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Lessons from Reagan: How Tax Reform Can Boost Economic Growth

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The views expressed in this testimony are those of the author alone and do not necessarily represent the views of the American Enterprise Institute.

Chairman Brady, Vice Chair Klobuchar, and Members of the Committee, thank you for inviting me to discuss the issue of tax reform with you today. In the testimony that follows, I will discuss the success of previous tax reforms, problems with the tax code today, and which tax policies could be used to promote economic growth.

In 1982, Ronald Reagan presided over a devastated economy. The unemployment rate hit 10.8%. Reagan advocated a firm prescription for our nation's economic woes. In his first inaugural address, he said to the nation that, "It is time to reawaken this industrial giant, to get government back within its means, and to lighten our punitive tax burden. And these will be our first priorities, and on these principles, there will be no compromise." When the US officially entered recession in July 1981, the President was prepared.

On August 13th, 1981, President Reagan signed into law the Economic Recovery Tax act of 1981 that drastically reduced the tax burden on Americans. And while these cuts would be pared back in 1982, the majority of cuts survived. The economic revival that followed was tremendous, as Senator Gramm recently detailed in the Wall Street Journal.[1] Within fifty-five months of the start of the recession, the economy had created 7.8 million more jobs than at its start and real per capital GDP grew by $3,091. During the same time frame, the number of people on disability stamps had fallen 14.3 percent, or by 644,000 people, and the number of food-stamp recipients had fallen 13.4 percent, or by three million people. Between 1981 and 1986, real median family income rose 7.7 percent a year.

While the anecdotal evidence is compelling, it requires rigorous theoretical and empirical analysis to determine whether this anecdotal experience linking the Reagan approach temporally is supported by hard science. In this testimony, I examine whether tax reform can drive growth, and whether it is the right policy for today's environment.

In the recovery following the 2007-2009 recession, the return to normal levels of employment and economic growth has been notably slow. Many factors have contributed to this slow recovery, including the nature of the financial crisis that accompanied it, policy uncertainty, and weakened economic performance internationally, especially in the Eurozone. Though growth has improved since the end of the recession, there is more that the federal government can do to foster a robust economy. Following in Reagan's footsteps, reforming the tax code is one place to start.

Expanding output requires expanding inputs. Indeed, a primary factor driving American economic growth in the past two centuries has been the growth of the stocks of capital and labor. In recent decades, the country's economic success has been driven more by innovative currents and the expansion of entire new industries with high growth potentials. This evolution surely, in part, reflects the acceleration of technological change, but it also is the result of a more uncomfortable truth: that the steady and predictable growth of the normal inputs of production, capital and labor, has slowed. That brings the United States to a strange new world where healthy growth is no sure thing, depending more and more on the presence or absence of technological good fortune. A

[1] http://online.wsj.com/article/SB10000872396390444812704577609863412900388.html

key objective of policy should be to return the United States to a path that can post steady and predictable growth of inputs and outputs, and take advantage of technological opportunities as they arise.

There are three primary problems with our tax code in this regard. The first is its needless complexity, in the form of hundreds of credits and cutouts for different types of people or activities. The second is the tendency for the code to discourage labor supply. The third is the heavy tax we impose on capital formation. Economists generally agree that each of these issues limits economic growth by creating distortions in the economic choices that people in the U.S. make today. The good news is that our tax code is so bad that the opportunity from fundamental tax reform is significant.

The distortions created by these fundamental problems are serious, and economists agree that a well-designed reform could have a significant effect on growth. For example, a survey of 69 public finance economists conducted by Victor Fuchs, Alan Krueger, and James Poterba (1998) found that, at the median, respondents believed that the 1986 tax reform President Reagan signed into law produced about one percentage point higher growth over a long period,[2] a conclusion that my review of the broader tax reform literature with Alan Auerbach supports with respect to a prospective sweeping fundamental reform, if not for the likely impact of the 1986 reform specifically.[3] If tax reform could add even a small amount of growth per year, this growth could compound, having a large long-term effect on the size and health of the economy.

In 2005, Alan Auerbach and I reviewed numerous tax reform proposals from different economists, and identified three characteristics that they had almost universally in common: reducing the marginal tax rate on corporate investment; improving incentives to save; smoothing out differing treatment of different industries and assets while minimizing economic distortions; and finally, improving incentives to work.[4] A sound reform should not only address marginal tax rates, but should reform the definition of the tax base as well. Through comprehensive tax reform, the system could be streamlined to improve taxpayers understanding (helping them make rational choices) and remove distortions that hamstring economic growth.

Taxes and the Labor Force

Growth in the labor force is an important contributor to economic growth, but one that has been shrinking over the past decades. At its peak in the 1970s, potential hours worked contributed 1.7 percentage points to potential GDP growth each year. Potential GDP is a theoretical measure of the output that an economy is capable of if all its factors of production were employed. From 2002-2012, however, hours worked only contributed

[2] Victor R. Fuchs, Alan B. Krueger, and James M. Poterba, "Economists' Views about Parameters, Values, and Policy: Survey Results in Labor and Public Finance," Journal of Economic Literature 36 (3): 1387-1425.
[3] Alan J. Auerbach and Kevin A. Hassett, Toward Fundamental Tax Reform, (Washington, DC: AEI Press, 2005), 150
[4] Alan J. Auerbach and Kevin A. Hassett, eds. *Toward Fundamental Tax Reform*. (Washington, DC: AEI Press 2005).

