

Executive Summary Backgrounder

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Tax Hikes, Economic Clouds, and Silver Linings: A Review of Deficits and the Economy

J. D. Foster, Ph.D.

Taxes harm the economy. Traditionally, those with a bias toward bigger government argue that the injury is minor and worth the societal benefits from increased spending or lower deficits. Those inclined toward smaller government argue that the injury is generally greater. In contrast, a new silver lining argument suggests that higher taxes may be benign and possibly even beneficial to economic growth. As with most fads, this too will pass.

Beyond the year-in, year-out wrestling over the annual federal budget, the pending calamity in Social Security and Medicare finances has made the economic effects of taxes a topic of great concern. These entitlement programs are vital to America's seniors but are unaffordable and unsustainable in their current forms. The options are limited: Congress must pare benefit growth, raise taxes, or enact some combination of the two—all in large amounts. Liberals commonly propose solving the shortfalls by raising taxes, but higher taxes would significantly shrink the economy and force American taxpayers to pay twice to close the funding gap—once in higher taxes and again through lower wages from a weaker economy.

Empirical evidence strongly supports the traditional view that higher taxes are bad for the economy. Yet taxes affect economic activity through many channels, and some evidence suggests that higher taxes can help the economy very modestly through one channel that relates higher taxes to lower interest rates and ultimately to higher invest-

ment levels. Advocates of higher taxes sometimes emphasize this silver lining, ignoring the many bad effects of taxation.

This paper considers the relationship between taxation and the economy from three perspectives: the historical record, the economic and revenue feedback effect, and the silver lining theory.

The Dark Clouds. In a recent study, Christina Romer and David Romer, professors of economics at the University of California at Berkeley, examined significant tax changes and the ensuing economic performances during the postwar period and found strong evidence that higher taxes tend to diminish economic activity. A study by Greg Mankiw and Matthew Weinzierl of Harvard University sheds additional light on the question. They found that reducing taxes on labor significantly improved economic performance, and reducing taxes on capital had an even stronger beneficial effect.

These two studies confirm the conventional wisdom that higher taxes diminish economic vitality, and they arrived at their common conclusion from very different approaches.

This paper, in its entirety, can be found at:
www.heritage.org/research/Taxes/bg2095.cfm

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The Silver Lining Theory of Higher Taxes. The opposing argument is that higher taxes lead to an increase in national saving, which in turn puts downward pressure on real interest rates, leading to higher levels of national investment and output. This narrow yet plausible argument rests on a chain of testable economic relationships:

Together, the two studies suggest a developing consensus that deficit reduction has a very slight effect on real interest rates and therefore would not appreciably affect the level of economic activity.

Tax changes affect the economy through many channels. The silver lining theory emphasizes the effects of deficit reduction on investment, but taxes

Silver Lining Theory



The argument's strength is that only one link—increased national saving leads to lower real interest rates—is controversial, but every link must be valid for the narrow argument to hold. The links must also be robust for the theory to be relevant. Otherwise, the broader range of negative effects from taxes would overwhelm the narrow positive effect from higher taxes. Advocates naturally focus on the possible silver lining, ignoring the dark clouds of negative economic effects.

Eric Engin of the National Bureau of Economic Research and Glenn Hubbard, Dean of the Columbia Business School, recently examined the historical record of government debt and interest rates. Using a theoretical framework relating government debt, investment levels, and real interest rates, Engin and Hubbard found a slight positive relationship between federal debt and interest rates. An increase in federal government debt of 1 percent of gross domestic product (GDP) would increase the long-term real interest rate by only about 3 basis points, or 0.03 percentage points.

A study by Thomas Laubach at the Federal Reserve found a similar result by looking at the effects of projected fiscal policies on longer-horizon interest rates rather than current levels of long-term interest rates. Laubach found that a 1 percentage point increase in the projected debt-to-GDP ratio would be expected to raise future interest rates by about 4 to 5 basis points.

also distort economic decision making by reducing the amount of investment that businesses are willing to undertake and the amount of labor that workers are willing to supply. Taxes also distort the allocation of resources in the economy. The accumulated negative effects of these various distortions more than offset any beneficial effect associated with the silver lining theory.

Conclusion. On balance, clear and compelling evidence shows that higher taxes reduce economic output. The silver lining theory argues that higher taxes could lead indirectly to a stronger economy through a chain of effects, but the evidence suggests that the effect is extremely weak and easily overwhelmed by the negative direct effects of raising taxes. In short, the evidence supports the view that tax increases harm economic performance.

As a first priority, federal, state, and local policymakers should eschew tax increases. As the tax burden in the United States continues to rise, policymakers at all levels of government should pursue tax relief to preserve and enhance a strong economy.

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Advocates of higher taxes traditionally justify their policies by the spending that they support, either directly by linking taxes to spending or indirectly by linking taxes to deficit reduction. In either case, when pressed they would begrudgingly acknowledge the harmful economic effects of higher taxes but argue that these effects are an acceptable price to pay for the benefits associated with the spending.

In recent years, some advocates have shifted to arguing that higher taxes are benign with respect to the economy and, in some circumstances, can actually enhance economic performance. This raises a fundamental question: Do higher taxes lead to a stronger economy?

