and control samples. The average shifting by

[26] Discussions with a tax director and with individuals at the U.S. Treasury validate this empirical finding – that NOL utilization precludes many firms that would otherwise claim the benefit from doing so. Some firms also discuss this statutory limitation in the financial statements. For example, the 2007 financial statements for Texas Instruments states "The American Jobs Creation Act of 2004, among other things, allows a deduction for income from qualified domestic production activities, which will be phased in from 2005 through 2010. We realized a benefit in 2007 of $1.1 million but did not realize a benefit in 2006 because of a taxable loss for the year."

DPAD firms is significantly greater than that by control firms (-0.01% vs. -0.19% for gross margin (t=2.62) and 0.17% vs. -0.04% for operating income (t=3.58)). The average domestic return on sales (*DomROS*) in the sample is 14.6% in Panel A, but the mean values for DPAD (16.7%) and control firms (12.0%) are significantly different (t=5.07). Domestic capital expenditures (*DomCapEx)* are equal to approximately 20% of firm's book value of PPE, and these amounts are not significantly different for DPAD and control firms over the full period. The level of employment for DPAD and control firms is also similar (*#DomEmp*); the average (median) employment is approximately 9,500 (3,000) employees for both DPAD and control firms.

5. Empirical Results

5.1 Tests of H1: Inter-temporal Shifting

Table 3 presents the results obtained from estimating Eq. (1) to test my first hypothesis. Column (1) presents the results when *ΔGrossMargin%* is used as the measure of income shifting, and Column (2) presents results when *ΔOpInc%* is used as the income shifting measure.

In Column (1), I find a positive and significant coefficient of 0.198 on *DPAD_Firm*, which means that the DPAD benefit is associated with gross margin shifting equal to 0.198% of firms' total assets. The estimate is similar in Column (2); the coefficient of 0.221 means that the benefit is associated with operating income shifting of 0.221% of firms' total assets. For the average DPAD firm in the sample used to test H1, this is equivalent to shifting \$8.7-\$9.8 million per firm.[27] I interpret these results as evidence that DPAD firms shift a greater amount of income into the post-DPAD period relative to the matched sample of control firms to maximize the

[27] Average lagged total assets for the DPAD firms in the H1 sample are \$4.4B. The estimates of shifting for the average firm are calculated as follows: 0.00198*\$4,400M = \$8.77M and 0.00221*\$4,400M = \$9.79M.

amount of domestic income that qualifies for the tax benefit. These results indicate that DPAD firms respond to the tax incentive with inter-temporal shifting.

5.2 Tests of H2: Cross-border Shifting

Table 4 includes results from testing if DPAD firms engage in greater cross-border shifting relative to control firms. Panel A (B) presents results from univariate (multivariate) analysis. In Panel A, the data show that the average level of domestic return-on-sales increases 2.3% (from 15.1% to 17.4%), which is significant at the 1% level (t=2.94). *DomROS* also significantly increases for the control firms (11.0% to 12.5% for a 1.5% increase; t=1.71). However, the difference-in-difference estimate of 0.9% is insignificant (t=0.92). This result means that, for the pooled panel of DPAD and control firm-years from 2003-2013, DPAD has no significant effect on the amount of intercompany shifting.

In Panel B, I estimate Eq. (2), controlling only for WW_ROS in Column (1) and then including additional controls in Column (2). I continue to find no significant effect for cross-border income shifting by DPAD firms across either specification. The coefficient on the difference-in-difference term, *DPAD_Firm*Post_DPAD* is positive, but insignificant (t=0.937 in Col. (1) and t=1.553 in Col (2)).

I also perform additional analysis of cross-border shifting by testing the amount of shifting in the different time periods in which the statutory DPAD benefit increased.[28] See discussion of these results in Section 5.4.

5.3 Tests of H3: Real Activity

Table 5, Panels A and B (C) present univariate (multivariate) results for the investment and

[28] In these results, I observe that DPAD firms report significantly higher increase in domestic return on sales in the period since 2010, relative to the matched sample of control firms. I interpret these results as evidence of cross-border shifting once the highest DPAD benefit is available. These results are discussed further below and presented in Table 6.

employment difference-in-difference analysis. Panel A shows that DPAD firms have a small and insignificant increase in capital expenditures after claiming the tax benefit, from 19% of total PPE to 20%. In contrast, the control firms have a significant *decline* in capital expenditures of 3%, from 23% of PPE to 20%. The difference-in-difference estimate of 4% means that the DPAD is associated with greater capital expenditure spending relative to the control firms, equivalent to 4% of total PPE. In Panel C, I continue to observe a positive and significant coefficient on the difference-in-difference term; after controlling for other factors that affect firm investment, the results indicate that DPAD firms spent significantly more on capital expenditures relative to the matched sample of control firms following the enactment of the DPAD provisions. The coefficient of 0.022 means that being a DPAD firm is associated with greater capital expenditures equivalent to 2.2% of total PPE. Given the average firm in the sample has PPE of $1.9B, this is equivalent to greater spending of $41.8M by the average firm. I interpret these results as evidence that the tax benefit is associated with greater domestic investment, relative to the matched sample of control firms.

Panel B presents results from the univariate analysis of employment. The control firms had a positive and significant increase in the number of employees, whereas the DPAD firms had no similar change. While the univariate difference-in-difference estimate is significant at the 10% level, this term is insignificant in Column (2) of Panel C after controlling for other variables that affect the level of firm employment. In sum, these results indicate that DPAD did not have a significant effect on increasing the level of domestic employment for firms claiming the tax deduction. One ex-post explanation for this could be that the statutory limitation for the deduction that is tied to employment (i.e., that the deduction cannot exceed 50% of W-2 wages) is not binding for many firms. That is, for many firms, the maximum deduction may be less than

50% of a firm's W-2 wages, and therefore, the firm has no real incentive to actually increase employment.