0.3 percentage points on average to potential GDP growth.[5] From the supply side, then, labor force growth could be expected to deliver a steady significant boost to growth. Today, the base case starts 1.4 percentage points lower.

If labor force participation were higher, GDP would have the potential to be higher as well. The income tax system unfortunately discourages labor force participation in many cases, especially for older workers and second earners.

As my colleagues Aspen Gorry and Sita Slavov explain in a recent analysis, the structure of the tax code in the U.S. is based on family units rather than individuals, and in many cases this leads to disincentives for secondary earners to work.[6] This is because married couples face a higher average tax rate when a second earner starts to work, and that secondary earner (usually a woman) faces a higher marginal tax rate as well. A review of the literature surrounding workers' responsiveness to marginal tax rates by Michael Keane[7] finds that women are very responsive to marginal tax rates, and the effect on their decision to work or not is especially large. A review of the 1986 tax reform by Nada Eissa[8] found that the reduction of the top marginal rate from 50 to 28 percent increased the labor supply of women with family incomes in that bracket, and had an especially strong impact on whether a woman worked or not (as opposed to the number of hours worked by these women).

In addition, the tax code combines with Social Security and Medicare structures to discourage older workers from participating in the labor force. Once a worker reaches retirement age, in many cases he receives little further benefit from working an extra year in terms of social security payments, but he still pays the same payroll taxes of 12.4 percent into Social Security. This decreases the returns to working for older workers, as described by Gorry and Slavov in a separate recent analysis.[9]

An efficient tax code would work to minimize disincentives for work. Where workers are especially responsive to marginal tax changes, the income tax system should be adjusted to take this into account, perhaps eliminating payroll taxes for older workers or changing the way a second earner is treated by the income tax system. Overall lower marginal tax rates also reduce the disincentives for joining the labor force or increasing the number of hours that someone works, so lowering overall marginal tax rates may increase labor force participation and encourage economic growth as well.

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[5] "Key Assumptions in Projecting Potential GDP-February 2013 Baseline," Congressional Budget Office. February 5,2013. http://www.cbo.gov/publication/43910

[6] Gorry, Aspen and Sita Slavov. "The Tax Treatment of the Family." AEI Economic Perspectives, May 2013.

[7] Michael P. Keane, "Labor Supply and Taxes: A Survey," *Journal of Economic Literature* 49, no. 4 (2011): 961–1075.

[8] Eissa, Nada. "Taxation and Labor Supply of Married Women: The Tax Reform Act of 1986 as a Natural Experimnet." NBER Working paper No. 5023, February 1995.

[9] Gorry, Aspen and Sita Slavov. "Financing Entitlements and Promoting Work: Does Policy Encourage Early Retirement?" AEI Economic Perspectives, December 2012.

Taxes on Capital

This nation employs several methods for taxing capital income, including the corporate income tax, capital gains tax, and tax on dividends, both at the individual and the corporate level. There is a large economic literature that documents strong theoretical and empirical support for reforms that would reduce capital taxes in the United States, but the consensus amongst economists on these issues has not always been reflected in a political consensus. While there has previously been a strong bipartisan consensus regarding capital gains taxes, which were cut dramatically by Jimmy Carter in 1978, and again by Bill Clinton in 1997, they have recently grown more contentious. Dividend taxes were also low until the beginning of this year, having been increased from 15% to 20% for taxpayers in the top bracket during the fiscal cliff negotiations at the end of 2012, with the addition of a 3.8% Medicare tax on dividends for those same taxpayers. There has been less of a political consensus regarding the corporate tax, and the U.S.'s currents status as the highest tax country in the developed world is likely the most pressing tax policy issue of the day.

In addition to labor, capital is the other main driver of production, and increasing investment and utilization of capital leads to economic growth. High taxes on capital reduce saving and investment, and therefore lead to lower long-run growth. Capital is not only beneficial to those who own it; an increase in capital improves the productivity of workers as well, and they benefit from wage increases as they become more productive. A goal of tax reform should be to decrease distortions in the tax code that disincentivize investment in order to promote growth of the capital stock, which would lead to greater productivity and economic growth.

As mentioned above, the economic literature has explored the area of capital taxation in detail. One of the first models which was used to show how an optimal tax on capital is zero was created by Auerbach and Kotlikoff. Over several decades, this model was subsequently used by authors who modified and added complexity to it in order to understand the long-run interactions of fiscal policy and economic decisions of people in their life cycles. Numerous studies — including Chamley (1985, 1986)[10] and Judd (1985, 1999)[11] – have used the Auerbach-Kotlikoff model to show that the optimal capital tax is zero after the initial period in the model. Later studies by Jones, Manuelli, and Rossi (1993, 1997)[12] and Erosa and Gervais[13] added in certain constraints (such as an