Beyond the year-in, year-out wrestling over public finances and spending, the pending calamity in Social Security and Medicare finances has made the economic effects of taxes a topic of great concern. These entitlement programs are vital to America's seniors but unaffordable and unsustainable in their current forms. The options are limited: Congress must pare benefit growth, raise taxes, or enact some combination of the two—all in large amounts.

Not surprisingly, one typical liberal response to sustain Social Security and Medicare is to raise taxes. This is clear from today's policy and political debates, but this response tends to fall flat if higher taxes hurt the economy. If the traditional view that higher taxes are bad for the economy is correct, then this liberal response would effectively ask American taxpayers to pay twice to close the funding gap created by excess-

Talking Points

- Recent empirical work using different approaches affirms the traditional view that there is a clear and robust relationship between lower taxes and higher economic output.
- Advocates of tax increases have offered a theory by which higher taxes can benefit the economy. This "silver lining" theory relies heavily on the premise that lower government deficits reduce real interest rates.
- While the narrow silver lining theory has merit, the positive effect on investment and output from lower real interest rates appears to be minimal and is overwhelmed by the many negative effects of raising taxes.
- Federal, state, and local policymakers should therefore look for every opportunity to reduce taxes, especially those that are most harmful to economic growth such as marginal tax rates and taxes on saving and investment.

This paper, in its entirety, can be found at:
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sive entitlement program promises—once in higher taxes and again through lower wages from a weaker economy.

With both near-term and long-term pressures to raise taxes building, what does the evidence say regarding the effects of taxes on the economy? According to most economic traditions, higher taxes result in lower incomes and less economic output. In the Keynesian tradition, higher levels of taxes depress aggregate demand. In standard public finance, higher taxes permit more government spending, which means that fewer resources are available to the generally more productive private sector. In the microeconomic and supply-side traditions, higher taxes lead to greater distortions in economic decision making, which generally results in poorer economic outcomes.

In contrast, the budding liberal tradition is that higher taxes are benign or possibly even beneficial. So which is it? Are higher taxes good or bad for the economy?

As discussed in this paper, the evidence very much supports the traditional view that higher taxes are bad for the economy. Taxes affect economic activity through many channels, however, and the evidence suggests one channel through which higher taxes can strengthen the economy, albeit very modestly. This channel relates higher taxes to lower interest rates and ultimately higher investment levels. Advocates of higher taxes sometimes emphasize this “silver lining” channel but ignore the many other channels through which high tax levels have deleterious effects on the economy. The evidence strongly suggests that while the silver lining theory has some substance, it is ultimately threadbare, overwhelmed by the many dark economic clouds that arise from higher tax levels.

Evidence and Arguments on Aggregate Tax Levels

There are many ways to examine evidence as to whether higher taxes result in more or less economic activity. The following discussion considers

the question from three perspectives: the historical record, the economic and revenue feedback effect of tax changes, and the validity of the silver lining theory of high tax levels.

The Post-World War II Record. In a recent study, Christina Romer and David Romer, professors of economics at the University of California at Berkeley, examined significant tax changes and the ensuing economic performances during the post-war period.¹

The level of taxation can change for many reasons. Reliably estimating the historical relationship between changes in tax policy and changes in economic performance requires filtering out episodes that may distort the results. For example, it is important to distinguish between changes in tax levels caused by changes in the economy and those caused by changes in the tax law. In other words, the direction of causality matters.

Rapid economic growth may cause tax receipts to soar, as happened at the end of the 1990s when tax receipts tied the all-time record of 20.9 percent of gross domestic product (GDP). Strong economic growth generating high tax levels can then lead to the spurious observation that high taxes caused the strong economy. The converse is also possible. As seen at the beginning of this decade, a recession will slow the growth in tax receipts or even cause overall tax levels to plummet. This could suggest that a lower level of taxes is associated in some causal sense with weaker economic performance. Including such episodes in the study would distort the results. Hence, it is important to exclude episodes when significant changes in tax levels were driven by economic changes.

Similarly, it is important to identify the motivations for tax legislation and to exclude those intended as countercyclical policy. Well-timed tax cuts may prevent an economic downturn or reduce its depth and duration. If the tax cuts are enacted with sufficient timeliness and strength to short-circuit a recession, then the national data will show no real signs of the recession that was averted. In such

1. Christina D. Romer and David H. Romer, “The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks,” University of California at Berkeley, July 2007, at <http://elsa.berkeley.edu/~cromer/RomerandRomer707.pdf> (December 6, 2007).

a case, effective pro-growth, countercyclical tax cuts will seem to have had no economic effect. Similarly, if tax changes were enacted during a recession, it would be difficult to determine whether normal economic growth resumed sooner or later than if there had been no tax changes.

The best test of how tax policy affects the economy excludes those episodes when tax levels changed due to changes in economic performance or when tax policy was changed to restore or maintain normal economic growth. This leaves two types of tax policy changes to include in the analysis. The first type arises when Congress changes tax policy and thus the level of taxation for reasons other than economic growth, such as to improve the perceived fairness of the tax system. Even though not motivated by economic considerations, such legislative tax changes nevertheless offer good tests of the general relationship between the level of tax collections and the economy.