5.4 Additional Analyses

5.4.1. Responses across 2005, 2007, and 2010

As mentioned in Section 2, the DPAD benefit increased in 2005 (from 0% to 3%), 2007 (to 6%), and 2009 (to 9%). In Table 6, I present results from tests designed to examine how firm responses differed across these three time periods.

Panel A of Table 6 presents results from testing the relation between DPAD firms and inter-temporal shifting in each period. I re-estimate Eq. (1) and replace the indicator *DPADFirm* with three period-specific indicators; for example, *DPADFirm_2005Q1* is an indicator variable equal to one for DPAD firms that disclose the tax benefit in 2005, and zero otherwise. The results show that the DPAD benefit causes firms to shift gross margin (operating income) in every period, equal to 0.18% (0.23%), 0.20% (0.23%), and 0.22% (0.21%) of their total assets in 2005, 2007, and 2010. This persistent result across the time periods shows that inter-temporal shifting is an important mechanism by which DPAD firms increase the amount of qualifying DPAD income regardless of the level of benefit and suggests that inter-temporal shifting is a relatively low-cost way by which DPAD firms increase qualifying domestic income.

Panel B of Table 6 presents tests of H2 and H3 across the three time periods. I replace the indicator *PostDPAD* in Eq. (2) and Eq. (3) with three separate indicator variables. For example, *Years_0506* is an indicator equal to one for each DPAD firm and its matched control firm, if the DPAD firm discusses the tax benefit in either its 2005 or 2006 financial statements. The term *DPADFirm*Years_0506* captures the difference-in-difference for DPAD firms that first discuss the benefit in 2005 or 2006. The results in Col. (1) show that there is no significant effect for the variables representing the early years (coefficient of -0.007). The total difference-in-difference estimate for 2007-2009 is the sum of *DPADFirm*Years0506* and *DPADFirm*Years0709* (0.008) and is also insignificant. However, the total effect in the most recent period beginning in 2010 is positive (0.028 = -0.007 + 0.015 + 0.020) and significant. This result is consistent with the DPAD benefit being associated with an increase of domestic return-on-sales, the proxy for cross-border accounting re-characterization, of 0.028. I interpret these results as evidence that the costs of domestic income shifting are high and that firms must receive sizeable benefits in order to engage in cross-border shifting.

In Col. (2) and (3), I calculate the period-specific difference-in-difference estimate for investment and employment (H3). Recall that the dependent variables are constructed using Compustat data (for domestic-only firms) and BEA data (for multinationals), the latter of which are unavailable for the most recent years. Thus, the regressions are estimated only through 2009. For investment, I find that the difference-in-difference estimate is positive and significant in both the 2005-2006 period, as well as in the period 2007-2009. In Col. (3), I find no differences in employment across the two periods, consistent with the prior results for the pooled sample.

5.4.2 Analysis of Real Inter-temporal Shifting

In untabulated analyses, I also test H1 using measures of real income shifting adapted from Roychowdhury (2006) to determine if the inter-temporal shifting is accomplished through accruals or by "real" actions. Roychowdhury (2006) shows that managers will take actions to manage revenues, production costs, and discretionary expenses around earnings announcement dates. I expect that firms may also engage in these activities for purposes of shifting income around the statutory DPAD increases. Therefore, I follow Roychowdhury (2006) and create four real income shifting measures related to cash flows from operations (*ΔCFO%*), production costs

($\Delta ProdCosts\%$), SG&A expense ($\Delta SGA\%$), and R&D expense ($\Delta RD\%$). As with the measures of gross margin and operating income, I treat the third quarter as the unmanaged benchmark and calculate the real shifting measures by comparing amounts in the fourth quarter of the year prior to the change (i.e., fourth quarter of 2004, 2006, and 2009) as well as the first quarter of the year after the change (i.e., first quarter of 2005, 2007, and 2010) to this benchmark. I then re-estimate Eq. (1) using these four dependent variables.

I find some evidence that firms engage in inter-temporal shifting through real actions. Specifically, DPAD firms shift income by overproducing to lower cost of goods sold in the post-DPAD period (coefficient of 0.304, t=1.98) and by reducing R&D expense (coefficient of -0.089, t=-3.546). I find little evidence of inter-temporal shifting through price discounts to temporarily increase sales or through reductions in SG&A expense. I conclude that firms execute the inter-temporal shifting through some real actions by firm managers and that the shifting is not limited to only accrual manipulation.

5.4.3 Cross-sectional Analyses of Investment

As discussed in Section 5.3, the DPAD is associated with a positive and significant increase in investment for the firms claiming the deduction, relative to the matched sample of control firms. In additional analyses, I test if the investment effects differ by firm size and level of financial constraint. I first partition the investment sample into quartiles based on size and find that the difference-in-difference effect is most pronounced for the smallest firms in the sample (average total assets = $260M). I then also test if the investment effects differ by level of financial constraint, as I expect that financially constrained firms are more likely to use the cash tax savings for investment projects that would otherwise be unfunded. I measure financial constraint using the size-age index (SA index) from Hadlock and Pierce (2010). I partition the sample into quartiles and find that the investment results are also most pronounced among the most constrained firms. These results suggest that the DPAD benefit provided necessary capital to smaller, more constrained firms that may not otherwise have been able to fund positive NPV investment projects. I also test if employment varies across size or financial constraint but find no significant differences within these sub-samples.

5.4.4 Analyses for Firms < $100M Assets

As discussed in Section 4.4, I exclude DPAD firms from the sample that do not have at least $100M of firm assets in the year that they first disclose. In additional tests, I match these 181 small firms to control firms that also have less than $100M of assets and then re-estimate Eq. (1)-(3). In general, I find little to no effect of shifting or real effects within this sample of smaller listed firms, although this sample is very small. These results suggest that, within the sample of DPAD firms that I have identified, the DPAD effects are concentrated within relatively large, listed firms.