[10] Christophe Chamley, "Optimal Taxation of Capital Income in General Equilibrium with Infinite Lives," *Econometrica* 54, no. 3 (1986): 607-22. Christophe Chamley. "Efficient Taxation in a Stylized Model of Intertemporal General Equilibrium," *International Economic Review*, vol. 26(2) (1985): 451-68.
[11] Kenneth Judd, "Redistributive Taxation in a Simple Perfect Foresight Model." *Journal of Public Economics* 28, no. 1 (1985): 59-83; Kenneth L. Judd, "Optimal Taxation and Spending in General Competitive Growth Models," *Journal of Public Economics* 71 (1999): 1-26.
[12] Larry E. Jones, Rodolfo E. Manuelli and Peter E. Rossi, *Journal of Political Economy* , Vol. 101, No. 3 (Jun., 1993), pp. 485-517. Jones, L.E., R.E. Manuelli, and P.E. Rossi, "On the Optimal Taxation of Capital Income.," *Journal of Economic Theory* 73 (1997): 93-117.
[13] Andrew Erosa, Martin Gervais, "Optimal Taxation in Life-Cycle Economies," *Journal of Economic Theory* 105 (August 2002): 338-369.

exogenous determination of government spending, or the inability to tax by age) and found that the inclusion of a capital tax was optimal under certain conditions. However, their results showed that the optimal capital income tax was small, and supported the idea that wage and consumption taxes were preferable for efficiency in the economy.

Kenneth Judd provides a useful explanation for these results in a chapter from a volume edited by Glenn Hubbard and myself.[14] A capital tax introduces a distortion into the return on saving and investment, a distortion that "explodes" over time. Even a small capital tax will not be optimal because the damage it causes will eventually grow without bound. The intuition of this result is quite straightforward. Recall that an efficient tax system will cause individuals to change their behavior as little as possible. A huge tax on apples and a small tax on bananas would cause an enormous shift away from apples and toward bananas. A small uniform tax on both would not. Think of consumption today as being represented by apples and consumption ten years from now as bananas. If you give up an apple today, you get a number of bananas ten years from now that depends on the interest you got on the money you saved after not eating the apple. At 10 percent interest, a dollar saved today becomes $2.60 ten years from now. If we tax that interest at 50 percent, a dollar saved today only yields $1.63 ten years from now. Clearly, a tax on interest can have a very large effect on how much money you have ten years from now, a very big effect on the rate at which you can trade apples today for bananas tomorrow. Indeed, this distortion grows bigger and bigger over time because of compounding. One dollar saved today produces $17.45 thirty years from now at 10 percent interest. If the interest is taxed at 50 percent, then a dollar saved yields only $4.32 over the same time period.

It is easy to dismiss these implications as theoretical, with little relevance to how capital taxes work in the world today. But the high tax rates on capital income in the U.S. stand in strong contrast not only to the implications of optimal tax theory described in the economics literature, but also to the policies of our trade partners. Not only do high capital taxes in the U.S. today distort the incentives for investment, but they have implications for U.S. competitiveness as well.

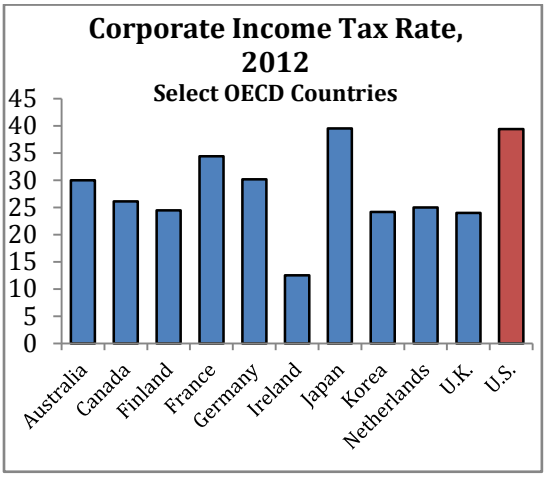
Corporate Tax Rates

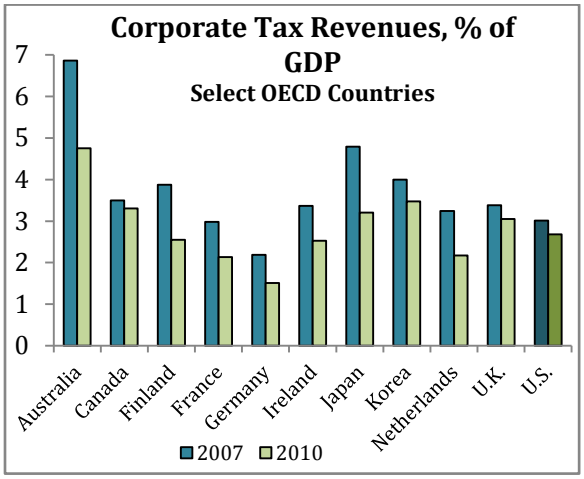
The corporate income tax has been levied in the United States since 1909, when it was introduced at the rate of 1 percent. Today, the U.S. federal tax rate for most corporations is 35 percent; on average, state taxes add another 4.2 percent tax. With a 39.2 percent combined corporate tax rate, we earned the honor of highest tax rate in the developed world last year when Japan lowered its rate from 39.5 to 38 percent. In lowering its corporate income rate, Japan followed a wave of reforms that began in the mid to late 1980s and has continued through the 2000s. The OECD average corporate tax rate fell almost 9 percent in the first decade of the 21st century; overall, top combined statutory rates amongst OECD countries have fallen from an average of about 48 percent in the

[14] Judd, K.L. (2001), "The Impact of Tax Reform in Modern Dynamic Economics," in K.A. Hassett and R.G. Hubbard, eds., *Transition Costs of Fundamental Tax Reform.*

early 1980s to a little over 25 percent in 2011.[15] The U.S., however, has not changed its top statutory rate since 1993.