The second type includes tax changes that were enacted with the expressed intent of improving economic performance beyond the near term. For example, Congress has sometimes cut taxes to strengthen the economy on a sustained basis, such as the 1981 Reagan tax cut and the 2001 and 2003 Bush tax cuts. Of course, such tax cuts are sometimes also intended to address near-term economic weakness, but the authors concluded that there was a longer-term consideration that was sufficient to warrant inclusion in the study. Conversely, Congress has sometimes announced that it is raising taxes to strengthen the economy, as with the 1991 tax hike signed by President George H. W. Bush and the 1993 tax hike ushered through Congress by President Bill Clinton.

Romer and Romer used the official narrative record to distinguish legislated tax changes from changes in tax levels attributable to other causes and to identify the motivations behind the legislation. For the executive branch, the narrative record includes the Economic Report of the President, which typically discusses the major tax proposals in some detail; the President's annual budget submis-

sion; and the State of the Union address. For the congressional branch narrative, the authors relied on committee reports, conference reports, and summaries provided by the Joint Tax Committee and the Congressional Budget Office.

Using these criteria, the authors identified 49 relevant tax law changes and administrative actions between 1947 and 2006. Of these, just under two-thirds produced tax changes in the ensuing quarters that were appropriate for study. Using these tax law changes, the authors were then able to assess the central question: Were tax hikes associated with lower economic activity?

The Romer and Romer study presents strong evidence that higher taxes tend to diminish economic activity. It found that a tax increase of 1 percent of GDP initially has a modest downward effect on output and that the effect grows rapidly before leveling off after 10 quarters for a maximum effect of lowering GDP by 3 percentage points. Applied to 2007, the study suggests that after two to three years, a tax increase of about 1 percent of GDP (about \$135 billion) would reduce output by about \$400 billion annually.

When expressed as tax reductions rather than as tax increases, the study found that "tax cuts have very large and persistent positive output effects."² Moreover, the authors emphasized that these results were "strongly significant, highly robust, and much larger than those obtained using broader measures of tax changes."³ In other words, the modern historical record strongly suggests a clear and robust relationship between lower taxes and higher economic output.

A View on the Economic and Revenue Feedback Effect. Taxes affect the economy in many ways. Taxes reduce the resources available to the economy by distorting economic incentives, so less labor is provided, less capital in the form of new saving is available, and less investment in education and new plant and equipment occurs. In addition, the distortions mean that resources employed in the economy are often not put to their most productive uses, further reducing national output and incomes. These are some of the avenues through which

2. *Ibid.*, p. 20.

3. *Ibid.*, abstract.

higher taxes reduce economic output, as found in the Romer and Romer study.

A recent National Bureau of Economic Research *Working Paper* by Greg Mankiw and Matthew Weinzierl, both of Harvard University, sheds additional light on the magnitude of the effects of taxes on the economy.⁴ In contrast to Romer and Romer, Mankiw and Weinzierl were interested primarily in identifying the feedback effects of tax changes. For example, if Congress reduced the tax on capital income without any consequent change in the level of economic activity or taxpayer behavior, then the tax policy change would obviously reduce tax receipts. This is sometimes referred to as the static revenue effect. However, such a tax reduction would increase the level of investment and therefore the level of output and income. The tax revenue gained from this increase in income is the revenue feedback effect, sometimes called the dynamic effect.

To measure the feedback effect, Mankiw and Weinzierl started with a standard neoclassical growth model of the economy, or the Ramsey model. A neoclassical growth model suggests the general nature of the relationships among capital, labor, and output. To make the model operational, the authors applied conventional parameter values for key variables, such as the responsiveness of labor supply to changes in the after-tax wage rate.

Every economic model rests on certain assumptions, so it is important to examine how alternative assumptions affect the robustness of the model's results. For example, the standard Ramsey model assumes an infinite-horizon consumer, which is a simple way of ensuring that the participants in the economy, such as workers and investors, make wise decisions in terms of both current and future consequences. However, it is more intuitive to assume that individuals operate with finite horizons, so Mankiw and Weinzierl introduced finite-horizon consumers into the model. Similarly, the authors considered the effect of assuming imperfect competition in the market for goods in lieu of the typical perfect competition assumption.

In all the variations they tested, Mankiw and Weinzierl found that changing the tax on capital or on labor produced a significant revenue feedback effect and thus implied a significant economic response. Specifically, the authors found that reducing the tax on capital produced a dynamic effect equal to about one-half of the static effect. This dynamic revenue effect can then be used to infer the extent of the change in the overall economy.

For example, if the initial effective tax rates on capital and labor are 25 percent and a 1 percentage point increase in the tax on capital is expected to raise \$20 billion per year on a static basis, then the resulting reduction in economic activity from the tax increase will reduce the revenue gain to \$10 billion. At a 25 percent effective tax rate, this result implies that the tax hike would permanently reduce annual economic activity by about \$40 billion.