6. Conclusion

This paper studies how firms have responded to the DPAD tax benefit and whether this large tax break has resulted in actual increases in U.S. investment and employment. I find that firms shift income across time to claim the deduction; results show that firms engage in inter-temporal shifting beginning in 2005, the first year in which the DPAD benefit was available. This shifting also occurs in later periods, consistent with the fact that inter-temporal shifting is a relatively low cost channel through which firms can maximize the tax deduction. I also find some evidence consistent with firms shifting less income out of the U.S. once the largest DPAD benefit is available in 2010. Finally, I find evidence consistent with the DPAD tax policy having some effect on the amount of domestic capital expenditures, particularly for financially constrained firms. I observe no large changes in domestic employment for DPAD firms.

These results are important for understanding the implications of current and future domestic production incentives. Prior literature has focused on testing the investment effects of these types of incentives. However, I show that firms respond in other ways, such as inter-temporal and cross-border shifting, that do not necessarily result in greater domestic spending. This result contributes to the literature by complementing prior results of Kemsley (1998), Blouin et al., (2014), and Ohrn (2014), and it also contributes to the policy debate related to repealing or extending the DPAD tax benefit. I look forward to future research that studies how accounting rules and tax policies interact to affect U.S. domestic production and, more broadly, worldwide corporate location decisions.

7. References

Almeida, H. and Campello, M. 2007. Financial Constraints, Asset Tangibility, and Corporate Investment. *Review of Financial Studies* 20(5), 1429-1460.

Angus, B. and Kies, K. 2000. The United States Responds to the WTO FSC Decision: Round One and Counting. *Tax Executive* 52, 436-443.

Biddle, G., Hilary, G., and Verdi, R. 2009. How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics* 48, 112-131.

Bilir, K. 2014. Patent laws, product life-cycle lengths, and multinational activity. *American Economic Review* 104, 1979-2013.

Bittker, B. and Lokken, L. 2005. *Fundamentals of International Taxation.*

Blouin, J. L., Krull, L. K., 2009. Bringing it home: a study of the incentives surrounding the repatriation of foreign earnings under the American Jobs Creation Act of 2004. *Journal of Accounting Research* 47, 1027–59.

Blouin, J. L., Krull, L. K., and Robinson, L. 2012. Is U.S. Multinational Intra-Firm Dividend Policy Influenced by Reporting Incentives? *The Accounting Review* 87, 1463-1491.

Blouin, J. L., Krull, L.K., and Schwab, C. 2014. The Effect of the Domestic Production Activities Deduction on Corporate Payout Behavior. Working paper.

Celasun, O., Di Bella, G., Mahedy, T., and Papageorgiou, C. 2014. The U.S. Manufacturing Recovery: Uptick or Renaissance? *IMF Working Paper.*

Clausing, K. 2005. Tax Holidays (and Other Escapes) in the American Jobs Creation Act. *National Tax Journal* 63(3), 331-346.

Collins, J., Kemsley, D., and Lang, M. 1998. Cross-jurisdictional Income Shifting and Earnings Valuation. *Journal of Accounting Research* 36(2), 209-229.

Committee for a Responsible Federal Budget (CRFB). 2013. The Tax Break-down: Section 199, The Domestic Activities Deduction. http://crfb.org/blogs/tax-break-down-section-199-domestic-production-activities-deduction

Creal, D., Robinson, L., Rogers, J., and Zechman, S. 2013. The multinational advantage. Chicago Booth Research Paper 11-37.

De Simone, L., Klassen, K., and Seidman, J. 2014. Unprofitable affiliates and income shifting behavior. Working paper.

Desai, M. and Hines, J. 2001. The Uneasy Marriage of Export Incentives and the Income Tax. *Tax Policy and the Economy*. MIT Press.

Dharmapala, D., Foley, C.F., Forbes, K., 2011. Watch what I do, not what I say: the unintended consequences of the Homeland Investment Act. *Journal of Finance* 66, 753–87.

Dyreng, S. and Lindsay, B. 2009. Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries of U.S. multinational firms' tax rates. *Journal of Accounting Research* 47, 1283-1316.

Dyreng, S. and Markle, K. 2014. The Effect of Financial Constraints on Tax-motivated Income Shifting by U.S. Multinationals. Working paper.

Edgerton, J. 2010. Investment Incentives and Corporate Tax Asymmetries. *Journal of Public Economics* 94(11).

Faulkender, M., Petersen, M., 2012. Investment and capital constraints: repatriations under the American Jobs Creation Act. *Review of Financial Studies* 25, 3351-3388.

Foley, F., Hartzell, J., Titman, S., and Twite, G. 2007. Why do firms hold so much cash? A tax-based explanation. *Journal of Financial Economics* 86, 579-607.

Goldberg, M., Leone, J., Rolleri, M., and Wnek, R. 2007. Application of the Domestic Production Activities Tax Deduction (Relating to a Wide Range of Industries). *Journal of Business & Economics Research* 5(9), 73-92.

Goolsbee, A. Investment Tax Incentives, Prices, and the Supply of Capital Goods. 1998. *Quarterly Journal of Economics* 113(1), 121-149.

Graham, J., Hanlon, M., and Shevlin, T. 2011. Real Effects of Accounting Rules: Evidence from Multinational Firms' Investment Location and Profit Repatriation Decisions. *Journal of Accounting Research* 49(1), 137-185.

Grubert, H., Mutti, J., 2000. Do taxes influence where U.S. corporations invest? *National Tax Journal* 53, 825–883

Guenther, D. 1994. Earnings Management in Response to Corporate Tax Rate Changes: Evidence from the 1986 Tax Reform Act. *The Accounting Review* 69(1), 230-243.