A common argument is that even though the statutory corporate tax rate is extremely high, the significant number of loopholes in our tax code allows firms to escape much of the apparent tax burden in the U.S. In truth, when looking at effective rates rather than statutory rates, the U.S. does not rank much better compared to other OECD countries. In a 2011 study with my AEI colleague Aparna Mathur, I computed the Effective Average Tax Rate (EATR) and Effective Marginal Tax Rate (EMTR) for corporations in OECD countries, and our results suggest that the effective rates have followed a similar trend to statutory rates.[16] In 1996 the U.S. EATR was slightly below the OECD average – 29.2 versus 30.2 – but in 2010, while the U.S. EATR remained largely constant at 29 percent, the OECD average (excluding the United States) had fallen to 20.5 percent. The United States fares slightly better when looking at the EMTR, but remains above the average. In 2010, the U.S. EMTR was 23.6 percent, compared to the non-US OECD average of 17.3 percent.





The relatively unfavorable position of the U.S. compared to the rest of the world creates a significant competitive disadvantage. The harm caused from suboptimal taxation is magnified significantly when capital is mobile, and when alternatives to locating in the U.S. exist.

Lowering the corporate income rate may be especially beneficial to boosting U.S. competitiveness in the manufacturing sector. Manufacturing has been especially mobile over the past two decades, and the U.S. has seen manufacturing employment and output decrease dramatically, a phenomenon that accelerated following the normalization of U.S. trade relations with China in 2000, according to research by Pierce and Schott.[17]

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[15] "OECD Tax Database," http://www.oecd.org/ctp/taxdatabase.

[16] Kevin A. Hassett and Aparna Mathur, *Report Card on Effective Corporate Tax Rates: United States Gets an F*, Tax Policy Outlook No. 1 (Washington, DC: American Enterprise Institute, February 2011), http://www.aei.org/docLib/TPO-2011-01-g.pdf.

[17] Pierce, Justin R., and Peter K. Schott. 2012. "The Surprisingly Swift Decline of U.S. Manufacturing Employment." NBER Working Paper No. 18655.

Today, however, it may be possible that the U.S. is improving as a location for the manufacturing industry in comparison with China, whose labor costs have steadily increased over the last decade. As energy costs and productivity have improved in the U.S., many observers see an opening for a broadening of the U.S. manufacturing sector – but a recent study by Thomas Duesterberg of the Aspen Institute emphasizes that lowering the corporate rate and moving to a territorial tax system are key to improving the environment for investment in capital and manufacturing in the U.S.[18] It will be difficult for the U.S. to attract foreign direct investment, especially if its corporate tax rate remains well above the OECD average.

Since capital is mobile in the long-run and other countries have relatively lower levels of capital taxation, there are several implications for the U.S. economy. First, the United States would likely draw more capital by lowering its corporate tax rates. It is possible that it is also on the wrong side of the "Laffer curve", and may be able to raise more revenue from a lower tax rate. In addition, the gains from a corporate tax cut would likely flow through to labor. As capital returns to the American economy, each worker will have a relatively larger stock of capital to work with, and the marginal product of labor will rise. Reforming our corporate income tax system has the potential to bring numerous benefits.

When corporate tax rates are high in an open economy, then investors and firms are free to move capital to other countries with more favorable taxes. If an American firm locates a plant in the U.S., for example, it will keep only 61 cents of every dollar the facility earns after federal, state, and local taxes. If it locates the new plant in Ireland, it keeps 87 cents of unrepatriated earnings. There is a large literature that finds that firms are incredibly skilled at moving money around to minimize their taxes. A classic paper by Roseanne Altshuler, Harry Grubert and T. Scott Newlon finds investment location is highly responsive to differences in tax rates (with elasticities ranging from 1.5 to 2.8).[19] In addition, Harry Grubert has written a large number of papers with various coauthors documenting massive income shifting behavior of U.S. multinationals.[20]

The Laffer curve represents the tradeoff between tax rates and revenue. When tax rates are 0, revenues is also zero, and as tax rates increase, so does revenue. But at a certain point, tax rates increase to an amount where revenue actually decreases because people shift behavior to avoid the tax. Economists will tell you that Laffer curve phenomena – that is, situations when tax rates go down and revenue goes up – are rare and unlikely, requiring high elasticities. It is true that they are rare, but it is not surprising given the

[18] Duesterberg, Thomas. "The Manufacturing Resurgence: What it Could Mean for the U.S. Economy." The Aspen Institute, Manufacturing and Society in the 21st Century. March 2013.
[19] Rosanne Altshuler, Harry Grubert, and T. Scott Newlon. "Has U.S. Investment Abroad Become More Sensitive to Tax Rates?" *International Taxation and Multinational Activity* edited by James R. Hines. Pg. 9-38 (January 2000)
[20] Examples include Harry Grubert, "Intangible Income, Intercompany Transactions, Income Shifting, and the Choice of Location." *National Tax Journal*, 56.1 (March 2003); Harry Grubert and John Mutti, "Do Taxes Influence Where U.S. Corporations Invest?" *National Tax Journal*, 53.3 (December 2000); Harry Grubert and Joel Slemrod, "The Effect of Taxes on Investment and Income Shifting to Puerto Rico." NBER Working Paper No. 4869 (September 1994) http://www.nber.org/papers/w4869.pdf.

elasticities described above that a number of authors have supported the idea that the U.S. is on the wrong side of the Laffer curve with regards to corporate income taxes.