Changing the tax rate on labor supply also produces a significant, although smaller, dynamic effect of about 17 percent. This means that a tax increase on labor that was intended to raise \$20 billion by static scoring would increase actual receipts by only \$16.6 billion because it would reduce economic activity by \$13.4 billion.

These results correspond well with another result from the Romer and Romer study. Romer and Romer found that a tax increase equivalent to about 1 percentage point of GDP lowers real GDP by 3 percentage points, and it does so predominantly by reducing the level of investment. The overall decline in business investment according to this analysis is 12.6 percent, but the authors noted that this figure appears to be heavily influenced by inventory investment responding to a cyclical effect from the tax hike. The authors found that non-inventory business investment (i.e., investment in business plants and equipment) declines by a still very significant 6.2 percent per percentage point increase in the tax on capital.⁵

Of course, Congress could raise taxes in a way that does not change the effective marginal tax rates

4. N. Gregory Mankiw and Matthew Weinzierl, "Dynamic Scoring: A Back-of-the-Envelope Guide," National Bureau of Economic Research *Working Paper* No. 11000, December 2004.

5. See Romer and Romer, "The Macroeconomic Effects of Tax Changes," p. 37.

on capital and labor. Many provisions in the tax code, especially in the individual income tax, could be eliminated to raise the average tax rate without affecting economically sensitive marginal tax rates. Examples include the child tax credit, the standard deduction, and personal exemptions. However, if recent debate is any guide, those who support tax increases are most interested in the kinds of tax policies that would raise the effective marginal tax rates on labor and capital, such as higher top income tax rates, higher corporate income tax rates, higher levies on capital gains and dividends, raising or eliminating the income cap on payroll taxes, restoring the estate and gift tax, and a new surtax on upper-income earners.⁶

The Romer and Romer study and the Mankiw and Weinzierl study confirm the conventional wisdom that higher taxes diminish economic vitality. Their importance is heightened when they are considered together because the two studies took very different approaches to reach their common conclusion. Nevertheless, two academic studies, regardless of how careful and innovative they are and how well-respected their authors are, cannot settle the question of whether higher taxes are economically harmful, benign, or helpful, and they certainly cannot settle the question before giving due consideration to the opposing argument from the advocates of tax hikes.

The Silver Lining Theory of Higher Taxes. Some advocates of higher taxes argue that higher taxes can strengthen the economy. The theory is that higher taxes lead to an increase in national saving, which in turn puts downward pressure on real interest rates and leads to higher levels of national investment and output. This is a narrow yet plausible argument resting on a chain of testable economic relationships. If each link in the chain proves to be valid and robust, then the argument has merit.

The strength of the tax hike argument is that all but one of the economic links are noncontroversial. A weakness is that all of the connections must be valid for the narrow argument to hold, and the connections must be robust for the theory to be relevant. A greater weakness is that even if the narrow theory is valid, the narrow positive effect from higher taxes must be weighed against the broader range of negative effects that taxes have on investment specifically and on the economy in general. This theory might be called the “silver lining” theory of tax policy: Within the dark clouds of negative economic effects from higher taxes, advocates ignore the billowing clouds to focus on a possible silver lining.

The argument begins with the observation that an increase in taxes, holding all else constant, will reduce the budget deficit and thus raise public saving. This is not generally a controversial proposition as long as Congress does not increase spending in response to the higher revenues. However, Congress has a long history of spending virtually every dollar it can, so an increase in tax revenues would likely soon be matched with a like increase in spending. Yet the issue here is the possibility of a positive economic outcome, so the assumption that Congress holds spending constant is sustained.

The next link in the chain is that an increase in public saving results in an increase in national saving. This would seem to be an obvious connection, but a respected theory suggests that private saving may adjust in the opposite direction of public saving.⁷ Nevertheless, the argument that national saving would increase is sufficiently intuitive and straightforward to permit acceptance here.

The silver lining theory ultimately hangs on the next link in the chain: that a significant increase in national saving will produce a material reduction in interest rates. Those who make this argument are generally referring to lower long-term real (inflation-adjusted) interest rates.

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6. See J. D. Foster, “The Rangel Bill: Roses Among the Thorns,” Heritage Foundation WebMemo No. 1679, October 26, 2007, at www.heritage.org/Research/Taxes/wm1679.cfm, and “AMT Fix Becomes Massive Tax Hike Via Misleading CBO Baselines,” Heritage Foundation WebMemo No. 1695, November 7, 2007, at www.heritage.org/Research/Taxes/wm1695.cfm.
 7. The idea behind this theory, sometimes called Ricardian Equivalence, is that citizens are aware of the implications of current fiscal policy and react accordingly. For example, they are aware of deficit spending and the implications for future tax levels. Consequently, a tax increase that reduces deficit spending means that taxpayers may reduce their own saving today because they will need fewer resources in the future to pay off the national debt.

On a purely theoretical basis, this is a highly debated proposition for a modern, open economy. The United States is typically a net importer of saving from abroad as U.S. net imports of foreign saving match U.S. net imports of goods and services in the balance of payments. Under these circumstances, an increase in public saving due to a tax increase could simply supplant a like amount of saving imported from abroad. If this occurs, then a change in tax levels would not appreciably affect real long-term interest rates.