Gupta, S. 1995. Determinants of the Choice between Partial and Comprehensive Income Tax Allocation: The Case of the Domestic International Sales Corporation. *The Accounting Review* 70(3), 489-511.

Hadlock, C. and Pierce, J. 2010. New Evidence on Measuring Financial Constraints: Moving Beyond the KZ Index. *Review of Financial Studies* 23, 1909-1940.

Harris, D., Morck, R., and Slemrod, J. 1993. Income Shifting in U.S. Multinational Corporations. *Studies in International Taxation.* University of Chicago Press.

Hassett, K., Hubbard, G., 2002. Tax policy and business investment. In: Auerbach, A., Feldstein, M. (Eds.), *Handbook of Public Economics*, vol. 3. Elsevier Science, Amsterdam, pp. 1294–1343.

Hassett, K., Newmark, K., 2008. Taxation and business behavior: a review of the recent literature. In: Diamond, J., Zodrow, G. (Eds.), *Fundamental Tax Reform: Issues, Choices and Implications.* MIT Press, Cambridge, pp. 191–214.

House Ways and Means Committee. 2014. Discussion Draft for Tax Reform Act of 2014.

Hufbauer, G. 2002. The Foreign Sales Corporation Drama: Reaching the Last Act? *International Economics Policy Briefs* PB02-10.

Internal Revenue Service Statistics of Income. 2011. 2010 Estimated Data Line Counts Corporation Tax Returns, 230-231.

Joint Committee on Taxation. 2013. Estimates of Federal Tax Expenditures for Fiscal Years 2012-2017. U.S. Government Printing Office.

Kemsley, D. 1998. The Effect of Taxes on Production Location. *Journal of Accounting Research* 36(2), 321-341.

Klassen, K., M. Lang, and M. Wolfson. 1993. Geographic Income Shifting by Multinational Corporations in Response to Tax Rate Changes. *Journal of Accounting Research* 31: 141-173.

Klassen, K. and LaPlante, S. 2012. Are U.S. Multinational Corporations Becoming More Aggressive Income Shifters? *Journal of Accounting Research* 50(5), 1245-1286.

Maydew, E. 1997. Tax-Induced Earnings Management by Firms with Net Operating Losses. *Journal of Accounting Research* 35(1), 83-96.

Mazerov, M. and Mai, C. 20130. States Can Opt Out of the Costly and Ineffective "Domestic Production" Corporate Tax Break. *Center for Budget and Policy Priorities.*

McNichols, M. and Stubben, S. 2008. Does earnings management affect firms' investment decisions? *The Accounting Review* 83 (6), 1571-1603.

Nitti, Tony. 2013. President Obama's Plan for Corporate Tax Reform: A 'Grand Bargain" or Simply Another Name for an Old Proposal? *Forbes.com* (July 30).

Ohrn, E. 2014. The Business Investment Response to the Domestic Production Activities Deduction. Working paper.

Petersen, M. 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies* 22, 435-480.

Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting and Economics* 42(3), 335-370.

Scholes, M., Wilson, P., and Wolfson, M. 1992. Firms' Responses to Anticipated Reductions in Tax Rates: The Tax Reform Act of 1986. *Journal of Accounting Research* 30: 161-185.

Serrato, J.C. and Zidar, O. 2014. Who Benefits from State Corporate Tax Cuts? A Local Labor Markets Approach with Heterogenous Firms. Working paper.

Shapiro, Robert. 2013. Anatomy of a Special Tax Break and the Case for Broad Corporate Tax Reform. *Progressive Policy Institute Policy Memo*.

Sirken, H., Zinser, M., Hohner, D., and Rose, J. 2012. U.S. Manufacturing Nears the Tipping Point: Which Industries, Why, and How Much? Boston Consulting Group Perspectives.

Slemrod, Joel. 1992. Do taxes matter? Evidence from the 1980s. *American Economic Review* 82: 250-256.

Appendix A

Summary of DISC, FSC, and ETI Regimes

The U.S. has a worldwide tax system, which subjects domestic multinational firms to U.S. taxation on their worldwide income (with deferral until the time of repatriation, as well as with foreign tax credits). The U.S. has historically provided special tax benefits to U.S. exporters, which are firms that generate foreign sales from domestically manufactured products. Congress enacted the first export subsidy, the Domestic International Sales Corporation ("DISC") regime, in 1971. The DISC regime allowed for up to 50% of the qualifying income related to foreign sales of domestically produced goods to be deferred and taxed only at the shareholder level once distributed. If instead the firm reinvested the foreign earnings, U.S. taxation on such earnings would be deferred indefinitely (Bittker and Lokken, 2005).

In 1984, the General Agreement on Tariffs and Trade (GATT) deemed the DISC provisions to constitute an illegal export subsidy. However, Congress asserted that certain income attributable to economic activities occurring outside the U.S. should be exempt from domestic taxation to afford treatment comparable to that of foreign exporters operating under a territorial tax system (Bittker and Lokken, 2005). Thus, Congress repealed the DISC rules and passed new provisions for Foreign Sales Corporations (FSC). The FSC regime continued to provide tax subsidies to U.S. exporters by permitting foreign subsidiaries to repatriate earnings related to export activities to the U.S. with no incremental U.S. tax liability.

The World Trade Organization (the successor to GATT) challenged the FSC provisions on the grounds that they also constituted an illegal export subsidy. In 2000, Congress repealed the FSC provisions and passed the Extraterritorial Income exclusion (ETI or exclusion). This exclusion permitted U.S. firms to claim a deduction equal to a portion of foreign gross receipts or income. Unlike the DISC and FSC regimes, these provisions did not require that the foreign revenue relate to export products; that is, firms could take the ETI benefit for foreign revenues earned on both foreign-manufactured and exported products. However, the foreign manufacturer (for example, a foreign subsidiary of the U.S. MNC) must agree to be taxed as a U.S. corporation and waive treaty benefits to receive such deduction. Given that the U.S. tax system is generally regarded as unfavorable, in practice only true exporters claimed the ETI benefit (Angus and Kies, 2000).