A 2007 paper by Kimberly Clausing examines OECD countries over the period 1979-2002.[21] Analyzing the variation in the countries tax rates and their tax revenues, she concludes that the revenue-maximizing corporate tax rate is 33 percent for the sample. Michael Deveraux examines the same relationship and finds evidence, although weak, that the revenue- maximizing rate might be rather low.[22] Focusing on Canada, a study by Jack Mintz estimated that a corporate rate at 28 percent would bring in the most revenue. Lastly, my work with AEI colleague Alex Brill also finds strong evidence that a Laffer curve exists in the corporate sphere and that the revenue maximizing rate has fallen from about 34 percent in the 1980s to 26 percent in the early 2000s.[23] If you take the Brill-Hassett estimates seriously, then the U.S. could increase tax revenue by $767 billion over the next ten years if it reduces its rate to 26.4 percent, and it would have to cut the rate all the way to 17.8 percent if it wanted to enact a revenue neutral reform.

This result is fully consistent with the large literature documenting how mobile capital income is internationally. Laffer curve results depend on high elasiticities, and high elasticities are independently documented as well. A recent CRS report respecifies this analysis and argues that the Laffer curve effect is not present in the data. However, even this CRS report provides strong evidence that corporate rate reductions would not cost a large amount of revenue, finding that, "Once appropriate estimation methods are used to correct problems arising with panel data, there appears to be no statistically significant relation between corporate tax rates and corporate tax revenues as a percentage of GDP." While this report has severe methodological problems, it suffices to say that even after aggressive specification search, the authors find that a reduction in the corporate rate would not be expected to have any effect on revenue, that is, a straight rate reduction should not be expected to reduce revenues.[24]

A final argument in favor of cutting the corporate tax rate is that it would benefit workers. This channel was recently discussed in a Senate Budget Committee testimony by the former director of the Brookings-Urban Tax Policy Center Roseanne Altshuler, who wrote, "Moreover, any increase in the corporate income tax rate will reduce domestic income and lower wages (through an outflow of capital) and adversely affect economic efficiency."[25]

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[21] Clausing, Kimberly A. "Corporate Tax Revenues in OECD Countries," *International Tax and Public Finance* 14:115-133 (2007).

[22] Michael P. Devereux, *Developments in the Taxation of Corporate Profit in the OECD Since 1965: Rates, Bases and Revenues*. Oxford University Working Paper. (May 2006)

[23] Alex Brill and Kevin Hassett, *Revenue Maximizing Corporate Income Taxes: The Laffer Curve in OECD Countries"* AEI working paper # 137, American Enterprise Institute, July 31, 2007.

[24] Gravelle and Thomas L. Hungerford, ''Corporate Tax Reform: Should We Really Believe the Research?''Tax Notes, Oct. 27, 2008, p. 419, Doc 2008-18748, or 2008 TNT 209-18.

[25] Rosanne Altshuler, "Testimony of Dr. Rosanne Altshuler Before the Senate Committee on the Budget." Hearing on Tax Reform: A Necessary Component for Restoring Fiscal Responsibility. February 2, 2011. Pg. 3. http://www.budget.senate.gov/democratic/ index.cfm/files/serve?File_id=d86dd771-f895-48f4-abf7-1e1f79dc319b

The benefits to American workers have been documented in a number of recent studies such as a 2007 paper by Alison Felix,[26] work done by Mihir A. Desai, C. Fritz Foley, and James R. Hines,[27] and my own research with my colleague Aparna Mathur.[28] They all conclude that labor bears much, if not all, of the burden of the corporate tax. The idea that workers may bear a portion of the corporate income tax is neither surprising nor new. Basic incidence analysis suggests that the burden of the tax will always be larger on the side of the market that is more inelastic. In the short run, the incidence will necessarily be borne out of the earnings of fixed capital since the supply of capital is fixed. However, it is the long run effects which are of greatest theoretical and practical interest. Since capital is relatively more mobile in the long-run than labor (which is relatively inelastically supplied), labor could bear a larger portion of the tax burden.

In one of the first empirical studies on the topic, (Hassett and Mathur, 2006, revised 2010) my colleague Aparna Mathur and I use a unique, self-compiled dataset on international tax rates and explore the link between taxes and manufacturing wages for a panel of 65 countries over 25 years.[29] We find that wages are significantly responsive to corporate taxation, controlling for other macroeconomic variables. Our evidence shows that higher corporate tax rates depress wages. My colleagues Aparna Mathur and Matt Jensen summarize these results concisely,[30] "the results suggest that a 1 percent increase in the corporate tax rates leads to a 0.5 percent decrease in wage rates. For example, if the corporate tax rate increases from 35 percent to 35.35 percent, a 1 percent increase, a 10 dollar per hour wage rate will decrease 0.5 percent to $9.95. Using information from the United States wage bill and tax revenues, this implies that every additional dollar of tax revenue leads to a $4 decrease in aggregate real wages. Examining the effects of tax rate changes one year later, rather than five, we find that a $1 increase in tax revenues leads to $2 decrease in wages." We also find that tax characteristics of neighboring countries, whether geographic or economic, have a significant effect on domestic wages. The study uses a standard specification drawn from the existing literature on wage variation across countries.