However, the relationship between government deficits and debt on the one hand and real interest rates on the other is empirically testable. Findings from two recent studies that speak to this proposition are presented in the next section.

The next link in the chain is that reducing the real long-term interest rate increases business investment. There is no real dispute as to the direction of the effect: A reduction in real interest rates should increase the level of capital employed. However, theory provides little guidance as to how much additional capital will be employed for a given reduction in the real interest rate. Furthermore, apparently, no modern research exists seeking to quantify this relationship.

The last link in the chain relates changes in the level of capital used in the economy to changes in the long-run level of overall economic activity. In the long run—that is after the economy has adjusted to these changes—an increase in the amount of capital employed raises long-run economic activity by raising the level of labor productivity. Simply put, more capital per worker means that workers are more productive. This relationship is robust and generally uncontested.

In summary, the total chain of events that comprises the silver lining theory can be shown as follows:

Of these links, only the link between increased national saving through budget deficit reduction and lower real interest rates is seriously controversial.

Real Interest Rates and Federal Borrowing

The debate over the effects of government debt and deficits on real interest rates has a long history and is ongoing. Recently, a pair of studies have garnered broad general acceptance in terms of methodology and results, and their results are largely consistent with one another.

Current Fiscal Policy and Real Interest Rates. Eric Engin of the National Bureau of Economic Research and Glenn Hubbard, Dean of the Columbia Business School, examined the historical record of government debt and interest rates.⁸ They started their analysis by positing a simple, intuitive theoretical relationship in which the value of the additional output from an additional unit of capital determines the real interest rate as shown in Chart 1. The downward-sloping line shows the relationship between the level of capital employed and the resulting real interest rate. If the initial level of capital employed is k_0 , then the real interest rate is r_0 .

If for some reason the level of capital employed in the economy declines to k_1 , the economy will then move back up the sloping line until the interest rate settles at r_1 . Thus, a lower amount of capital employed will mean that the efficiency of the last unit of capital employed is higher, so the real interest rate is higher.

Engin and Hubbard then make the critical assumption that the level of national saving at any point in time is fixed, so a higher level of government debt means less private saving is available for investment. Thus, issuing an additional dollar of government debt reduces or “crowds out” private

Silver Lining Theory



investment by a dollar. With less capital employed, the productive efficiency of the last unit of capital is higher, as is the real interest rate.

This relationship between government debt and interest rates seems straightforward, and the issue would appear to be one of estimating the slope of the line in Chart 1. A steep slope would indicate a strong relationship between government debt and interest rates, whereas a nearly flat line would indicate a weak relationship. However, there is one further complication.

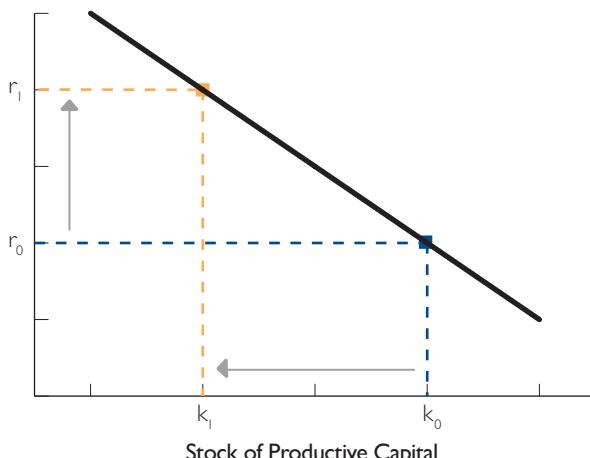
It is certainly true, as the authors assume, that the supply of saving from domestic sources available for domestic investment changes slowly over time. However, the United States imports large amounts of saving from abroad and exports large amounts of saving to foreign investors. In any given period, the net of these flows may be quite large. Thus, the total supply of saving—domestic saving plus net imported saving—may vary significantly over even short periods. In this case, the proposed relationship between government debt and interest rates may be very weak. In effect, if flows of foreign saving are significant, then the slope of the line in Chart 1 will tend toward the horizontal.

Using this theoretical framework relating government debt, investment levels, and real interest rates, Engen and Hubbard found a statistically significant relationship between federal debt and interest rates, but they also found that *the effect is generally very small*. Specifically, the authors found that an increase in the level of federal government debt of 1 percent of GDP would increase the long-term real interest rate by about 3 basis points, or 0.03 percentage point. In terms of Chart 1, the line is nearly but not quite completely flat.

These results have interesting implications for recent experience. Federal government budget deficits have raised the debt-to-GDP ratio from 35.1 percent in 2000 to 37 percent in 2007. According to the Engen and Hubbard analysis, fiscal policy tended to raise the real interest rate over this period by about 6 basis points compared to what it otherwise would have been. The 10-year Treasury bond

Theoretical Relationship Between Capital Stock and Interest Rates

Real Interest Rate



Source: The Heritage Foundation.

rate averaged 4.63 percent in 2007, so this analysis suggests that the rate would have been 4.57 percent if the debt-to-GDP ratio had returned to its 2000 level by 2007. On the other hand, the debt-to-GDP ratio actually fell slightly from 2006 to 2007, suggesting that the improvement in the federal fiscal picture likely exerted some slight downward pressure on the long-term bond rate in 2007.