Again, the WTO stated that these provisions constituted an illegal export subsidy. As discussed in Section 2.1., the WTO began to assess retaliatory customs penalties in 2004. The ETI was repealed shortly thereafter by the American Jobs Creation Act of 2004 and replaced with the Domestic Production Activities Deduction.

Appendix B

Search Terms to Identify DPAD Firms

The following search terms are used to identify DPAD firms based on discussion of the tax benefit in firms' publicly filed financial statements.

Search Terms:

Section 199/Sec. 199

Section 199 manufacturing deduction/credit

DPAD

DMD

Domestic Production/ Domestic Production Activities/Domestic Production Deduction

Domestic Manufacturing Deduction

Domestic Production Activity Deduction

Manufacturing Deduction/Manufacturer's Deduction/Manufacturers Deduction/ Manufacturers' Production Deduction

Manufacturing Benefit/Manufacturers Benefit/Manufacturer's Benefit/

Activities Deduction/Activity Deduction

Production Benefit/Deduction

Production Activities

Qualified Production

Qualified domestic production

Qualified activities

QPAI

Qualified Manufacturing Activities

Production Exclusion

Manufacturing Exclusion

FSP 109-1

Appendix C
Variable Definitions

Cash	Total cash holdings (CHE), divided by total assets in year *t-1*
Cash_Flow	Operating cash flow (OANCF), divided by total assets in year *t-1*
DomCapEx	Domestic capital expenditures in year *t*, divided by net plant, property, and equipment (PPENT) in year *t-1*. For domestic-only firms, domestic capital expenditures are equal to total capital expenditures (CAPX) in Compustat. For multinational firms, domestic capital expenditures are equal to the amount of domestic capital expenditures reported by U.S. parent companies on the BEA Survey of U.S. Direct Investment Abroad.
DomEmp	The number of domestic employees in year *t*. For domestic-only firms, this variable is equal to the number of employees (EMP) in Compustat. For multinational firms, the variable is equal to the number reported by U.S. parent companies on the BEA Survey of U.S. Direct Investment Abroad.
DomROS	Domestic return on sales, measured as pre-tax domestic income in year *t* (PIDOM), divided by total domestic segment sales in year *t*.
%DomSales	The percentage of sales that are domestic, calculated as domestic segment sales in year *t,* divided by total sales in year *t* (SALE).
DPAD_Firm	An indicator equal to one if the firm ever discloses or discusses the DPAD benefit in its annual financial statements, and zero otherwise.
ΔGrossMargin%	The amount of shifted gross margin, where gross margin is defined as quarterly sales (SALEQ), less quarterly cost of goods sold (COGSQ). The shifted amount is one half of the negative of the fourth-quarter shift, plus the first quarter reversal, scaled by total assets in year *t-1*.
Inventory	Total inventory (INVT) in year *t,* divided by total assets in year *t-1*.
Leverage	Total debt in year *t-1* (DLTT+DLC), divided by the firm's market value of equity in year *t-1* (PRCC_F*CSHO).
MTB	The ratio of the market value of equity in year *t-1* (PRCC_F*CSHO) to the book value of equity in year *t-1* (SEQ).
ΔOpInc%	The amount of shifted operating income, where operating income is defined as quarterly sales (SALEQ), less expenses, including quarterly cost of goods sold (COGSQ), quarterly R&D (XRDQ), and quarterly SG&A (XSGAQ). The shifted amount is one half of the negative of the fourth-quarter shift, plus the first quarter reversal, scaled by total assets in year *t-1*.
Post-DPAD	An indicator equal to one for each DPAD firm and its matched control beginning in the year that the DPAD firm first discloses/discusses the DPAD benefit in its annual financial statements, and zero otherwise.
RD	Total R&D expense (XRD), divided by the firm's total assets in year *t-1*.
ROA	The ratio of pre-tax income (PI), divided by the firm's total assets in

	year *t-1*.
Sales_Growth	Percentage change in sales (SALE) from year *t-1* to year *t*.
Size	Log of total assets in year *t-1*.
Tangibility	Total plant, property, and equipment (PPENT) in year *t*, divided by total assets in year *t-1*.
WWROS	Worldwide return on sales, measured as total pre-tax income in year *t* (PI), divided by total sales (SALE) in year *t*.

Table 1
Sample Selection

Panel A: DPAD & Control Firm-Year Observations

	DPAD Firms		*Control Firms*		*Total Sample*
Year	**Distinct Firms**	**Firm-Years**	**Distinct Firms**	**Firm-Years**	**Firm-Years**
2004	43	43	43	43	86
2005	294	314	294	324	638
2006	77	263	77	325	588
2007	87	293	87	336	629
2008	42	273	42	282	555
2009	31	237	31	257	494
2010	47	276	47	306	582
2011	67	346	67	379	725
2012	61	355	61	393	748
2013	18	108	18	135	243
Total	**767**	**2,508**	**767**	**2,780**	**5,288**

Panel B: Firm-Year Sample for H1-H3

	***H1* Inter-temporal Shifting**	***H2* Cross-country Shifting**	***H3a* Real Investment Effects**	***H3b* Real Employment Effects**
Sample DPAD & Control Firm-Years, 2004-2013	5,288	5,288	5,288	5,288
Less: Observations not in 1st Quarter of 2005, 2007, or 2010 tax year for H1	(3,462)	-	-	-
Less: Observations missing data to calculate dependent variable	-	(2,721)	(3,252)	(3,287)
Plus: Observations in period prior to DPAD disclosure to calculate difference-in-difference effect	-	1,216	1,539	1,474
Total Firm-Year Observations for H1-H3	1,826	3,783	3,575	3,475