Other subsequent studies have supported this finding. R. Alison Felix[31] uses cross-country data over the period 1979-2002 to estimate the effect corporate tax rate changes on annual gross wages. She finds that a 1 percentage point increase in the corporate tax

[26] Rachael Alison Felix, "Passing the Burden: Corporate Tax Incidence in Open Economies." (October 2007) http://www.kc.frb.org/Publicat/RegionalRWP/RRWP07-01.pdf
[27] Mehir A. Desai, C. Fritz Foley, and James R. Hines, Jr., "Labor and Capital Shares of the Corporate Tax Burden: International Evidence," Prepared for the International Tax Policy Forum and Urban-Brookings Tax Policy Center conference on Who Pays the Corporate Tax in an Open Economy?, December 18, 2007.
[28] Kevin A. Hassett and Aparna Mathur, "Spatial Tax Competition and Domestic Wages" *AEI Working Paper* (December 2010).
[29] The original paper was updated in 2010. The 2010 version is described here. Kevin A. Hassett and Aparna Mathur, "Taxes and Wages," *AEI Working Paper 128* (June 2006); Kevin A. Hassett and Aparna Mathur, "Spatial Tax Competition and Domestic Wages" *AEI Working Paper* (December 2010).
[30] Matthew H. Jensen and Aparna Mathur, "Corporate Tax Burden on Labor: Theory and Empirical Evidence," *Tax Notes*, June 6, 2011, p. 1083, *Doc 2011-10018*
[31] Rachael Alison Felix, "Passing the Burden: Corporate Tax Incidence in Open Economies." (October 2007) http://www.kc.frb.org/Publicat/RegionalRWP/RRWP07-01.pdf

rate decreases annual wages by 0.7 percent, which is a larger effect than the one documented in my study with Mathur. Another example is a study by Mihir A. Desai, C. Fritz Foley, and James R. Hines, who use data on foreign activities of U.S. multinationals to create a panel of more than 50 countries between 1989 and 2004.[32] They investigate the effect of corporate taxes on labor and capital. Their estimates show that 45 and 75 percent of the burden of corporate taxes is borne by labor with the remainder (out of a 100 percent) borne by capital. Lastly, a European study by Wiji Arulampalam, Michael Devereux and Giorgia Maffini on corporate taxes, which uses firm level data in 9 countries over the period 1996-2003.59 They conclude that an exogenous rise of $1 would reduce the wage bill by 49 cents.

A different study focusing on the incidence across states is Tax Foundation Working Paper by Robert Carroll, who also finds that corporate taxes negatively affected wages during the 1970 and 2007 period.[33] The paper estimates that a 1 percent increase in the average state and local corporate tax rate can be expected to lower real wages by 0.014 percent.

Some have critiqued the empirical techniques employed in the Hassett and Mathur study. Gravelle and Hungerford (2008)[34], for example, argue that purchasing power parity conversions would be preferable to exchange rate conversions and that omitted variable bias could lead to artificially high estimates of the corporate tax burden on labor. However, most of the studies in the literature, including Hassett and Mathur use standard techniques employed in empirical economics. Many of the critiques leveled by Gravelle and Hungerford could be applied to any study that involves data. Furthermore, an accurate assessment of this matter would recognize that the preponderance of empirical papers and a great many theoretical papers all support the same conclusion that much of the burden of corporate taxation falls on labor. For those who would like an overview, my colleagues Aparna Mathur and Matt Jensen reviewed this literature in the June 2011 issue of Tax Notes[35].

These results are consistent with the frequently employed assumptions in the public finance literature that capital is highly mobile, but labor is not. Under these conditions labor will bear the burden of capital taxes after some lag, while firms observe productivity gains and workers renegotiate fixed wage contracts.

Dividend Taxes

In addition to the corporate income tax, the United States also taxes dividends paid out to

[32] Mehir A. Desai, C. Fritz Foley, and James R. Hines, Jr., "Labor and Capital Shares of the Corporate Tax Burden: International Evidence," Prepared for the International Tax Policy Forum and Urban-Brookings Tax Policy Center conference on Who Pays the Corporate Tax in an Open Economy?, December 18, 2007.
[33] Carroll, Robert. "The Corporate Income Tax and Workers' Wages: New Evidence From the 50 States," Tax Foundation Special Report No. 169 (Aug. 2009).
[34] Gravelle and Thomas L. Hungerford, ''Corporate Tax Reform: Should We Really Believe the Research?''Tax Notes, Oct. 27, 2008, p. 419, Doc 2008-18748, or 2008 TNT 209-18.
[35] Mathur, Aparna and Matthew H. Jensen. "Corporate Tax Burden on Labor: Theory and Empirical Evidence." *Tax Notes*, June 6, 2011, p. 1083-1089.

shareholders and capital gains at the individual level. This extra layer of capital taxation increases the overall effective tax rate that burdens new investment. On the other hand, depreciation and expensing provisions lower the effective tax rates on business income, and numerous loopholes and other tax expenditures lower the rate for industries that happen to be favored in Washington.