The slight effect on real interest rates that is attributable to recent changes in the level of federal debt is shown in Chart 2. One line shows the actual 10-year Treasury bond rate for the period. The second line shows what the 10-year Treasury bond rate would have been if the debt-to-GDP ratio had been held constant. The two lines are almost identical, suggesting that federal fiscal policy has not significantly affected real interest rates over this period relative to an interest rate-neutral fiscal policy.

Looking further back into the historical record shows a similarly minuscule and inconsistent effect. In 20 of the years since 1970—just over half of the

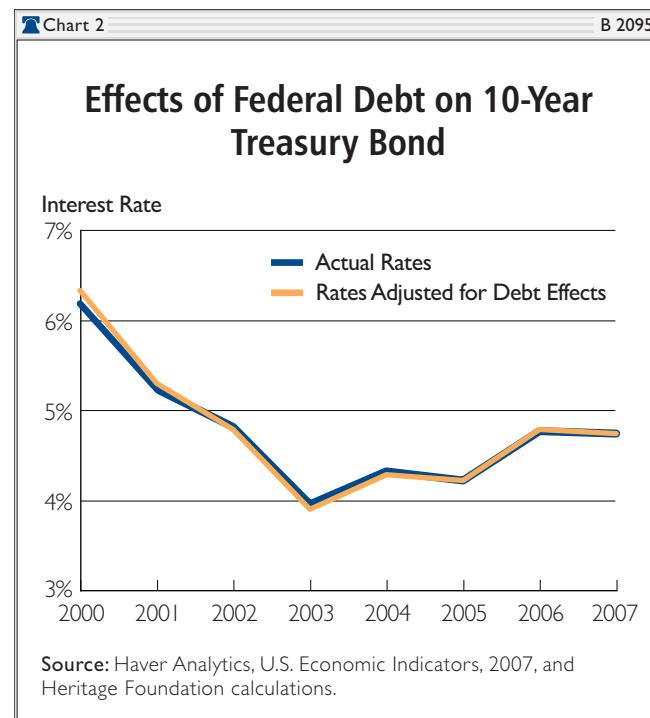
8. Eric M. Engen and R. Glenn Hubbard, "Federal Government Debt and Interest Rates," National Bureau of Economic Research Working Paper No. 10681, August 2004.

time—changes in federal debt exerted a slight upward pressure (averaging about 5 basis points) on long-term real interest rates. However, for almost half the time, changes in federal debt applied a slight downward pressure that averaged about 4 basis points. The strong implication is that, despite all of the fiscal policy changes since 1970, the effects of deficit finance on real interest rates and the economy were minor, verging on inconsequential.

Projections of Fiscal Policy and Future Interest Rates. A second study, performed by Thomas Laubach at the Federal Reserve, found a similar result using a different framework.⁹ Laubach considered the effects of projected fiscal policies as opposed to current policies, and he looked at longer-horizon interest rates rather than current levels of long-term interest rates.

The advantage of the Laubach framework is that many factors affect interest rates, especially in the short run, so isolating the near-term effects of fiscal policy can be difficult. Often, however, these effects are transitory, as when automatic fiscal policy stabilizers operate during a recession or when deficits rise appreciably due to a temporary surge in spending, such as during the response to Hurricane Katrina. Levels of government debt expected to prevail several years into the future are unlikely to be affected materially by the current business cycle or near-term transitory spending patterns and thus are more likely to indicate accurately the influence of government debt on future real interest rates.

Laubach used the five-year forecasts for federal deficits and debt as published by the Congressional Budget Office (CBO) and the Office of Management and Budget (OMB). Budget deficit forecasts are notoriously inaccurate, and their ranges of error grow as the forecast horizon extends further into the future.¹⁰ Nevertheless, the CBO and OMB forecasts



constitute the best publicly available information about future federal fiscal policy at the time of their publication. Therefore, they offer a reasonable basis on which to assess fiscal policy effects, as understood by the market, on future interest rates as set by the market.