Table 1 (cont'd.)
Sample Selection

Panel C: DPAD Industry Distribution

		DPAD Firms		2005 Compustat Firms		IRS Statistics
SIC	**SIC Desc.**	**# Obs** (1)	**% Obs** (2)	**# Obs** (3)	**% Obs** (4)	**% Obs** (5)
0	Ag., Forestry, and Fishing	3	0.39%	10	0.50%	0.48%
1	Mining and Construction	89	11.60%	76	3.81%	9.44%
2-3	Manufacturing	509	66.36%	646	32.35%	65.10%
4	Trans., Comm., Electric, and Gas	18	2.35%	129	6.46%	16.52%
5	Wholesale & Retail Trade	37	4.82%	330	16.52%	5.34%
6	Finance, Ins., & Real Estate	7	0.91%	389	19.48%	0.72%
7-8	Services	103	13.43%	413	20.68%	1.88%
9	Public Administration	1	0.14%	4	0.20%	0.52%
		767	100.00%	1,997	100.00%	100.00%

Panel A describes the sample of DPAD and control firms; Panel B outlines the selection steps for the three samples used to test each of the three hypotheses; and Panel C includes statistics on the distribution of firms across industries. Firms are identified as a "DPAD firm" if it discusses the DPAD tax benefit in any of its annual financial statements from 2004 (the year in which DPAD was enacted) through 2013. Each DPAD firm is matched to a control firm on size, performance, and industry in the year preceding the first year in which the firm discloses the DPAD benefit. The sample includes firm-year observations for DPAD firms and the matched control firms that meet the following requirements: i) US-incorporated firm; ii) positive total assets, sales, and pre-tax income; iii) greater than $100M of assets in the year of matching; iv) data to calculate inter-temporal shifting measures for H1; and v) non-missing data to calculate all control variables. Panel B shows that H1 is calculated using data to measure shifting in the first quarter following the enactment of DPAD (1st quarter of the 2005 fiscal year), as well as in two additional quarters when the amount of DPAD benefit increased (1st quarter of 2007 and 1st quarter of 2010); H2 and H3 are tested using firm-year observations with sufficient data to calculate the dependent variable for each test (domestic return on sales, domestic investment, and domestic employment, respectively). Firm-year observations in the pre-period, starting in 2003, are then added to the samples for H2 and H3 to calculate the difference-in-difference effect for treatment and control firms, pre- and post-DPAD. Panel C validates that the industry distribution of DPAD firms identified by hand-collection is consistent with the distribution of firms reporting the DPAD deduction to the IRS; the panel also compares the industry distribution to Compustat.

Table 2
Descriptive Statistics

Panel A: Descriptive Statistics for the Full Sample

Variables	Obs	Mean	Median	Std.Dev.	5%	95%
Inter-temporal Shifting Measures (H1)						
ΔGrossMargin%	1,826	-0.11	-0.01	1.16	-0.02	0.01
ΔOpInc%	1,826	0.06	0.04	1.04	-1.69	1.70
Cross-jurisdictional Shifting Measures (H2)						
DomROS	3,783	0.14	0.10	0.14	0.02	0.42
Investment & Employment Measures (H3)						
DomCapEx	3,575	0.20	0.13	0.22	0.02	0.64
#DomEmp	3,475	9.57	3.33	16.94	.20	41.71
Ln(#DomEmp)	3,475	8.09	8.13	1.58	5.46	10.65
Control Variables						
Size	5,288	7.15	6.97	1.60	4.89	10.22
ROA	5,288	0.13	0.11	0.10	0.02	0.33
MTB	5,288	3.10	2.41	3.10	0.83	8.00
Sales_growth	5,288	0.11	0.09	0.20	-0.16	0.47
Leverage	5,288	0.22	0.18	0.22	0.00	0.63
WWROS	3,783	0.13	0.11	0.09	0.03	0.31
%DomSales	3,783	0.62	0.62	0.21	0.25	0.95
RD	3,783	0.04	0.02	0.05	0.00	0.15
Cash	3,783	0.20	0.14	0.20	0.01	0.62
Cash_Flow	3,575	0.14	0.13	0.10	0.02	0.32
Inventory	3,475	0.14	0.11	0.15	0.00	0.42
Tangibility	3,475	0.31	0.23	0.27	0.04	0.90

Table 2 (cont'd.)
Descriptive Statistics

Panel B: Comparison of Descriptive Statistics for DPAD & Control Firms

	DPAD Firms		Control Firms			
	Obs	**Mean**	**Obs**	**Mean**	**Diff.**	**t-stat**
Inter-temporal Shifting Measures (H1)						
ΔGrossMargin%	878	-0.01	948	-0.19	0.18	2.62***
ΔOpInc%	878	0.17	948	-0.04	0.22	3.58***
Cross-border Shifting Measures (H2)						
DomROS	2,082	0.167	1,701	0.120	0.05	5.07***
Real Activity Measures (H3)						
DomCapEx	1,682	0.19	1,893	0.21	-0.02	-1.33
#DomEmp	1,666	9.67	1,809	9.47	0.20	0.15
Ln(#DomEmp)	1,666	8.17	1,809	8.02	0.15	1.24
Control Variables						
Size	2,508	7.12	2,780	7.18	-0.06	-0.56
ROA	2,508	0.15	2,780	0.14	0.01	1.58
MTB	2,508	3.21	2,780	3.01	0.20	1.35
Sales_Growth	2,508	0.11	2,780	0.11	0.00	0.11
Leverage	2,508	0.20	2,780	0.30	-0.10	-2.64***
WWROS	2,082	0.14	1,701	0.12	0.02	2.62***
%DomSales	2,082	0.64	1,701	0.60	0.04	2.58***
RD	2,082	0.04	1,701	0.04	0.01	2.16**
Cash	2,082	0.19	1,701	0.22	-0.03	-2.00**
Cash_Flow	1,682	0.14	1,893	0.14	0.00	0.17
Inventory	1,666	0.15	1,809	0.14	0.02	1.48
Tangibility	1,666	0.31	1,809	0.32	-0.01	-0.55

This table includes descriptive statistics for variables used in Tables 3-6. Panel A includes statistics for the full sample. Panel B includes a comparison of the mean averages of these variables across the DPAD and control samples of firms.