The double taxation of corporate income discourages investment in equipment and structures. The dividend then tax raises the cost of funds to firms, increasing the hurdle rate for new projects. The accompanying reduction in capital spending reduces economic growth and interferes with the creation of new jobs.

The literature on dividend tax policy and investment has had a rather contentious history. Theoretically speaking, it is possible to derive cases where dividend taxes have a large effect on investment, but other cases exist that are equally plausible that suggest that dividend taxes have a smaller effect. An early and path-breaking study by Poterba and Summers (1985) concluded, "our results suggest that dividend taxes reduce corporate investment and exacerbate distortions in the intersectoral and intertemporal allocation of capital".[36] A more recent study that I coauthored with Alan Auerbach of the University of California at Berkeley found evidence that supported somewhat smaller economic effects of dividend tax reductions (or increases),[37] which seems to be supported by other recent analyses of the effects of dividend tax cuts. This is not to say, however, that increasing the dividend tax rate at the beginning of 2013 did not have an effect on firm behavior, however. In fact, a 2010 study by Gourio and Miao[38] found that a decrease of the dividend and capital gains taxes from 25 and 20 percent to 15 percent each would lead to an increase of 4 percent in long-run capital stock. Lower capital accumulation in the long-run means lower growth and productivity.

Other Capital Tax Issues

In addition to corporate taxes, other forms of capital income taxes are ripe for updating, and many smaller changes would improve efficiency and encourage investment in the U.S. One such change to the current system would be the implementation of permanent business expensing. In other words, allowing firms that purchase new machines and other capital goods to be able to write them off immediately, instead of over many years.

A well-developed body of research by economists provides support for something that people in business will readily confirm: firms are much more likely to expand their capital stock when the cost of capital is low. Implementing full expensing can reduce the cost of capital significantly. Future deductions are not as valuable as current deductions because of the time value of money, and because these deductions are not indexed for

[36] Poterba, J.M., and L.H. Summers, "The Econonomic Effects of Dividend Taxation", (1985) in E. Altman and M. Subrahmanyam, eds., *Recent Advances in Corporate Finance*, pp. 227-284.
[37] Auerbach, A.J., and K.A. Hassett (2003), "On the Marginal Source of Investment Funds," *Journal of Public Economics*, 87, pp. 205-232.
[38] François Gourio and Jianjun Miao, 2010. "Firm Heterogeneity and the Long-Run Effects of Dividend Tax Reform," *American Economic Journal: Macroeconomics*, vol. 2(1), pages 131-68, January.

inflation. Expensing gives firms the entire deduction up front, and with full expensing, the value of the deduction will exactly offset the present value return on the investment over its lifetime, so the effective marginal tax rate on investment will be zero.

Although much of the recent economic literature on expensing has focused on the merits of temporary provisions enacted as stimulus, there is wide agreement in the economics profession that permanent measures can have significant long-run growth effects. Many researchers actually agree that expensing provisions provide more growth per dollar of foregone revenue than reductions to other capital taxes. This is because full expensing offers tax benefits to new investment only, whereas cuts to corporate, dividends, or capital gains tax rates offer tax benefits to old capital as well. The Treasury Department, for example, estimates that cuts to the corporate, capital gains, or dividends rates are only about 60% as effective in terms of "bang-for-the-buck" investment growth as expensing provisions.[39]

In addition to inefficient expensing provisions, another problem with the current structure of capital taxes is the asymmetric treatment of debt and equity, which encourages heavy debt loads and increases the overall level of risk in the corporate sector. Firms that borrow to finance investments are allowed under current law to deduct interest payments associated with that debt. Dividend payments are not deductible. This encourages firms to use debt finance over raising equity whenever possible. When firms have large debt loads, they are much more likely to enter bankruptcy during difficult times.

Consumption Taxation

The best solution for tax reform that encourages investment and growth is to move from our income tax system to a system that taxes consumption. Consumption-based taxes have been explored in research that exploded in the 1970s and 80s and has continued to this day. As I previously mentioned, an important result of the tax-reform literature is that, in the long run, an efficient tax system must not tax capital income.

Increasingly sophisticated economic models have attempted to predict the impact of a wholesale change to a consumption tax on the American economy. Some such models find the gain from a switch to a consumption tax to be enormous. For example, Larry Summers, President Obama's first director of the National Economic Council, wrote in 1981, "The results suggest that the elimination of capital income taxation would have very substantial economic effects. For example, a complete shift to consumption taxation might raise steady-state output by as much as 18 percent and consumption by 16 percent."[40] These large gains occur because an income tax discourages capital formation, and the increase in capital formation leads to a higher level of economic growth for some length of time.

[39] U.S. Department of the Treasury, "Background Paper." Paper presented in the Treasury Conference on Business Taxation and Global Competitiveness, U.S. Department of the Treasury, July 23, 2007.
[40] Lawrence H. Summers, "Capital Taxation and Accumulation in a Life-Cycle Growth Model." *American Economic Review* 71 (September 1981): 533-44.