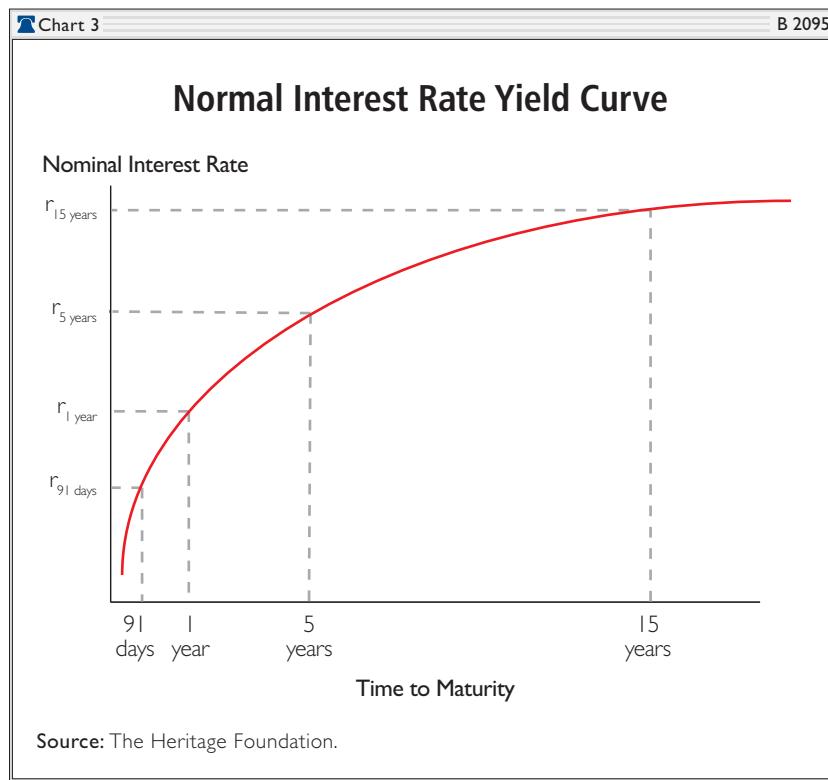
To measure market expectations of future nominal interest rates, Laubach takes advantage of the information embedded in the interest rate yield curve. The yield curve is the relation between interest rates and the terms to maturity of various debt instruments of similar risk characteristics such as the 91-day Treasury bill and the 10-year Treasury bond. Chart 3 shows a typical yield curve. Short-term interest rates tend to be lower than long-term interest rates because the funds are committed for shorter periods.¹¹

9. Thomas Laubach, "New Evidence on the Interest Rate Effects of Budget Deficits and Debt," Board of Governors of the Federal Reserve System, May 2003, at www.federalreserve.gov/pubs/feds/2003/200312/200312pap.pdf (December 6, 2007).
10. For example, see Congressional Budget Office, "The Uncertainty of Budget Projections: A Discussion of Data and Methods," March 2007, at www.cbo.gov/ftpdocs/78xx/doc7837/03-05-Uncertain.pdf (December 6, 2007).
11. Using the yield curve, the market's beliefs about future interest rates over intermediate periods can be deduced arithmetically using the specific points of time along the curve. For example, using the term structure of interest rates and a Treasury bond maturing in 20 years, one can calculate the market's expected interest rate for a 10-year bond maturing in 2022 that would be sold in 2012.

Laubach used this information on government forecasts of *future* debt levels relative to GDP to determine whether there was a consistent relationship to market expectations about *future* interest rates. The analysis revealed a statistically significant relationship in that a 1 percentage point increase in the projected debt-to-GDP ratio would be expected to raise future interest rates by about 4 to 5 basis points. This result is both quantitatively small and remarkably close to the 3-basis-point effect found by Engin and Hubbard.

These results have implications for current level interest rates. At the end of 2007, the debt-to-GDP ratio stood at 36.8 percent. The latest OMB forecasts show budget deficits through 2013, but they are sufficiently small relative to the size of the economy that the debt-to-GDP ratio falls to 33.4 percent by 2013.¹² Similarly, the CBO forecasts a 33.2 percent debt-to-GDP ratio in 2013.¹³ The average of the two forecasts for 2013 is 31.6 percent, or 4.3 percentage points below the 2007 level. The Laubach study suggests, therefore, that the expected progress on reducing the debt-to-GDP ratio over the next few years is putting downward pressure on long-term interest rates equivalent to 15 to 20 basis points.

Together, the Engin and Hubbard study and the Laubach study suggest a tentative, developing consensus about the general magnitude of the effects of deficit financing on real interest rates. The studies appear to suggest that, for deficits and debt levels in the ranges seen in recent years and projected in the medium term, the effects on real interest rates are in the expected direction, consistent across episodes and across estimating methodologies, and very slight—measured in terms of a handful of basis points.



Recap of the Silver Lining Theory

The silver lining theory argues that higher taxes could lead to a stronger economy through a chain of connected effects, including a real interest rate effect. There is little dispute that a generic increase in taxes will increase national saving. Nor is there much dispute about the direction of change in the economy resulting from a change in real interest rates: Lower real interest rates would increase the amount of capital employed in the economy, raising output by raising productivity. The silver lining theory's validity and relevance stands or falls on whether or not government deficits significantly affect real interest rates.

The consensus seems to be that there is a relationship between deficits and debt on the one hand and real interest rates on the other, but that it is very, very weak, so the resulting increase in investment and output as posited by the silver lining theory

12. Office of Management and Budget, *Budget of the U.S. Government, Fiscal Year 2009*, February 4, 2008, at www.whitehouse.gov/omb/budget/fy2009/pdf/budget.pdf (February 25, 2008).

13. Congressional Budget Office, "The Budget and Economic Outlook: Fiscal Years 2008 to 2018," January 2008, at www.cbo.gov/ftpdocs/89xx/doc8917/01-23-2008_BudgetOutlook.pdf (February 25, 2008).

would be commensurately weak. With respect to this specific set of relationships emphasizing the importance of changes in the real interest rate, the answer seems to be that tax changes of the usual magnitude would have little appreciable effect on the level of economic activity. The silver lining theory turns out to be rather threadbare.