Table 3
Inter-temporal Shifting

	Dependent Variable: Income Shifting Measures	
	ΔGrossMargin%	*ΔOpInc%*
	(1)	(2)
DPAD_Firm	**0.198***** **(2.813)**	**0.221***** **(3.645)**
Size	-0.022 (-1.035)	0.022 (1.163)
ROA	0.562 (1.179)	0.508 (1.199)
MTB	0.008 (0.637)	0.017 (1.542)
Sales_Growth	1.184*** (7.307)	0.533*** (3.948)
Leverage	0.159 (1.634)	0.183** (2.051)
Constant	-0.960*** (-3.930)	-1.214*** (-3.883)
Industry FE?	Y	Y
Quarter FE?	Y	Y
Observations	1,826	1,826
R-squared	0.073	0.052

This table presents results of OLS regressions that test inter-temporal income shifting by DPAD firms, relative to a matched sample of control firms. The regressions are estimated for the sample in the first quarter of 2005, 2007, and 2010, which are the three quarters in which the statutory DPAD benefit increased. All variables are defined in Appendix C. T-statistics are presented in parentheses. Each specification includes quarter and industry fixed effects, and standard errors are clustered by firm. The superscript asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Th e regression specification is as follows: $TimeShift = \alpha + \beta_1 DPADFirm + Controls + \varepsilon$.

Table 4
Cross-border Shifting

Panel A: Univariate Tests of Cross-border Shifting

	DPAD Firms			Control Firms			DPAD - Control	
	N	Mean	t-stat.	N	Mean	t-stat.	Diff.	t-stat
Pre-DPAD *DomROS*	675	0.151		541	0.110		0.040	3.56***
Post-DPAD *DomROS*	1,407	0.174		1,160	0.125		0.049	4.79***
Difference	2,082	0.024	2.94***	1,701	0.015	1.71*	0.009	0.92

Panel B: Multivariate Tests of Cross-border Shifting

	Dependent Var: DomROS	
	(1)	(2)
DPAD_Firm	0.022***	0.025***
	(3.454)	(3.457)
Post-DPAD	0.000	-0.003
	(0.004)	(-0.401)
DPAD_Firm*Post-DPAD	**0.008**	**0.012**
	(0.937)	**(1.553)**
WW_ROS	1.116***	1.054***
	(23.626)	(23.331)
Size		-0.009***
		(-4.032)
RD		0.281***
		(3.082)
Cash		0.020
		(0.924)
Leverage		-0.012
		(-1.455)
%Dom_Sales		-0.126***
		(-5.593)
Constant	-0.009	0.141***
	(-0.611)	(4.771)
Ind FE?	Y	Y
Year FE?	Y	Y
Observations	3,783	3,783
R-squared	0.506	0.569

Table 4 (cont'd.)

Cross-border Shifting

This table presents results of the difference-in-difference analysis comparing cross-border income shifting, measured with domestic return on sales (*Dom_ROS*), by DPAD firms to control firms, pre- and post-DPAD. *Post-DPAD* is a firm-specific indicator equal to one for each DPAD firm and its matched control in the year and subsequent years following the DPAD firm's first disclosure of the tax benefit. Panel A (B) presents univariate (multivariate) analysis. All variables are defined in Appendix C. T-statistics are presented in parentheses in Panel B. Because *PostDPAD* is a firm-specific variable, each specification in Panel B also includes year fixed effects to account for aggregate changes in shifting over time. The specification also includes industry fixed effects, and standard errors are clustered by firm and by year. The superscript asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The regression specification is: $DomROS = \alpha + \beta_1 DPADFirm + \beta_2 PostDPAD + \beta_3 DPADFirm * PostDPAD + Controls + \varepsilon$.

Table 5
Real Effects: Investment & Employment

Panel A: Univariate Analysis of Investment Effects

CapEx	*DPAD Firms*			*Control Firms*			*DPAD - Control*	
	N	Mean	t-stat.	N	Mean	t-stat.	Diff.	t-stat
Pre-DPAD *CapEx*	612	0.19		927	0.23		-0.04	-2.35**
Post-DPAD *CapEx*	1,070	0.20		966	0.20		0.00	0.22
Difference	1,682	0.01	0.97	1,893	-0.03	-2.20**	0.04	2.37**

Panel B: Univariate Analysis of Employment Effects

#Employees	*DPAD Firms*			*Control Firms*			*DPAD - Control*	
	N	Mean	t-stat.	N	Mean	t-stat.	Diff.	t-stat
Pre-DPAD *Ln(#Emp)*	601	8.16		873	7.91		0.25	1.71*
Post-DPAD *Ln(#Emp)*	1,065	8.17		936	8.12		0.05	0.55
Difference	1,666	0.01	0.14	1,809	0.21	2.00*	-0.20	-1.81*