Summers' paper was one of the first glimpses of this result, and, in retrospect, it is a bit of an outlier. Models of increasing complexity today generally find effects smaller than those described by Summers. Nonetheless, economists have consistently found large positive output effects from fundamental tax reform. Pecorino (1994)[41] estimated the hypothetical effect on the growth rate of replacing the 1985 US income tax structure with a consumption tax to be of the order of 1 percent per capita per year. Over the course of several years, this result would closely correspond with the estimates found in other studies that mostly focus on long-run increases in output. An OECD study by Arnold (2008) provides an empirical analysis of the effect of the tax structure on long-run GDP. The main findings include "Property taxes, and particularly recurrent taxes on immovable property, seem to be the most growth-friendly, followed by consumption taxes and then by personal income taxes. Corporate income taxes appear to have the most negative effect on GDP per capita."[42] Alan Auerbach and I found support for this assertion in a review of the literature that we conducted in 2005, which suggested that a transition to an ideal system might increase economic output between 5 and 10 percent.[43]

While the literature unanimously supports the idea that a consumption tax would boost output, it is important to consider the reform's possible effects on distributional equity. Different models of consumption taxes have differing effects on the distribution of the tax burden, but advocates of consumption taxation have made significant adjustments and improvements to consumption tax models in response to this concern. A value-added tax (VAT), for example, is one pure form of a consumption tax —a firm pays tax on the difference between its total revenue and the cash it has paid to other businesses, and is not allowed to deduct wages paid before calculating its tax. But under the VAT, everyone pays the same tax rate regardless of income.[44] Hall and Rabushka (1995) showed how a VAT could be modified to maintain the economic benefit while maintaining the tax code's current redistributive role. Their "flat tax" is a two-part VAT that allows firms to deduct wages before calculating their tax, but workers must pay tax on the wages that they receive at the same rate faced by the corporation, with income up to a set amount excluded.[45]

David Bradford took this logic one step further in the development of his X-tax. He, too, passed the responsibility for paying taxes on wages on to the workers, and then taxed their wages using a graduated rate system. In principle, this approach allows for any possible level of redistribution, which weakens the logical basis for opposition to a consumption tax on social-justice concerns.[46]

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[41] Pecorino, Paul. "The Growth Rate Effects of Tax Reform." *Oxford Economic Papers* 46, no. 3 (1994): 492-501.

[42] Jens Arnold, "Do tax structures affect aggregate economic growth? Empirical evidence from a panel of OECD countries", *OECD Economics Department Working Paper* 643, 2008.

[43] Auerbach, Alan J. and Kevin A. Hassett, ed. *Toward Fundamental Tax Reform*. Washington DC: The AEI Press, 2005.

[44] It is possible to add progressivity to a VAT by narrowing the base; however, this creates inefficiency.

[45] Robert E. Hall and Alvin Rabushka, *The Flat Tax: Updated Revised Edition*, Second Edition, Revised ed. (Hoover Institution Press, 1995)

[46] Bradford, David F, "The X Tax in the World Economy." *CEPS Working Paper No. 93* (August 2003). http://www.princeton.edu/~ceps/workingpapers/93bradford.pdf

A 2001 paper by Altig, Auerbach, Kotlikoff, Smetters and Walliser explored the degree to which this redistributional twist compromised the economic effects of a consumption tax, using a model to estimate the effects of different types of tax reform on individuals in twelve different income classes.[47] They simulate several different approaches to tax reform, including a proportional income tax, a proportional consumption tax, a standard flat tax, a flat tax with transition relief and the X-tax. Some tax reforms, notably the flat tax, increased overall long-run welfare at the expense of the poor, which is a concern for many critics of consumption taxes. However, their model found that under the X-tax, aggregate long-run consumption increased by 7.5 percent, and long-run welfare improved for individuals in every income class.

For a good review of the X-tax, my AEI colleague Alan Viard and Robert Carroll of Ernst & Young have set out to introduce the Bradford X-tax to the broader public in their book entitled, "Progressive Consumption Taxation: The X-Tax Revisited,"[48] which I would recommend to anyone interested. Their book sets forth solutions to commonly perceived problems concerning the taxation of pensions and fringe benefits, business firms, financial intermediaries, international transactions, owner-occupied housing, state and local governments, and nonprofit institutions, and the transition. By adopting these proposed approaches, the United States can move to a progressive tax system that no longer penalizes saving and investment.

Conclusions

Tax reform is the great untapped policy opportunity available to policymakers today. Best would be a sweeping fundamental reform, but a well-designed corporate reform could increase expected growth without threatening America's coffers. The largest obstacle to growth in the U.S. today is the high corporate income tax, which discourages investment in capital and industry at home and weakens the competitiveness of the U.S. in comparison with other OECD countries. In order to encourage companies to locate in the U.S. and to increase investment at home, the corporate tax rate should be reduced. In addition, other aspects of capital taxation discourage saving and investment and weaken the economy in the long run.

In addition, the tax code today discourages labor force participation in multiple ways, especially for older workers and secondary earners, who are usually women. A goal of tax reform should be to reduce these work disincentives, by lowering marginal tax rates and changing how secondary and older workers are treated by income and payroll tax schemes.

These measures together can help increase the capital stock and hours worked, thus driving expected economic growth away from the disappointing "new normal."

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[47] Altig, David, Alan J. Auerbach, Laurence J. Kotlikoff, Kent A. Smetters, and Jan Walliser. "Simulating Fundamental Tax Reform in the United States." *The American Economic Review* 91, no. 3 (2001): 574-595.
[48] Robert Carroll and Alan D. Viard. *Progressive Consumption Taxation: The X-Tax Revisited.* AEI Press. June 2012.