Taxes, Real Interest Rates, and Investment

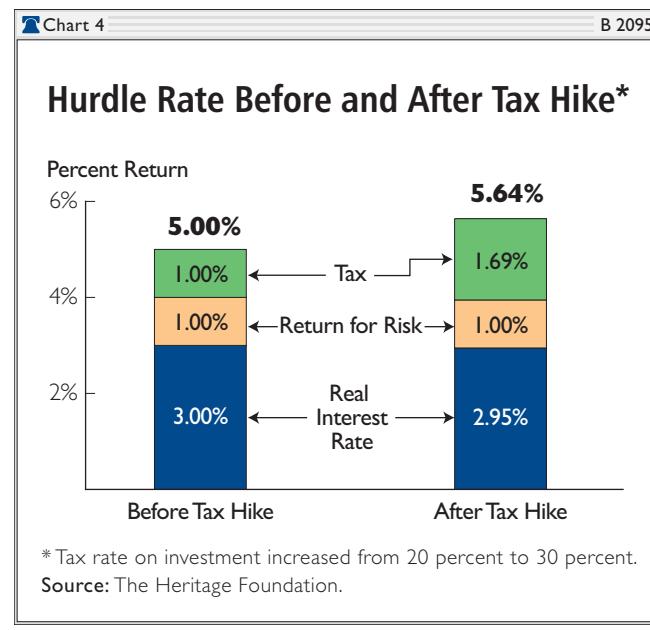
Tax changes affect the economy through many channels. Because the silver lining theory emphasizes investment, it is worthwhile to explore the relationship between taxes and investment a bit further.

As described above, a tax increase that raises public saving would be expected to exert very slight downward pressure on real interest rates, which would tend to raise the level of investment by some undetermined amount. However, if the tax increase was on capital, then the offsetting effects on investment must be considered. When looking at silver linings, one cannot ignore the darkness of the clouds.

Every investment must earn enough to compensate the investor on an after-tax basis for the time value of money (i.e., the real interest rate) and the risks associated with the investment.¹⁴ In addition, the investment must earn enough to cover the taxes that will be subtracted from its gross earnings. The combination of these factors is variously referred to as the cost of capital, the service price of capital, or the hurdle rate on investment. The important point is that no investment is undertaken if it is not expected to generate a return in excess of the hurdle rate.

For example, if the real interest rate were 3 percent per year and compensating investors for risk required an additional 1 percent per year, the required real after-tax return would total 4 percent. If the tax rate on the returns to this investment were 20 percent, then the (before tax) hurdle rate on this investment would be 5 percent.

If the tax on capital income were raised to 30 percent and the proceeds were used entirely for deficit reduction, then the real interest rate would



decline to 2.95 percent and the required after-tax return would fall to 3.95 percent, as tax increase advocates suggest. However, the increased tax rate on capital income would raise the hurdle rate to 5.64 percent—an increase of 12 percent. Despite the suggested real interest rate effect, the net consequence of the tax increase would be a significant reduction in investment and economic activity.

This is just one example of many that could explain why the modest positive effect of a tax increase through real interest rates and investment is overwhelmed in practice to produce the traditional result that higher taxes result in less prosperity. Alternatively, if the tax increase falls wholly on labor, the reduction in labor supply must be balanced against the improvement in investment incentives caused by a minute fall in real interest rates. Again, the net result would be a smaller economy.

The implication is that tax increases do indeed harm the processes of economic growth and that arguments to the contrary are not well supported. Federal policymakers should therefore look for every opportunity to reduce taxes, especially those that are most harmful to economic growth such as marginal tax rates and taxes on saving and investment.

14. To simplify the discussion, I assume physical capital does not depreciate.

Conclusion

On balance, clear and compelling evidence shows that higher taxes reduce economic output. The silver lining argument appears to be valid within a narrow scope of influence on the economy, but it is overwhelmed by the dark clouds of weaker economic performance caused by other effects of higher taxes.

The argument that tax increases are economically beneficial must establish a positive net effect from two opposing elements: The gain due to increased capital investment from a lower real interest rate must exceed the losses in output due to the increased economic distortions from the tax hike. Even granting that lower deficits bring downward pressure on real interest rates, the effect appears to be minimal—in the hundredths of a percentage point. Yet even granting that such a real-interest-rate effect exists, proponents of tax hikes as being pro-growth must then establish that the resulting encouragement for business investment exceeds the downward pressures on business investment and

labor supply and the misallocation of resources from higher taxes.

Given the modest potential gains in business investment from deficit reduction and the potentially significant losses in both business investment and labor supply from a tax hike, it seems entirely implausible that most hikes under consideration would not harm the economy. The silver lining theory is superficially appealing and has the rhetorical merit of being relatively easy to explain. However, its strengths end there.

In short, the evidence supports the view that tax increases harm economic performance. As a first priority, federal, state, and local policymakers should eschew tax increases. As the tax burden in the United States continues to rise, policymakers at all levels of government should pursue tax relief to preserve and enhance a strong economy.

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