Table 5 (cont'd.)
DPAD Real Effects

Panel C: Multivariate Analysis

	Dependent Var: Domestic Activity	
	(1) *CapEx*	(2) *Ln(#Emp)*
DPAD_Firm	-0.018	0.083
	(-1.627)	(1.113)
Post-DPAD	0.009	-0.109
	(0.622)	(-1.286)
DPAD_Firm*Post-DPAD	**0.022****	**-0.039**
	(2.089)	**(-0.533)**
Size	-0.029***	0.745***
	(-8.919)	(40.620)
ROA	0.285**	0.126
	(2.319)	(0.380)
Sales_Growth	0.196***	-0.491***
	(4.839)	(-4.326)
Cash_Flow	0.047	0.751**
	(0.371)	(2.063)
MTB	0.001	
	(0.538)	
Leverage	-0.013*	
	(-1.854)	
Cash	0.132***	
	(3.909)	
Inventory		1.284***
		(4.752)
Tangibility		-0.102
		(-0.621)
Constant	0.255***	1.971***
	(4.511)	(3.576)
Ind FE	Y	Y
Year FE	Y	Y
Observations	3,575	3,475
R-squared	0.281	0.688

Table 5 (cont'd.)
DPAD Real Effects

This table includes the results of the difference-in-difference analysis comparing real domestic activity by DPAD firms to control firms, pre- and post-DPAD. Domestic activity is measured with domestic capital expenditures and domestic employment using Compustat and BEA data. *Post-DPAD* is a firm-specific indicator equal to one for each DPAD firm and its control in the year and subsequent years following the DPAD firm's first disclosure of the tax benefit. Panel A (B) presents univariate (multivariate) analysis. All variables are defined in Appendix C. T-statistics are presented in parentheses in Panel B. Each specification in Panel B includes year and industry fixed effects, and standard errors are clustered by firm and by year. The superscript asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The regression specification in Panel B is as follows: $Dom\_Activity = \alpha + \beta_1 DPADFirm + \beta_2 PostDPAD + \beta_3 DPADFirm * PostDPAD + Controls + \varepsilon$.

Table 6
Analysis of DPAD Effects in 2005, 2007, and 2010

Panel A: Inter-temporal Shifting

	Dependent Var: Inter-temporal Shifting Measures	
	(1)	(2)
	ΔGross_Margin%	*ΔOpInc%*
DPADFirm_2005Q1	**0.180***	**0.229*****
	(1.892)	**(2.636)**
DPADFirm_2007Q1	**0.197****	**0.227*****
	(2.108)	**(2.674)**
DPADFirm_2010Q1	**0.216****	**0.205*****
	(2.490)	**(2.682)**
Size	-0.022	0.022
	(-1.031)	(1.161)
ROA	0.565	0.505
	(1.183)	(1.189)
MTB	0.008	0.017
	(0.631)	(1.544)
Sales_Growth	1.184***	0.533***
	(7.285)	(3.947)
Leverage	0.160	0.183**
	(1.634)	(2.045)
Constant	-0.959***	-1.213***
	(-3.894)	(-3.864)
Industry FE?	Y	Y
Quarter FE?	Y	Y
Observations	1,826	1,826
R-squared	0.073	0.052

Table 6 (cont'd)
Analysis of DPAD Effects in 2005, 2007, and 2010

Panel B: Cross-jurisdiction shifting & Real Effects

	Dependent Var: Inter-temporal Shifting (H2) or Real Activity (H3)		
	(1) *Dom_ROS*	(2) *CapEx*	(3) *Ln(#Emp)*
DPAD_Firm	0.025***	-0.017	0.092
	(4.005)	(-1.618)	(1.226)
Years_0506	0.002	0.017	-0.081
	(0.305)	(1.039)	(-0.929)
Years_0709	-0.001	-0.001	-0.169
	(-0.156)	(-0.092)	(-1.429)
Years_1013	-0.003		
	(-0.347)		
DPAD_Firm*Years_0506	**-0.007**	**0.016***	**-0.003**
	(-0.720)	**(1.756)**	**(-0.042)**
DPAD_Firm*Years_0709	**0.015***	**0.025****	**-0.079**
	(1.884)	**(2.209)**	**(-1.005)**
DPAD_Firm*Years_1013	**0.020*****		
	(3.480)		
Size	-0.009***	-0.028***	0.745***
	(-3.959)	(-8.903)	(40.588)
Cash	0.020	0.132***	
	(0.711)	(3.909)	
Leverage	-0.013	-0.013*	
	(-1.589)	(-1.854)	
WW_ROS	1.053***		
	(26.416)		
RD	0.283***		
	(2.963)		
%Dom_Sales	-0.126***		
	(-6.341)		
ROA		0.285**	0.116
		(2.319)	(0.348)
Sales_Growth		0.196***	-0.491***
		(4.839)	(-4.322)
Cash Flow		0.047	0.759**
		(0.371)	(2.084)

Table 6 (cont'd)

Analysis of DPAD Effects in 2005, 2007, and 2010

MTB		0.001	
		(0.538)	
Inventory			1.281***
			(4.741)
Tangibility			-0.099
			(-0.604)
Constant	0.139***	0.255***	1.976***
	(4.523)	(4.511)	(3.578)
Ind FE?	Y	Y	Y
Year FE?	Y	Y	Y
Observations	3,783	3,575	3,475
R-squared	0.570	0.281	0.688

This table includes the results of analyzing the responses of DPAD firms, relative to control firms, following an increase in the DPAD benefit in 2005 (from 0% to 3%), in 2007 (from 3% to 6%), and in 2010 (from 6%-9%). Panel A includes results comparing inter-temporal shifting in the first three quarters of 2005, 2007, and 2010. Panel B includes the difference-in-difference tests for cross-border shifting and real effects in the three periods of 2005-2006, 2007-2009, and 2010-2013. In Panel B, domestic activity is measured with domestic capital expenditures and domestic employment using Compustat and BEA data. Because BEA data is not available through 2013, the effect for 2010-2013 is not calculated in Columns (2) and (3). All variables are defined in Appendix C. T-statistics are presented in parentheses. Each specification in Panel A (B) includes quarter (year) and industry fixed effects, and in Panel A (B), standard errors are clustered by firm (and by year). The superscript asterisks *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.